



Bristol Radio Control Model Aircraft Club (BRCMAC)

February 2015 Newsletter

Chairman's Chat

At last the days are getting longer and although still cold we have managed to get some weekend flying in. No doubt some of our new members will see a real difference as the weather gets warmer and flying hours can be extended. It is always difficult flying in winter, if as now it has been wet and windy rather than cold and frosty.

As our editor has mentioned in this newsletter, we now have a new website and forum, this is your Club and actively getting involved in the forum and adding website content is essential if we are going to keep this site interesting.

Steve Bridges is our Webmaster and is asking for more photos of our planes and details of their specification, he will add to the website anything you send in.

We have many members that have a vast amount of modelling experience,(see our Editor's contribution below), a variety of skills and many with alternative hobbies and interesting careers both past and present, so please sign on to the forum and make a contribution.

Just to keep you in the picture, we had two broken fence posts on the bridal path side of the site, (thanks to those members that notified us). On Saturday, Murray, James, Steve and I repaired these a lot faster than expected. We still had enough time to fly. Since these posts have been up for five years, we expect more to let go this season, please keep us informed if you see fences down.

We are also replacing the wheel bearings on our trailer as this is currently not roadworthy.

We had an interesting presentation at our February meeting from Wing Commander Steve Chappell from the RAF Historical Society and we raised £50.00 for the British Royal Legion that they support, thanks to those members that contributed.

Don't forget our next meeting on 3rd March at the Chantry is a '**Bring & Buy**' plus indoor flying. Send any details of kits or accessories that you want to sell to Steve Bridges (webmaster@brcmac.org.uk) and he will add them to the sales banner on the forum in advance of the meeting. There is a lot for sale already, sign on the forum and have a look!

Ian Ferrari

New Club Web Site & Forum

Those of you who attended the February meeting at The Chantry and seen Steve Bridges' excellent presentation will be aware of that the new BRCMAC Web Site has now been officially launched. You can access it simply by typing 'BRCMAC' into your web browser and the new site should be the first one up there, or by the following link: <http://brcmac.org.uk/wp/>

The new site has been considerably updated and has a much more modern feel to it. It uses many new web features, with streaming banner photos and many embedded links.

By clicking on the 'Members' tab at the top of the page, this will take you into the Club Forum where you can post questions and generally communicate with the whole club membership on any model aviation related subject you like. Initial registration is simple. Just follow the on-screen instructions.

Have a look and see what you think. Steve Bridges, our Webmaster, is happy to receive any constructive criticism.

Finally, I would like to offer grateful thanks to Sarah Frazer who maintained the old web site for many years but has now decided to pass the baton on. Thank you Sarah for all your hard work.

Peter Bennett

Multi-rotor Flying

An interesting point was raised at last year's AGM concerning the Club's policy regarding the flying of multi-rotor aircraft. We treat them just the same as any other rotary winged aircraft, including the requirement for the pilot to have the appropriate 'A' certificate before he can fly unsupervised at the field. It is also essential that pilots of such aircraft maintain at all times unaided visual contact with their aircraft.

The BMFA has published a very useful guide on the subject in its recent Bulletin 219. I make no apology for reproducing the rather lengthy extract from it below:

MULTIROTOR MODEL AIRCRAFT EQUIPPED WITH CAMERAS LEGAL REQUIREMENTS AND GUIDANCE

The sport of model flying has undergone some significant changes over the last few years, many of them technology based. Developments in areas such as batteries, motors and control systems have made types of aircraft that were previously only within the remit of the experienced and resourceful home builder, a practical "off the shelf" proposition.

The BMFA regularly receives queries from enthusiastic potential aviators particularly, with regard to aerial photography and the use of multirotors as a tool for this purpose. This document aims to answer some of the questions that we are asked on a regular basis by novice pilots and also by modellers who have flown more traditional types of model aircraft, and are branching out into multirotor aircraft and aerial imaging for the first time, (the majority of this guidance also applies to any type of model aircraft used to carry a camera).

Camera carrying aircraft come in all shapes and sizes, from the micro quadcopters with tiny built in cameras, to the larger multirotors capable of supporting a considerable payload and imaging capability, many newcomers to this aspect of model flying will purchase the readily available medium sized quadcopters capable of lifting popular "action" cameras.

The important point before flying your camera equipped multirotor is to be clear on the legal restrictions and conditions placed on this type of activity.

THE LEGAL POSITION

The operation of multirotors for sport and recreational purposes is covered by the same legal considerations as other model aircraft; the law makes no specific distinction on types of aircraft other than weight limits.

The overriding consideration is compliance with the relevant articles of the Civil Aviation, Air Navigation Order; the primary "endangering" provisions are addressed by Articles 138 and 137 which are reproduced below:

Article 138;

"A person must not recklessly or negligently cause or permit an aircraft to endanger any person or property"

Article 137;

'A person must not recklessly or negligently act in a manner likely to endanger an aircraft, or any person in an aircraft'

THESE APPLY TO ALL MODEL AIRCRAFT AT ALL TIMES, WHATEVER THEIR WEIGHT OR SIZE.

Article 166 (set out below) covers the general principles that again apply to all model aircraft, however, only the provisions that specifically apply to the activity we are discussing here are included, the conditions applying to aircraft weighing in excess of 7kg have been removed as in multirotor terms, these are fairly specialized pieces of equipment more usually employed in aerial work.

Article 166, (Small Unmanned Aircraft)

(2) The person in charge of a small unmanned aircraft may only fly the aircraft if reasonably satisfied that the flight can safely be made.

(3) The person in charge of a small unmanned aircraft must maintain direct, unaided visual contact with the aircraft sufficient to monitor its flight path in relation to other aircraft, persons, vehicles, vessels and structures for the purpose of avoiding collisions.

(5) The person in charge of a small unmanned aircraft must not fly the aircraft for the purposes of aerial work except in accordance with a permission granted by the CAA.

Perhaps the most relevant provisions in terms of photography/filming with model aircraft as a sport and recreational activity are covered within Article 167 below, which sets out the basic conditions of operation as well as specifying exact distances.

Article 167, (Small unmanned surveillance aircraft)

The person in charge of a small unmanned surveillance aircraft must not fly the aircraft in any of the circumstances described in paragraph (2) except in accordance with a permission issued by the CAA.

(2) The circumstances referred to in paragraph (1) are:-

(a) over or within 150 metres of any congested area;

(b) over or within 150 metres of an organised open-air assembly of more than 1,000 persons;

(c) within 50 metres of any vessel, vehicle or structure which is not under the control of the person in charge of the aircraft; or

(d) subject to paragraphs (3) and (4), within 50 metres of any person.

(3) Subject to paragraph (4), during take-off or landing, a small unmanned surveillance aircraft must not be flown within 30 metres of any person.

(4) Paragraphs (2) (d) and (3) do not apply to the person in charge of the small unmanned surveillance aircraft or a person under the control of the person in charge of the aircraft.

(5) In this article 'a small unmanned surveillance aircraft' means a small unmanned aircraft which is equipped to undertake any form of surveillance or data acquisition.

The BMFA Members Handbook also contains the following notes which help to clarify the conditions outlined within Article 167.

BMFA Notes.

They are only concerned with models equipped with cameras, video equipment etc. that have the potential to be used for surveillance purposes, either visual or electronic. It should also be noted that the above legislation (articles 166 and 167) does NOT prohibit you from flying a camera or video equipped model for recreational purposes. The person in charge of the model must retain direct visual contact with the model (Article 166) and there are some restrictions as to where you can fly (Article 167). Probably the most important of these restrictions are the limits of not flying within 50 metres of any person or 30 metres from any person during take-off and landing and these are exactly the same as for any model over 7 kg.

THE PRACTICAL APPLICATION

As ever a little common sense goes a long way towards interpreting and complying with the relevant legal requirements.

The primary aim of the various Air Navigation Order provisions is to prevent members of the public being endangered and full size aviation being endangered, to a lesser degree these provisions also help to limit the potential for causing nuisance and for invading privacy.

In terms of filming or image capturing this limits how close we can get to people and structures that are nothing to do with us (i.e. not under the control of the pilot), however the positive aspect is that the wording of 167(c) permits closer operations where it is with the consent and knowledge of all parties involved (notwithstanding the primary endangering considerations of course).

AERIAL WORK OR SPORT AND RECREATION?

Another primary consideration is the purpose of the flight, the flying of a model aircraft with a camera on board is recognised as a sport and recreational activity by the CAA and therefore covered under the terms of the insurance provided as part of the BMFA membership package (provided that the activity is legal in respect of the Air Navigation Order).

However, where a flight is made for payment or the purpose is in any way commercial i.e. not as a sport and recreational activity, then it becomes classed as aerial work by the CAA and requires an exemption to the Air Navigation Order to be issued in order to take place lawfully.

Details of aerial work and exemption application information can be obtained through the CAA website www.caa.co.uk

It should be borne in mind that “aerial work” is an entirely separate activity to model flying, and as such it must be insured under the terms of an appropriate commercial policy, the standard policy provided to BMFA members does not provide cover for aerial photography on a commercial basis.

FLYING LOCATIONS

We receive regular queries regarding appropriate flying locations for multirotor aircraft. Whilst the overall considerations are the same as for any other model aircraft, there is no doubt that multirotors open up new areas for flying due to their ability to operate in relatively small spaces, this does however mean that careful consideration is required before flying in order to remain lawful.

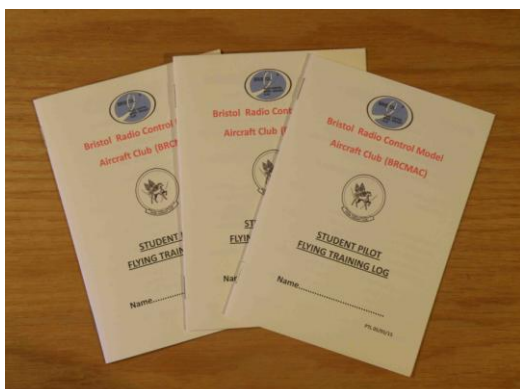
If intending to fly on private land then the permission of the landowner should be sought, if flying on public land such as a park or open access site then you must ensure that there are no bylaws in place specifically prohibiting or restricting model flying.

The other main consideration is the overall suitability of the location for the activity, and that all flying can take place in compliance with the primary “endangering” provisions of the ANO (Articles 137 and 138) and also in accordance with the distances set out in Article 167 above.

IN SUMMARY

- Be familiar with the legal requirements relating to your chosen activity.
- Do not endanger person or property.
- Ensure that the proposed flying location is appropriate and safe.
- Maintain line of site for the purposes of control at all times (see CAA Exemption for specific details of FPV flight permissions).
- Charging for flights renders the activity Aerial Work.
- Do not constitute a nuisance.
- Do not invade privacy.
- Ensure that appropriate liability insurance cover is in place to protect you in the event of an incident leading to a claim against you.

Training Flight Logs



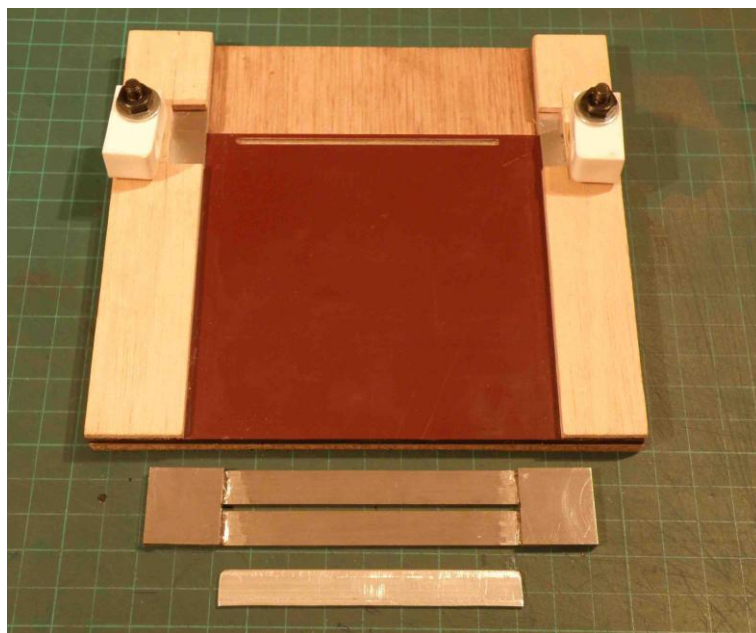
As discussed at the AGM, editions of the new Flight Training Logs have now been produced and are being distributed to all Instructors for use with new trainees. If you need one but do not have one, contact Peter Bennett or Ian Ferrari.

Making a scale Vickers Gun

While making a model of a WWI fighter some while ago, I was frustrated at the lack of any really decent kits of an air-cooled Vickers machine gun (as opposed to the water cooled versions used by ground troops), especially in my chosen scale of 1/5. So I decided to have a go and make one myself.

Reference Material First, I needed some reference material. Fortunately, the Windsock Data Publication on Vickers Guns gives a detailed history of the gun itself and includes some very useful line drawings. I acquired a copy and enlarged the drawings to 1/5 scale.

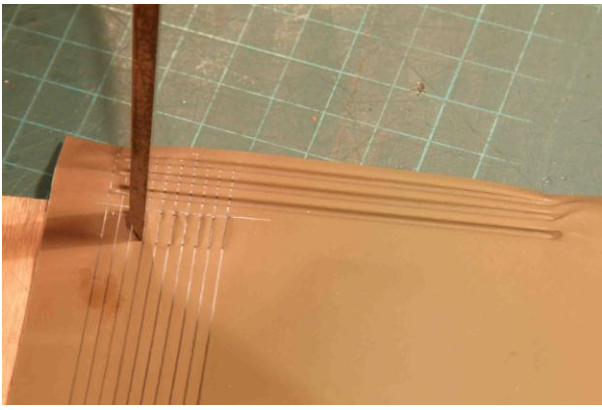
The most complicated part of the job was to make a realistic looking gun barrel wrapper which featured a series of lengthways corrugations and a number of cooling louvers. These would be tricky to replicate. After lengthy cogitation, I decided the best way to go was to make this part out of aluminium litho plate. It would be light and realistically thin.



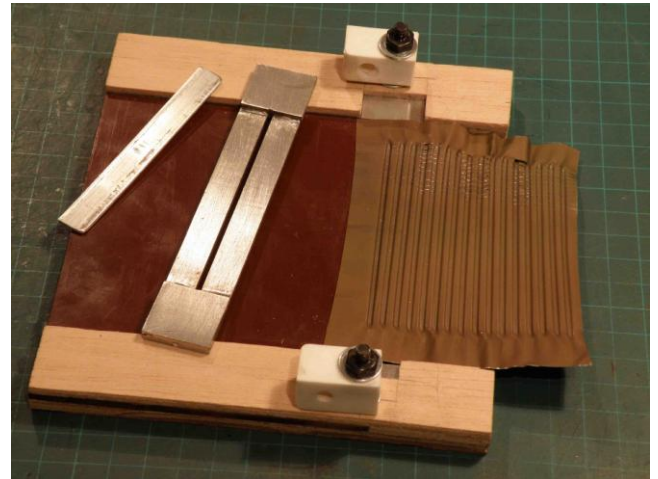
Groovy Tool I needed to fabricate a tool with which I could impress the corrugations. I made up an MDF back plate on which I fixed a piece of sheet Tufnol (you could use thick PCB instead) into which I scored a groove near the top edge simply by scraping the squared-off tip of piano wire several times against a ruler placed on the Tufnol sheet until a suitable groove developed. The base plate was finished off with a couple of guides down each side and some retaining clips made from nylon joining blocks. Next, I manufactured an 'punch bar guide' from 2 strips of steel soldered at each end to 2 tie bars, leaving a slot corresponding with the length of the groove in the Tufnol sheet. Finally, I made a simple 'punch bar' out of a piece of aluminium strip that fitted in the slot of the punch

bar guide, the lower edge of the punch having been rounded off with a file. The photo shows all the parts.

Annealing Litho Plate Next, I cut several pieces of litho plate to fit between the side guides. These first have to be heat treated in order to anneal and soften it before impressing any grooves. This was done by holding the litho plate in a flame on the gas cooker. In its raw form, litho plate is usually bare metal on one side and has a paint finish on the other. I noted that the painted side changed colour as it was heated, from blue to olive green, giving a very useful guide as to when it was annealed. I found that I needed to repeat annealing process a couple of times at various stages as the sheet began to work harden as the job progressed.

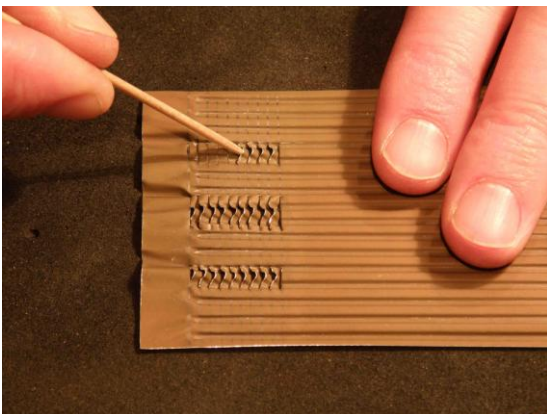


Cutting Cooling Louvers I marked out and cut a series of short cuts into the sheet with a chisel. These will eventually form the cooling louvers around the barrel.



Punching out the Grooves An annealed piece of litho plate was placed between the base board guides with its leading edge aligned with the top edge of the Tufnol sheet. The punch bar guide was locked down on top of this, the aluminium punch bar placed in its slot and hammered down. This produces one groove across the width of the sheet. The punch bar guide was unlocked, the sheet advanced, the guide locked down and the next groove impressed in the same way. The process is repeated until all the grooves have been impressed. At this stage I had a litho plate sheet with lots of magnificent grooves but lots of horrendous looking wrinkles at the sides.

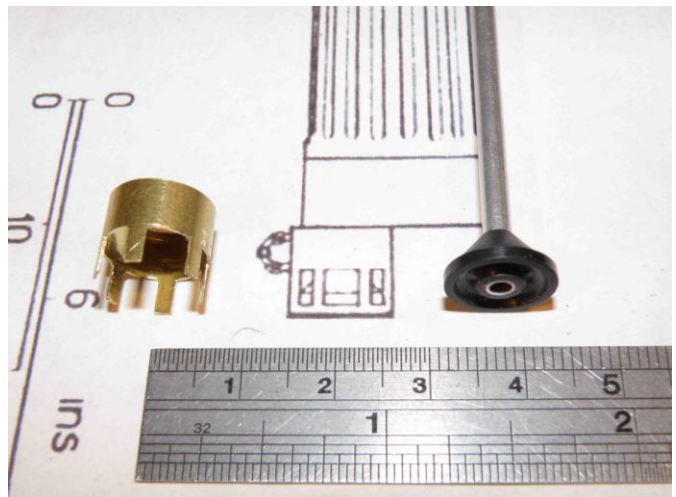
Forming the Louvers The edges are trimmed and the previously cut slots were opened out using a cocktail stick.

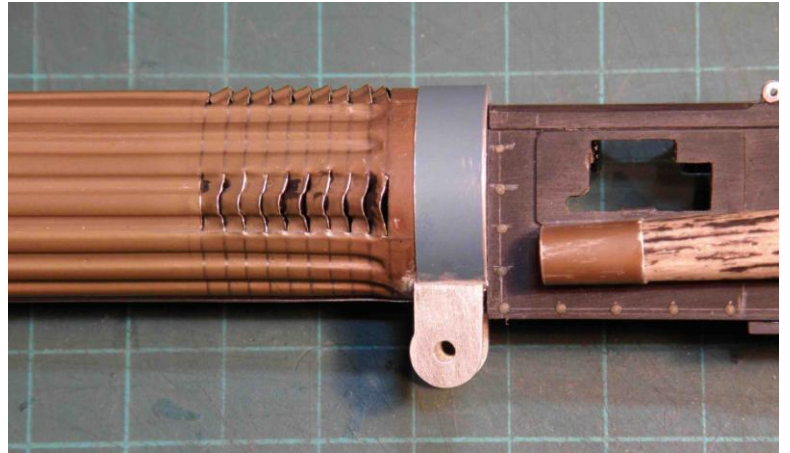
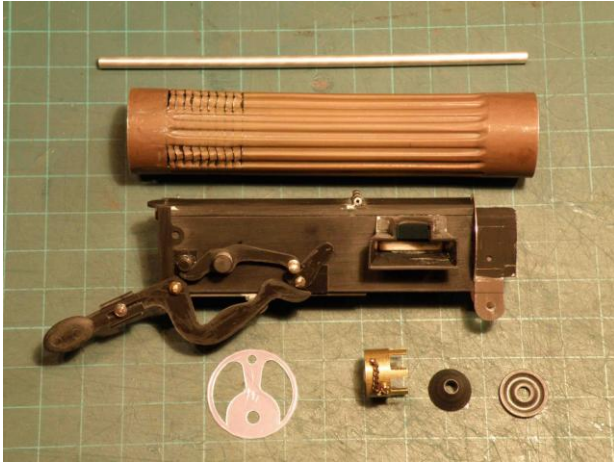




Rolling the Barrel The barrel is formed by gently rolling around a length of tube or dowel with a diameter about 75% of the desired end product until the two edges overlap slightly. I now had a grooved barrel with wrinkly ends. These had to be smoothed out. After annealing the ends again in the cooker flame I inserted a metal tube of the final diameter of the barrel into just the end and rolled this carefully. With patience, all the wrinkles were smoothed out of both ends. Two rings of the metal tube were cut off and glued into the ends of the barrel, and the overlapped edges glued together. One completed gun barrel wrapper!

Turned Parts. Those plastic parts that required to be turned were fixed to a home-made arbour with double sided tape and turned in a drill mounted in a drill stand clamped in a WorkMate bench (I did not have a lathe) on which I had also clamped a home-made tool rest. Crude, but it worked!

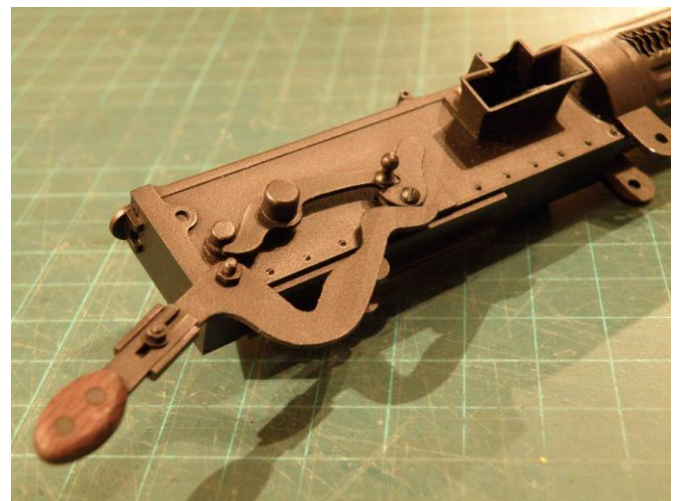




Gun Body The rest of the gun was made up of bits of plastic sheet, litho plate, balsa, metal tube, tiny nuts and bolts, and a model loco hand-rail knob on the cocking handle. Rivets and screw heads were made from drops of PVA glue, thickened with a little talc, and applied with an ink cartridge refill syringe. All the parts were assembled and sprayed with a gun metal black.



End Result This was a modelling project all of its own and required a fair bit of engineering with limited technical resources in order to achieve a satisfactory end result that is light and reasonably realistic. However, it was not a 'quick fix' by any means but it can be done. I have to say I am pleased with it and feel it was worth the effort.



Peter Bennett

'A' Test Success

Congratulations go to James Anderson and Paul Readings (right) who both passed their BMFA 'A' tests at the end of last year.



Trivia Corner - A Few interesting but useless facts

- Proportional to their weight, men are stronger than horses.
- It is possible to lead a cow upstairs but not downstairs.
- A mole can dig a tunnel 300 feet long in just one night.
- Ants stretch when they wake up in the morning.
- It's against the law to have a pet dog in Iceland.
- Thomas Edison, light bulb inventor, was afraid of the dark.
- During your lifetime, you'll probably eat about 60,000 pounds of food. That's the weight of about 6 elephants
- Baby robins eat 14 feet of earthworms every day.
- A giraffe can clean its ears with its 21-inch long tongue.
- Bats always turn left when exiting a cave.
- Owls are the only birds that can see the colour blue.
- Honey is the only food that doesn't spoil.
- What do bullet proof vests, fire escapes, windshield wipers and laser printers all have in common?
-- They were all invented by women.
- If you were to spell out numbers, how far would you have to go until you would find the letter "A"?
-- One thousand
- What trivia fact about Mel Blanc (voice of Bugs Bunny) is most ironic?
-- He was allergic to carrots.

Ian Ferrari

Historic Bi-plane Rigging Drawings

The fifth in the series of contemporary WW1 aircraft rigging drawings originally penned by Air Mechanic 1st Class Campbell under command of Chief Mechanic George Thomas Taylor is reproduced on the back page – a magnificent SE5a. Enjoy!

Peter Bennett

Future News letters

To make future Newsletters interesting your articles or stories (visits to shows or exhibitions, model builds, flying experiences, modelling techniques etc.) for sales and anything not necessarily model aircraft related will be most welcome and should be forwarded to secretary@brcmac.org.uk for inclusion as appropriate.

That's all for now. Happy flying.

Peter Bennett

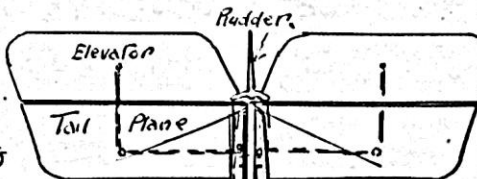
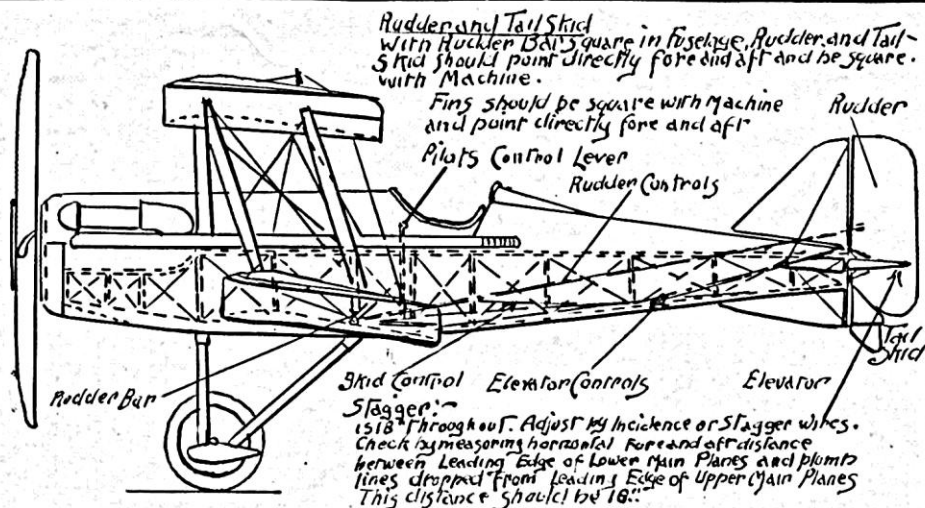
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Flying Position:-

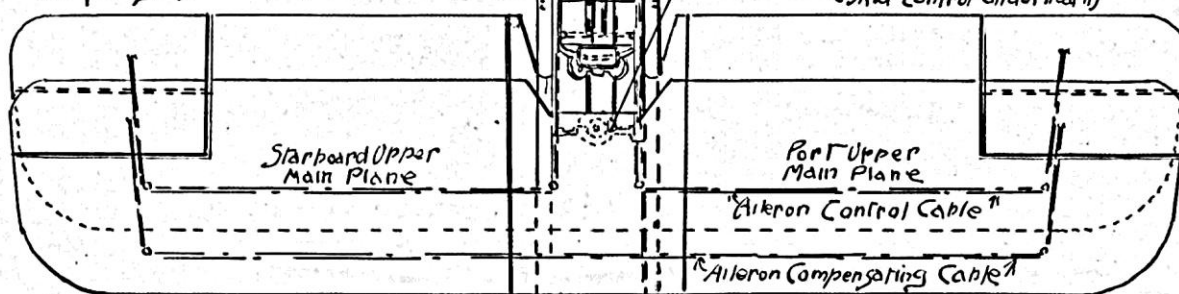
Machine is in Flying Position when Engine bearers are level longitudinally and front and rear Spar Tubes level transversely fuselage.
Support fuselage so that Rear Spar Tube is level transversely and Engine bearers level longitudinally. By means of Side Bracing wires between front and rear Spar tubes, adjust until tubes are parallel and level.
Mark mid-points of all Cross Struts top and bottom, insert steel tube to fit without play into fittings. Stretch centre line below fuselage from mid-point of Rear Spar Tube to axis of front true up bottom cross bracing wires until mid-points of all bottom cross struts are in line with bottom stretched centre line. Proceed in similar manner for top of fuselage (mark points on side struts at equal vertical distances - 5" is convenient distance - below top face of top longerons. Adjust side bracing wires one side until all marked points on side struts that side are in line. Check by levelling from marked points to marked point on adjacent side struts using straightedge and working from front to rear. Proceed same way for other side. Check for no wind in fuselage by placing straightedge transversely across top longerons about front Spar Tube and placing another straightedge transversely across top longerons at any other point about 2 1/2' from Spar Tube. Upper edge of second straightedge at each point checked should be in line with upper edge of first straightedge. Finally tension internal cross bracing wires making corresponding diagonals equal in each section.



Elevators:-
With Control Lever neutral transversely but leaning forward 10° from the vertical. Elevators should be horizontal.

Tail Plane:-
With knob of hand wheel for Tail Plane (Actuating Gear opposite the word 'Normal' on Struts). Centre line of Tail Plane should be on incidence of 5° with rear end of Tail Plane in extreme top position. Tail Plane should have negative incidence of 2°. Tail Plane should be level transversely and square with Machine. Check former by spirit level over spars and latter by taking measurements from bottom sockets of rear Spar of Tail Plane.

Ailerons:-
Should drop 3/4" with Control lever Central.
Rudder Control Cables (Skid Control underneath)



Centre Flying Section

Upper CS Planes should be symmetrical about vertical centre line of Machine. Adjust by front and rear cross bracing wires. Prop plumb lines from lateral extremities of front Spar. Stagger - 18". Adjust by side cross bracing wires and check by measuring horizontal fore and aft distances between plumb lines dropped from lateral extremities of front Spar and corresponding points on lateral extremities of bottom front Spar Tube.

Dihedral:-
15° for both upper and lower main planes. Adjust by front landing wires and check by Army level and straightedge along front spars.

Incidence:-
15° throughout for upper and lower main planes. Adjust by incidence wires and rear landing and flying wires and check by Army level and straightedge, placing latter from leading to trailing edge of ribs. Check for main planes being square with machine by measuring front top and bottom sockets of front outer struts to rudder post and propeller boss.

