Bristol Radio Control Model Aircraft Club (BRCMAC)

May 2014 Newsletter

Chairman's Chat

Welcome to our May newsletter, my last newsletter comment was to hope that the weather would improve for flying but unfortunately there was not much change in March and April, we have finally had a few glorious days, hopefully more to come when the next batch of rain clears.

I am still waiting for a response to my emails from some of our 'B' flyers, asking them to fly at our BBQ on 26th July. If you are one of them please get back to me, we need your expertise on the day.

We have had some interesting articles in our past newsletters and an excellent article from Sarah and another from Martin Fardell in this one. There must be some budding authors in our club who can generate some more for our future newsletters. Come on guys, get your laptops out!

Mobile phones have once again become a focal point. Please read the editorial below, a lot of effort is being put in by your committee to ensure our club has dealt with this matter correctly

Congratulations to Mike Chinnick who recently passed his 'A' test (see below).

We are considering running a small BBQ on Friday afternoons, weather permitting and if we can get enough flyers at the field. Interested? Great then let us know, phone or email.

Hope to see you at the field soon.

Ian Ferrari

Mobile Phones on the Flight Line

Following a recent issue within our club relating to the use a mobile phone on the flight line contrary to the stated club policy (although this is not formally embodied in the club rules), your Committee made the following enquiry to the BMFA regarding its policy on the use of mobile phones. This enquiry and the detailed reply from the BMFA are reproduced here in full. The BMFA also confirmed that there would be no insurance implications if we were to change our policy.

Enquiry to BMFA

Currently we have a club rule which requires mobile phones are switched off at our flying site. However, this seems rather severe and I have noted some other clubs' rules on the internet now only ban phones on their flight lines. Some of our members have valid reasons for wishing to stay contactable from family members while at the field, so there is a desire for change from some quarters.

I could only find a couple of old safety bulletins on the BMFA website, mentioning a 10ft separation. Is this still the current BMFA position?

Given the difference in frequencies, interference seems impossible rather than unlikely. The issue of memory corruption of transmitters is surely dealt with by requiring pilots to check controls before flying? Usually, when there is a problem, it is a bad connection or wrong model.

Would going 2.4Ghz only ensure better control safety?

Lastly and most important, could you please advise if there are any insurance implications of a relaxation of the ban to only disallow use of phones on the flight line?

Reply from the BMFA

The issue of mobile phones on the flight line has recently been the subject of a few Emails and phone calls at the office, a number of them from club members wishing to challenge their club's stance and ruling on the matter.

I have been asked on a number of occasions whether the BMFA position and guidance offered has been changed, or is likely to change, particularly in view of the now, extremely common use of 2.4GHz for model control.

The short answer is, no, essentially while the issue of interference from mobile phones has always been a difficult one to replicate, and thus come up with 100% clear answers, there is enough evidence over time to suggest that the original guidance to not permit mobile phones on the flight line is as valid now, as it was when originally issued.

We should be aiming to give our control equipment the best possible chance of doing its job and this should be a "whole solution" approach, from the very start of the choosing of equipment and installing it, to the way in which we use it.

There is no doubt that we are operating in an increasingly "busy" environment in terms of the general radio spectrum, and whilst the 2.4 GHz band, and the protocols that we use are relatively immune to interference, there is no doubt that the mobile phone in your pocket could easily be the transmission that pushes your equipment past it's limit and causes loss of bind, lock out, or failsafe activation……..the figurative "straw that breaks the camel's back".

So next time this subject comes up at your flying site, think carefully before criticizing your clubs stance on this subject, their policy may just save you a model or two and make for an overall safer flying field.

Of course, as with all things in life a little common sense application is required and there are circumstances where the benefits in terms of personal safety outweigh the potential negatives associated with carrying a mobile phone, a good example of this would be a lone flyer in a remote location (where perhaps your equipment is not having to work quite as hard in terms of signal rejection) such as out on the slope, the positive benefit in terms of being able to summon

assistance if you have a mishap or are unwell, could be considered to outweigh the negative benefit of possible interference issues.

Of course you could go for perhaps the most sensible option of carrying a mobile phone in your pocket, but leaving it switched off whilst you are actually flying.

Switching to electric and The Short 'Scylla' – by Martin Fardell

Switching from i/c power to electric has meant that many scale subjects which would once have been quite ridiculous have now become a practical proposition. I started with a few smaller scale models to get the hang of the electric stuff and then felt it was time to try something bigger and more ambitious.

The Short Scylla was a four-engined biplane airliner. Imperial Airways were already using the Short Kent flying boats for luxury long distance travel and they decided that they needed a land plane equivalent, to use on the London-Paris route. Short responded with a design which essentially took the flying boat wings and engines and bolted them onto a boxy metal fuselage with wheels. First flight was in March 1934 and the prototype was in service by June of that year. 38 passengers were carried in some comfort. Only two were built, named "Scylla" and "Syrinx" and they were both still carrying passengers up to the start of the war in 1939. They were then requisitioned and moved to Whitchurch and used briefly as transports. Sadly, they did not survive for long.

My model is to 1/12th scale – the real Scylla was big, spanning 113 feet, so that gives about 9½ feet for the model. The top speed of the Scylla was 137mph, so at 1/12th scale there is no chance of mine flying at scale speed! Otherwise it flies very nicely; a bit inclined to wander off course in a breeze, but all more or less under control.

For those who are interested the electrics set up is four E-Max motors, each with its own 4s LiPo, each with a capacity of 3300mAh. With 12 by 8 props the maximum power from each motor is about 500W, about equivalent to 40 size two-strokes. The model weighs 10kg (22lbs) so we are looking at a bit under 100 watts per pound. In fact there is far more power than needed for gentle non-aerobatic flying and the batteries give a comfortable 15 minutes duration.

4 Dummy Jupiters to make. 36 cylinders in all!

As you can see from the photos the fuselage has corrugations on all four sides. This looked like being a problem but I found an easy way to do it. I coated a sheet of 3/32nd balsa on one side with Balsaloc (heat activated adhesive), cut the wood into strips and then ironed them on. Dead easy! The four nacelles are fibreglass mouldings, and the outer two contain batteries for their motors. The inner motors have their batteries in the nose, to help with CG position. The wings and tail surfaces are covered with silk over tissue, clear doped. The whole model is sprayed with Mick Reeves silver epoxy.

I have only had half a dozen flights with it up to now. No competition flights as yet, as all comps this year so far have been cancelled due to dreadful weather!

Martin Fardell

Not a trim tab, but a servo tab to drive the rudder. The pilot moves the servo tab, which then drives the free floating rudder. Quite common on large aircraft in the 1930's.

‘A’ Success for Mike Chinnick

I passed my A test with my WOT4 on the 3rd May 2014, tested by Martin Fardell - " Thanks Martin ". I would like to thank all club members who helped and encouraged me in achieving this at the young age of 53. My son 'Tom' and I are relatively new members to the club and are very impressed with the flying site, but most of all by the very friendly club members who have made us feel very welcome.

Please find photo of me with my WOT4-E MK2 electric Balsa.

For those interested, I modified the plane to take the Turnigy Nano-tech 4000mAh 3 cell batteries. The motor is KMS Quantum 2820/06. 26A KV RPM 930 Brushless motor. The Prop is a 11*8 and I get approx 10 minutes slow flying, and 7-8 minutes chucking it around. The Speed Controller is Ripmax Dragon X 45A. The overall weight including Batteries is 1.9 Kg. This is quite heavy, but it deals very well with cross winds and can be flown in windy conditions where a foamy may suffer, but still gives good endurance.

I am looking forward to flying with you all this season, and wish you all light winds and soft landings.

Kind Regards

Mike Chinnick

Desert Hawk UAV – by Sarah Frazer

A static display by the Army of an Unmanned Aerial Vehicles (UAV), the Desert Hawk, in Bristol city centre in February, prompted some research to see how similar it was to the electric model aircraft we modellers fly. The Desert Hawk is a good candidate to do a comparison with, as it has a wingspan of 1.4m and weighs 1.9Kg empty, 2.9kg with the payload. Comparing empty weight and wingspan, these two attributes are similar to a small electric model aircraft which uses the popular 3S-2200 mAHr Li-Po battery pack.

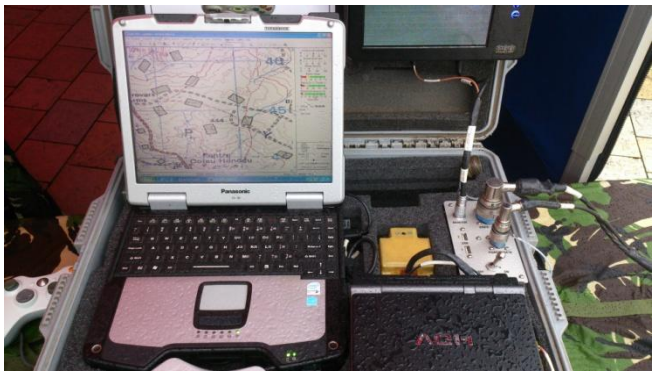
The Desert Hawk uses a 500 Watt brushless outrunner, which with a mission weight of 2.9Kg, would give a power/weight ratio of 78 Watt/lb. This power/weight ratio, in model aircraft terms, would give reasonable performance equivalent to a Wot 4 Foam-E. But no aerobatics for the Desert Hawk as it uses this power to get to height, up to 500 feet Above Ground Level (AGL), and to get to station quickly if needed (operating speed 30 to 80 kph). The higher power/weight level is also very useful at altitude as the Desert Hawk's maximum operating ceiling is 14,000'.

The electronic speed controller is mounted above the motor with its heat sink mounted on the outside of the fuselage, the better heat dissipation allows a higher continuous power consumption than that of the foam encased ESC of the WOT 4. The increased heat dissipation is also of advantage in hot and high conditions.

One noticeable difference between the UAV and model aircraft is the size of the battery. Whereas a model of this size would use a 3S-2200 mAHr Li-Po, the Desert Hawk has a huge battery which is about the size of an electric power drill battery. Though so physically big, it is still only a 3S battery. The capacity of the Desert Hawk battery is 15.2AHr, giving a duration lasting up to ninety minutes!

Whereas a WOT4 is made of foam, reinforced with carbon spars, the Desert Hawk is constructed of mainly polypropylene with fibreglass skinned wings filled with what looks like polyurethane foam. At the flying site the WOT 4 is assembled quite quickly by fixing the wings on. The Desert Hawk however is made up of a number of components which can be carried in a rucksack or in a set of specially constructed cases. The eight components of the Desert Hawk comprise the three piece wing, the fuselage rear, the fuselage front, the horizontal stabiliser, sensor payload and battery. One of the really nice features of the Desert Hawk is that in the event of a rough arrival the UAV is designed to 'fall apart' into individual components. Any components that are damaged can quickly and easily be swapped out with the many spares that are part of the Desert Hawk system.

What makes the Desert Hawk a UAV and not a model aircraft is the payload of On Board Electronics (OBE) and the associated Ground Control System (GCS). The Desert Hawk electronics monitor static and dynamic air pressure, roll, yaw and pitch angular change rate, GPS data, battery voltage and current.



Forward Facing Camera

Electro-Optical Imager

All this data, along with the Forward Facing Camera and downward facing Electro-Optical Imager, is transmitted via the Down Link Antenna to the GCS. The Desert Hawk's Uplink Antenna receives all the control and GPS navigation data.

The GCS has a twin aerial mast, one for the Uplink and one for the Downlink. In the event that communications are lost with the UAV, it can use its own GPS system to continue its mission and then fly back to base. The UAV is also programmed with Digital Terrain Elevation Data (DTED), DTED is a topology data file that the UAV can use with its stored GPS data and measured barometric height to ensure that it avoids any high ground and can also fly at a pre-set height Above Ground Level (AGL). A mission requirement may be to fly above a minimum height AGL and also below a maximum height AGL. This provides a more consistent image than flying at a GPS set constant height.

Some modellers attach a name and address label (Return To Sender label) to their models in case they

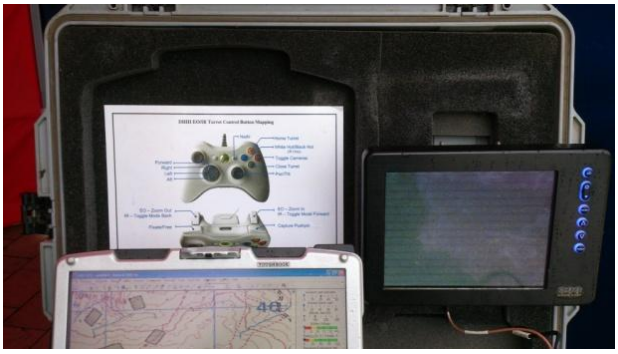
Uplink & Downlink Aerials

Return To Sender Label

happen to fly away, well the Army does as well. Their label offers a cash reward if delivered to the troops, if the electronics package has not been returned.

The GCS computer, a ruggedized laptop, can display GPS data from the UAV and superimpose its position on an OS style map or satellite image. Images from the forward facing camera and the downward facing Electro-Optical imager can also be viewed as well. The downward facing Electro-Optical imager can be slewed to look forwards and backwards and also port and starboard. This enables the UAV to observe an area without actually flying over it. Other data such as battery voltage, battery life, throttle position and remaining endurance are also displayed as well.

Whereas the WOT 4 needs to be flown continuously the Desert Hawk can be programmed to fly on a GPS course and also fly a number of set circuits around a specific location. When flown manually the Desert Hawk has the benefit of an automatic flight stabilisation system, similar to the three axis Spektrum AS3X.



The controller for the Desert Hawk is basically a X-Box controller, which is used not only to control the UAV, but can control the Electro-Optical Imager as well.

Though there are many similarities between our electric model aircraft and UAV's the most significant difference is that the UAV can operate autonomously and are part of a larger system, of which the air vehicle is just one component. It would be jolly nice, in the event of a crash, to be able to quickly replace a damaged component and get back flying. Having an automatic landing system and a flight stabilisation system may also be of benefit on those gusty approaches. But for myself, I enjoy the challenge of flying my model aircraft knowing all my good, and bad, flying is all down to me ☺.

Sarah Frazer

Arnie's Article

If you have not done so already, check out the article written by BRCMAC member Arnie Mansell in the latest edition of the BMFA News covering the design and build of his latest F3A model masterpiece – the 'Boson'. Great stuff. I think there must be many of us in the club who would like to hear first hand about the design process. Perhaps a Winter Club evening talk Arnie?

Club Tub Replacement

Following the unfortunate demise of our rather ancient Club Tub, this has now been replaced with a new model, a Seagull Swift 40. John Paton has donated a brand new SC46 two-stroke engine for use in the model – thank you John. Both RX and the two 'buddy box' RX are Spectrum 2.4GhZ. The aircraft is fully assembled and is currently in the process of being set and the engine run in. Once this 'shake down' is completed, it will be available for use by trainees and instructors.

New 'Old' Logo?

Whilst scanning through a disk of archived Club records and newsletters, I came across a file containing a picture of an old BRCMAC logo used way back. While definitely 'of its time', I think it still looks pretty stylish and says something about the history of our club.

I thought that members old and new would appreciate seeing it so I have included it in the heading of this Newsletter along with our current logo. If you like it, I will continue to show them both on future editions. What do you think? Let me know.

Peter

Site Maintenance

We have recently replaced some fence posts that have snapped, we have now also ordered material to repair the Porta-Kabin. We will need to arrange a small working party in the next three weeks to carry out repairs to the fascia and paint it. If you are available week-days or on a Saturday to help, please drop an email to ianferrari@blueyonder.co.uk or murray.barnes@blueyonder.co.uk

Publicity

Alan Marshall has taken on the responsibility for club publicity and recently confirmed that he has had conversations with the following magazines who have agreed to run an editorial for our club: Standbrook- Guides. Boundary Magazine - Chipping Sodbury, Yate. Thornbury Magazine. BS35 Magazine. My Thornbury (& My Yate). RCM&E. So look out for these in the coming weeks.

Historic Bi-plane Rigging Drawings

Following on from the Bristol Fighter included in the last edition, the next in the series of contemporary WW1 rigging drawings originally penned by Air Mechanic 1sr Class Campbell by command of Chief Mechanic George Thomas Taylor to be reproduced here on the back page (and in higher resolution on our web site) is a rather nice BE2C. Enjoy!

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.

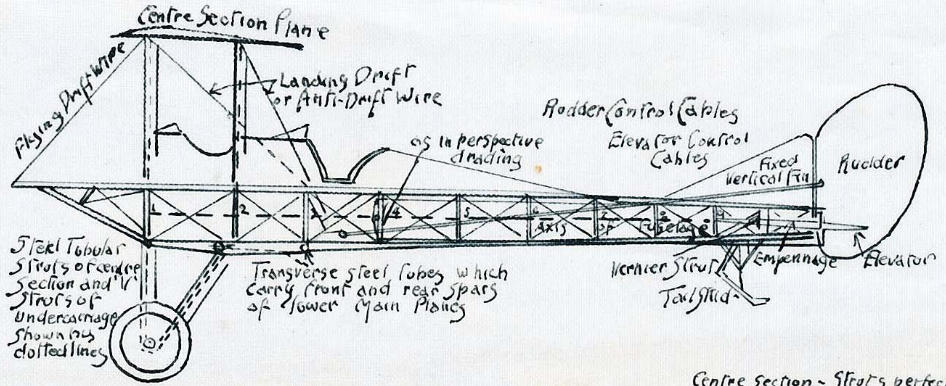
That's all for now. Happy flying.

Peter Bennett

Editor

B. E. 2c BIPLANE

Fuselage. Flying position - engine bearers level longitudinally and laterally. Lower longerons in first three bays level. Upper and lower longerons level laterally throughout. Opposite diagonals of internal cross bracing wires to be equal throughout. length of fuselage. To true up sides stretch strings on each side of the fuselage from straight edges whose upper edges are level with the mid-points of No 1. and No 9 struts. Adjust side-bracings until the line of the strings cuts the middle points of struts 2. 3. 5 6. 7 and 8. The distance from upper surface of lower longeron to line at struts 2. 3 and 4 should be 9½ inches. Rudder post to be vertical

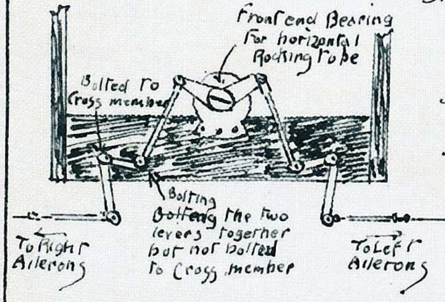


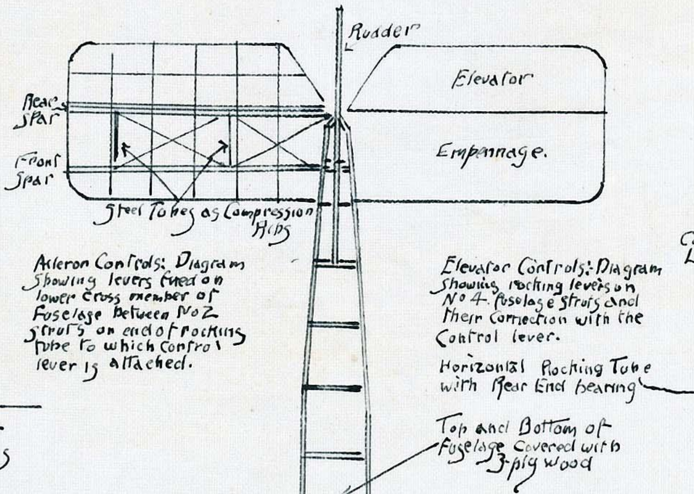
Empennage and Elevators:- Set empennage so that vertical distance from upper surface of front spar to top of longeron above is 3⅞ inches: this will possibly require re-adjustment to get machine to fly level longitudinally. Adjust empennage to be level laterally. rest on spars close to fuselage. and square with fuselage by measuring distance from same central point in the fuselage to tips of rear spar of empennage. With the control lever staggered forward 6" adjust elevator controls so that elevators form a direct continuation of the empennage

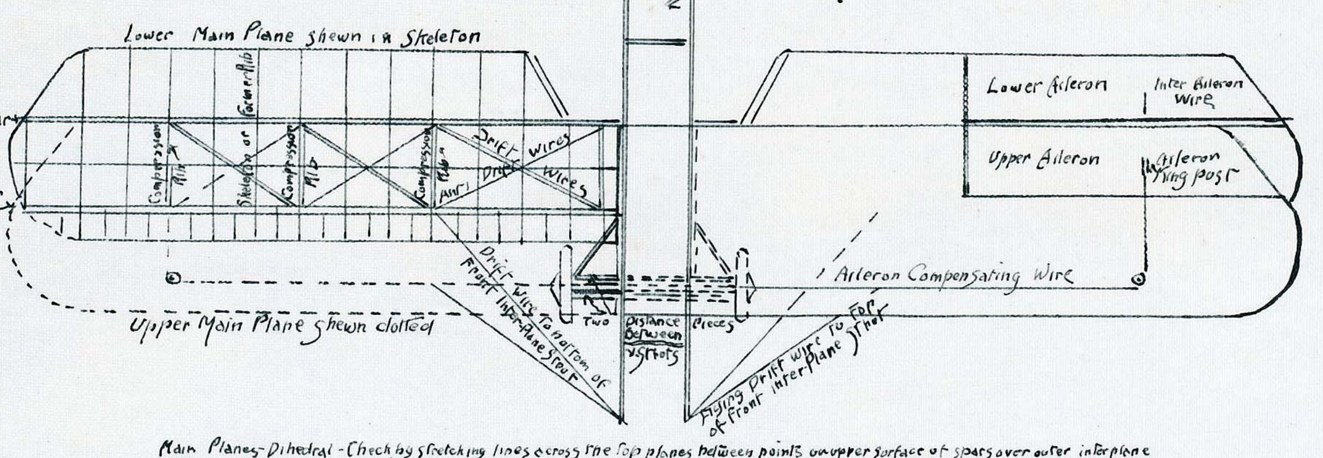
Centre Section - Struts perfectly vertical viewed from the side with machine in flying position. From front struts slope upwards and outwards: test by measuring diagonals between two pairs of points on struts equidistant from the engine bearers

Stagger:- 24 inches throughout. Check by plumb lines from leading edge of upper planes

Incidence - Determined by the spar-sockets on the fuselage and is the same throughout the length of the planes. Ailerons should be set with a droop of ⅝ths of an inch when the control lever is central



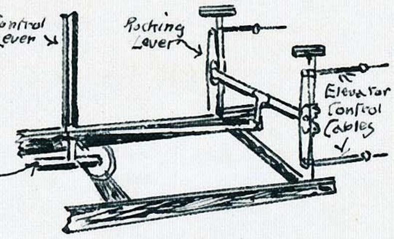




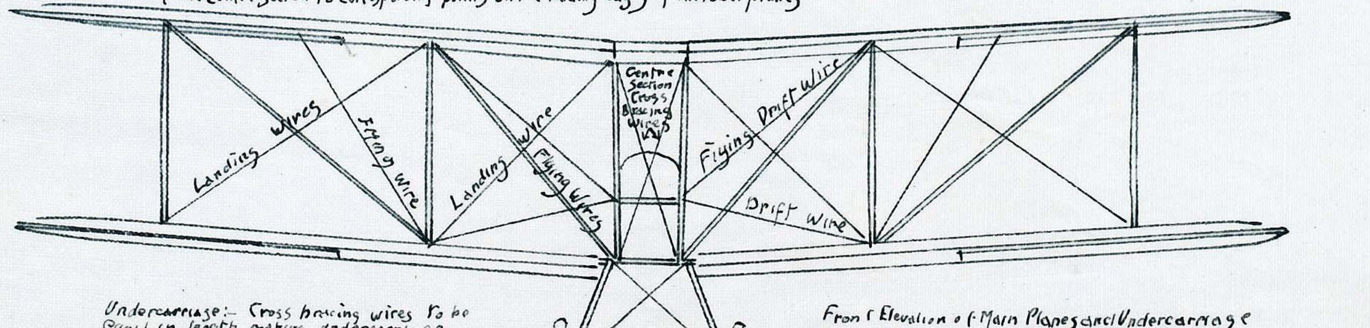
Aileron Controls: Diagram showing levers fixed on lower cross member of Fuselage between No 2 struts on end of rocking tube to which control lever is attached.

Elevator Controls:- Diagram showing rocking levers on No 4. fuselage struts and their connection with the control lever.

Horizontal Rocking Tube with Rear End bearing



Main Planes - Dihedral - Check by stretching lines across the top planes between points on upper surface of spars over outer interplane struts right and left. Check from front and rear spars and vertical distance from main spars of centre section to string should be 9½ inches at all points. Check dihedral for being symmetrical by measuring the distance from the mid-point of the leading edge of the centre section to corresponding points on the leading edges of the lower planes



Undercarriage:- Cross bracing wires to be equal in length making undercarriage symmetrical about the centre line. Plumb line from middle of first lower cross member should cut side in its middle point

Front Elevation of Main Planes and Undercarriage
Span: 37 ft 6 ins   Chord of Main Planes 5 ft. 6 ins
Gap: 6 ft 2 ins (approx)   Incidence: Main Planes 3½°
Tail " 3½°
End of Engine Bearers to Rudder post 23 ft (approx)

Traced by 2. A.M. 1st Class. Campbell. by command of Chief MEC. Taylor. G.