

# MBB Bo 209 MONSUN

## CONSTRUCTION NOTES

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### INTRODUCTION

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These notes are intended as a guide only to the construction of the MBB Bo209 Monsun, given that building from plans invariably gives the builder many opportunities to incorporate his/her (?) own preferences with respect to methods and materials employed. At the time of writing the model is awaiting R/C gear installation and final fitout before test flying, which should happen before the end of October 2002. Because of the extremely conventional and conservative design of this model its performance can be reliably predicted, hence I am happy to present these plans before the first flight. Final control-throws and verification of CG position will be notified once these have been flight-tested. In the unlikely event that you should complete your Monsun before I fly mine you can let me know how close I was with my calculations!!

The prototype here used an Astro 15G because I had a couple of these at hand, but any of the new brushless motors such as the Phasor series would be ideal with a similar number of cells. Bulkhead mounting could be easily accomplished with minor modifications.

The construction photos in the gallery section of the Monsun page should provide assistance in clarifying details not obvious in the plans. If you are still having problems after perusal of these feel free to email me and I will try to answer your question as soon as time (and work/family etc) permits. Please let me know if you build one, and also if you find any serious errors or omissions in the plans.

I hope you enjoy this model!

Graham.

Sydney, Australia

September 2002

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## WINGS

Construction begins with the wings, as the lower fuselage cannot be shaped until the wings are completed. Cut the cores as normal from white foam, noting that there is no washout built in (the wing planform and airfoil changes from root to tip make it unnecessary). Construction follows standard foam wing techniques. The only slightly unusual feature here is the full-width landing gear mounting assembly in the wing centre-section, the channel for which I cut AFTER the centre-section had been sheeted. The sequence for the centre-section should be:

- a. Cut foam core
- b. Sheet foam core
- c. Add LE and TE
- d. Make up 1/8 ply L/G assembly plate from the 3 pieces shown on the plans and use as a template to trace location on bottom wing skin.
- e. Cut and remove lower wing skin where L/G is to be mounted, then use a cardboard template to Hot Wire Cut the channel to the correct depth as shown on the plans.
- f. Cut away the sheeting where the torsion bar supports G1-G4 are installed at the ends of the centre-section, and HWC the vertical channel where they are to be located.
- g. Epoxy all ply parts into position.
- h. Drill a 1/8in diameter hole in the ply plate at each end where the wire legs go down into the slots in G1 and G4. Note that the correct location of these holes ensures that the L/G wire does not migrate inwards from these slots. The outer ply plates G2 and G3 prevent outward movement.

I used the lightest wood I could find for the wing sheeting, and attached it to the cores using Gudy 870, an extremely light (approx 5g per sq metre) polyacrylic-ester adhesive which comes in large rolls on a silicon-faced paper backing, and is applied in the same manner as double-sided adhesive tape. In industry it is used for photograph and poster mounting to large display boards. I have used it on three models now, and when used with care seems to be absolutely ideal for electric models as it is light, very easy to use, creates no mess and is useable immediately (does not have to cure, although apparently the bond does increase in strength slightly over a few days). Do a search on Google for information and suppliers if you wish to give it a try.

Don't forget to install the aileron servo extension leads before glassing the dihedral breaks. After the three wing panels have been joined and the dihedral breaks reinforced

with glass cloth tape then the battery mounting block may be shaped. Wing dowels are not drilled until after the fuselage basic assembly has been completed so that their position can be determined from the holes in former F5. The scrap block on the bottom of the FWD centre section is added once the fuselage lower sheeting has been fitted.

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## FUSELAGE

Study the plans and photos until you are happy with what goes where, then make a kit of the fuselage pieces. Glue the ply doublers then all longerons and balsa doublers to the 3/32in balsa fuselage sides, then assemble the formers into position over the plan. Nose-steering mounting holes should be drilled prior to assembly, as should wing dowel holes (and hole for the cowl retention, if this is the method you choose to employ). Note the grain direction is horizontal for the balsa formers F6-F9. I basically started at the rear and worked my way forward. Though a building jig is not essential (I didn't use one) it would have been VERY useful. Ensure you use only the lightest wood for all the fuselage construction, otherwise it will be difficult to bend the sides to the curvature of the front fuselage without cracking the wood. To this end I used the same material (Gudy 870) to attach the ply doublers as I did the wing skins, because it retains slight flexibility (not unlike contact adhesive). Before sheeting the top and bottom rear fuselage with 1/16 balsa you should ensure the tubes for the control snake outers and receiver aerial have been fitted. The top of the cowl and bottom fwd sheeting are applied once you are satisfied with the fit of the "working bits" in the front end.

The canopy can be made a variety of ways, including stretch-moulding from clear plastic if you wish to go for cockpit detail. As the original had a tinted canopy which (from some angles) looks almost opaque anyway, I took the easy way out and elected for a solid canopy. I first shaped a canopy pan and fwd former from 3/32 balsa, carved the shape from blue foam which was then attached to the balsa framework. This was then covered with a single layer of 6oz carbon-fibre cloth/epoxy. Once set the foam is melted out via large hole in the base of the pan, and the whole canopy filled with lightweight spackle filler watered down to a consistency similar to shaving cream. The whole lot when dry is then sanded smooth and covered with Solarfilm (I used a slightly iridescent midnight-blue colour which looks really good - better than black IMHO).

The canopy and cowl can be attached with Magic tape or latches can be fitted. Only the canopy has to come off for battery changes. The cowl (which should be hollowed extensively) only needs to be removed whenever the motor is installed or removed. Note that the Astro mount is offset for the gearbox, and the slots in the 1/64 ply motor mount tube for the brush holders will not be truly horizontal because of the timing advance.

I have drawn a couple of loops of springing in the nosewheel wire on the plan but did not use this feature on the model due to the fairly flexible nature of 1/8in piano wire anyway, (and the fact I couldn't find my wire bender!). It should be OK either way.

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## TAIL SURFACES

I found some very light quarter-grain balsa for the tailplane (yes it does actually exist, contrary to popular belief!) and covered all tail surfaces with film before assembly to the fuselage to obtain a neater appearance.

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## MISCELLANEOUS

I chose to mount the battery to the fwd wing block in the location shown using Velcro straps.

Wing bolt hole are drilled and tapped with the wing in position once the fuselage has been completed.

The prototype was built with only minor changes from the CAD plans as originally drafted. I attempted to make note of any changes as I went along for future reference, but just in case you find any of these slipped through the cracks and didn't make it to this final version of the plans please don't hesitate to let me know so I can make the appropriate corrections.

Enjoy, and standby for the flight report!

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