

GENERAL WESTERN METEOR

A 30" span scale model designed by Peter Rake, with the prototype model build and flown by Pat O'Donnell

As you can see from the date on the plan this is another of those designs of mine that has been hanging about for some time. Models were built from the design, but suitable photos were always sadly lacking. Fortunately, Pat O'Donnell came to the rescue and the result is the model you see presented here.

THE MODEL

The model was drawn up during my

phase of designing types suited to the GWS IPS style power units, but the plan actually shows a small outrunner motor instead of the not always reliable brushed unit. If you wanted to revert to that power arrangement, it shouldn't be too difficult to sort out the modification.

Similarly, the model shows closed loop controls on the plan but a quick look at the photos reveals that Pat opted to use lightweight pushrods on his model. Either method works well but the closed loop system is the more accurate in

scale terms.

The plan also shows scale rib spacing, which results in a rather high rib count. That's not a problem if you use the laser cut parts the publisher will make available, but for anyone choosing to hand cutting parts, the rib count could easily be reduced by omitting every other rib. Once again, less accurate, but it would reduce both workload and the overall weight of the model.

Among other options that might be considered, the sheet tail surfaces could



easily be replaced with built-up structures using laminated outlines.

The model is intended to be flown three channel (rudder/elevator/motor speed), but since the aileron positions are indicated on the plan, the more enterprising amongst you may decide to make it a four channel model. You would, however, have to reduce the dihedral, which would mean replacing the spars shown.

EQUIPMENT

The motor shown (a 15 gram outrunner) will provide ample power when coupled with a 2S LiPo pack. Any similar small motor will be fine, but avoid using anything with much more powerful. The plan shows 5 gram servos, but the more modern 3.7 gram servos would save a little weight. I'm not sure how well they'd stand up to the constant pressure of closed loops though. The indicated hatch will provide ample access for installing the equipment and changing battery packs.

Pat ended up using an 850 mAh pack, largely because he needed the nose weight. Keep the tail light, mount the equipment as far forward as practical and a smaller pack will work out fine. You should be aiming for a flying weight of around eight ounces, although Pat's model turned out a little heavier than that at closer to ten ounces, so you do have a little leeway.

TAIL SURFACES

Let's start with the simplest part of the model. As already stated, these could be built-up structures with laminated outlines but that's something for the individual builder to decide, whether he wants to go to that additional effort. As designed, the all-sheet tail surfaces work fine for a minimal increase in weight - the weight of wood gained is offset against the weight of glue not required.

The only actual building (and I use the term loosely) involved is joining the elevators. Cut a groove into the leading edges where the joiner will fit and glue the elevators to the joiner. Use the tailplane as a guide to ensure you get the spacing correct.

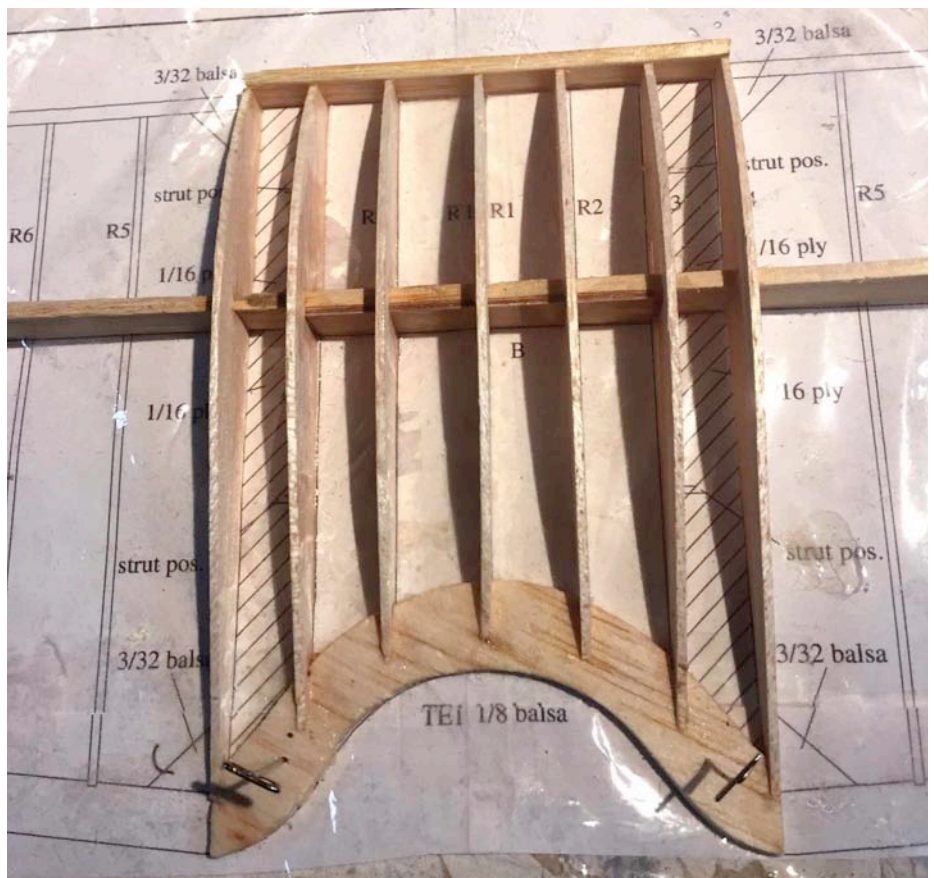
After that it's just a case of sanding overall and rounding off the edges. Hinging and fitting the horns is best left until after the tail surfaces are covered.

WINGS

Despite the number of ribs involved the wings are easy enough to build, although they do need to be built in a specific order. As noted on the plan, start by joining the spars with brace B. Also, glue together parts WT1 and WT2. Once dry, begin the actual construction by pinning down the spar over the centre section drawing and also pinning down part TE1 and the leading edge.

Now glue in place ribs R1, R2, R3 and R4, all of which should be at 90 degrees to the building board. Glue in the 1/16" ply strut plates and allow the assembly to dry completely.

Unpin the centre section and lower one side of the spar over the wing drawing, pinning it in place. Pin down TE2 and the leading edge, gluing as required. Glue in place the assembled wing tip, angled upwards to meet the spar end. Fit



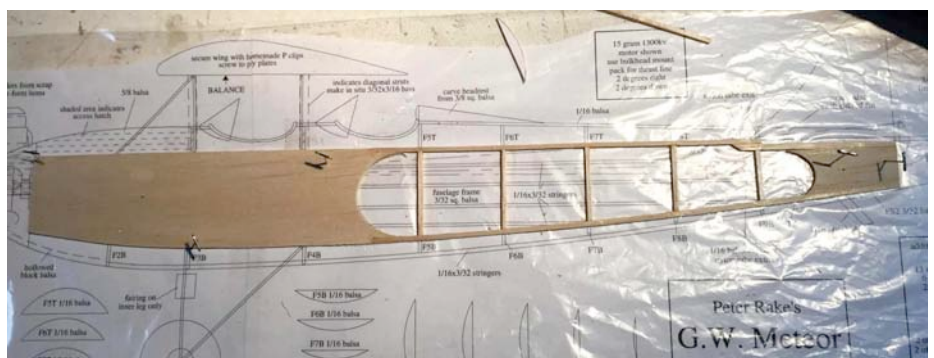
Once the spars are joined wing construction begins with the centre section.



The spar is lowered over one wing panel and the panel assembled around it.



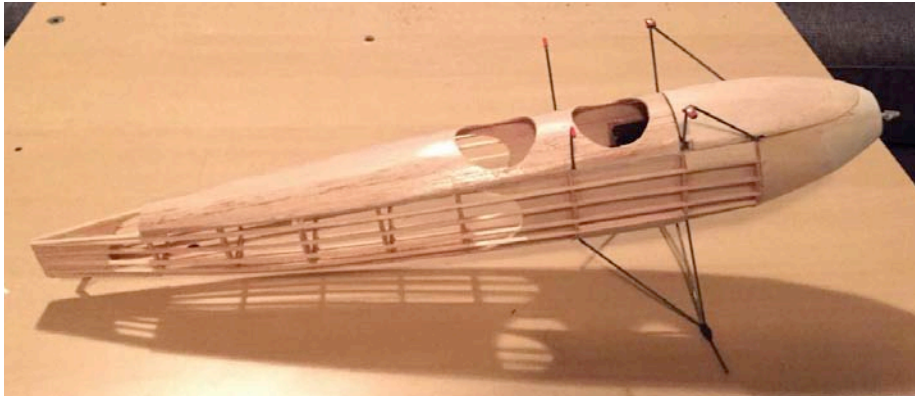
Finally the built side is packed up while the second wing panel is built.



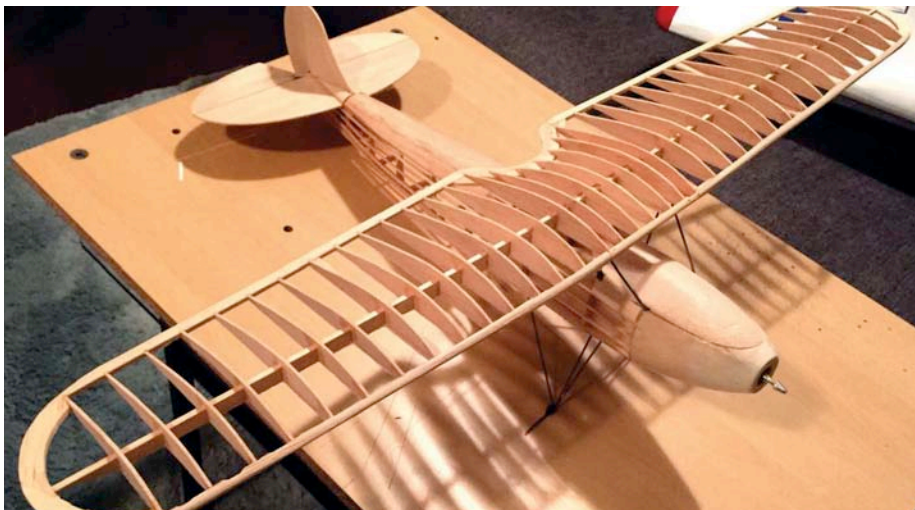
Fuselage construction follows the time honoured technique of starting with two matched side frames.



Although not quite the order in which I described, this shot demonstrated how the entire fuselage can be braced (pinned down) while formers and stringers are added.



With the top decking and wire parts in place, the nose blocks are fitted and shaped.



The obligatory naked model shot reveals the basically simple structure that results in a nicely rounded shape.



The fact it will sit on a coffee-table demonstrates the compact nature of the model.

all remaining wing ribs, ensuring that they are all at 90 degrees to the building board. Finally, glue in place the 3/32" balsa strut mount plates and allow to dry.

Once the first wing panel has thoroughly dried (overnight?) unpin it and lower the opposite spar over its wing drawing. Repeat the above process until you have a complete wing assembly.

Remove the wing from the board, shape the leading and trailing edges and sand smooth overall. That's it; the wing is now ready for covering. Easy, wasn't it?

The advantage of building the wing in this manner is that it is almost (somebody is bound to prove me wrong, but they'll have to work really hard at it) impossible to end up with unequal dihedral. Also, as long as the spars aren't soft balsa, there is no weak spot just outboard of where the centre section struts attach to the wing - talking of which, the P-clips mentioned on the drawing are nothing more technical than thin brass strip wrapped around the strut wire and hammered flat to snugly enclose the wire. They are then drilled to accept the screw that will hold them against the ply strut plates.

Since the strut positions are shown on the wing drawing, it's worthwhile marking them onto the ply plates. Then, since most of us are likely to end up with slightly differing P-clips (the holes probably won't all be in exactly the same place) use the clips themselves to mark the wing plates for drilling the screw holes - and label the clips as to where they need to go on the wing. If desired, the P-clips can be soldered to the appropriate centre section strut once said struts are there to be soldered to.

If in any doubt that your mounting screws will hold securely in the ply plates, add a small rectangle of ply above each screw position to act as a doubler. So, without further ado, let's move onto the fuselage assembly.

FUSELAGE

Although possibly slightly more intricate than the fuselage on many of my designs, it really isn't that difficult to build. As long as the basic box structure at its core is straight and square, the fuselage will go together fairly quickly. So, the basic box would be as good a place as any to begin since all the other parts attach to it.

Start by marking the sheet fuselage sides with the former positions and then score and crack inwards the front sides. A shallow V-cut into the inside of each side will allow the sides to be lightly cracked without making a gap on the outside. The groove should be filled with glue as you pull in the nose onto F1, but we aren't quite ready for that just yet. First we need to build the complete side frames over the plan, making sure that both grooves do actually end up in the inner face of both frames.

Once we have the two frames to hand, these can be joined using formers F2, F3 and F4. Before allowing these to dry, ensure that the assembly is perfectly straight and square. Now apply glue into the grooves and pull in the nose onto F1. Check that it remains straight and square and that both sides angle inwards by the same amount. Allow this assembly to dry completely before proceeding. Pull together and glue the tail, fitting the cross

braces as you go. Pay particular attention to keeping the rear fuselage both straight and square. Fortunately, the top of the rear fuselage is flat, so this operation can be performed with the fuselage inverted over the plan. Once this assembly is completely dry, remove from the board and bind and glue the wire parts to ply formers F2, F3 and F4. Bind and solder together the front centre section struts. Don't worry that the rear c/s strut can pivot, it won't be able to once the wing is in place, simply because of the braced front struts. Also bind and solder together the main undercarriage legs, but don't fit the axle wire until you have finished shaping the front fuselage blocks.

An alternative route here, if you detest shaping around wires sticking out, is to tack-glue the block balsa sections in place and shape them, then remove them and fit the wires. However, I'll continue to describe the build as I would do it - with wires already in place.

Fit the decking formers F5T, F6T, F7T, F8T and F9T and add the 1/16" balsa sheet decking paying attention to NOT distorting the fuselage box in the process. Temporarily fit scrap balsa spacers where the tail surfaces will go and glue the tail fairing blocks to F9T only. The spacers will be removed once all the shaping and sanding is complete, so don't glue them too securely.

Now, fit all the remaining side and bottom formers, parts TS and the 1/16" x 3/32" balsa stringers. Don't make the stringers too soft or you may cause yourself handling problems during the shaping stage.

Temporarily glue in place the lower and side nose blocks and even more lightly tack glue in place those that will form the access hatch. As you'll notice, Pat didn't do it quite as shown on the plan but making the hatch L shaped (as shown) will mean that you retain easy access to the motor, as well as radio and battery access.

Now comes the messy bit; carving planing and sanding the fuselage to shape. Once you have that done, remove the block balsa parts and hollow them out to accommodate your chosen motor. Fit the motor, noting the thrust lines, before gluing in place the fixed blocks. Arrange your hatch retaining system (Pat used magnets and washers), remove the tail surface spacers and solder in place the final undercarriage leg. Now sit back and admire your handiwork because all the building is done.

“ On a model this simple (in outline and surface detail), the dummy cylinders are essential to retain the scale appearance ”



CUT PARTS SET FOR THE



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Get straight down to construction without delay! This month's full size free plan feature is supported by a laser-cut set of ready-to-use balsa and plywood components. This provides the parts that, otherwise, you would need to trace out onto the wood before cutting out and includes wing ribs and tips, tail centre parts, fuselage doublers, top deck, formers etc.

**IT DOES NOT INCLUDE STRIP
AND SHEET MATERIAL OR
SHAPED WIRE PARTS**

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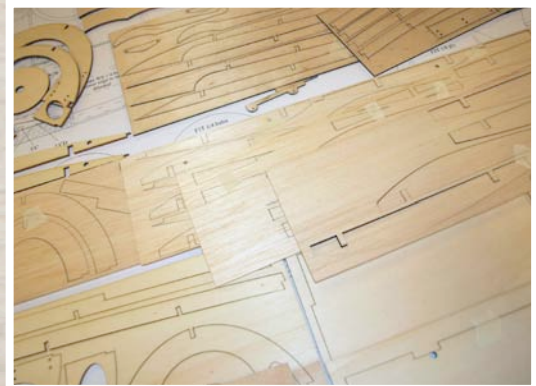
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All set to commit aviation, even if the balance wasn't quite right at first.

COVERING AND FINISHING

Covering any model is all a matter of personal taste but just make sure it's lightweight covering (no Solartex please). Pat used a combination of lightweight film and a painted finish, but obviously this carries a weight penalty. Especially since it is so difficult to achieve a satisfactory result in silver paint when using only a lightly sprayed coat. Yes, you can have any colour you like, as long as it's silver. I believe Pat's scheme is of his own making, rather than a scheme used on the full size machine.

The wing struts are just streamline section bass strip and are intended to be purely cosmetic. However, if you want to make them functional, feel free to do so.

On a model this simple (in outline and surface detail), the dummy cylinders are essential to retain the scale appearance, but can be as simple, or as complicated as you care to make them. Pat has opted for fairly simple basic cylinders and that works just fine. However, more detail is allowed if that's what does it for you.

Personally, I usually enjoy making the 'tweedly bits'. On this model they are likely to be a bit vulnerable in a less than perfect landing - small wheels and grass



flying sites are not a match made in heaven for smooth landings.

FLYING

The only point I'll make here is to insist that you balance the model to hang just a hint nose low when supported at the point shown on the plan. Pat managed to end up with a slightly tail heavy model when he first attempted to fly it, with fairly predictable results. That, combined with much more power than required (E-flight Park 280), resulted in a model highly

sensitive to elevator and one that wanted to go vertical if the throttle was increased. Fortunately, he was able to get the little Meteor down with nothing worse than a broken prop.

Balanced correctly and fitted with a 5.25" x 4.75" prop., the model now performs faultlessly but could still use a bit more down and right thrust because of the excess power. A Park 250 would be a better option if you have to use an E-flite motor. ■

10 Once correctly balanced the model has proved to be a steady performer that should cause no problems at all. Looks good, flies well, who needs more?

