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Microplan V

A 36" wingspan semi-scale model biplane for geared 400 size motors and 3 function mini R/C, designed and described by Peter Rake

This unusual Mexican designed and built aircraft of 1918 was inspired by a peanut scale plan and backed up with further information from the book "Jane's Fighting Aircraft of W.W.I".

The design is somewhat dated compared to European fighters of the same era, but for me this just adds to its appeal. (I have always been fond of unusual prototypes.)

An original design biplane with an all moving tail and warping wings that was powered by the Mexican built version of the Spanish Hispano Suiza engine.

Construction

This is very obvious with most of the information on the plan. I will, however, describe the basic construction and cover in more detail any area that I feel warrants additional instruction.

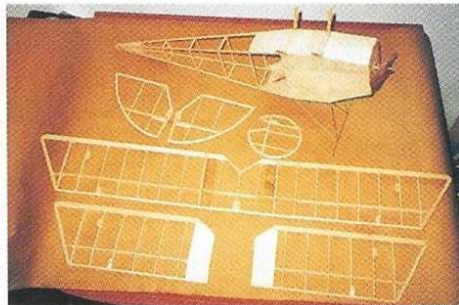
The single most important piece of advice is to keep the tail end as light as you can. Electric power doesn't give that great a margin of power, so any unnecessary weight is to be avoided at almost any cost.

Having studied the plan you may well be thinking that the model is far too delicately built for R/C flying. I can assure you that this is not the case. Experience has shown that, whilst the model won't survive a very heavy arrival, it is adequately strong enough for normal use.

The plan shows removable wing panels which the prototype model didn't have - I know that a lot of modellers don't like one-piece aircraft. My model has the top wing epoxied to hard wood c/s struts and the lower wing panels and inter-plane struts glued in position. This system is obviously lighter than as drawn on the plan, but is a lot less durable. It just makes you more careful about contact with the ground and works wonders for improving the smoothness of your landings.



The main components are prepared for building.



Airframe and wing panels ready for assembly.

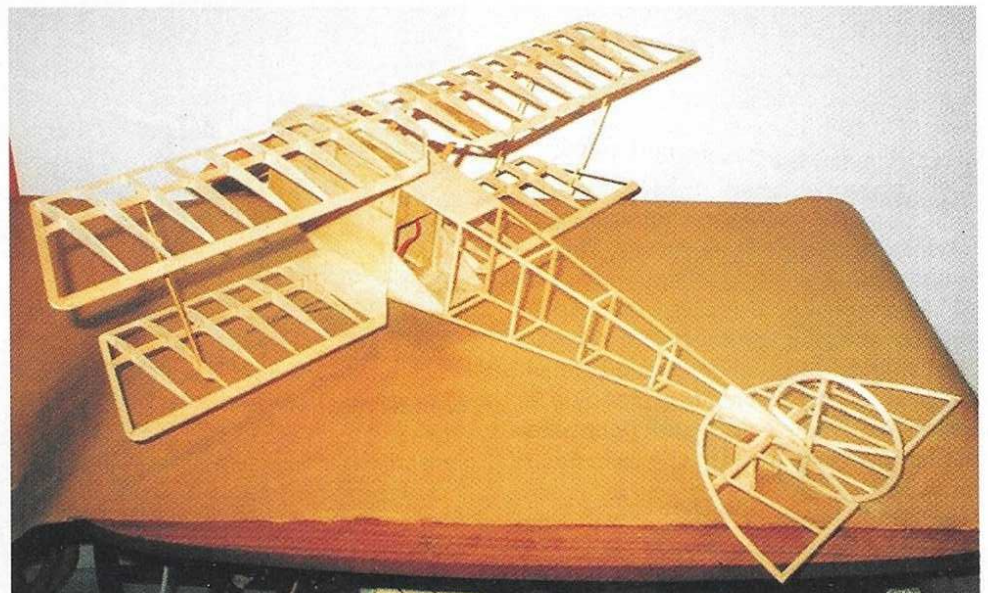
Fuselage

Although not for the absolute novice, the construction should prove quite straightforward. The plan will assist in a visible explanation of the construction methods used and you should find nothing difficult in the procedures. Just study the plan carefully before cutting, dry fitting and finally gluing.

Do make sure that you use hard balsa for the longerons, but medium to soft will be fine for the rest of the model. Most of the assembly on my model was done using PVA adhesive. Cyano is best for any of the bound wire to wood joints being much lighter than epoxy.

If you have built one of the Scout series of models by Flair you will be familiar with the construction method used on the basic fuselage assembly. This involves building it in two halves, the front sheet sided section and the rear built up strip

Airframe is now ready for covering. It may look flimsy, but it is light and does fly well.



eloz



section. These are built to the basic box stage separately and then joined, over the plan prior to fitting the wire parts, any remaining formers, sheet decking and infill areas.

I would recommend that the hinge tubes, wing dowels and tail skid parts are not fitted until after you have given the fuselage its final overall sanding. Don't forget the 1/32" ply capping over the rudder tube, it really does need to be there. Access to the R/C gear for both installation and charging is via the 1/32" ply hatch between the u/c legs. On my model this is hinged at the front with tape and held closed at the rear with a wire-in-tube catch.

Tail Surfaces

Probably the most difficult part here is laminating the curved outlines which is achieved using water-soaked 1/16" x 1/8" balsa formed around cardboard templates and allowed to dry completely before use. Then just build them over the plan with 1/8" sheet or strip balsa.

After sanding smooth, drill holes for the hinge wires and they are ready to cover.

Wing Panels

The top wing is in three sections. The centre section and the two panels are joined to give 1/2" dihedral under each outer most rib with ply braces.

Make sure that the spar notches into which the ribs fit are accurately cut and not too wide. Be sure to use hard balsa for the spars on all the wing panels, the root ribs of the lower wing panels and the ribs to which the strut plates are fitted.

The lower wing panels are built in the same manner as the top panels.

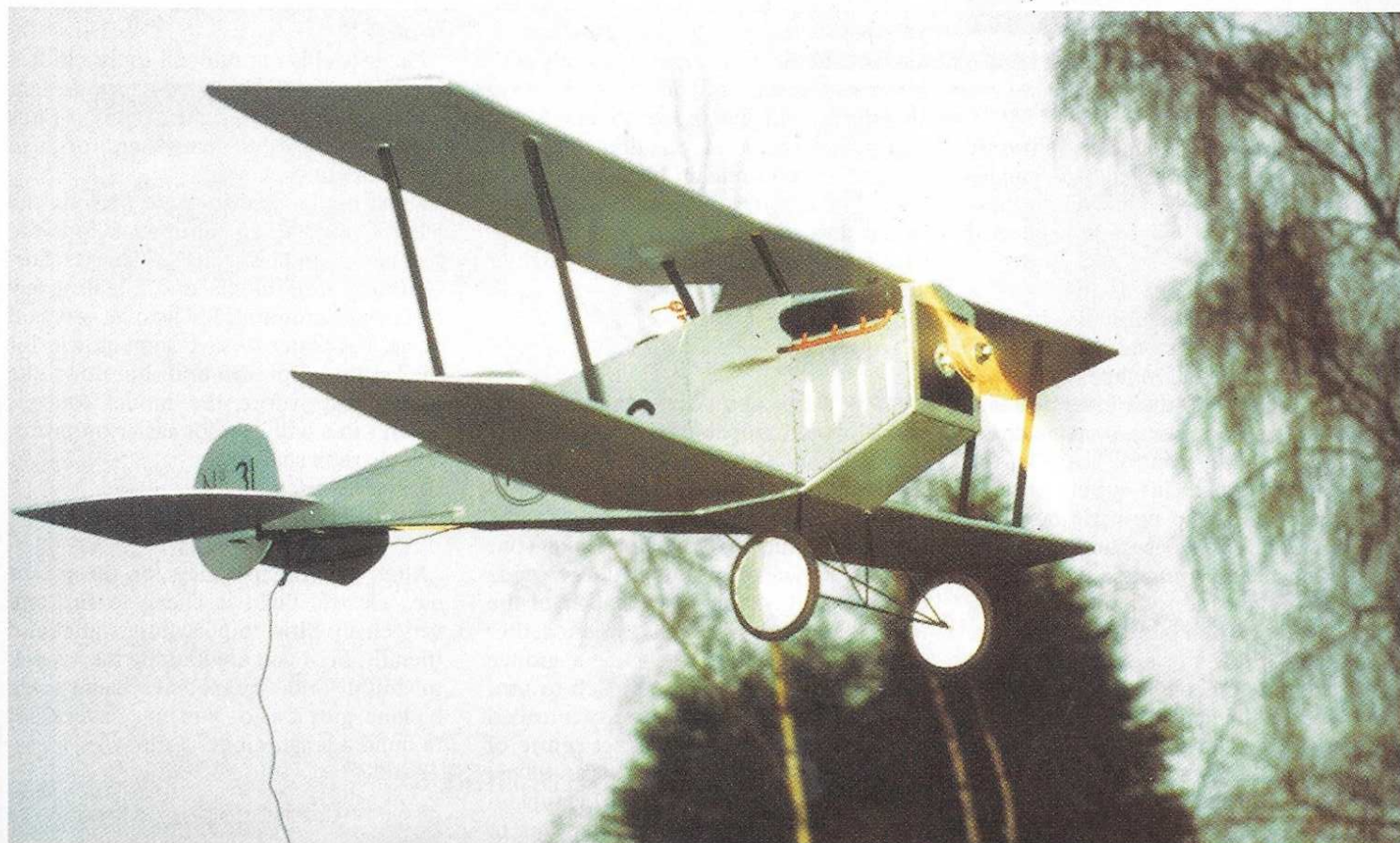
The model is not difficult to fly - in fact it's quite easy.

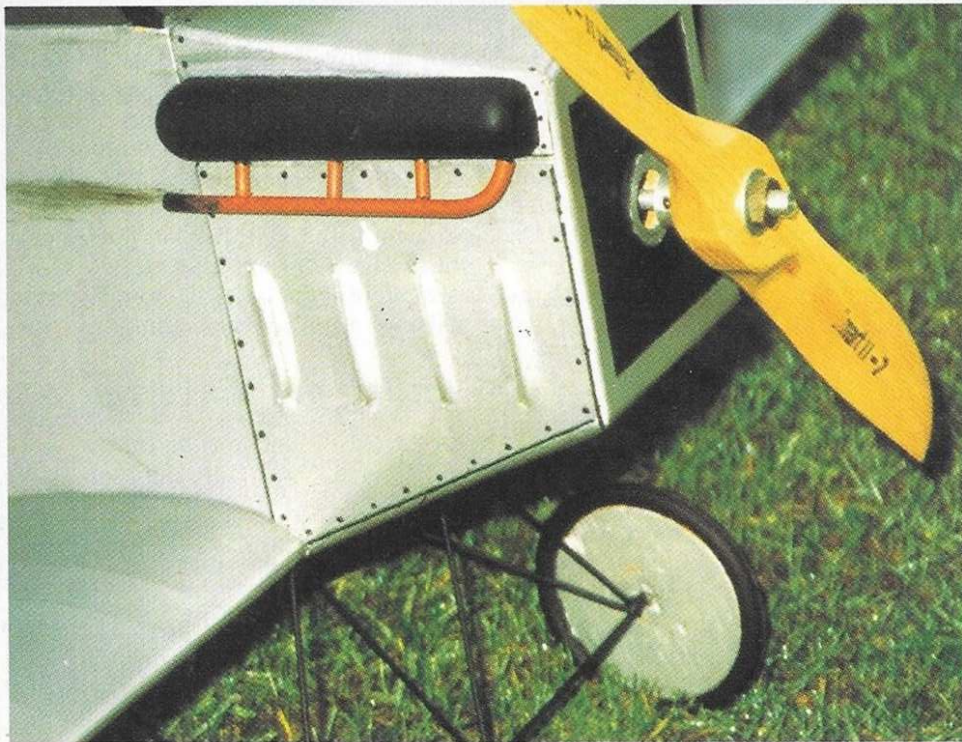
If you remembered to drill the 4 root bay ribs to take the wing tubes and to fit the strut plates to the top surface of these wings, all that remains is to sheet the inboard rib bays, top and bottom, with 1/32" balsa. Don't under any circumstance be tempted to omit this sheeting. I know it isn't very thick, but it adds a lot of strength for very little weight. It will also prevent the covering from distorting the root ribs when you shrink it.

Fitting and Covering

The control functions on the prototype are provided via a Hitec mini 4 function

Speed 400 motor and 11" x 7" wooden prop fitted. Note the sheet front sides and top.





The addition of lithoplate to the front side panels will add the extra weight where it's required. Note the dummy exhaust details and wheels from balsa.



Model is covered overall in Silver Litespan.

Rx., two HS101 servos and a Kontronix Easy 1000 speed controller. This combination provides a very reliable and inexpensive control set-up and has been used in many of my models to good effect.

The servos are mounted using 1/8" x 3/8" hard wood beams, whilst the Rx. and speed controller are mounted on the fuselage sides with servo tape.

Control linkages to the rudder and elevators are via closed-loop systems direct from the 1/32" ply control horns to the servo output arms. This system takes a little longer to set up properly but does save the weight of clevises and adjusters.

The control runs are made using 25 lb. breaking strain mono-filament fishing line. This has proved more than adequate on models of this size and is very much lighter than nylon coated trace wire.

My model is covered with silver Litespan overall and has the nose area painted silver to give it a bit higher gloss than the rest of the model. I don't claim that this is 100% accurate, but it does

look right. A study of monochrome photos shows no obvious colour difference between the nose and the rest of the aircraft. The struts, u/c and markings are very dark, and have been done black on my model. An alternative for the u/c and struts could be dark wood - Mahogany or similar. The interplane struts are simply made from 1/8" dowel faired with balsa and rely on the spring of the lower wing dowels to allow them to be just plugged into place.

Should you decide to go for a lighter, one-piece model all you need do is replace the wire lower wing dowels with short stub dowels of cocktail stick to aid alignment, and glue the lower panels and interplane struts in position. The top wing fixing can remain unchanged. This would be a better method than the hard wood struts that I used. Both more accurate and more durable - probably lighter too.

Details

A few words about the detailing of my model would probably be in order at this stage. Whilst it's possible to use commercial WWI wheels on the model you will find that they could weigh as much as the entire airframe, so why not make your own. Cut two discs and two 1/4" wide rings from 3/32" to the diameter of the wheel, less the tyre. Glue these together to make a pair and then cut a groove around the outside edge of each to provide seating for the tyre. Epoxy a drilled hard wood block to the exact centre of each wheel, on the same side that the ply ring is fitted, and glue the bearing tube in place. Do not be tempted to use cyano to

fit the block as it's just too brittle for the job - believe me!

The tyre is made using either a stiff rubber tube, or a Hoover drive belt. This should be firmly glued into the groove around the wheel rim. All that remains now is to fix it to the axle and add the card cone that forms the wheel cover which should be heavily scored on the inside to simulate the spokes.

You should now have a pair of wheels, not totally accurate but do look the part.

The rocker covers and exhausts are shaped, sealed and painted balsa. The louver panels at the nose are made from Litho-plate glued in place. I know that Litho-plate seems a relatively heavy way of going about this, but at least it's weight where we're likely to need it.

Power Unit

The prototype model is powered by a 7.2 volt Speed 400 motor running a Mini Olympus gearbox, with the energy supplied by 7 x 500 AR cells. This set up turning an 11" x 7" wooden propeller works very well, and will give flight times well in excess of five minutes.

Flying

The Microplano Veloz is not a trainer, or even a novices model. It's intended for either the electric flight enthusiasts or those who, having flown scale models, would like to have a go at electric flight without having to spend a vast amount of money.

The model is not difficult to fly - in fact it's quite easy. It's just that with this light structure and the weight of the Ni-Cads you don't want too many hard, or even heavy landings.

Don't be tempted to try to prolong the glide if she does go "dead stick" on you, line her up and bring her in. This is a fairly draggy little model and a stall a few feet off the ground is likely to be very bad news. Far better to save some power for the landing approach and shut down the power just before the model touches down - this will be a lot easier on props. and gearbox shafts.

Conclusion

After the initial outlay for the motor etc., electric flight is cheap to run and very clean. Most important it's quiet and friendly. So if you are looking for a quick to build and inexpensive semi-scale biplane, give it a go - you may never want to build a larger model again!

RCMW

Peter Rake