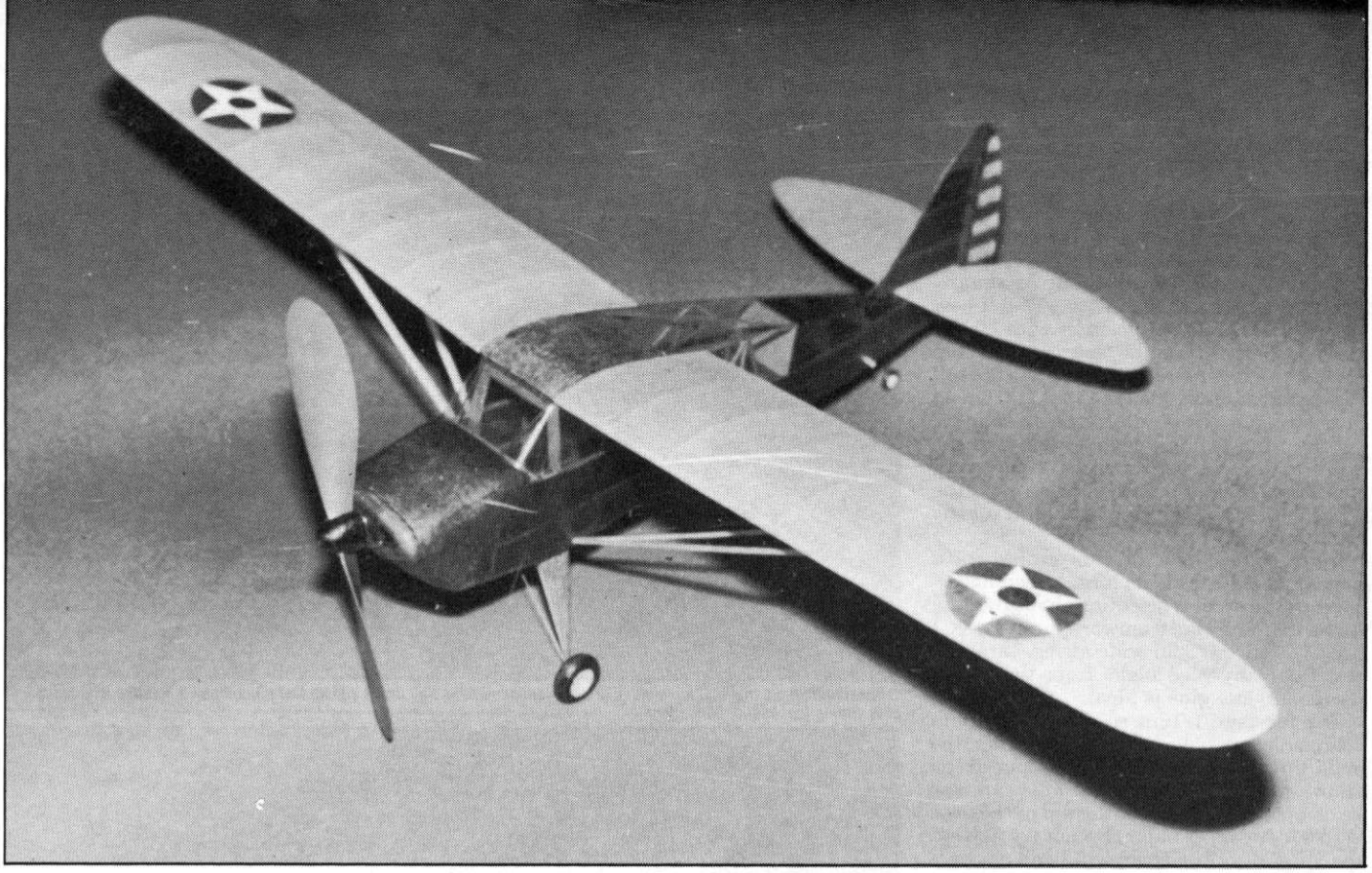


INTERSTATE L-6

Try a spot of Rubber Scale — build John Watters' 27 inch (¾in : 1ft) replica of this little known U.S. trainer. Full-size plans overleaf; comprehensive instructions below

IN GENERAL CONVERSATION with a colleague of mine, who knew that I was interested in model aircraft, and for that matter most things aeronautical, he mentioned that he had the first three volumes of Aircraft of the Fighting Powers 'originals' and would I like to look at them...obviously the answer was yes.

Although I have quite a comprehensive amount of literature on both full size aircraft and models, I must admit that I had never seen any copies of these books - let alone owned any. True to his word he brought them for me to look at. After a few attempts to 'cross his palm with silver', to lever the volumes away from him (I must admit I would not have parted with them either), I was reduced to relying on the trusty Xerox copying machine to add the more interesting information to my collection.

One of the many new (to me anyway) aircraft within these volumes that looked right for modelling was the Interstate L-6. This aircraft gets its designation from being the sixth light liaison aircraft. The full size machine started life as the Interstate Cadet; and was modified to the L-6 by enlarging the cabin area, and glazing in particular. This was to allow for the addition of a 'map table'.

After studying the L-6, it seemed most appropriate to design it for rubber power (with a few necessary modifications). One thing it does have in its favour, for rubber power anyway, is its reasonably long undercarriage legs. This allows for a good propeller diameter with some ground clearance, without having to exaggerate the undercarriage.

Tailplane and Fin

The enlarged tailplane area is the only deviation from true scale outline.

Due to the rather 'curvy' outline of the fin and tailplane, and its flat plate section, a laminated outline seemed to be the best type of construction. To anyone who has not tried a laminated construction before it may look difficult, but once mastered it really isn't. Excellent stiffness for little weight is the main advantage.

First mark out onto either a piece of 1/16in medium balsa sheet or card the whole of the inner profile of the tailplane. Cut out the shape and with a candle rub the edges of the template until it has a thin coating of wax. Run a piece of string around the outside of the template and measure the length, which will be that of the balsa strips you will need.

For the laminates themselves, cut strips of 1/16in wide balsa from 1/32in medium sheet. Make the strips longer than actually required, and cut a few more than you need, just in case you break one. The template can now be pinned down onto your building board. Before the strips are wrapped around the template, they should be softened. This you can do either by soaking them in water, or use good old saliva, i.e. run the strips through your lips a few times.

Position the first strip (still wet) against the edge of the template and pin it in place. Now with a firm continuous motion, wrap the strip around the template, pulling gently. The strip can be held against the template by scraps of balsa pinned against the strip. The next and any further strips are added in the same manner, but one face of the strip should be smeared with PVA glue. The small retaining scraps are removed and repositioned each time a strip is added.

After building up the outline of the required thickness, and allowing it to set thoroughly, sand the structure smooth whilst it is still on the template. Lastly, remove the outline from the template and trim to length. Now pin the outline down over the plan and build up the inside structure from the 1/16in sq cross pieces. Finally remove the completed part from the plan and lightly sand smooth.

The above construction method can be used equally well for the fin and wing tips. If on the other hand it all seems too much, the outlines can be made up from sheet pieces - but is is recommended that you laminate!

Fuselage

Begin by building up one side frame to the shaded outline. Select medium stiff strips for the top and bottom longerons. The remaining spacers can be from lighter balsa. I used a PVA glue for all the 'balsa to balsa' joints.

Use whichever method you prefer for building up the second side (building the two frames one on top of the other will give you the best results). Now with both sides completed, glue formers F4 and F5 into position on one side frame. You will probably find it best to check the correct alignment of these formers by positioning the side frame over the plan view. The second side can now be added, and when set

glue the frames together at the tail.

The upper fuselage formers F6, F7 and F8 can now be glued in place and the bottom 1/16 in sq spacers added. The nose formers F1 and F2, plus the dashboard former F3, are added next along with the remaining 1/16in sq bottom spacers.

Because of the slightly 'out of square' fuselage cross-section, you may find it best to hold the frames in position with elastic bands when fitting the spacers. The top fuselage stringers from former F5 to the tail can be added next, plus the three 1/16in sq nose stringers. Now add the cabin spacers, i.e. the wing leading edge section and the two tubes which pass through the part wing ribs. I used rolled gummed paper to make the tubes, although aluminium or even plastic could be used.

In my view, one of this craft's most appealing features is its large 'green-house' cabin, so particular attention should be paid to the roof and side framwork in this area. I used 1/16in × 1/32in wide strips, carefully removing any glue blobs from the joints. Cyanoacrylate glue is ideal.

The fuselage 1/16in sq side and bottom stringers can now be added, butting the ends up to the front and rear spacers as shown on the plan. The nose area can now be completed. Sheet over the top of the nose with 1/32in sheet balsa. Do not try to bend the sheet dry. The sheet will bend easier if wetted on the 'inside' surface and then slowly bend to shape. Hold the sheeting in place with either elastic bands or tape, and allow it to dry out before gluing in place.

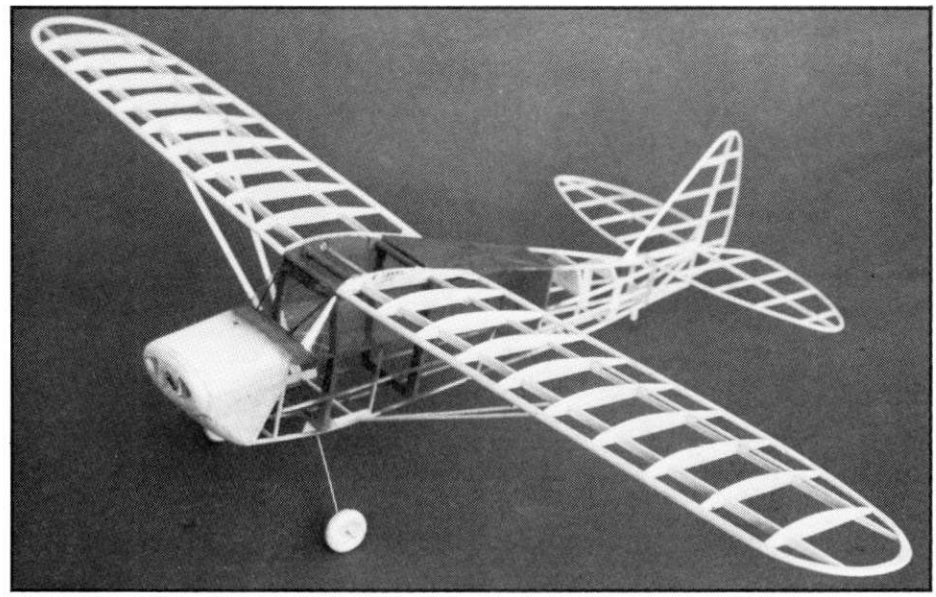
The remaining 1/8in sheet nose side pieces can be added, along with the ¼in thick bottom block. Make up the nose from either block or laminated sheets. Tack glue the nose block into place and sand the whole nose area to shape. The whole fuselage structure should now be given a light sanding.

Now bend the front undercarriage legs from 20swg wire, and bind and cement to the bottom of former F4. Add all the remaining bits and pieces, i.e. windshield struts, wing strut tubes and any cockpit detail you wish. I was unable to find any of the latter, but decided that because of the large area of cockpit structure visible, this structure would look far better painted. I gave my model a light spraying of dark green paint, although felt tip pens could be used to colour.

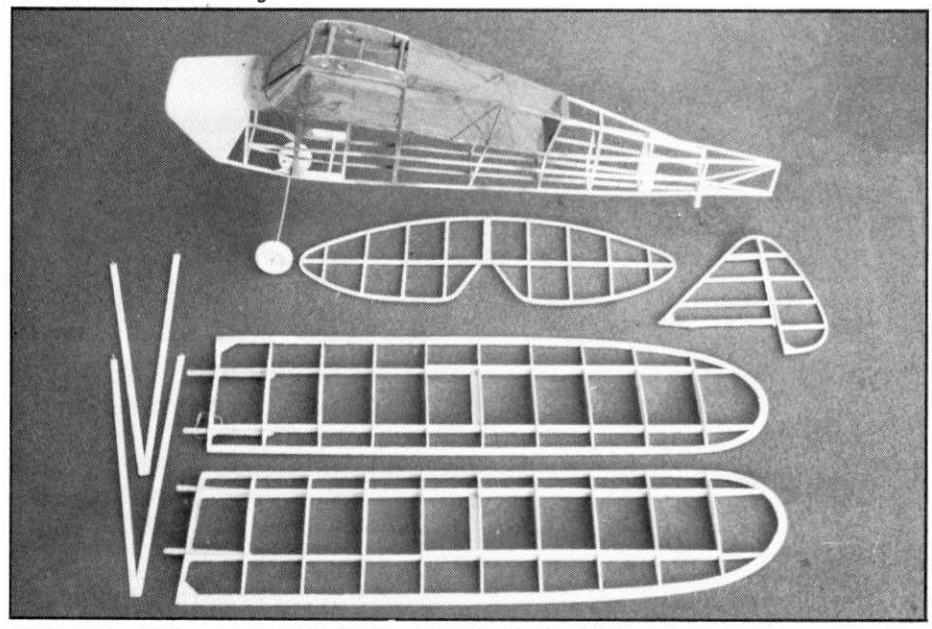
Fitting the undercarriage leg fairings and tailwheel are best left until after the fuselage has been covered.

The cockpit glazing should not really offer any problems, although care should be taken not to smear the glazing with glue. Using acetate, thinned down dope worked well as the adhesive. To attach the glazing to the main cockpit structure is sufficient; and this also gives a neater appearance rather than trying to stick it to every piece. The windshield can be held in place more easily by letting it into a slot in the top sheeting.

The fixing method itself, for the benefit of anyone who has not tried it, it is as follows. First, with a small brush, apply a coat of dope onto the outer edges of the cockpit structure, i.e. the cockpit outline. Now hold the acetate pieces in place with masking tape or sharp pins. Next, run thinned-down dope along the edge of the acetate sheeting and the doped structure. It should creep between the two and form a bond. This takes time, so don't rush it. If all else fails, spots of cyano work wonders. (continued on p.495)

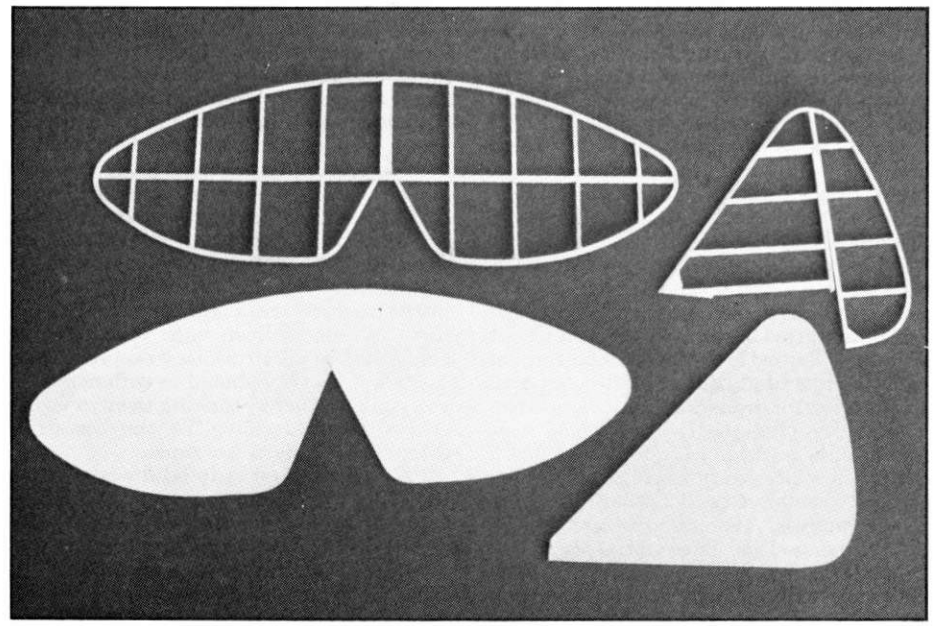


Construction of the L-6 is relatively straightforward – but don't rush! Care taken will ensure accuracy and make for easier trimming.



All the bits ready for covering. Note that the cockpit interior has been painted to avoid anaemic-looking balsa strips.

Finished tailplane and fin structures rest above the templates used to form the laminated outlines. Do try this method – it's strong, and surprisingly quick. Details in text.



Wings

Using either a stiff card or plywood template, cut out the required number of wing rib blanks. The correct profile for all the wing ribs can then be formed by sandwiching the blanks between the templates and sanding them to shape. The spar slots can then be cut into the sandwich. The wing tips can be made up either by laminating strips to 1/32in thick balsa together, using the same method as for the fin and tailplane, or building up from pieces of 1/16in thick sheet.

Begin the wing by pinning down the leading and trailing edge strips, and the two wing spars. The wing-tip pieces can now be glued in place, trimming them to suit. To obtain the correct wing-tip contour make sure that they sit on top of the two wing spars. The wing ribs can now be glued in place, cutting them to length as required. Set the wing root in place, and position it to the correct dihedral angle, using the template. Remove the completed wing from your board after it has set and sand to shape.

The wing strut platform and tubes can now be added. The tubes should be epoxied or cyanoed into place. The same goes for the small wing retaining hooks.

With both wings completed a check on the dihedral should be made as follows. Cut the four ⅛in dia. wooden dowels to length and push them into the tubes in the fuselage to the correct depth. Push one of the wings onto the dowels, making sure that the dowels stay in place (i.e. that they don't disappear into the tubes). Now add the other wing, and retain them by a small elastic band between both wing hooks. If all has gone well you should have both wings at the same dihedral when viewed from the front. If not, you can either sand off or add on a small amount of balsa to the dihedral root rib.

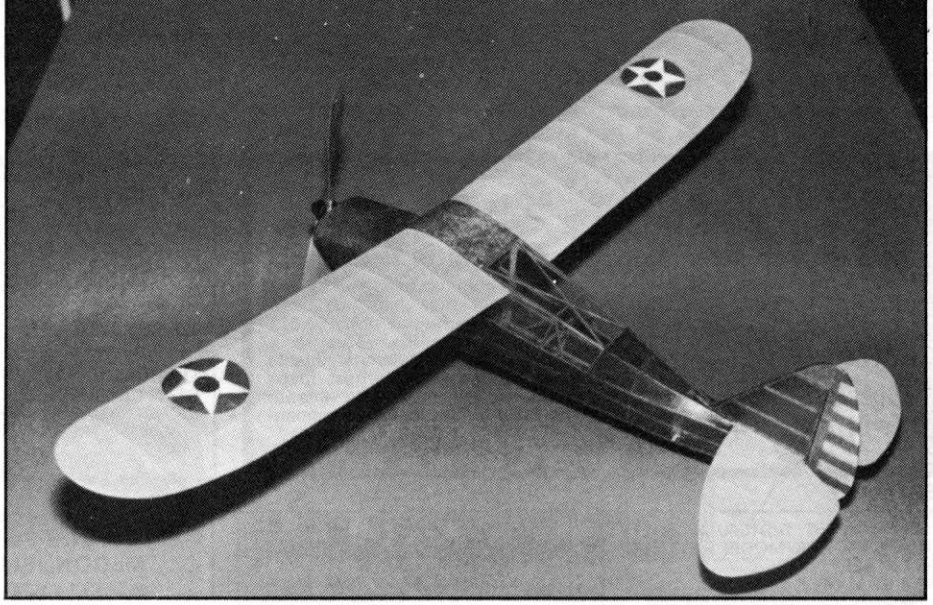
When the wings have been set up correctly the dowels can be glued in place. Do this while the wings are still on the fuselage.

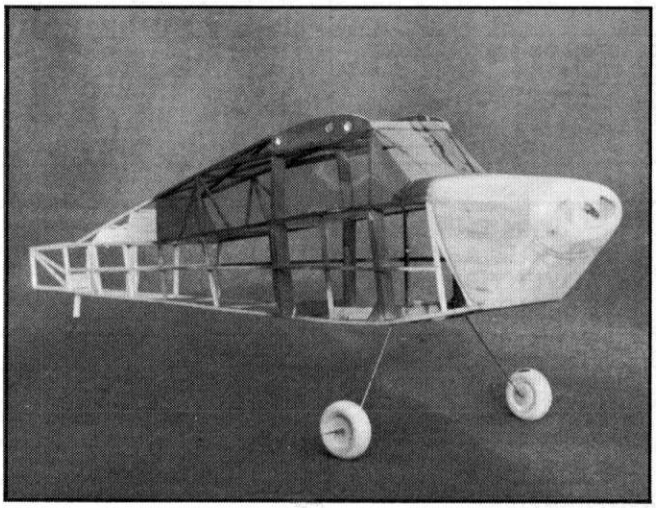
The wing struts can now be made up and checked for fit. First cut strips from 1/16in medium hard sheet balsa and sand them to a streamlined section. Glue the ends of the strips together and pin them down over the plan to form the 'V'. The struts should be left slightly longer than shown to allow for fitting. When set, remove from your board and epoxy a small length of 22swg wire, bent to the correct angle into the joined end of the struts. Now position the strut into the fuselage and check the fit where the strut ends meet the underside of the wings. Mark and cut the ends of each strut so that they just end on the small tubes. A small piece of 22swg wire should now be epoxied into the ends of each strut, again bent to the right shape. The struts fit well when they have to be slightly sprung to fit into the wing tubes, but not so much that they distort the wings.

Covering and Finishing

Although the only reference I could find for this particular aircraft shows it in the colours of the United States Army, it was also used as a trainer. The choice is yours. Probably someone knows exactly what colours they should have been even in the 'Cadet' version. I must admit I found this one a hard model to research.

The Army colours for this period were drab dark green all over. I opted for somewhat brighter training colours, i.e. a blue body and trim with yellow wings and tail.





Above: The L-6 is an attractive subject. John chose to finish his prototype in pre-war U.S. trainer colours, i.e. blue fuselage and fin, with red and white rudder stripes, and yellow wings and tail. Right: The basic fuselage structure. Cowling is easily fashioned from block or laminations of sheet.

The whole model was covered with coloured lightweight tissue, and clear doped. A mixture of about 40% dope, 60% thinners should be used. Apply dope sparingly, especially to the tail surfaces, which should be pinned down flat while the dope is drying.

Any markings or colour trim should be applied either with coloured tissue (or better still, sprayed on). Coloured felt nib pens are very good if used with care. 'Staedtler' pens, or similar, are ideal; and they come in many colours. Choose the 'waterproof' type, and apply sparingly. Good results can be obtained - experiment.

Flying and Trimming

The model turned out to be well within my design weight, and without rubber; it weighed 36gms. I used an 8½in Peck Polymer plastic propeller and, for the trial motor, a 24in loop or ⅛in rubber.

The model should be balanced out at the position shown on the plan. Add ballast as required to either the nose or tail. Test gliding and first flights are (as always) best carried out over long grass and in reasonably calm conditions. Note that gliding the model from shoulder height does not always give a true picture of the model's glide characteristics. To some extent this is because of the drag of the propeller, even though it is freewheeling.

Adding a few turns to the motor - just enough to take up any motor slack - will give a powered glide, and will show up the model's gliding ability better by raising the model to its flying speed. Any out of the ordinary tendencies will also show up better!

If the model stalls, carefully bend the elevator down; bend it up to overcome a diving tendency. If you do not wish to fix the tail and fin to the fuselage the fin can be glued onto the tailplane and whole unit may be held onto the fuselage by elastic bands. In this case, trimming out may be done by packing shims under the leading or trailing edge of the tailplane. All shims should be glued in place when you are satisfied.

With the motor well lubricated increase the number of turns with each flight, and watch the model's flight pattern. It is usually best to get rubber models to turn to the right under power. To begin with use a very small amount of right rudder offset; no more than 1/16in at most. As you increase the number of turns, there may be a tendency for the model to stall on the power run. The cure is to add pieces of packing at the top of the nose block. As power is increased, the model may tend to turn to the left; if this looks like getting out of hand, add some packing to the left hand side of the nose block to produce opposite sidethrust. Add only small amounts of packing at a time, 1/64in or 1/32in, preferably cut from ply or hard balsa.

The model's final performance rests with you, but if trimmed out carefully (and if it is warp free) you will enjoy many realistic flights.