



Pica Waco



Clifford McIlwee builds a classic kit from the USA

Why the Waco?

The Pica Waco is, in my opinion, a beautiful aeroplane and one of the prettiest 'bipes' to take to the air. It is also fully aerobatic which helps when deciding which schedule to fly. The Pica kit of the Waco comes in a very large box with loads of strip and sheet wood as well as mouldings and an extensive fittings kit. One thing I did notice, however, was the suggested weight of the finished model, so even before I opened the box I was thinking in terms of keeping the building light. The packaging was first class with all the pieces in separate bundles, all labelled, with the cowl very well protected at one end. A forty-four page instruction manual, two full-size plans for the wings and fuselage plus a decal set are provided.

Building

The wings are built first and use balsa spars. The wing ribs are 1/8th" die-cut, so I lightened them with 13mm holes (five holes in each rib). This did not weaken the ribs in any way, and I lightened the bottom ribs in the same manner. The die-cut ribs do require a little sanding, possibly reflecting the kit's age, but they all fit nicely on the plan and the wings really do go together very quickly and no problems were encountered with the alignment of any parts. The selection of balsa for the finishing of the wings was first-class in this particular kit.

On page twenty of the instructions it shows a bell-crank arrangement for the ailerons, but I decided to go for a separate servo in each wing, however, the hardware provided (bell-cranks, all the bearings, etc.) are good quality and strong mouldings and perfectly good for their purpose.

One other really nice touch is a set of aileron covers, which are supplied as ABS mouldings which have scale 'riblets' on them, it's just a matter of scoring them off their moulding, cleaning them up and cyning them in position. These are provided for both wings.

Once I had the two wings built I gave them a careful sanding and put them away on a flat surface. The top wing is 72", so if you work in a small workshop like I do, you must treat them with extra care.

The changes I made to the wings were only to mount 4mm captive nuts on the top wing mounting blocks instead of screwing the wings on with No.8 sheet metal screws as the instructions suggested. This modification makes for a far more reliable method of holding a top wing onto a plane of this size and weight.

Fuselage

This is the area which required the most work and modifications. The changes were, however, purely a matter of personal preference as all the die-cut formers were a good fit. Page twenty-three shows all the necessary laminations that are needed and these have to be labelled by the builder to save trouble in understanding later pages.

The fuselage is built upside-down on the 'plan view' along two crutches (F29).

The pretty lines of the Waco show up well in this photo taken in early morning sunshine.





The fuselage with wings and cowl removed shows the cabane struts arrangement and fuel line detail.

Once the ten bottom formers are in place, the undercarriage mounts and wing seating parts are glued in position. The main undercarriage is also installed at this stage and 'taped up' at the axles for soldering at a later stage.

Two maple motor mounts are supplied (F34). I glued them in position along with the tank-box sides (F18) which when set, really strengthens the whole front of the fuselage. They're 10" long by 5/8" square! I was also pleased to see that there is plenty of room for the largest of fuel tanks should one be fitted.

Because the plane is aerobatic, large and would have a high drag factor when landing I decided to fit something with a bit of oomph!

I cut the maple mounts off flush with the front F-4B ply bulkhead, this is only 1/8" ply, so I laminated an identical one to it made out of 1/4" ply, taking note of thrustline etc. This enabled me to use a Weston U.K. soft mount for my engine. Also any adjustments at a later stage could be more easily carried out such as downthrust, sidethrust etc.

It is very important at this stage to get the powerplant sorted out because of the tank box and the construction immediately behind it would be extremely awkward to modify if adjustments to the size of powerplant were required later. I selected a Super Tigre 3250 because of the large props it would be capable of turning. On page twenty-seven it tells you to glue in place "Y" stringers and then "X" stringers, I was confused at the reason for this but then realised it was to keep the fuselage from distorting whilst to fit the stringers. You also have to be careful with the length of some stringers because some end 3/4 of the way along the fuselage and some run right up past the wing seat.

The cabane section is very well thought out and is completely self-aligning, which pleased me. It is just a ply-wire-ply sandwich which then slots into the front formers. It was a very good fit and everything seemed to line up nicely. One thing you don't scrimp on is the epoxy in this area. I used araldite 24 hour, because I find it less brittle than five minute types.



Author Clifford with the Waco.



No problem with fitting the radio gear in that cavernous fuselage opening.

There are pushrods provided to operate the rudders and elevators but I used closed-loop on the rudder and installed two mini-servos with a Y-lead below the tailplane for the elevators. This is one feature I would recommend because not only does it give you more security (no elevators = no model!) but they are barely visible below the stabiliser.

The whole of the tailend is made from a selection of pre-cut 1/2" balsa butt-joined and then finished off with 1/2" sq. strips for the 'ribs'. When you come to this stage and pin the whole tail assembly to fuselage you then realise you're going to have one really nice model - it takes on the appearance of a large butterfly!

After all the sheeting up front was done, the whole airframe was 'gently' sanded - don't damage those stringers - and a final check for structural strength proved it to be excellent.

One downside is that the tail feathers are so big and thick that these could almost cause a CG problem, so the builder should really keep adhesive and filler etc., at the rear to the very minimum.

I measured the cowl and sent off to Vortex Plastics for a dummy seven cylinder engine vac forming and proceeded to finish the front end. The cowl is an excellent ABS moulding and once you have glued 'blisters', which are also ABS in position with some polystyrene cement it really looks the part. I think it's the combination of the cowl blisters and the 'butterfly' bit at the back which makes this plane really pleasing to the eye.

The only other jobs left were to be the 'nitty-gritty' type. N struts were made from basswood which was provided, and also the spats which are made up from balsa block and turned out to be surprisingly light and strong.

Covering, Finishing and Flying

From page thirty-nine onwards the instructions explain in great detail about the setting up of the model, including the mounting of the spats. No problems were encountered at all and all wing-tail incidences are aligned for you during construction.

The entire plane was covered in white Solartex then I added rib tapes from Solartex and also put 'tex' tapes along the fuselage stringers, this helped to prevent 'handling damage', because the stringers do not sit square into the formers.

The whole plane, apart from the leading edges of the wings, were sprayed with Flair matt white and then the leading edges with Flair matt red. The spats and N-struts were covered with tissue. The reason for painting the Solartex was to seal the weave and to try and keep the plane as clean as possible in the future.

The decal set provided is first-class, but I opted to cut the



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numbers out and use them as a stencil, this way I could retain the matt finish to the lettering and is also identical to the red trim on the plane. I was pleased with the way this turned out. On looking at photos of the Waco, there are four fuelpipes coming out of the tank on the top wing. These are easily made from brass tube and held onto the centre cabanes with strips of aluminium tape.

There is also a diagram in the instructions for the non functional rigging and because the model was white, I went for some black shirring elastic which showed up well and was held on by pins covered with thin brass tube. I also made a

Flying

When I got to the field and set up the model, the wind was gusting across the runway one minute and along the strip the next! So myself and Robert Grahme decided to give the engine a good running on the ground. After a bit of 'tweaking' etc., the engine was found to be good at the top-end and middle, but it was a bit 'lumpy' on tick-over. However, we decided to fly as the wind steadied and seemed to be staying in the same direction.

Robert took the controls and with the throws set as per the instructions, he opened the throttle. At about ten feet away, the tail lifted and a split second later the Waco was airborne. I glanced at the throttle setting which was only open a quarter of its travel and then noticed the smile on Robert's face! Being an experienced pilot, he immediately gained plenty of height and made a couple of high passes before deciding that the model would be OK for some aerobatic evaluation. It looked absolutely fabulous in the air and very, very realistic, but it was then I noticed that the left top aileron was fluttering very badly so a landing was called. The Waco was brought in but on the final leg, at about 30 - 35 feet up, the engine cut and it dropped like a brick. Robert managed to keep her level and no damage was done. I knew I had to sort out the 'lumpy' tickover and probable engine cut.

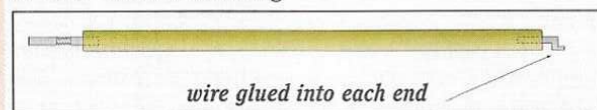
I was using a J-Tech silencer but this was found to be far too noisy and not giving enough back pressure for the engine fuel. I was using Dynaglo 5 but have now changed to Super-Tigre Big Brute. A fellow member said he had the same problem with a ST 4500 and the only solution was to correct the fuel and the silencer.

The aileron problem has been sorted by replacing the 'kit' aileron connecting rods with full length 12swg piano wire. The ones in the kit are hard $\frac{7}{16}$ " x 12" balsa are were bending under the load. I think this is one area which Pica could possible improve upon. See Fig. 1.

Fig. 1

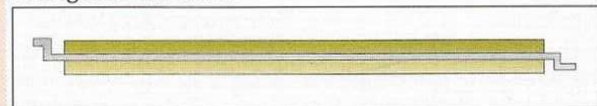
Kit version

$\frac{7}{16}$ " x 12" hard balsa fairing



Modified version

12swg wire with balsa



couple of hatches from 1/32" ply for access to the fuel tank and throttle cable should the need arise.

The plane balanced at the required spot without the need for lead with the hefty S.T. 3250 up front, but if you were going to use the recommended engine and Solartex type covering you could expect to add some ballast.

Conclusion

All in all a good kit of a lovely plane, but small improvements here and there wouldn't go amiss. These are very minor however, and the whole thing builds nicely and accurately with no major problems encountered. **SCALE**



Rear three-quarters view shows the cockpit, luggage locker, centre section fuel tank and wing walk detail which breaks up the outline of the Waco and brings the model to life.



The pretty lines of the Waco show up well in this photo taken in early morning sunshine.

PRODUCT DOSSIER:

Model Specification:

Scale:	$\frac{1}{8}$ " (100% accurate outline)
Span:	72"
Weight:	15lbs inc. fuel (13lbs is the target weight of the kit)
Engine:	S. T. 3250
Fuel:	Dynaglo 5 (maiden flight)
Prop:	20 x 8 wood
Covering:	Solartex - tissue (spats and struts)
Paint:	Flair matt

Accessories in kit:

Decals, cowl, cowl blisters, dummy centre section fuel tank, aileron covers, windshield, very complete hardware, including spat mounts and cowl brackets.