

Shuttle/Airwolf

Ken Moseley explains how he turned his Shuttle XX into a mean machine



A justifiably pleased Ken Moseley with his very smart Shuttle/Airwolf.

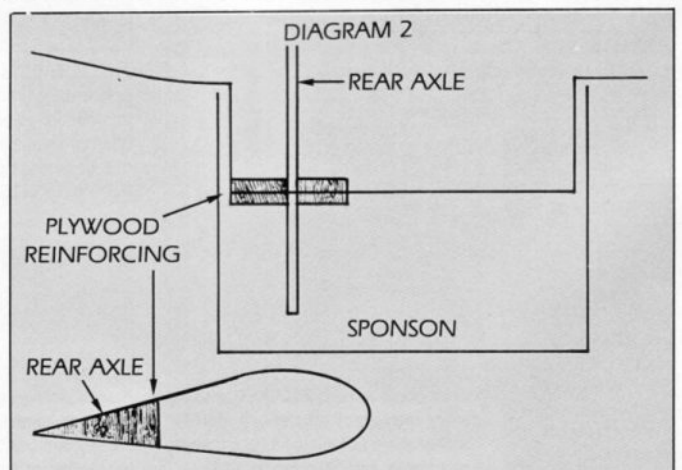
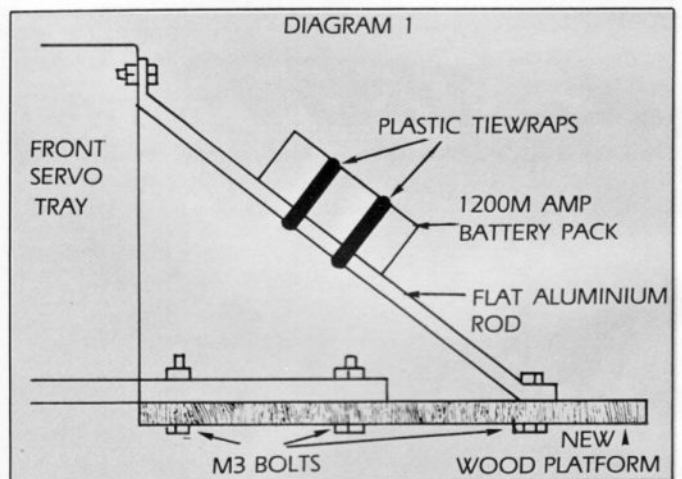
decided to cut out the front windscreen with a Stanley knife, leaving a centre strip in position which I reinforced by gluing a 16 gauge wire on the inside. Next I cut out all the air intakes and engine cooling ports, the dummy exhaust holes, and the real exhaust hole underneath the fuz which is clearly marked.

Mechanics

Now to look at the mechanics, I removed the tail gearbox and belt, also the skids and rotor head. At this stage fit a piece of tape around the end of the tail tube (gearbox end), covering the end of the pitch change wire, this should ensure that the wire does not snag when the tail boom is installed in the fuselage, remember to remove the tape before fitting the gearbox. I then taped the receiver aerial to the tail boom, leaving the last four inches or so loose. I know some of you will disagree with this method, but I like to hide the aerial out of sight and this worked well for me. You now remove the battery pack and receiver from the front plastic tray.

The very popular 'Hirobo Shuttle' can now become the fast and deadly 'Airwolf'. To make this transformation I used my Shuttle XX and bought an Airwolf fuselage from Dave Nieman, in London.

Firstly I would like to say that the fibreglass body was very well finished and with plenty of detail. It consisted of seven parts, i.e. main fuz section, front nose section, top canopy, tail fins and sponsons, all moulded in fibre-glass, and woodpack is included, but due to the new reinforced shell, only a few parts are required. At this stage I de-



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pack). Personally this machine deserves retracting wheels to set off its smooth lines and sleek body. I am sure the staff at Dave Niemans shop will be only too pleased to advise you on a suitable u/c, and if you use the bell crank type they can also supply a retract servo. Once I had installed the front wheel assembly and the retract servo, I then refitted the Rx on top of the retract servo with double sided sticky tape. I used a 120mA battery pack and as this may upset the centre of gravity if fitted too far forward, I cut a piece of aluminium rod, (12mm wide, 3mm thick, 180mm in length) and fitted it at 45 degrees from the top of the servo tray to a point near the front wheel axle

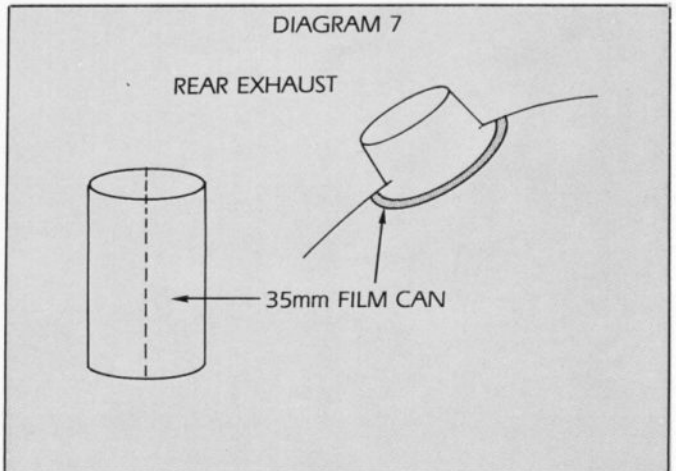
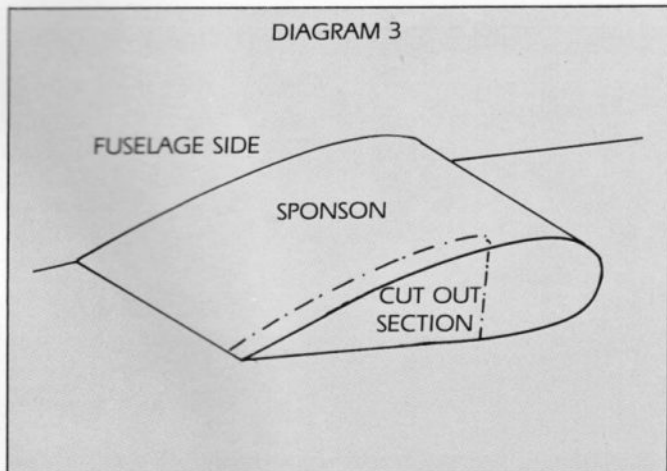
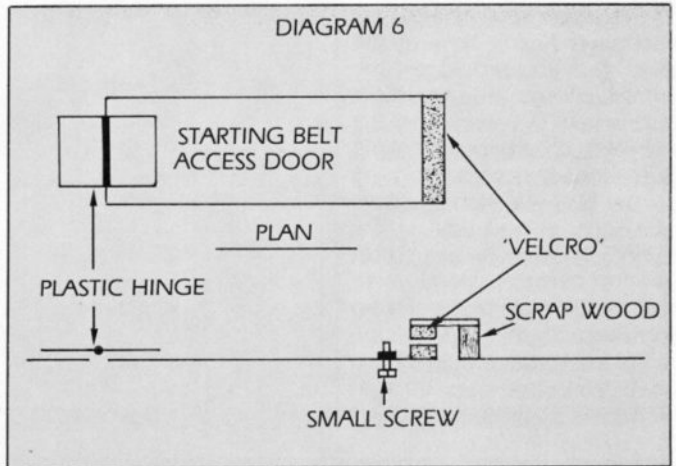
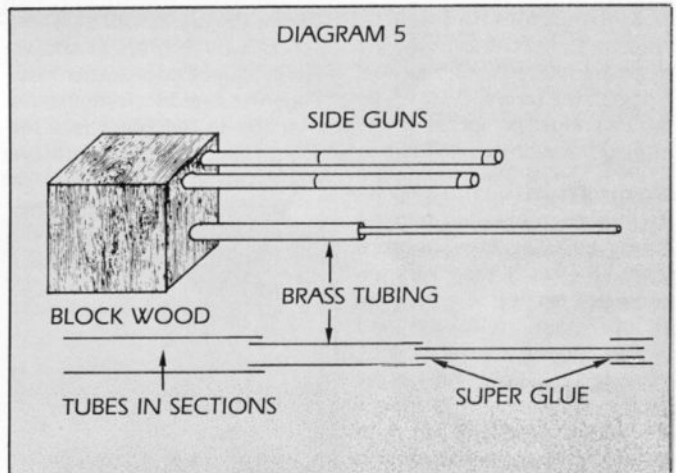
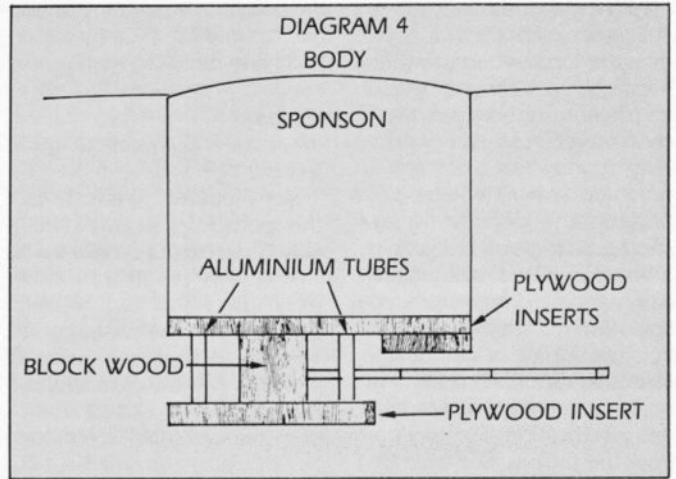
Underside view here shows cooling air exit, underside 'weapons pack' and wheel wells to good effect.



Drill this tray and bolt on the front wooden platforms (from the wood pack) using M3 x 16 bolts and locknuts.

Regarding the type of undercarriage, you can use an air-retract system or the much cheaper bell crank and wire system which I used, or even use the fixed-down wire mounts for the wheels (enclosed with the

(see diagram 1). This will then allow you to fit the 1200 battery pack in the most suitable position for the centre of gravity. If using a standard 500 pack then fit it alongside the Rx or on the vertical servo tray. This aluminium rod also serves as a restraint by stopping the nose wheel from flexing upwards under the weight of the



machine on landing.

The top canopy will not fit over the top servo tray with the middle servo (left/right Cyclic) in its present position, just take it out and replace it the opposite way round. You will need to purchase two new servo rods because the distance is now shorter to the side bell cranks.

I replaced the starting belt with a longer one because you now have to start the helicopter from the outside of the fuselage, obviously 'Shuttles' fitted with bottom cone start do not need this modification. The fuel pipe from the tank can be extended through the body shell for refuelling purposes, but again I wanted to keep the body line clear, so I fitted an extra fuel nipple to the tank and ran a pipe out to a refuelling socket on the fuselage, a worthwhile idea.

Body Shell

Back to the body shell, trim the excess material off the sponsons so that they fit level on the fuselage sides, do not glue them on at this stage. With the rear wheels mounted on their legs, mark and cut a pilot hole in the sponsons where you judge the wheels will drop through. Push the wheels into the raised position and up inside the sponson, then tape the sponson into position on the body. Through the pilot hole you should see the wheel, enlarge this hole into a nice wheel slot then allow the wheel to drop through making sure it does not snag on the wheel bay. This done, remove the sponson and tidy up the wheel slot. Repeat this procedure for the other side. Now cut out and glue four pieces of scrap plywood to the edge of the body shell, where the rear undercarriage axle goes through

the body. One piece inside and one outside like a sandwich on each side (see diagram 2).

Guns

What is Airwolf without guns, so here I go again.

Side mounted guns first, mark the sponson as shown in diagram 3, and cut out carefully with a hacksaw. Lightly sandpaper these parts and fit a piece of plywood into the cut-out piece. Then fit another two pieces of plywood into the main sponson (see diagram 4). Cut six lengths of aluminium tube, 25mm long by 5mm diameter. Then cut out two pieces of block wood 25 x 25mm. On one side of the sponson drill three holes as shown. Paint all yellow sections now. Glue the one block (remember that the drilled holes face forward), and the tubes into one side sponson first, then glue on

the corresponding piece, repeat for the other side. Now refer to diagram 5 for the construction of the guns, made from brass tubing. Once the guns have been completed glue them in their correct position in the block wood holes. If you want the guns to be more realistic paint them silver before gluing them into position. Complete the undercarriage and test that it is working correctly before gluing on the sponsons. When the sponsons have set, fill the join with a small amount of car body filler.

I put the mechanics in and out of the fuselage several times so as to get everything fitted tidy and working correctly. To fit the mechanics, use the bottom exhaust hole as a guide and once you have made sure the mast is vertical, looking from the front, mark and drill the four

bottom retaining screw holes in the fuselage. Fit the four mounting screws, but do not tighten fully at this point. I found it necessary to place a piece of plywood quarter of an inch thick between the body shell and the bottom of the mechanics under the front screws only, this centralises the mast in the top hole. Experiment with this until it is right then tighten all four screws. Next, gently lift the rear of the tail boom up against the top of the fuselage and cut a small piece of balsa wood to fit underneath it and so keep the tail boom in position. I did not glue this piece into position yet but kept it until the final fitting of the mechanics into the fuselage.

Plumbing and Electrics

With the mechanics in position you can now work out the pos-



ition of the glow plug remote socket and length of the wires to the glow plug, the external fuel socket and length of the fuel pipe, the on/off radio switch. A small hole would also be an advantage, to adjust the engine if required at a later date. I decided that a starting hole in the side of such a nice fuselage, would not look very nice, so I took the tidy approach and made a door. I cut a larger hole than necessary at the starting belt position, save the cut out piece to use as the door. Using an aircraft plastic rudder hinge fit the door back in place, and to keep everything neat and tidy I fitted two small pieces of 'velcro' to keep the door secure. A small bolt or screw fitted to the door serves as a handle. See diagram 6. The two large front air intakes were cut out and ordinary cardboard toilet roll in-

ners were made oval and glued into position. This idea made the intakes more authentic and also helped the air flow to the engine compartment. The top air intakes near the swashplate, were cut out, and 35mm film cans were cut to shape and then fitted on the inside with an inner layer of aluminium gauze before gluing into position. The rear (top) exhausts were also made from 35mm film cans, cut them slant and place in position, then mark out the two holes. This done, glue down the exhausts and then split another 35mm film can top to bottom, remove the end of the can then glue one half under each exhaust pipe as for diagram 7. The two rear lower exhausts were the tops of felt pens, cut and fitted into holes in the fuselage.

The engine cooling vents were covered inside by

aluminium gauze. Fitting the horizontal fin was reasonably easy. The vertical fin was just as easy but required a couple of spacer washers fitted to the mounting bolts to align it with the fuselage. The bottom launchers were made from three brass tubes with six small pieces glued inside them, and mounted on a piece of plywood 80 x 30mm, do not glue in position yet. Two pieces of flat perspex were cut out to fit the front windscreen, but not glued into position until after the fuselage was painted. I tinted the top of the windscreen by masking off then lightly spraying the perspex inside with a black paint. (Remember to keep the paint nozzle clear of paint blobs, otherwise you will spoil the tinted effect).

The front nose wheel slot was cut out using the same method

as for the rear wheel bays. A small strip of perspex was glued around the front of the front wheel bay (see photos). The front machine guns and wind indicator holes were drilled out and brass tubes cut and fitted in place, (painted silver). I used a small amount of car body filler to support these brass tubes on the inside. Next I rubbed down the fuselage using 600 grade wet/dry paper, masked off the areas previously painted, the wheels and the position of the bottom launchers.

Finishing

I then sprayed the fuselage all over with a cellulose paint called 'graphite', which as you can see is very smart and available from your local car shop. Now came the masking for the white paint (Ford diamond white) just follow the photographs and remember to include the tail gear box, it will take paint very easily. The side panels were painted black, and the top exhausts silver. Now glue on the bottom launches.

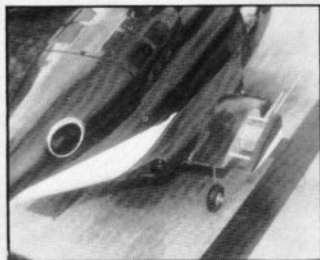
The fuselage was sprayed with a couple of coats of 'Tuf-kote' (fuel proofed) inside and out, which when dry I buffed up with a household furniture spray. Now fit the mechanics, the windscreen, tail gear box and the rotor head. My 'Airwolf' was built over a two week period using odd hours here and there, once I knew what scrap materials to use I found everything went together much quicker. I am sure that now you know what methods to use you could build an authentic looking 'Shuttle Airwolf' in a few days.

I found great delight when flying the Shuttle with its body on, in fact it appeared to go faster. I only encountered two snags when flight testing and they were, the nose would drop slightly in the wind and this was solved by moving the 1200 battery pack up the 45% aluminium bar, this moved the centre of gravity back from the nose, the other was that the side guns would vibrate. This was more obvious before the engine had leaned out and slight adjustment of the engine solved the problem.

I am sure you will have a great time building and flying this superb example of 'Airwolf'. My thanks to the staff of Dave Nieman Models for their advice, and to Alan Lewis and Dave Moseley for their help.

Happy hovering! □

Jet exhaust are from film cans. Diagrams explain production of the gun pack. Note also the mesh in the cooling louvres.



Next starting belt door is held closed with Velcro.

