Model is simplicity itself to build – but not to fly! Dare you try it?

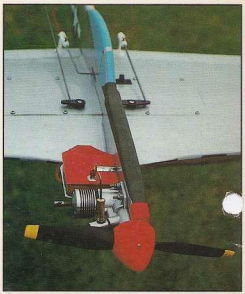
Mustang!

BUILD FROM OUR FULL-SIZE PLANS

Build William Beavor's 1.5cc-powered fighter

Ever wanted your own P51 Mustang? Well why not build this one? It won't cost much in time or money and it's lots of FUN. Other features include strong one piece construction (ensuring more flying, less pre flight preparation), compact size (easy to transport), totally accessible control rods and linkages, high manoeuvrability (including inverted, when fitted with the tank shown) and economic flying when fitted with the recommended diesel engine.

Using a diesel does have the additional advantage of keeping back-up equipment to a minimum. Just think, no glow plug battery and no glow plug to give you a hard time. It's a case of fuel it, flick it, fly it. But be warned, this is not a beginners model. If you thought diesels were only for powered gliders and vintage models think again. Better still, build a Mustang and find out for yourself.

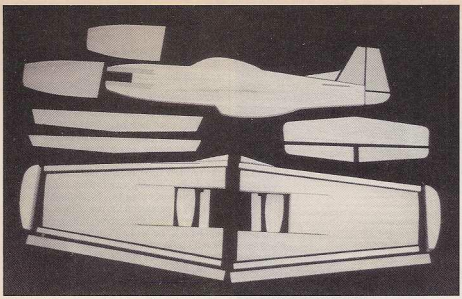


Prototype used PAW 1.49 power – diesels are convenient.

Wing construction

Use the templates on the plan to cut the foam cores, but note the washout. This improves the model's performance when it's time to land. The wings are then Obechi veneered in the usual way.

You should now have two veneered wing panels – small eh? Now glue the leading and trailing edges (including those distinctive P51 D leading edge gussets) and shape them. The tips should be made from light laminations of 3/8in (9mm) balsa. Once they have dried, glue in position. Now carefully mark the exact positions of the two spars and radio bays. Note that the length of both spars is greater on top of the wings than the bottom.



The kit of bits; foam wing is such a simple shape you could carve and sand it...

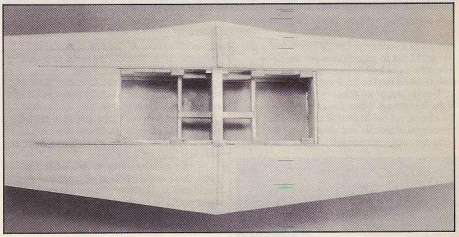
Check that everything is marked accurately then proceed to cut (using a scalpel) through the veneer along all the lines marked. There should now be cuts along the front and back of each spar position, and along the ends of the radio bays, ends of spars, top and bottom of each half. Using the scalpel, carefully lift the veneer from the spar positions. You should find that it lifts fairly easily in large strips. You now have two wing halves with foam visible where the spars go.

Removing the foam can be accomplished using either a hot wire cutter or alternatively a hacksaw blade to saw the foam out – I've tried both. Next cut, using a fretsaw, down the scalpel cuts at the ends of the radio bays (the blade follows them if done carefully). Retain the resulting 'blocks', they can be used to check the shape of W1 and the two W3 riblets, which may differ in outline from those shown on the plan. The W3s are cut so that if placed against an appropriate end of a 'block' veneer is visible top and bottom.

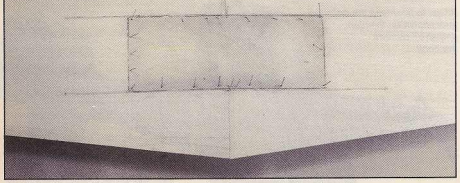
Before sticking the wing together it is probably wise to epoxy the spars into one wing half first (using the other half to align them), this will simplify the operation. Epoxy was used throughout the joining process. If you are satisfied with the shape of the W3s then these can go in. Once everything has dried the spars can be planed and sanded flush with the surface of the wing, the tips can also be shaped.

W1, the two W2s and the servo beams will have to be made up as a sub assembly before installing in the wing (W1 can be made from the balsa cut from the fuselage for the wing). Next epoxy the 1/8in sq (3mm) strips and the hatch cover screw blocks onto the spars, allowing for the thickness of the 1mm ply floor and hatch covers.

Now for the fun bit, the radio bay floor. Actually it's not as hard as it may seem, assuming that your radio bay floor is a nice snug fit. Make sure you have plenty of pins to hand and some means of knocking them in. Next, using the steam from a kettle, steam the outer surface of the ply floor (this will cause it to curve) and epoxy it in position. Use the pins to hold it in position, start from the centre and work your way out. Once set remove the pins and sand flush with the veneer. The hatch covers and ailerons complete the wing but do not fit these permanently until after final assembly.



The wing, completed and ready for gluing to the fuselage.



A prickly situation! Pins hold the radio bay floor in place while the glue sets.

Fuselage

This shouldn't present any problems. My preferred method of cutting the hole for the wing is to use a fretsaw after the ply nose doublers have been added (if this is done before the wing centre section, retain the offcut and use to make W1). Do check that this hole, and the tailplane slot, are in the correct places. Otherwise the performance will suffer (the plane might as well). Round off all edges that should be, to complete the fuselage.

Tail

These bits are even easier to make than the fuselage. Glue the fin and dorsal fillet together before sanding to shape. The wire elevator joiner is best fitted into grooves made in the inner edges of the elevators. These grooves can be easily formed, using the elevator joiner as a gouge, after sanding the elevators to shape.

My preference, when it comes to hinges, is Mylar. This has the advantages of being both cheap and free from slop. Don't forget to peg all hinges (cocktail sticks work well), a flapping elevator or aileron can really ruin your day.

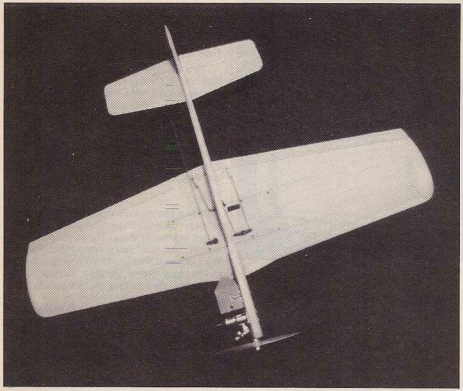
Final assembly

Before gluing everything together, do a 'dry run', to check that it all fits correctly. Once satisfied that everything is aligned correctly, mark their positions, glue together in stages and double check alignment. The ailerons can now be fitted and pegged. The radio hatch covers can be drilled and screwed in place, to check their fit. The engine and tank can also be fitted, for the same reason. "What tank?" I hear you ask. Well, grab some tin snips (or a pair of old scissors), an empty fuel (or oil) can, soldering iron, solder, some brass tube and I'll tell you how to make a tank which will give your Mustang inverted flight capability (and it's diesel proof).

The tank

As you can see from the plan, there is not a lot of space on the aircraft for one of those 'orrible plastic rattling things' (clunk tank). Also clunk tanks and diesels don't mix (the silicone tube tends to fall off the clunk). Solution: a custom-built non-rattling tin tank.

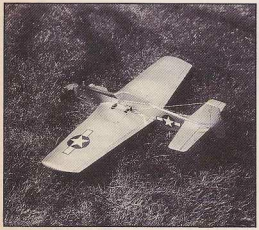
Start by cutting the ends off your empty fuel or oil can and down the weld seam. Flatten out the resulting sheet of tinplate. Accurately mark out the two tank pieces on the painted



The completed airframe ready for some colour.

side using a scriber or similar object (old nail). Be careful not to scratch or score the shiny side, this could lead to internal rusting of the tank (I found out the hard way).

Use tin snips/old scissors (must be sharp) to do the cutting. When you cut the larger of the pieces, cut out as an oblong first. Then cut the central diagonals and simply bend the scrap material back and forth until it fractures along the 5mm edges. This saves all sorts of contortions trying to get tin snips to cut them.



Use a centre punch (or the old nail) to centre pop the pipe positions and drill. Resist the temptation of bending everything to shape. Instead scrape the paint from all areas where solder joints will be made (don't forget the tank fixings). Now use pliers to form all the bends.

For the soldering, an iron of about 65watts will be required and some Ersin flux cored solder (electrical solder). This form of solder is ideal as it simplifies the soldering process and its flux is non-corrosive (no dreaded internal rusting). Solder the pipes in position first before assembling the rest of the tank.

The best way to hold the tank together for soldering is to use a vice. However, do insulate the tank from it (use cardboard, hardboard or plywood) or you will need an iron of about 165watts rather than 65 due to the heatsinking qualities of the vice.

Finally add the tank fixings after 'tinning' them with solder. Incidentally keep the other ends of the bicycle spokes, they make ideal aileron pushrods (unfortunately they are too short for the elevator pushrods); they even have ready formed ends. Flush the tank out with fuel and check for leaks.

If your metal working skills are not that good, there are small fixed pickup tanks that would suffice. However, sustained inverted flight would be impossible, also an alternative method of fixing the tank to the fuselage would have to be found.

War paint

My usual method of finishing is to dope lightweight tissue on to everything (to seal the grain). Then clear dope everything (including both sides of the hatches) three times, lightly sanding between each coat. Then spray using car aerosol paint of appropriate colours. Finally fuel proof with 'Tufcote'. But for the Mustang I chose to use 'Flair Spectrum' paint which eliminated the need for fuel proofer and covered well. If however, you are gifted with the digital dexterity of a brain surgeon, you could cover it with film… possibly.

Whatever method you choose, make sure the colour scheme is different top and bottom to avoid disorientation.

Installation

Screw and bolt as appropriate engine (a powerful 1.5cc diesel e.g. PAW 1.49) tank, servos, control horns etc., in place. Use clear Neoprene tubing (easier to see air bubbles if they occur) to connect tank to engine. Wrap the receiver (preferably a mini) and a 250mAh (or similar) battery pack in foam and install in the appropriate wing bay. Incidentally I would strongly recommend the use of mini equipment (including servos). Remember the lighter it is the better it's going to fly, and the less it's going to emulate a house brick in freefall when the engine cuts. However, an earlier FW 190 of the same size and configuration to the Mustang has flown with standard size equipment.

Make sure you don't have more control movement than specified and that the balance point is not aft of the position shown. OK fasten your bicycle clips because it's time for some…

Flying

Fuel up (use an adapted washing up liquid bottle or similar) by holding the model vertically nose down. When the tank is full it 'tells you so' by filling the feed pipe with fuel. Keep forcing fuel in until no more air bubbles appear. My PAW 1.49s usually start fairly quickly once primed in this way.

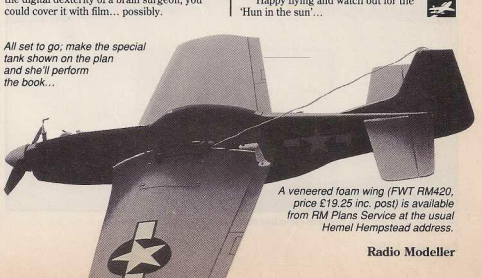
For the first flights at least, it would be helpful to have someone hand launch for you. The launcher should launch the model flat and fast from above the head. This is to allow the Mustang to reach flying speed as quickly and safely as possible. Do not be tempted to assist the model departure by using large amounts of elevator or elevator trim or having the model launched javelin style. This can have the effect of slowing the model and preventing it reaching flying speed… splat!

Once airborne you should find the 'Mustang' is fast and goes where it is pointed. The rolls are… well, see for yourself! If you have built the tank then your 'Mustang' will be able to perform virtually any manoeuvre that can be performed, using ailerons/elevator only, including sustained inverted flight.

If this is your first small model then I recommend keeping it fairly close as judging distance can be tricky, if you're used to standard sized models.

When the engine cuts (after about 7 to 10 minutes on a PAW 1.49) do not try to cheat gravity for too long. Instead keep the speed up all the way to touch down. You can loosen your bicycle clips now and break out the Valium.

Happy flying and watch out for the 'Hun in the sun'…



All set to go; make the special tank shown on the plan and she'll perform the book…

A veneered foam wing (FWT RM420, price £19.25 inc. post) is available from RM Plans Service at the usual Hemel Hempstead address.