Colchester Models A4 Skyhawk

A new ARTF import from China suitable for 10 – 14 lb thrust engines

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After the success that Colchester Models have had importing and flying the AMD Hawk, Colchester were approached by a Chinese firm to see if they wanted to import a new model from China. The first of these has now arrived and one is the subject of this test report.

The model is aimed at the 54 size engine, but as its size was so similar to the Hawk it was felt a MW44 gold might be a better power plant.

First Impressions of the Model

The first impression was that this is another quality product from China that was well packed and well finished. The wings are made up from traditional balsa sheet and light-ply ribs. The spars are webbed with vertical balsa sheet and the wing surfaces are sheeted with ⅛" balsa sheet. All balsa parts appear to have been covered in epoxy cloth and are nicely filled and sprayed. The decals are vinyl cut out decals in a single sheet. The glue joints in the wings are very neatly done and look to be glued with cyno (CA).

The fuselage is standard epoxy moulding with limited panel lines and detail. The formers are all fitted in place and well glued in with glue that looks like thick acrylic glue. I have been using acrylic glue for some while and it seems to give the best results of any glue for gluing to epoxy.

One of the most impressive parts of the model is the landing gear that comes with the model. Given that they incorporate brakes, oleo legs and very nice quality tyres the overall weight did not seem excessive. The wheels are ball-raced and the aluminium parts are anodised aluminium colour.

With my engine choice, it was essential that I kept the weight to the barest minimum and I had the option of substituting Springair retracts in place of the supplied units. This might save 200 g of weight but would not look as nice and I would not have brakes.

The wings are secured with a large diameter carbon fibre tube that looks adequate for the job. I had just to scratch clean excess paint and glue from the fibreglass socket and the rod slid into place with a snug fit on the wings and the fuselage.

As is quite common with Chinese models there were no instructions except for the throws and the C of G position. A careful check of the components soon showed how it was to be put together. The flying surfaces are all secured with Robart type pin hinges and have been accurately predrilled. The only omission was the flaps that have not been provided with any method of hinging. Colchester A1 Models will be providing a set of their own instructions.

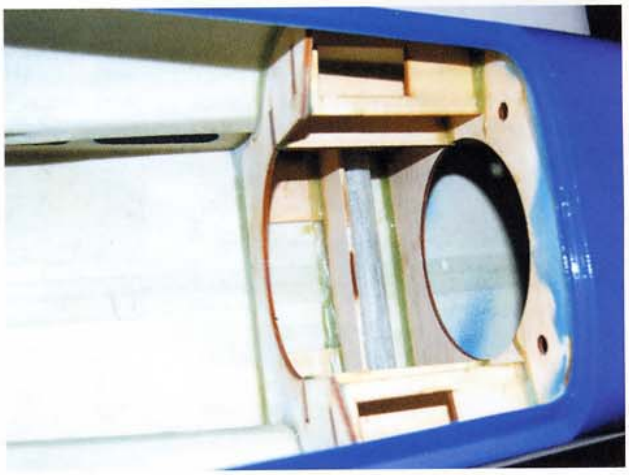
The twin walled tailpipe had no bell-mouth and was sized for a 44 rather than 54 size engine. It was nicely made, though heavy and I decided to use the standard Wren product to save weight.

A quick weight measurement of all the parts confirmed that it was possible to make it quite

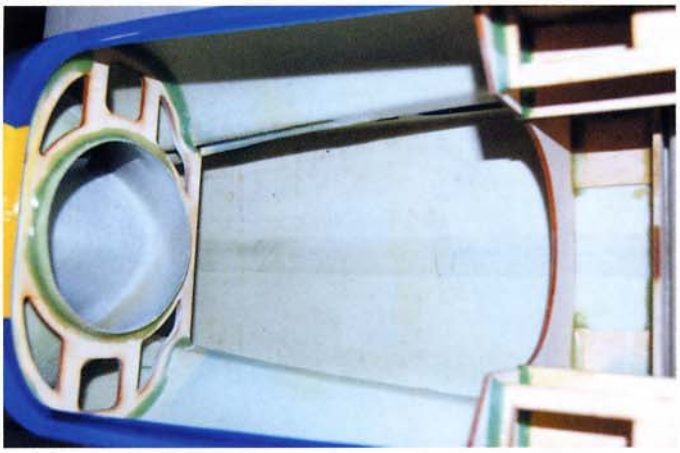
SPECIFICATION AS MEASURED:-

Length	57.0" (1445 mm)
Wingspan	47.5" (1210 mm)
Weights:	
Retracts and legs	482 g
Fuselage	224 g
Wing	762 g
Tail surfaces	312 g
Wheel covers	74 g
Cockpit	196 g
Bag of fittings	204 g
Tanks	346 g
Wren tail pipe	112 g
Total plane weight	3718 g (8.4 lb)
Servos and battery	450 g
Wren MW44 Gold	1189 g
Including pump valves	
Dubro tank etc.	
Likely flying weight	5357 g (12 lb)
Use Dubro tank	5011 g (11.25 lb)
(Actual finished dry weight with supplied bottom tank and supplied retracts 11.4 lb)	

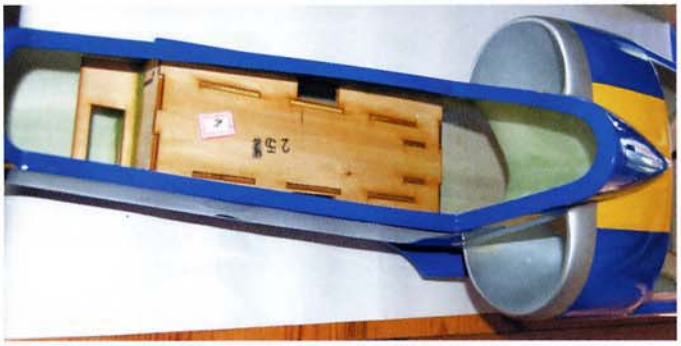
The parts as they come from the box



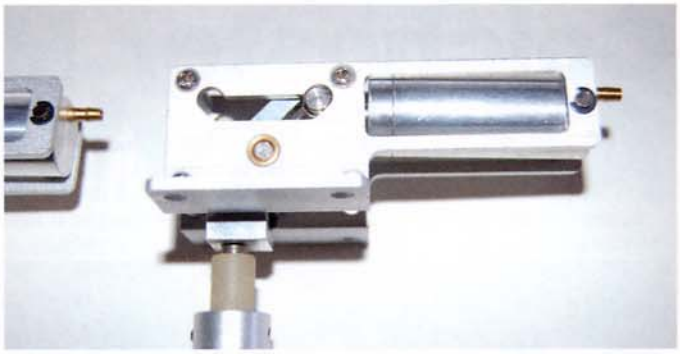
Engine mounts and mounts for rudder and elevator servos



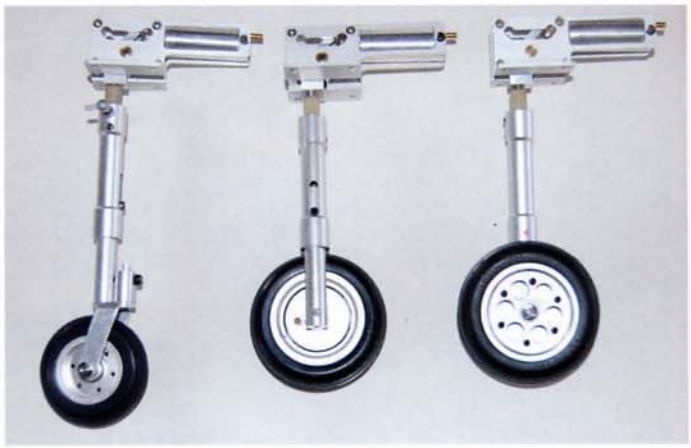
Recess in bottom is for 1 litre tank, room for the 2 saddle tanks in each intake cheek



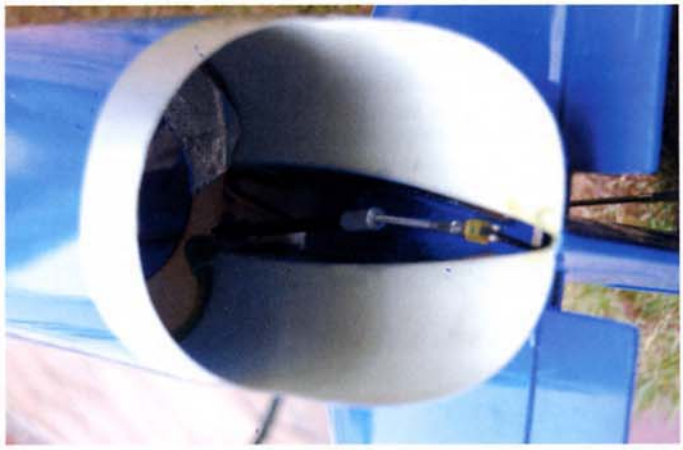
U/C ply box serves as mounts for steering, retract and brake servos



Superb retract units



Retracts with supplied oleos, tyres and brakes



Torque rod for elevator operated by pushrod to servo by engine mount

light and fly well with a MW44 gold. The plane comes with 3 fibreglass tanks of a total of 2.12 litres capacity. Initially I used the large flat tank that came with the kit, but switched later to a pair of 20 oz Dubro tanks in series. I decided to use the retracts and oleo legs at least to start with.

With all the parts loosely fitted together I could see that this was a 'sport' rather than a pure scale plane, but it had the look of a nice flyer about it with the larger than scale wing. The scale A4 wing is very small and with the resulting high wing loading can make it tricky to fly. The larger span wing is a good choice.

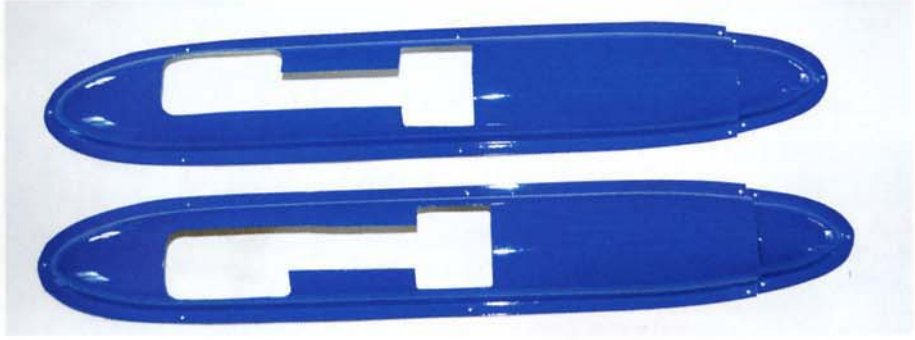
Set of 3 fibreglass tanks supplied

Rudder and Elevator

The elevators are conventionally hinged with Robart type pin hinges. The elevators are moved with a torque rod that is centrally operated with a metal horn that is fixed to the torque rod with a grub screw. The tailplane is fitted as far forward in the cut out slot as possible and this leaves a small space at the rear for getting to the torque rod. I found it best to put the torque rod in the fuselage taped in place while the tailplane was fitted into the slot. The slot will need easing with a knife and sandpaper to enable the tailplane to slide through it. If it is a very tight fit it will scratch the painted surface as it is pushed in if unprotected. The horn should hang downwards so that the pushrod lines up with the holes in the formers and the servo position. The holes in the horn are too large for clevises and I drilled a series of smaller holes alongside the ones provided.

The tailplane will need marking out so it is centrally located when finally glued in place. Your choice of glue will determine the amount of cleaning up you are left to do when the tailplane is glued. I used Acrylic glue but Epoxy would be equally suitable.

The rudder is a very substantial piece of balsa that is hinged with the same pin hinges.



Main U/C retract covers

Tailplane assembly

Direct link servo to rudder

It was designed to be operated by a torque rod that could leave a fair amount of slop in the system. I was also worried that it could suffer from flutter. I decided to glue a servo inside the fin and make the installation as direct and simple as possible. The Hitec 125MG servo was screwed onto a ply plate and the ply plate was glued with epoxy onto a ⅛" sheet of balsa. The skin of the fin was cut just wide enough and long enough to take the servo horn.

Before gluing in place I checked that the horn was centred by operating it using the Tx and Rx. As soon as I was satisfied, the plane was laid on it side and the inside of the fin where the servo was to be glued was smeared with acrylic glue. The servo on its mounting plate was inserted from inside the fin and held in place until the glue set.

The pin hinges need a smear of grease on the hinge knuckle before gluing in place with epoxy. This avoids any tendency to have the joint glue up solid. I always keep and eye on the glue as it sets and clean off any excess with a knife before it has gone rock hard.

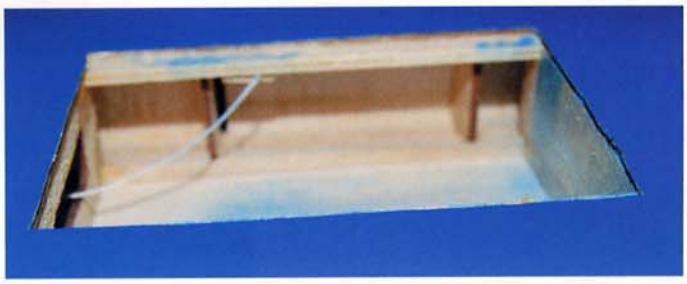
I opted for a MG125 servo for the rudder and a Futaba 3305 for the elevator. It was interesting that the servo comes with a warning for NiCad use only. This is not a problem as I will be using a 6-cell NiCad battery.

Tailplane

The torque rod assembly was made up and the rod provided with a ground flat for the grub screw. The holes for the rod ends were drilled in the halves of the elevators and the inner elevator was recessed to house the inner part of the rod. The whole assembly was put together dry first, both with the elevators not attached to the tailplane and then with it attached. Once I was happy that the holes were all in the right position and the elevators were level, I was able to think about gluing the tailplane in place.

The tailplane was marked on the upper and lower surface with the centreline and front and rear thickness of the fuselage. The tailplane was inserted after putting the torque rod in place. It was glued with acrylic glue inside the underside of the tailplane. I made a fillet of glue on both sides. This avoided making a mess of the painted surfaces. The upper surface had a fillet of canopy glue applied and then immediately the excess was wiped off. The tailplane was a tight fit so the glue wicked into the joint by capillary action.

Once this was done and the glue was set, the final assembly of the elevators could be done. To avoid glue getting from the torque rods onto the painted surfaces I used some clear tape on the painted surface during the gluing. The hinge pins were greased and glued with epoxy as before. At the same time the torque rod was glued in place with epoxy. Be sure to keep an eye on the hinges as the glue sets to avoid the joints getting stuck with glue.



Cut out box for flap and aileron servos

The elevator is operated by a simple carbon fibre pushrod. It used the installed mounting for the servo, and the supplied carbon tube pushrod and made some end caps from aluminium rod threaded with a 3 mm hole. The caps were glued on with epoxy and cross drilled and pinned just to be on the safe side. The existing holes from the servo to the horn needed some enlargement to allow for the direct action of the pushrod.

I have used the same method of operating elevators on a number of these small jets and found this is the simplest and best way of operating the flying surfaces. The only problem encountered was the pushrod will rub against the side of the fuselage and it was necessary to bend the 3 mm threaded rod at the elevator end slightly and the threaded ends need locking with super glue to retain the correct position. The kit was designed with the pushrod exiting the side of the fuselage and operating the elevators via an external horn. Although what I have devised is not perfect it is tidier.

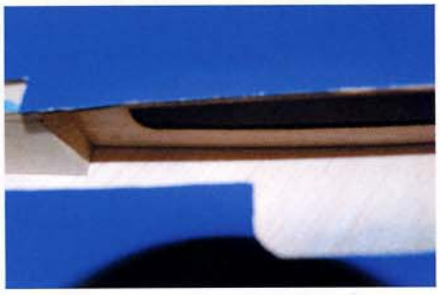
Hatches and Cockpit

These are accurately made to size and only need pegs and sprung loaded catches fitted. Unfortunately the spring-loaded catches are not good quality and mine broke just after being installed! These will need replacing with better quality components. The cockpit is a simple job, as the sprayed canopy just needs cutting out and trimming until it is a good fit. I glued it to the completed cockpit assembly with Acrylic glue. It is ideal for this job as it does not fog the clear plastic and gets a very good grip.

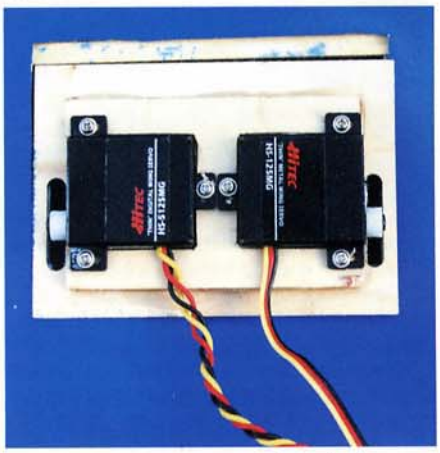
Wings

The wings are built up balsa and ply structures and are sheeted with balsa and covered with glass cloth. The quality of this work is superb. The flaps are hinged with Robart pin hinges rather than the suggested Mylar hinges as that makes a more suitable hinge. The holes were not pre-drilled but it was a simple, quick job to do. The ailerons were hinged with the supplied Robart type pin hinges into the pre-drilled holes.

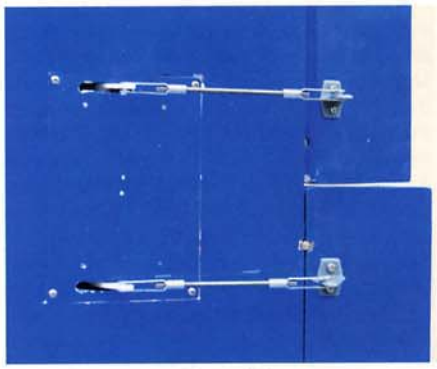
I used the Hitec thin wing aileron servos, HS 125 for the flaps and ailerons. These have a quite adequate rating for a light plane like this. The 2 servos can be mounted by cutting out some ply to take the servos back to back. The ply mounts are glued to the supplied ply covers and the servos screwed to the mounts. The wires are fed back to the hole in the wing ribs via preinstalled string guidelines – a thoughtful touch.



Cut out in wing for retracts, ply rib in background



Two Hitec 125 servos mounted on ply plate

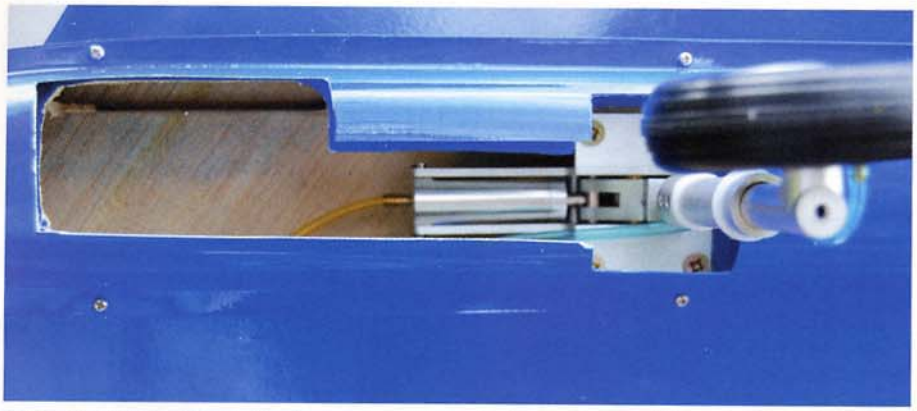


Servo plate screwed in position

Split flaps should slow the model down well

These servos have long enough wires that they do not need extension wires in the wings. The servo plate is simply screwed with the supplied small screws into the ply supports for the plate. The flaps and ailerons were fitted with the supplied horns.

The main undercarriage legs are installed next, and they are simply screwed into the preinstalled mounts with suitable wood screws. I installed the brake and U/C lines



Retracts installed and cover in place

and terminated them with Robart couplings. I happened to have some spare air line of a different colour so the brake lines could be easily seen. The Robart couplings were mounted male on one line and female on the other so the lines could only be connected one way round. I tested the retracts and brakes and they worked perfectly.

The final job was to install the fibreglass wheel covers. This was a simple job using the supplied screws. I debated whether to use glue as well, but thought it might be handy to be able to remove them later if needed.

The wing is held in with a small tab that has a pre-drilled hole. It was intended that a blind nut is fastened to the upper surface of this tab so that it can be screwed into from below. In the end I just drilled out a 5 mm hole through the wing and fuselage through the tongue and tapped with 6 mm tap. With the wing separated from the fuselage I applied CA to the tapped threads to strengthen them and left it to set hard. I needed to run a tap through several times to free up the hole enough to allow the plastic wing bolts to screw in reasonably freely.

Fuselage

The engine mounts are preinstalled for a MW54 engine. I glued 2 ply plates below them with doublers to get back to near the centre height. The engine is screwed in with wood screws or bolts and captive nuts. The tail pipe bell-mouth is installed 20 – 30 mm behind the exhaust outlet. If it is too close to the engine it may cause overheating and a drop in thrust. The bell-mouth has 4 straps. I screwed 3 of the straps to blocks that were positioned near the bell-mouth so that the pipe was held nice and securely.

The C of G of the plane is 220 mm behind the wing root tips. The engine needs to be as far forward as possible and all batteries will be in the nose possibly together with some nose weight.

The decals could be better. They are printed on clear acrylic sheet and they need cutting out and sticking on after peeling off the backing. This leaves unsightly lines around the area cut out. It would have been much better to have proper paint masks and water slide decals. The colour of the yellow is not strong enough and the blue beneath bleeds through.

The outlet of the jet pipe was held in place with 4 small blocks of balsa so that the pipe is nearer the bottom rather than the top, providing correct alignment with the engine.

The tanks supplied were measured and the flat one in the bottom of the fuselage was 1 litre and the 2 side tanks were 0.6 litres, making a possible 2.2 litres in total. This far more than we need for the MW44 and I decided initially to fit just the 1 litre tank with the plated paper clunk described in RCJI in issue 79.

The rest of the fit out was just installing the wiring, fuel lines ECU and pump. This is unremarkable so I will not comment further on it. At this stage the C of G can be checked and it will be necessary to fit as many of the heavy parts to the front of the plane.

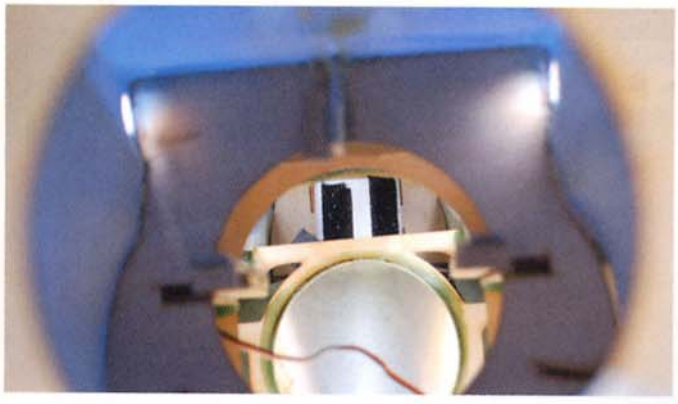
Engine installed with fuel tank in place secured with Velcro

Conclusion

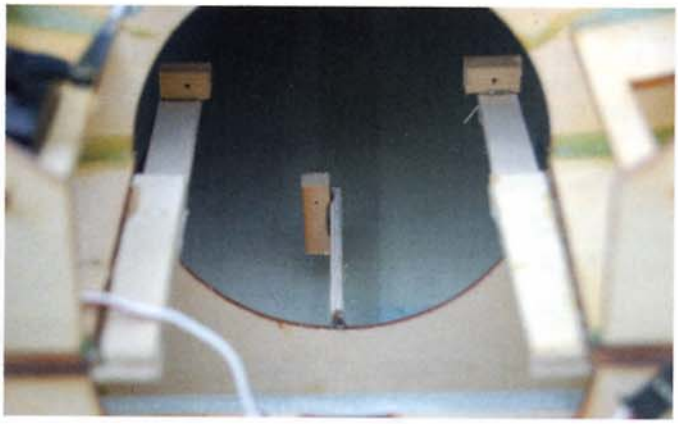
This is yet another ARTF jet that is being made in China. This plane is a much more reasonable cost than many of the larger planes currently being sold and yet the quality is excellent.

When we flew the plane initially the retracts worked perfectly, however when we flew a few times from grass, gross play developed in the retracts and oleo legs. On inspection it was clear that the aluminium that was used was very soft and the parts that were subject to stress were bent. This a real shame as the parts were so nicely made and did operate well. The manufacturers are planning to use a better specification of aluminium in future. All the

Elevator servo installed

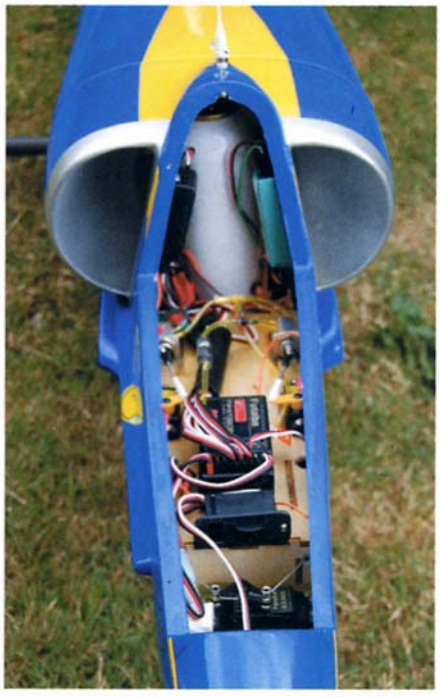


View through fuselage, not much glue this side, but substantial fillet on other side



Engine mounts for MW44 and blocks for tailpipe screws

Loads of room in the engine bay



Tight squeeze to get all the wiring in without making too much of a mess

parts fit together well and are nicely finished.

As is often the case with Chinese kits there were no instructions and the bag of fittings supplied were poor quality. Colchester A1 Models will be adding to the value by providing instructions and making sure that all fittings required are of s suitable standard.

A4 Skyhawk available from Colchester A1 Models +44(01) 1206 572094,

David Wilde: RcMman@aol.com

Paul after the test flight

Paul Gray very kindly agreed to give his impressions of the flying qualities of the plane…

A4 Flying experience – Paul Gray

At a recent jet meeting a passing comment from John Wright was music to my ears, 'I have a new A4 Skyhawk and would like you to test fly it'. Well, not one to look a gift horse in the mouth… I said no, no, no I couldn't… oh if you insist!

So the day came some weeks later when we could co-ordinate our calendars. Unfortunately the weather had no wish to co-ordinate with anything! The wind was 15 to 20 mph gusting, and the wind direction was the worst it could be for our flying field, straight over the bank of trees creating hellish turbulence. So, this was going to be a good test for the new model!

Visual inspection indicated that the plane was of a very high build standard, the level we have come to expect from these Far East ARTFs. The model is not perfect scale, it is designed for practical use, every weekend type flying. The wing is slightly oversize; as are the intakes, but this should not be a problem except for the purists.

The model is designed for size '54 engines and this one had the MW44 Gold version fitted, with full auto start. The model was fuelled and with a push of the stick the 44 Gold burst into life, perfect start, no issues at all. Full engine on range check had already been carried out.

Taxi indicated the ground handling was very good, so a long taxi downwind on our grass runway was instigated. The take-off direction that day meant that the run was towards the trees (and turbulence) so I was prepared for a rough ride. Take-off flaps lowered, a visual check of the field to ensure all was still clear, and open throttle… The engine throttled up perfectly and the A4 rolled. The grass was around 2" long (50 mm) and damp so the acceleration was testament to the little engine. After around 50 yards I started to feed in up elevator, and to my surprise she rose gracefully into the air. Many Skyhawks I have flown in the past had a tendency to 'over rotate', but no this one! Gear up quickly, and then the turbulence hit… very violent, but the A4 bounced her way through with no real problems.

Out of the other side the air smoothed out as I turned over the trees, flaps up… no drama here either. Well I flew for around 8 minutes, the model handled the conditions really well, I felt at home very soon after take-off. I may have put a couple of clicks of trim in, but to be honest I cannot remember… it was that much of a non-event. I carried out the usual test maneuvers, loop, roll, slow speed, all were completely acceptable for a first flight.

Landing flap was deployed and again, no drama, but due to the conditions I elected a flaps in landing. Gear down, 3 greens, and into approach. Once again, considering the conditions the plane had no issues and control was good right through to touch down. The touch down was the usual delta nose high set up.

All in all, a nice plane for the Wren 44 and perfect for grass/small field flying. My overall view was good, and as I say, conditions were really bad. I look forward to putting the model through its paces another time (Please John!) on one of those long balmy days we get so often in England!!! (Well I can dream can't I?)

Paul Gray