

Kalt Baron 60 Helicopter

A review by Gary Richardson



Gary Richardson, a previous *British Heli Nats Winner*, gives a review of the top of the line aerobatic model produced by one of Japan's leading model manufacturers.

A good helicopter can be whatever you wish it to be, it all depends on how you set it up. It can be anything between a slow plodder for a beginner to a high speed aerobatic model for an expert or it can undergo a metamorphosis and become a scale model.

This is a good model and can be any of these. Though certain aspects of the kit make it more suitable for the experienced flyer who knows exactly what he needs from his machine.

As the model is obviously intended for use in FAI contests it is that aspect of its flying I will concentrate on.

What is it like?

First impressions could leave you thinking that it is a Baron 50 in a streamlined fuselage, but this is not so. It's a little bigger, a little heavier and a lot more expensive. It also has precision cast alloy parts and ball races in all its important little places.

The fuselage is a streamlined glassfibre egg split round the middle, width ways and held together with far too many screws. It of course, spoils the access to the engine and other parts which is the main reason for having a pod and boom type of model. Alternatively you could say that it makes the model easier to see and that the streamlining increases the top speed.

A standard Baron 50 canopy can be fitted without any modifications or you could use a scale fuselage.

I'm told that the 1983 Japanese FAI competition winner used a Baron 60 heavily disguised as a

Jet Ranger (they get less marks if they don't have a pretty model). I have also seen a Baron 60/Jet Ranger at Sandown and could not detect any reduction in performance.

The machine has been designed round a rear exhaust OS60 helicopter motor. This is clever as it puts the silencer out of the way under the frame between the skid supports and makes the machine more streamlined. A side exhaust motor could be used but a hole for the silencer would have to be cut in the standard fuselage though it will fit in a Jet Ranger without problems.

You could also have trouble with the exhaust fixing fouling on the bottom of the frame, depending on the engine length and type of exhaust used.

If you fit the OS60 engine you will find that it has not got enough push to turn the maximum size rotor at revs high enough to make it really perform. This leaves you with the option of feeding the engine on high nitro fuel (the Japanese use 15% to 30%) or reducing the rotor diameter by an inch or two.

Another option is to fit a higher power engine ie - Rossi, Pico, Ops, Fisher Redshift, all make 61 engines that are quoted as delivering 2 bhp. Whereas the OS is listed at 1.7 bhp for the ringed piston engine and 1.8 bhp for the ABC version.

I have used a Rossi long stroke engine that gave more than enough power on straight fuel and also ran almost twice as long on a tank full. The carburettor is a bit more critical on straight fuel but a Webra Dynamix carburettor and exhaust pressure to the tank cured that. Unfortunately engine vibrations caused fuel frothing so I have now installed a Pico engine.

The drive from the engine is taken via the superb Kalt 4 shoe clutch to a massive nylon drive gear with a steel! beval gear on top. The autorotation unit is also a new design and very big. In fact, the whole transmission looks as if it could stand anything short of a direct hit by a 'H' bomb. Regrettably, the straight cut tail drive gears are noisy and this is the most noticeable if you do close in hovering without the full canopy to muffle them.

Pitch/Cyclic control

The control of a helicopter stands or falls on how much play is in its

linkages and I am pleased to say that there is virtually zero play in the new swashplate and pitch control assembly. It is a complete redesign from the Baron 50 and the only plastic parts on it are the ball link connectors and a slider on the shaft. The other parts are metal, mostly diecastings.

As received the unit is a bit stiff but this can be cured polishing the ball connectors to size. It's also a good idea to check the pivot pins to ensure they are firm though the later models have circlips to hold them in.

The adverts usually say 'Phase adjust ring'?? This means you can swing the swashplate about 10 degrees either side of the straight ahead position. It may be of some use on a flybarless model but not on one with a flybar (I think it is a method of adjusting the swashplate vertical height that also happens to turn).

The pitch control has gone back to the long lever from just above the main gear to the servo. You try to assemble it though!! it works perfectly till you tighten the screws then it always binds at some point. It took me three nights to get it so that it was free enough to fall under its own weight.

Rotor head

Two are suitable for this model. The K-3SB diecast model and the super deluxe Blackhead.

The Blackhead has been around for some years now and Kalt are obviously happy with it as all they have done to change it is to add some coning angle and a pair of thrust races. For anyone not familiar with it it features lots of ball races, two positions for Bell Hiller mixing and adjustable stiffness of the teeter rubber. Though it's a bolt together job it does not suffer from any problems caused by relative movement of parts, even under high stress loads.

K-3 SB

The K-3 SB head uses diecast parts. Has ball races on everything that moves and a spring plate to support the blade holders.

The springy plate gets rid of the teeter bearings and rubbers and also flies very nicely. Three stiffnesses of spring plate are available so you can tailor the head to suit your model.

Rotor blades

There are three types at differing degrees of availability.

1. Standard

Semi-symmetrical ready finished with clear polyurethane varnish, one root fixing hole is drilled and they are closely matched for weight. They can be used with or without weights and are supplied in many lengths. Until the Baron 60 these blades have been supplied as standard with all the larger Kalt models. They are an excellent blade that works well from low to high revs.

2. E Series

Symmetrical requires covering, root fixings are glued in place and only need drilling and sanding. Made of seven laminations of five types of wood. They are intended for use with a lot of lead when they fly very well but at lower revs and with a completely different feel to normally weighted blades.

They are designed to fly themselves as much as possible and it is apparent that the Baron 60 and E Series blades were designed round each other.

It must have been a shock to Kalt when the FAI banned lead weighted blades from contests.

3. Kalt glassfibre blades

These are Kalt's answer to the FAI. I've not flown these but have seen them in use and the Baron 60 using them went as fast if not faster than any other machine including Heim own Star Ranger. It also autorotated superbly. Unfortunately these blades are not being brought into the country!!
Note: My flying with this model has been mostly with E Series or Standard blades fitted with about 3/4oz of tip weight.

Oddments

The servos mount on pre-shaped adjustable alloy plates as on the Baron 50. But due to the new collective linkage the collective servo has to push across its width, so my collective and throttle servos have been turned through 90 degrees to avoid this and make the collective control a bit more positive.

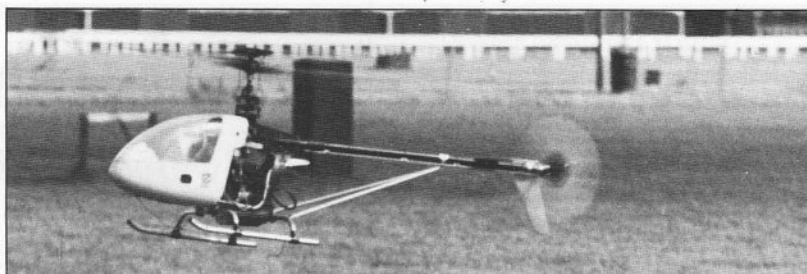
There is plenty of room up front and I have put the gyro there rather than use the plate provided behind the engine in the heat and oil.

Balance comes out right with the batteries mounted in the nose.

Servicing

Serviceability and access are very good on the Baron 50 and the Baron 60 is just as good once you have removed the rear part of the canopy. (A split up the back of this is useful so you can slide it off without disturbing the tail boom.)

The engine can be dropped straight through the bottom of the frame after removing six screws and the throttle linkage. A two-



The Baron 60 utilising a Baron 50 fuselage.



The Baron 60 with its unusual egg-shaped fuselage.



The Long Ranger fuselage available to fit around the 60 mechanics. These fuselages are available from Circus Hobbies or Slough Radio Control.

piece cooling shroud is fitted and is held together by three plastic clip fasteners. This is a boon when you need to see or work on the carburettor and it's easier than undoing all the screws and trying to look under a shroud that will not lift high enough.

Set-up

A main rotor turning at a constant high revs seems to be the norm in Europe.

In Japan the judges down mark models for high rotor speeds when flying the hovering manoeuvres.

Because of this Japanese models are designed for slower rotor revs when hovering and the throttle is balanced to give the higher revs required for aerobatics at higher throttle settings.

To achieve high stability and lift at these lower revs high aspect ratio properly weighted blades are a must. This probably means good quality glass blades are the ones to use.

My models are set up European style – it's much less trouble.

Flying

Anything put out by the cyclic or collective servos gets up to the main rotor blades. What happens then depends on how heavy the blades are, where their CG is, how fast you run them, etc, etc. Generally speaking though this is not a

model that you point and hit the go button for your aerobatics it needs flying.

Autorotations are good with or without blade weight because of the long blades and low disc loading.

The tail rotor is superb, extremely responsive and progressive in response yet powerful when required. This is probably due to the high speed and airfoil section blades (not the illegal (FAI) knife-edge supersonic sections still used by some people).

Conclusion

The Baron 60 would make a very nice general purpose flyer and could be used inside a scale fuselage with heavy blades. This would allow the rotors to be run relatively slowly with full control.

If aerobatic performance is what you need the amount of power can cause problems, unless you are prepared to pay for nitro in your fuel or select your engine with care.

For aerobatic flying however the Baron 60 needs skill to achieve its high potential, and it is high. First in Japan, second in America, first in Europe.

Unfortunately I am lacking these skills and will probably use my Baron 50 Custom in competitions for some time longer while I try to acquire them.