

## Kalt 'Cyclone' kit review



One of the problems of writing kit reviews is that the better the kit is, the less there is to write about. If the kit presents difficulties the reviewer can give details of these and describe how he managed to overcome them. The result is interesting to read and tends to give a much more favourable impression overall than the reviewer might have wished. When the kit is a good one there may be little to write about other than a bald description of its contents which will give an unfairly negative impression.

Anyone who has already built one or two model helicopter kits should have no trouble whatsoever in producing a flyable Kalt 'Cyclone' in the space of two evenings work. A little bit of determination would see it flying in one evening. If you want to paint it - not really necessary, but it helps to make it look different from all the others - add on another evening. You should by now have gathered that this one is going to be a struggle to write about

### **The Kit**

This latest introduction to the Kalt range is one of two new helicopters which utilise the two 'innovations' of plastic construction and belt-driven tail rotors. Plastic construction is not new, of course, but only Jim Morley seems to have mastered the art of using it until now and his designs do use a metal sub-frame. Likewise, belt driven tails are not exactly unique, but have been plagued with problems in the past - certainly on I.C. engine designs anyway.

The 'Cyclone' is probably unique in using these two features on what might be called a 'full-size' helicopter, i.e. for .50-.60 size engines. In fact, it is identical in size to the well-known 'Baron 50' and many of its components are directly interchangeable, though not necessarily identical.

In place of the usual metal side frames there are two substantial reinforced plastic mouldings which enclose the alloy engine mounting block which is a feature of all Kalt models. The servo mounts,

radio support plate and undercarriage cross rails are of the same material, while the tailboom is the usual Kalt carbon-fibre item. There is no tail gearbox, of course, and the tail rotor shaft and bearings are supported by two mouldings which clamp round the tailboom. Horizontal and vertical tail surfaces appear to be identical to the 'Baron' range, but without the moulded-in motif. Tail rotor blades are plastic mouldings in a livid shade of green which is 'high visibility' to say the least!

Simplicity is the keynote of the tail drive system. The belt passes round a plastic pulley (metal if the optional autorotation unit is fitted) which is part of the hub of the very substantial main gear, then between two 'pinch' rollers and down the tailboom. After rotating through 90 degrees it then passes round a small metal pulley on the tail rotor shaft. The pinch rollers run on stub shafts which are held in place in the side frame mouldings by the belt tension. Instructions state that these pulleys are liable to wear and should be replaced regularly. This does mean removing one of the side mouldings which virtually means dismantling the whole helicopter.

Rotor head supplied is the simple 'flexiplate' type head, similar to the 'Baron 20' head while the shaft, bearings, etc. are similar to the 'Baron 50'. Bell/Hiller mixers are fitted as standard.

The canopy is moulded in three pieces, an upper transparent section, a lower section of the inevitable Kalt yellow plastic and a substantial bulkhead/former which fits into the rear. Solvent is supplied for joining the upper and lower halves, while silicone rubber sealant is recommended for attaching the bulkhead. Four self-tapping screws secure the complete unit to lugs on the side mouldings. A notable inclusion is a mounting plate for on/off switch and control box which is mounted on the left-hand side moulding just inside the rear of the canopy.

## **Assembly**

This is almost a case of 'shake the box with the left hand while applying Allen keys with the right'! All of the various subassemblies are in numbered plastic bags which match the numbered sections in the instructions, with the necessary nuts, bolts, etc. being in another suitably numbered bag. The rotor head is ready assembled apart from installation of the flybar.

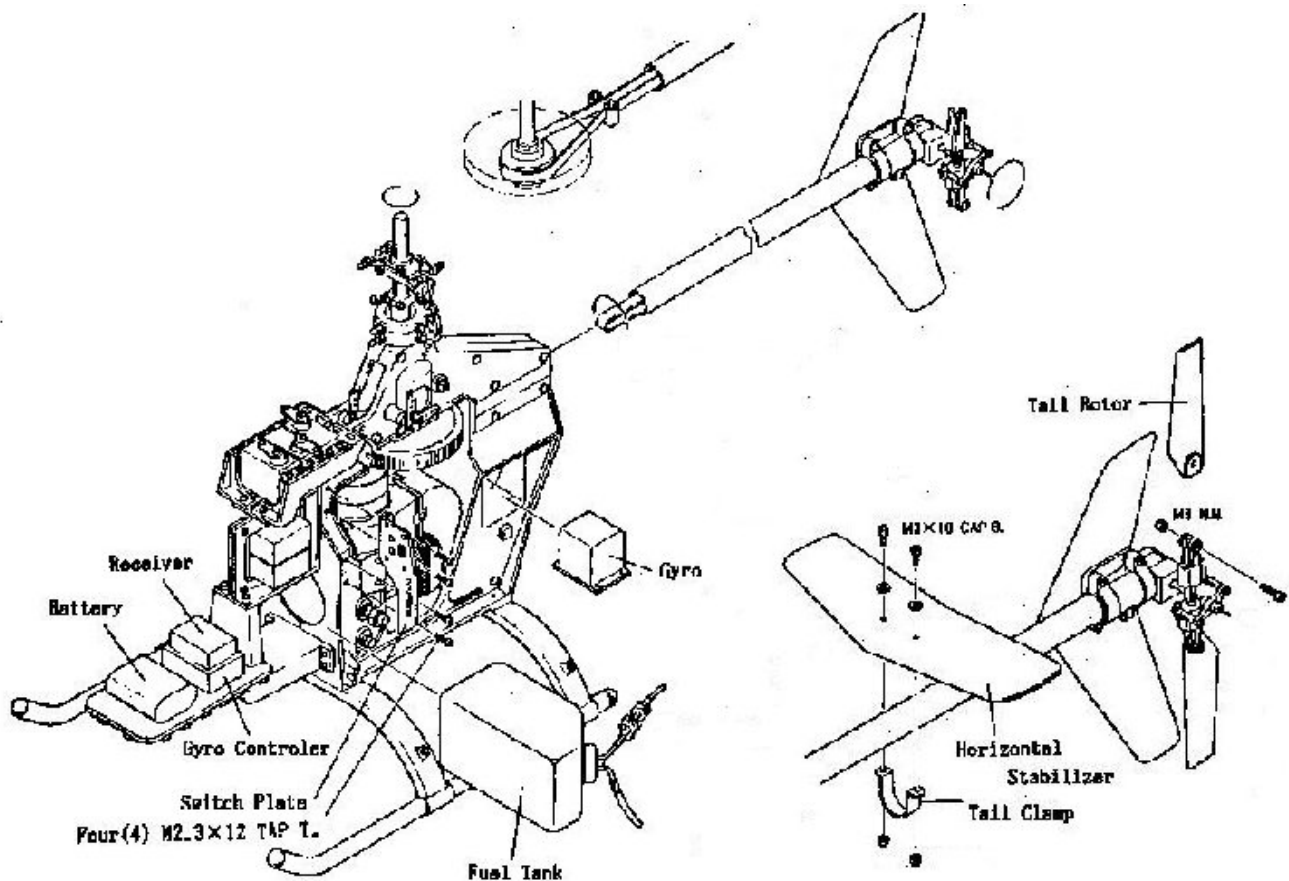
A completely new twin-shoe clutch is used which has very substantial steel shoes sprung inwards by short, straight, lengths of piano wire. You may feel that this gives much too heavy a spring effect, but don't be tempted to 'ease' the springs - they are just right!

After assembling the clutch onto the motor and the various items onto the main shaft, these two units can be placed between the side mouldings - don't forget the pinch rollers - and the whole lot bolted together. Now add the undercarriage and the model is just about half finished! If you forgot the starter belt and cooling shroud, go back and start again. It is a good idea to check that the pitch change mechanism is completely free before finally bolting everything together, however, since this can be quite stiff initially.

After threading the belt through the tailboom (smooth side inside) the boom can be inserted and the belt placed over the tail shaft, the two halves of the tail shaft housing bolted together with the vertical fin and you have a helicopter. The instructions for tensioning the belt specify that an 8kg weight be hung from the tailboom with the model held vertically while you tighten the bolts which clamp the front end of the tailboom between the side mouldings. However, Slough R/C Models advice is to increase the tension until there is no slip between main and tail shafts. This requires what appears to be an incredible amount of pull on the tailboom, but is probably around 15-20lb; which is about right. Don't make up the tail control snake until after doing this, otherwise it will be much too short!

One point about the assembly which I liked is that all the nylock nuts used fit into shaped recesses in the mouldings so it is only necessary to tighten with an Allen key from the other end. I have commented elsewhere that cap head bolts and nylock nuts must be very cheap in Japan, judging by the general reluctance of manufacturers from other parts of the world to use them.

All you have left to do is to add the servo mounts, tail blade holders and blades, fit the radio gear and make up the linkages. The instructions give lengths and an actual size drawing for every link and they are very close to correct. However, do check the pitch range before flying - mine came out at -8 to +5 degrees!



## Installation

This is very straightforward since everything is fully detailed in the instructions. Adjustable servo mounts cater for most servos. A standard four-channel radio can be used by fitting an additional bellcrank enabling the throttle to be connected to the pitch change mechanism. A suitable mounting hole is provided in the right-hand side moulding, but the bellcrank is not supplied.

Assuming that you are using a helicopter radio with five servos, the pitch servos (lateral, fore/aft and collective) are mounted immediately in front of the swashplate with the tail rotor and throttle servos mounted below them. All linkages are very direct.

The side mouldings incorporate a recess for a tail gyro, this being behind the main shaft. This is particularly tailored to gyro's having separate electronics and/or control panels; hence the control panel mounting plate previously mentioned. If you have one of those one-piece gyros (British, of course) you may find it will not fit, or if it does, you may have a tail-heavy chopper (?).

On the review model a 'Quest' gyro was fitted and this was installed in front of the tank, with a 1200 mAh flight pack in front of the gyro and the receiver mounted on top of the battery. Not very pretty perhaps, but the C.G. came out dead on the main shaft. Another neat feature is the inclusion of hooks on the radio mounting plate to allow rubber bands to be used to hold the receiver in position.

## **Finishing and setting-up**

A nice set of vinyl decals is supplied with a choice of black or blue lettering. If you don't mind your model being in Kalt yellow and looking just like all the others then stick them on and go and fly. Personally, I find yellow rather a hard colour to see, so I applied a couple of coats of orange Humbrol enamel and then added yellow trim with a red pinstripe.

I was taken to task by John Wallington for painting the tail rotor blades since this added weight. In fact, the paint added just 0.1g to each blade and I just had to cover that green.

Pitch range is recommended as being 0 - 7 degrees but this is for initial training purposes. As I intended to do fast descents and aerobatics the pitch range was set to -2 to +7 degrees, as also recommended, and with around +4 degrees in the hover. Slough R/C suggested that the main blades be set very loose since this was necessary to avoid 'nodding' when using the flexiplate head.

## **Flying**

As expected, a few little tweaks were required to achieve hovering trim, the main one being to reduce the tail rotor pitch throw. I had been warned that the tail was very powerful and this is certainly true. No matter how much you check the pitch of each main blade, they are always out of track on the first flight of any new helicopter. Note that with Kalt designs the tracking should always be corrected by changing the length of the links from the pitch arms to the centre ball of the mixing arms on the seesaw assembly. If you do it any other way you will get unequal pitch response on the two blades. Incidentally, you may find that the control lever on the fly-bar needs bending outwards slightly to avoid fouling on full movement.

The tail is very stable; no doubt due to the belt drive eliminating torsional variations that are normally present in a piano wire shaft drive systems. There is also a remarkable lack of vibration - probably due to the removal of two gearboxes from the system.

Performance is very lively; certainly more so than a 'Baron 50'. At first sight this seems odd since the weight is virtually identical. However, the 'Cyclone' has a main gear ratio of 9:1 compared to the 'Baron's' 10:1 and this may well be the reason.

A new Kalt silencer is available specially designed for the 'Cyclone'. If you run at high revs this is a little on the noisy side. If you do run into 'nodding' problems, in the hover, raising the rotor speed is one of the usually suggested cures. However, I found that when this type of fore/aft oscillation did occur it was more responsive to changing the pitch rather than the rpm. Obviously if you reduce the pitch, this will normally increase the rpm, but I found that reducing the pitch and lowering the rpm (by means of the hovering throttle) also cured the oscillation. This tends to indicate that running the blades very loose as suggested may not be the answer.

I'll report further on this in the 'Hovering About' column after I've done more flying. I also have a set of Kalt 'H' series blades to try ('H' for heavy!). No aerobatics have so far been attempted due to the need to keep it in one piece until all the photos are taken! (The fact that all the flying shots were achieved in one flight confirms the excellence of the model).

## Conclusions

We shall have to wait and see just what Kalt have in mind for the Cyclone. Is it a 'Baron 50' replacement or the start of a whole new series perhaps? Whichever, it seems to be a worthwhile development in terms of simplicity and speed of assembly. It should also be cheaper to repair and need less maintenance. So far there are only two options available for this model, these being an autorotation unit and a tail boom support. Stay tuned for further developments.

## Specification

Model	'Cyclone'
Manufacturer	Kalt Sangyo Co. Ltd.
Importer/Distributor	Slough R/C Models, The Bishop Leisure Centre, Bath Road, Taplow, Berks.
Price	£225.
Engine	0.50cu.in. helicopter type. OS50 FSR-H in review model.
Rotor dia	55in. (1400mm).
Weight	91b. 7oz. (4.28kg) with 5 servos, gyro and 1200mAh battery.
Control Requirements	4 - 6 channels + gyro.
Control Movements	6 mm each way (12 mm total) at the ball joints of swashplate and at the tail pitch control lever.