

A further look at the

Concept 30

Kyocho, as one of the world's leading manufacturers of radio control cars, boats and aircraft have a vast knowledge of moulding components in advanced plastics and composite materials. This technology together with the design assistance of Taya (ex-world champ-

ion helicopter pilot) has been used to create their first helicopter the Concept 30. This model comes ready built in two versions, the DX and the SE. The latter having lighter paddles and ball races are substituted for the plain bearings in areas such as flybar, pivots, pitch slider, mixing arms and tail drive wire guide.

The rotor head design has been carefully thought out to provide perfectly straight links

between the flybar control arms and the swashplate resulting in the most accurate and slop free system I have encountered on any model regardless of price. The head also features a flybar that is in the same plane as the main blades and has flapping hinges, the damping of which is controlled by rubber 'O' rings.

The collective pitch system uses not one but two control



Nigel Ashwood runs an expert hand and eye over Kyosho's new baby

Nigel says, "I was happy with this one right from the start and it's obvious it was designed by an expert flier."

KYOSHO
THE FINEST RADIO CONTROL MODELS

rods from the bottom slider to the mixers passing through a plastic spacer in the centre of the swashplate. This system means the shaft does not have to have a slot milled in it, a feature that weakens and can distort shafts.

The main shaft is supported by two ballraces, the lower one is incorporated in the engine mount this gives quite a large distance between the bearings, minimizing the effect of any radial play in the ballraces.

The engine supplied in the DX

version (in England) is the Erya 30 which is fairly conventional having a ringed piston, ballraced crankshaft, twin needle carb and large heatsink head, the slight difference being that it is mounted in an inverted position. Most fixed wing fliers avoid inverted engine installations like the plague due to flooding the plug, hydraulic locks and other various starting difficulties, but I can honestly say that not once has the engine failed to start promptly. Whilst

on the subject of engine starting the installation in the Concept has two plus points, one being the excellent glo plug accessibility and the other is the lack of the need for starting belts or starter extensions. I was glad to see that Kyosho decided to drive the tail rotor via a wire drive and bevel gearbox instead of the latest trend of belt drives, this makes for greater versatility and ease of fitment of a scale body if desired.



We think it's quite pretty. It's a good example of the state of the art, without being a mix of

everyone else's ideas. Although it does have the now fashionable pusher tail rotor.

Concept 30

The tail rotor gearbox is a neat unit featuring ball bearing supported input and output shafts, very substantial nylon bevel gears, ballraced pitch slider and a choice of two tail blade assemblies, one being conventional single bearing blade holders and separate blades, the other a one piece moulded blade unit using a Delrin hinge system, both types are included in the kit. The latter is vulnerable if the tail should strike the ground and therefore should be only used by competent pilots.

the increased head response and power to do aerobatics. The standard metal paddles are 29% heavier and have 16% less area than the SE type and provide a very soft cyclic response.

All the linkages are pre-assembled by Kyosho and with the exception of the flybar to swashplate links proved to be correct lengths. This made the radio installation a very painless exercise, I used my JR Apex computer radio with 5 JR 507 servos and a Futaba 154 gyro powered by Futaba 1000 mAH nicad. The servo mounting trays

up where people use certain radios without pitch/curve (end point) adjustments, they cannot get enough overall pitch movement. This should not be a problem with novice pilots but experts who want to do aerobatics and autorotations will need to increase the pitch range to -3 deg to +8 deg.

The canopy which seems to be moulded in some sort of nylon type material needs just the minimum amount of work to complete it. The instructions show the clear screen attached to the canopy with four self tap-

equal to many bigger machines. The afternoon I completed the model was absolutely ideal trimming out weather so after a quick chat to Martin Briggs on the phone to tell him the model was ready for its first flight, we set off for the local flying field.

It takes confidence to autorotate a new and unfamiliar model. Our intrepid reviewer had the confidence and was delighted with the results.



Assembly

As I stated before the model comes ready built (well almost) all the modeller has to do is bolt on the undercarriage, rotor head, install the tail boom, a few links and the radio. Being a mistrusting type of person, I decided to check the tightness of all nuts and bolts and I was pleased to find the assembly was without any fault whatsoever. Gear mesh and engine alignment were also perfect. Before fitting the rotor head I changed the metal paddles for the plastic SE type as I wanted

have slotted screw holes thereby accepting most standard size servos and another nice little feature is a RX switch and gyro control unit mount which is accessible through a side window in the canopy. All of the required servo throws are shown in the instructions and Ripmax, the importers of this model to England, have thoughtfully included a supplementary sheet to help the novice with such information as whether the gyro sense should be normal or reverse etc. One problem, however, has shown

ping screws, in my experience this can lead to the screw holes cracking so I elected to use 1/2in wide vinyl tape as the fixing method. All that remained was to decorate the model with the provided sheet of self adhesive decals which even included tracking tape for the rotor blades. The now completed model weighed in at just 5lbs which is pretty light and this promised to give a good power to weight ratio.

Flight Test

This was later confirmed during flight testing, the climb being

The first flight proved to be an instant success, just a minor adjustment to the engine's idle mixture, which incidentally started within seconds of the starter being applied, was all that was necessary. The tracking did not need any adjustment nor did any of the trims, so all looked well. The model was hovered for a further two tankfulls of fuel with the engine slightly fourstroking just to run it in. This provided Martin time to take some photos. I am never happy flying a model unless I know it can autorotate, so the next

The gears are quite meaty and should take a lot of abuse, in fact, close examination didn't reveal any weak spots. The tapered moulding on the extreme right is the engine starter cone. The design is such that the engine has been angled down so that ones little 'piggies' holding the starter don't come to grief.

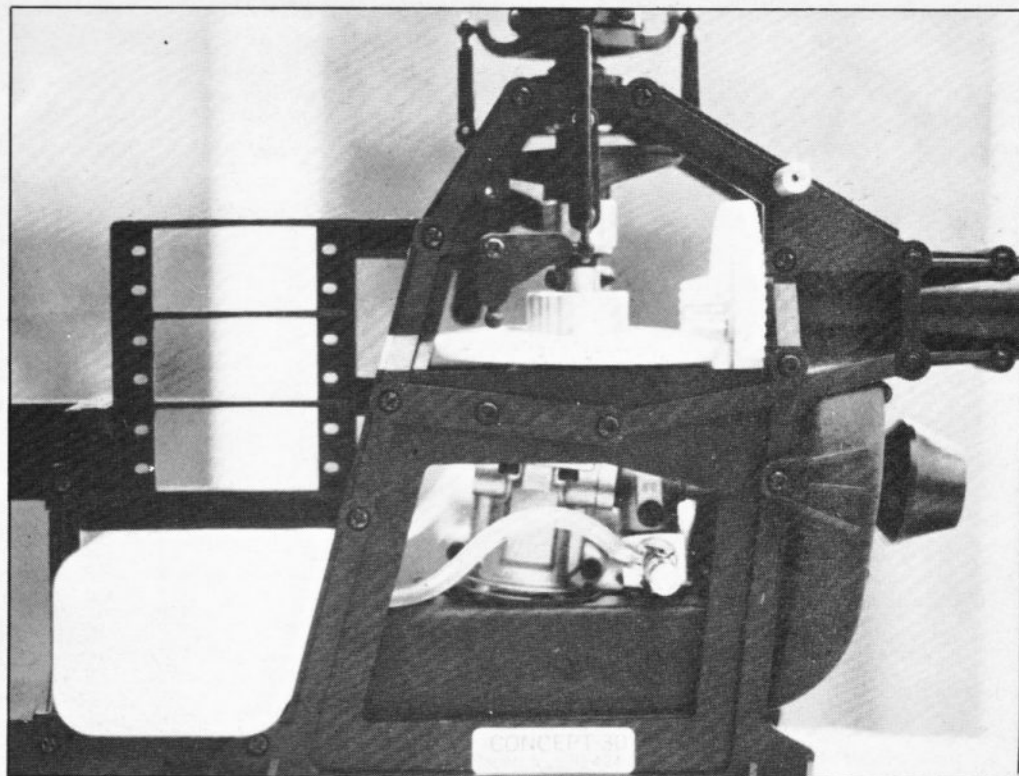
move was to check the descent rate. The first attempt was a little fast so the amount of negative was reduced. The second descent was just right, so half-way down I killed the engine, considering there was no wind at all a half decent auto was performed. The only fault that Martin and myself could detect was a slight feeling of stickiness in the fore and aft cyclic control, this is probably due to the very tight linkages. After several more flights some of the linkages stiffness had eased and the engine was developing a healthy amount of power, so I tried some loops and rolls, absolutely no problem.

Even on windy days the model penetrates well, is steady in the hover and has a powerful but steady tail. Although the blades which are a hard skinned foam with a full length glass fibre spar have a very forward CG. They are also light. This does not make for very good autos in flat calm conditions. Another minor criticism is the fit of the ball links, every other plastic moulding is accurate so why should these be so tight?

To sum up the Concept 30, it is an ideal trainer that can still be entertaining to an expert flier, it has a very good spares back-up and deserves to be a great success.

I hope Kyosho will build on their experience gained with this model and produce maybe a 50 to 60 size version.

A quite complex ducting directs cooling air and any fuel residue down and away from the model, although — as can be seen here — the glowplug is still very accessible.



Our reviewer took the rotor head apart so that we could see how it worked. On reassembly he discarded the metal paddles for the lighter plastic ones. The former are only used for initial training and being very, very heavy, ensure that things stay very unexciting.

