HELI-PAD

by John Heaton

THE THOUGHT OF a helicopter powered by a four stroke glow motor has intrigued me for a while. The time to do something had arrived so a KKK Hughes 300 fitted with an OS45 two stroke, trimmed out and flying nicely, was chosen as a test bed. Realising that a four stroke engine's low rpm, about 10,000 revs or so, would reduce the rotor speed, I set the model up with a fairly low rpm rotor (which is my philosophy anyway), and tried the model initially on standard settings, 0° at low and 8° pitch at maximum throttle, and it was twitchy and high revving. When the pitch was increased to reduce the rpm, clutch slip set in.

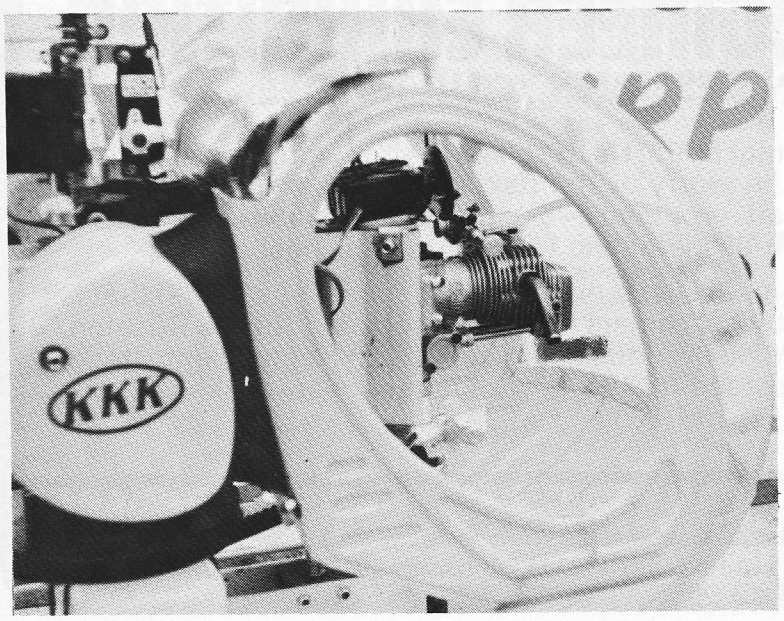
The clutch was dismantled (the KKK comes fully assembled) to find that it was a trailing shoe job. I simply turned it over and made it into a leading shoe unit, the only modification needed being to countersink the holes on the other side of the clutch. This time the model flew very nicely and exceedingly efficiently, and would, when the throttle trim was set high, make a lovely gentle descent with the throttle lowered completely. On measuring the pitch angle to achieve this state, I found I had increased the blade pitch by 9°.

I flew the Hughes for a couple of days to ensure everything mechanical was completely run in and then installed an OS40 four stroke. This fitted into the existing mount perfectly, as it has the same crankcase dimensions as the two stroke version. I had heard lots of theories about having to fit heavier flywheels in order to run a four stroke in a helicopter, but for the first flights it was left just as it was. It proved to be a doddle to start, idled perfectly and gave no trouble at all. The Hughes actually flew without any adjustments to the flying trim, although the test flights took place on a windy day and the air flow through the rotor disc had the effect of reducing the power requirement.

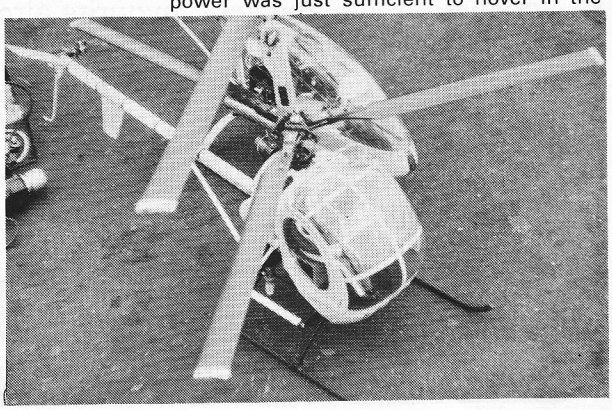
Slough Radio Control produce this *Sea King* shell for the kalt *Baron* helicopters. This one was built by John Griffiths and employs Baron 50 mechanics with a .60 engine. Lining was applied with a draughting pen.

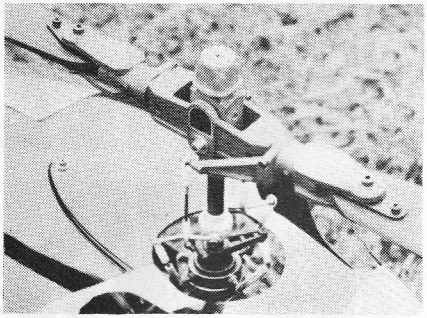
In some ways operation of this four stroke is better than a normal engine. With a two stroke, opening a cold engine's throttle always seems to scavenge additional oil from the crankcase into the combustion chamber, causing rich running until warmed up. With the four stroke this was not apparent. Subsequent testing on calm days revealed that power was just sufficient to hover in the

Below and below right: your columnist's KKK *Hughes 300* which has been fitted with an OS40 Four Stroke.



Four Stroke Power!





Sean Wiles' *Augusta 109*, featuring Kalt GS22 mechanics and a flybarless rotor head, shown above in close up.

cushion of air provided by ground effect, while circuits, having the advantage of transitional lift, were quite easy.

The mixture adjustment related to rotor pitch had to be set just right to achieve flight on calm days, while in windy conditions power was not a factor.

What was very reassuring was that throughout a solid week of intense flying the engine never missed a beat, burnt out a plug and the model did not need any adjustments. Yaw control became completely docile, which was a real surprise. Whether this was a result of only having half a horse power to play with, or because a four stroke engine has a flatter power curve than a two stroke engine, I do not know. Yaw stability was so good you could take off and hover, fly a circuit and descend with the collective lever fully lowered without having to touch the rudder throughout the flight. After about ten days I decided that the power from the OS40 four stroke was adequate for sport flying from open spaces but did not have the power reserve for confined area flying. I reverted to the OS45 and look forward to carrying on four stroke flying with a more powerful engine, perhaps the new HP49. The Enya 60 is the obvious candidate but it is a bit big to fit into the existing mountings.

Inherently, no problems at all were found with four stroke flying. Things I discovered during this experiment were that the exhaust extension to carry the exhaust clear of the cockpit area actually increased power (and noise). From stone cold the motor took a minute or so to warm up to full power. The power trailed off slightly when fully hot but not like the pronounced drop of a hard working two stroke. The engine was extremly messy when compared with the 45FSR, throwing oil from the front bearing and generally making the inside of the canopy very oily. State of the art flying in terms of cleanliness is having an intensively flown model with a bone dry engine, in fact one of my two strokes has corrosion on the outside!

Augusta 109 news

Sean Wiles has completed his Augusta 109 powered by Kalt GS22 mechanics. His first test of the 109 indicated a definite disinterest in lift off, the overall weight of 17lb proving too much for the engine. I would have called it a day but Sean, ingenious fellow that he is, shortened and lightened the fuselage to reduce the weight to 14lb. As Eric says, you can't even see the join! Not content with this, the model is flying on a rigid rotor system. Flight performance is very good and final fitment of a Futaba gyro left Sean very happy with his creation.

Rangers, Rangers, everywhere . . . and who could blame the modeller, for it's one of the prettiest choppers going.

Distributor's comment

It has been brought to the distributor's attention that people following the alterations suggested in the Radio Modeller's 'Helipad,' have been experiencing difficulties with setting up and flying of the Helimax.

It should be noted by those concerned that the manufacturer does not recommend; (1) changing the paddle blades from standard, (2) loosening the teeter or, (3) slowing the rotor-head rpm; all of which will effect the model's flight characteristics dramatically, causing problems such as nodding.

If the Helimax *is set up, as per the manufacturer's instructions, will perform excellently, and should anyone have any difficulties please will they contact Nigel Freeman of Ripmax Customer Relations (01-804 8272) who will be only too pleased to assist you in setting up your* Helimax *correctly.*

We, at Ripmax, will also be pleased to trim your Helimax *for you, if you arrange an appointment.*