

A HELI-PAD

by John Heaton



R/C HELICOPTERS ARE perhaps unique in radio modelling in that it is easy to completely alter the external appearance with the use of a commercially produced kit. This month I thought we would examine the Hirobo kit for converting any of the *Falcons* to a *Hughes 500*. This is what this interesting kit consists of: A moulded glassfibre fuselage, which includes all the necessary woodwork and bracketing and an absolutely complete hardware pack, even down to a longer starting belt to allow starting through a conveniently placed side window. The *Hughes 500* holds quite a few nostalgic memories for me as it was the type I first flew in competitions a couple of years ago.

For this particular conversion I wondered for some time whether to use a *505* or a *707* and whether to go up to a .45 or .50 size motor. The problem was eventually solved when a really nice *505* with some tasty extras came into the shop. On reflection, I think I would have gone for the *707* as they fly with less effort due to the longer rotor blades, but on the tail end, you cannot use longer blades as the *Hughes 500* is a short fat helicopter. To obtain the necessary clearance between main and tail rotors, you would end up with *505* size blades anyway.

The interesting extras of the *505* included an auto-rotation, ball bearing tail pitch change, washout control, *707* parallelogram pitch up mechanism and a machined

The deep, deep bulbous pod and stalky forward swept skid assembly is emphasised in this photograph of the *Hughes 500*.

John displays the *Hughes 500* to show its size. It's a long way from head to skids.



aluminium engine mounting bracket. None of these would make much difference to the performance, but they are nice to have all the same. Making a conscious effort to keep the tail end light I changed the plywood tailplane (for the 'C' version) for a light-weight balsa 'D' version T-tail. This tailplane I covered with heat-shrink tube blade covering and ended up with an extremely light weight unit with a beautiful finish for very little effort.

I also modified the undercarriage skids to obtain the characteristic forward slope of this particular version.

The kit provides pre-cut formers to carry the mechanics but I also added three balsa bulkheads within the tail boom to reduce the

chances of the drive whipping. Another mod., which I cribbed from Sean Wiles of Romsey was to make the servo trays longer so they project further into the nose of the model and reduce the amount of nose weight required.

My eventual choice for an engine was an OS.45 (aero version) on a standard outlet Hirobo silencer, a choice that turned out to be a bit noisy but not too expensive, light weight and not restrictive. Radio chosen was the Acoms FM. Having had a trial fit of the components, I decided to paint the model. I had fancy visions of a *Magnum PI* livery but ended up with a simple matt brown military finish. I spoiled this slightly by using Tuf-kote

rather than matt polyurethane but I really wanted an idiot proof and durable finish.

Dummy rivets were then added to give the model character and an Action Man pilot was used. Full assembly took about an hour and the first impression I got was of the model's colossal size. It simply towers over my other machines but it's no bigger, just dumpy and fat.

I took the model out for its first trials and the engine started in the normal way. I did have to spend a few minutes readjusting the blade angle as she was over-pitched and labouring, but she was up and away in no time. One disadvantage of the light spindly tailplane was that main rotor induced

vibration manifests itself in a shaking fin, although you couldn't see any vibration in the fuselage itself. I had fitted the largest size tail blades and had plenty of tail power, despite the *Hughes 500* layout which gives high weathercock stability (i.e. short front, big fin) which is good for sport flying but not so good for manoeuvring downwind or figure eights etc.

First circuit exhibited nice handling characteristics, the *505* head with heavy metal paddles and main blade mixing demonstrated excellent stability with entirely adequate manoeuvrability. Initially full forward trim did not quite give me sufficient forward cyclic for hands off circuits and I had to give the odd nudge of forward stick. I had not used any ballast at all thinking that this trim would counteract a slight tail heavy condition. I bolted a small lead weight to the servo plates and, hey presto, perfection. She would now do perfect circuits hands off, and hover nicely with a simple readjustment of trim.

The radio was performing impeccably, with absolutely spot on resolution coupled with good range. I flew that day for as long as I dared, bearing in mind the battery life. Things gradually improved in terms of performance and smoothness as things bedded down. That night, I checked the model over and found only the undercarriage to frame bolts need to be snugged down. The following day I fine-tuned the model after the bedding down process. Out of interest, I tried the Hirobo plastic paddles and promptly took them off as they spoiled the smooth stability of the *505* system. The manoeuvrability of the standard system is such that you can pull up to the vertical for a stall turn without undue effort and you can't ask more than that (aerobatic freaks excepted of course). Of more importance in my view than pure handling response, is the way in which you correlate your throttle to collective pitch to achieve a nice steady purr from the engine at

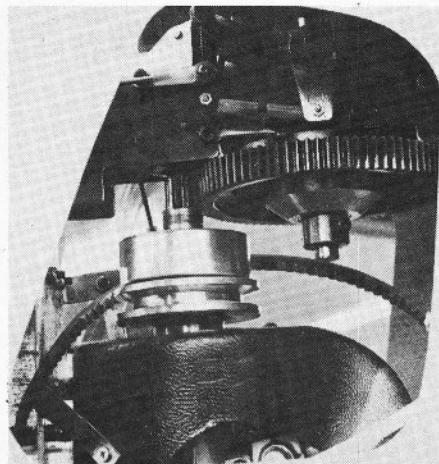
all times, whatever position the collective lever is in. In other words, if the model revs up unduly when you pitch up to climb, there is insufficient pitch going in to soak up power and if the model revs down unduly when you pitch up to climb, then there is too much pitch coming on and overloading the engine. The adjustment is really the art of setting up model helicopters and it is very rewarding to get it right. A number of factors come into play — differentials on the throttle and pitch, setting of engine mixture, especially idle setting, even type of fuel and plug selection.

Competition plans

This was an interesting exercise in choosing the most suitable competition model from my demonstration fleet. The choices were Bell *212*, Kalt *Cobra*, Hughes *500D*, KKK *Hughes* and the big *Lama*. The last two are not really candidates because of size and weight limits, although in terms of performance, the petrol *Lama* on a calm day can be flown very authentically, but would be outclassed in terms of pure handling. The three-bladed head articulated rotor just does not give the same linear fixed wing type handling as do the stabiliser barred types. This manifests itself with full size type characteristics like flap back and touchiness, in fact, I would say the head response is about on par with a full size articulated rotor. Tail response on the *Lama* is good and powerful yet docile.

The KKK is much more conventional in handling but buffeted by high winds because of its blunt shape, despite high weight. It could, however, do well in competitions with a gentle touch. The tail is quite sparkling and pirouettes in strong winds are easy.

The *212* and *Cobra* are about on a par in terms of handling. Being a newer kit, the *Cobra* has some advantages in terms of actual handling, but in terms of handling they are almost identical as indeed you would expect as important factors are the same.



Large rear window opening gives access to starter pulley and serrated 'V' belt.

Gearing approximately ten to one, head operation the same, fixed swashplate, Hiller head, high tail rotor for less control interaction, and, although different in concept, tail power from rotor has about equal potential.

The *Hughes/Falcon* has about the same tail power and has the more direct response of the mixed Bell Hiller head. Against that is the fact that it doesn't fly quite as smoothly as the first two. In terms of power, the *212* has definitely the highest power weight ratio, being a light model with a 61 engine. The *Cobra* and *Hughes* only having 45s, are not as sparkling in the towering climb, and of course, there is less latitude for error of adjustment. However, they will both climb rapidly on warm still days with enough power left for right hand tail commands. In conclusion, it is possible to win a competition with almost any type of helicopter, it is the hands on the sticks which count.