HELI-PAD

by John Heaton

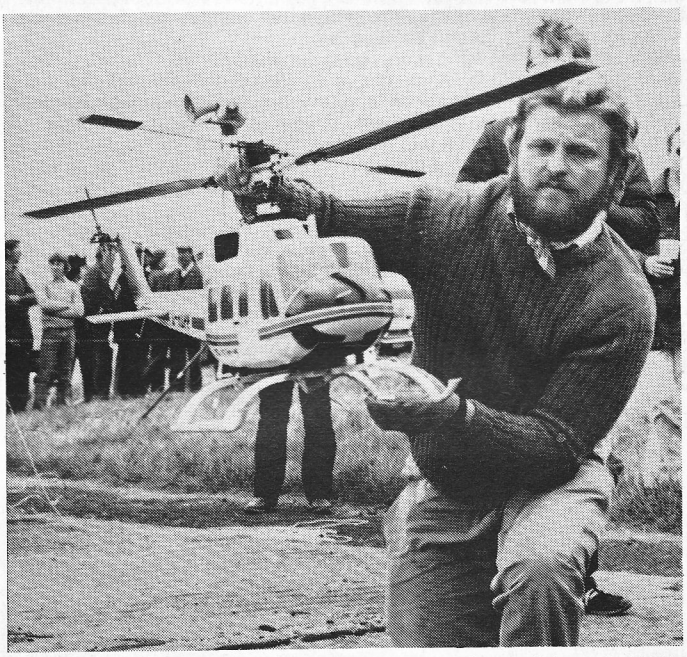
IT HAS been about a year since the Kalt *Barons* came on the market and I thought a recap of experiences with both my own demonstration and customers' models may be of interest. The kits go together very easily, especially the *Baron 50*, which is provided with slotted metal servo plates and plastic fins and stabilisers. Another refinement on the *50* example is the large robust aluminium engine block, which makes a good rigid mounting and is easily accessible for engine removal. The other main differences between the *Baron* trainer and the *Baron 50* are the swash plate and the pitch-up mechanisms. These are plastic assemblies on the cheaper version and funnily enough never seem to give any trouble, although the swash plate is not ball raced. The more expensive *50* version has better metal ball raced components. You have to study the exploded views carefully when assembling the pitch-up mechanisms and also be careful that the collective pushrod that goes up the shaft does not bind causing erratic operation.

Tail drive is quite a clever design in that the drive does not depend on the tightness of the grubscrews but the drive wire is bent at right angles for positive grip, foolproof in operation but needing a bit more care during assembly. Don't (as I have done so many times) bend the end of the drive shaft at right angles and find you have forgotten to mount the little locating collar. (Especially annoying when you haven't got a spare drive shaft).

When mounting the transmission ensure that the nylon cog meshes well with the spur gear. It doesn't matter how you adjust mesh but I find the easiest way to cure a too-loose mesh is to pack washers between the nylon cog and freewheel hub, which effectively pushes the gears into closer mesh. I find with all these nylon-cogged jobs that if meshed tightly they last for ages, but if meshed only halfway the life is not halved but reduced by as much as tenfold.

Blades on these machines are pre-finished in what looks like an epoxy coating and are usually balanced within limits. If I am in a hurry I just suspend the head from the flybar with the blades mounted and attach a piece of black or white **Fablon** to the light blade's tip to ease the tracking adjustment. If they balance perfectly then I attach a very small piece of **Fablon** to both tips! (To make them visible for tracking purposes). If not in a hurry I prefer to properly finish the exposed ends, cover with **Fablon** in the normal way and balance them accurately, which I feel is a more professional job. The nice thing though is that you can bolt on blades straight out of the packet and nine times out of ten you will be OK. Bit of a change from the early *Jet Ranger* days when you had about four hours' work just assembling the blades. I have only dwelt on the more interesting facets of assembly as it is it is just like a Meccano set.

Len Mount (inverted) and Mike Western (upright) preparing for a demonstration of 'mirror' hovering.

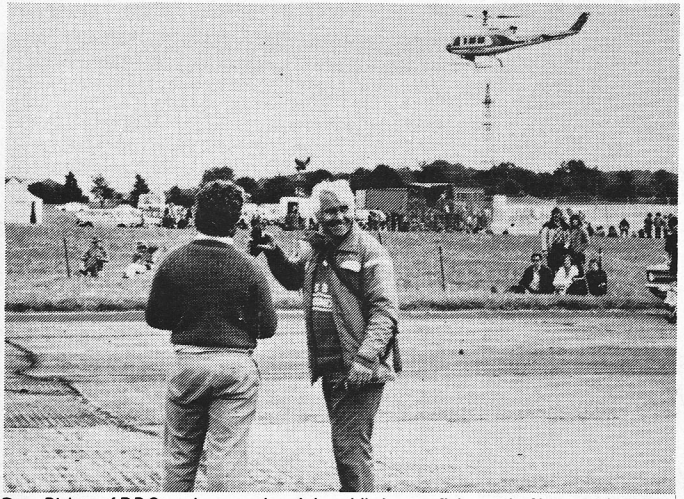


Your columnist flew this *Jet Ranger* during a display of helicopter flying at the British Nationals at Barkston Heath.

Setting up

The *Barons* are probably among the easiest collective pitch models to set up, having a fixed swash plate (collective-wise) with a separate linkage for collective pitch change. I find that cyclic movement needs to be the maximum you can get at the swash plate, as they only steer through the Hiller paddles, without any measure of direct Bell-type mixing, and hence have a nice docile response. That is not saying that I have not seen them looping and rolling when John Griffiths and Nigel Brackley set them up with high revs and light paddles, but the way I set them up is with standard paddles and engine rpm about 10,000 and they are very docile indeed.

As a matter of interest I find the instructions tend to give far too little pitch on the main blades with a corresponding excessive rpm and personally disregard the advised settings and set the blades at about 7½° at half throttle which, with an average size servo disc, gives about four or five at low throttle and 12° or 13° at high. Then adjust the rpm whilst hovering to what you desire, i.e. if labouring, decrease pitch and if rpm is excessive increase pitch. I always tend to start off with the pitch on the high side as if it is wrong it only labours, which is not damaging, whilst if you err on the underpitched side, excessive rpm can be murderous, especially on a brand new engine. It must be understood that *you* have to set the rpm at what you choose, simply by adjusting the pitch. It is of no relevance what angle you set the blades at initially and you cannot be instructed on specific angles as the variables are numerous — engine power and characteristics, fuel mixture, weight of model, finish of blades, even the weather makes a difference. All this sounds a bit tricky but is not really. First, you set your model up to a middle-of-the-road adjustment; i.e. mixture midway between weak and rich and blade angle holding the engine at a steady purr. Over the weeks you realise that most apparent changes in



Dave Bishop of DB Sound pounced on John while he was flying at the Nats, and 'conned' him into a demo of hands-off flying, which in this case meant putting the transmitter down and walking away while the chopper drifted slowly downwind.

trim, etc. can be put down to weather changes and unless the model is underpowered no adjustments are needed. I always have more confidence in a model (especially for public displays) which has been flown during a few weeks of different conditions without adjustment, because you then become aware of how the weather effects the model and can recognise a fault developing.

A lot of this sort of thing is only based on experience. One of the most important things in a helicopter is not to set the mixture too lean. When I first set one up I hover for a few minutes then make a descent and listen for a sign of richness. If you can detect this 'burble' of richness in the descent it will be somewhere about right and you know the model will be OK for circuits. Beware of a situation where the engine note sort of hardens off when you descend, or you may get a flame out.

I usually fit *Barons* with an HGK45, which is very adequate and quite inexpensive. Set up this way they are very suitable for training, general fun flying or for that matter competitions. The nice thing about helicopters is that you need nothing fancy in the way of equipment to win competitions. Let's face it, you only have big blades on top, little blades at back, and they are all pretty similar. You only have to achieve ordinary control responses which are built into kits anyway and the rest is up to the pilot.

Oddly enough the manufacturers treat the *50* version as aerobatic but in fact the trainer version is more responsive because about the only geometric difference between the heads is that the trainer's swash plate has a longer spike to transmit cyclic movement up to the head, hence more response for a given swash plate movement. All that is of course purely academic because you can totally alter a helicopter's characteristics by the way in which you adjust it.

Long term findings

The clutch, as, it seems, on all Japanese kits, shows scope for improvement. It looks a nice workmanlike job, but you find that you get wear on the pivots and pins and the springs break, whilst the actual friction surface doesn't get a mark. I would say that in comparison with the Hirobo clutch, and presuming both machines are set up correctly, the average cost per hour or gallon would work out the same, because although the metal **Kalt** clutch tends to last longer than the plastic **Hirobo** one, when the replacement time comes the Kalt costs more as you need shoes, pivots and springs. As always with helicopters it is a case of swings and roundabouts.

I am pleased to see that the Kalt fuel system is the one I advocate, i.e. unpressurised, one tube up, one tube down, close off the tube up when filled, vent through the tube down, hey presto, a constant head chicken hopper type tank. No more rich when full, weak when empty engine runs.

Apart from the clutch, the mechanics seem just about maintenance free and surprisingly the tail drive shaft, which only has one support bearing halfway down the boom, never seems to whip or give any trouble. Booms are easy to break, being carbon fibre, but not that expensive to replace and not difficult to change to alloy if it upsets you.

One of the few mods I *have* made to the *Barons* is a flybarless head using my own heavy blades. It takes a lot of care setting up to get constant rpm, but engine off landings are fascinating. With all that inertia you don't even have to be careful as it will hover for several seconds with a dead engine. After spending several months perfecting flybarless flight and engine-off landings, etc. I find there is so much scope with a standard docile helicopter that I never stop learning and I am pleased that it is so comparatively easy for newcomers to enjoy practical helicopter flying with the offerings on the market today.

If you have had good success with a model and want to try something more adventurous rather than looping the loop and making engine out landings, just try hovering over a spot and keeping the helicopter still whilst walking round the model. That should keep you occupied until next month.