HELI-PAD

by John Heaton

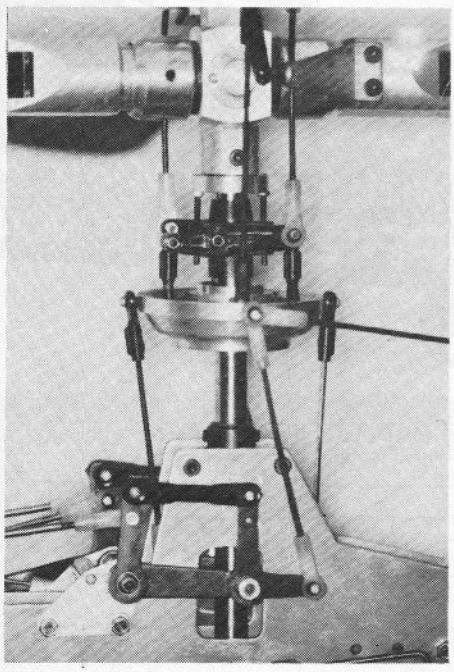
THIS MONTH I have decided to do something a little different and give brief hints, tips and information from experience amassed on different machines over the years. So, in alphabetical order.

Graupner Bell 47

A cute little model this, not fashionable but a good little flier with extremely smooth and reliable mechanics. Watch nuts and bolts carefully, they try and catch you out with 2.6mm and 3mm mixtures. If you break tail blade pins press them out and use 10 BA nuts and bolts. I can remember all the hassle of figuring out how to fit other servos into a frame designed for Graupner R/C with bottom mounting servos and recently had a brainwave; glue them in with adhesive. In fact I did think about getting one of these models going with a cheap radio set glued in, for a novel fun model.

Graupner 212

Recently covered by test (August 1981); fuselage looks lovely in its bare state but get a coat of paint on and pinholes show. I find the best way is to brush on a first coat of really thick primer filler, rub down then start to spray. Figure out servo mounting before fitting tray as it is difficult when installed.



Make tail drive outer tube bend very gently round fin curve. Be careful when mounting blind nuts for transmission plate fixing as they are inaccessible when the woodwork is mounted.

Hirobo Falcons

505 blades can be single bolt mounted, preferably with a bush — may save a blade in a tip over. Check tail drive grub screws and nylon cog for a proper mesh. On the *505* it is better to fit top servo tray level with 'L' cranks for less cyclic mixing with collective. If the tail stays fracture at the bend fixing just resquash both tubes, drill more holes and mount the horizontal stabiliser nearer the front. Be careful cutting the canopy, especially the *707*, as it is easy to crack them.

Hirobo scale jobs

Use quick set epoxy to assemble gearbox halves and make sure bearings are sealed to shafts to prevent leaks (I use superglue).

Lama

Be extra careful when cutting the large canopy, the safest way is to use a fine tooth saw. Dummy engine — leave a substantial lip to aid gluing, fix with a spot of superglue on each rear frame joint. Stick dummy engine on with servo tape, as bolting it down will crack plastic, as it will with the side panels.

Jet Ranger

Watch tail drive S bend, design lends itself well to speed up device for nicer line up though no problems if curved properly.

Gazelle

Nice model this — take care with fan halves as they crack easily if tightened unevenly and get all the pitch change you can. Cut holes for swashplate rods before painting as they always have to be altered. Nose ballast usually needed.

Iroquois

Large model, very authentic. One nice feature is the detachable fuselage half for access. Bend tail drive as gently as possible.

Kalt Barons

Recently covered in full, (November 1981).

The revised *Falcon* swash plate as described in end column.

Kalt scale jobs

Gearboxes come ready assembled complete with freewheel, usually oil tight. It is beneficial to very lightly grease clutch pivot on assembly as it is prone to wear.

Cobra

The *Cobra* is the only Kalt scale model I have built but is a lovely medium size model which flies well on a 45. Assembly takes a bit of concentration due to slimness of the fuselage and a handy tip is to look through the dummy jet exhaust with a torch when assembling. I fancy building another using the new OS 46 rear exhaust so I can enclose the silencer completely.

KKK

New in the country, I am delighted with my first example which now has had four gallons of fuel through it. Watch the spark plug, mine fouled after three gallons. Canopy is prone to cracking in odd places, especially if it mounted with unnecessary stress, and the machine is set up revving more than necessary. Machine seems touchy on lead-lag, adjustment doesn't respond at all well to the normal "let them fly loose" attitude. I find the best way is to tighten lead-lag bolt with blades set so that with the links off they hang level. Mainshaft is long and thin so be careful when handling. Tail drive shaft is supported by central bush mounted in foam. Mine became loose and I rehashed a mount with longer support tube a la *Falcon*. I also fitted an extension silencer pointing aft and achieved the happy result of not getting a single speck of oil on the machine anywhere, no matter how long I fly. As a matter of interest this machine is quite noisy despite quiet exhaust, the intake is the main culprit along with a fair bit of blade and mechanical noise.

Kavan Alouette

The *Alouette* fixed pitch is the machine I first learned circuits with and I was basically very satisfied with it. Tail gears are very prone to stripping, a problem compounded by a floppy fuselage and tail guard. Primary drive belt lasts well and clutch is good although snatching can shear main shaft bolts if tickover is too fast. Clear part of the canopy is superb and seems crack resistant — tail drive is quite the best I have seen (petrol *Lama* excepted) having purpose designed support bearings down the trusses and squared ends for totally idiot proof assembly. The collective version I did not have success with and have yet to see one fly.

Kavan Jet Ranger

The superb subject of last month's test and now having a good few hours put on it and proving to be a very smooth reliable machine. Tail drive is sometimes prone to whipping and it better with tail guide supported in three places (ends and middle). Mechanics last well but after many hours the toothed cog on crankshaft shows wear, similarly the toothed belt. Amazingly the right angle tail drive gears I have not known to fail but the same ones on the *Alouette* are quite prone to stripping.

Rubber engine mounting really does its job well, none of the scale detail has moved and bulbs still work. An interesting experiment I try to make on all my models is to have someone hold it above his head with engine running at flying rpm and feel the vibration. On the *Jet Ranger* it is virtually non-existant. Vibration is a specialised subject but I feel that rubber mounting a light object like a servo can sometimes magnify the vibration and you might have been better with rigid mountings. If you flexibly mount you need sufficient mass to keep the thing you want isolated still and have the mountings take up the vibration. Most of the gears are fixed with rolled pins which are inherently secure when new, but I have had, in the past, pins slip out after having been removed a few times. So, if in doubt, superglue them in.

Lark

Basically a good little flier especially fitted with a Schnuerle ported 25. They are exceedingly cheap to repair, mechanics are a little basic having few ball bearings but reflected in the low price. In my experience, the *Lark,* if assembled carefully with regard to linkages and fitted with a decent engine, flies very well and gives good service. If degenerated with sloppy assembly they get beyond it. I personally feel they are the most attractively shaped sports type helicopters on the market. None of the mechanics last as well as more expensive machines but they cost pennies to replace. Starting is a bit of a chore with mounting and dismounting toothed belt. An advantage is that being light they bounce well and you can take chances you wouldn't normally take on a more expensive machine. Standard paddles give a nice cyclic response and tail has plenty of power, tail gearbox only has plain bearings and needs plenty of lubrication. On my machine the tail drive whipped and I devised more guides, also the grub screws securing the tail drive to the tail gearbox slipped, but these are all things which can be fixed by using a bit of common sense. I fitted mine with a model racing car engine with comprehensive silencing and performance was sparkling. It sounded a treat just whirring around the sky, you could just about scrape a loop out of it as well. One exciting incident with mine was when the canopy, (attached with velcro) complete with Action Man, fell off from a great height. I fought it down with a C of G a good two inches back from the mast to a perfect landing. The canopy landed on the flower bed and wasn't scratched. I thereafter used a self-tapper for added security.

Schluter Heliboy

Still a good few of these machines around. They form the basis of the Schluter System 80 models. Supreme in aerobatics as Len Mount demonstrates but they don't have to be that twitchy. Mechanics are soundly designed with good strength even when violently aerobatted. They do tend to do a lot of damage to themselves in a crash because of high rotor speed (8 to 1 gearing and using high power motors) but I understand that spares have come down in price since coming under the wing of the Williams empire. Tail drive is good, being grub screwed on to a flat. Cooling shroud is a bit fragile. Plug removal is a bit fiddly but not as bad as some. Some of the mechanical bits such as the collective pitch arm bushes are prone to wear, mechanism around the fly bar is a bit flimsy but no real problems. Tail blades are lovely, moulded plastic, strong and give plenty of tail power. Most *Heliboys* are fitted with tuned pipes and make a nice noise as they manoeuvre, blade noise outdoing exhaust noise.

General

I have never found an ordinary scale job that needs more than OS 50 and standard silencer even with an on-board starter. This is apparent with the Hughes 300 as the petrol engine only produces 1.2hp for 17.1lb., whilst the OS 50 produces about 1.3hp. As a matter of interest, a very rule of thumb power ratio for both model and full size is 1 hp to 10lb weight; (full size example Bell 47, 295 hp, 3,000lb all up weight). Ball joints balls self-tap to servo arms with 2mm bolts and don't need nuts. Starting belts for Japanese machines often grip too well and snatch — just apply a light oil.

A very useful dodge for cheapskates. If the ball joints are slack, just apply superglue which goes between the surfaces and solidifies and forms a shim tightening joint. For machines with gearboxes (Hirobo, Kalt) be sure to snug down the bolts holding the transmission plates to the woodwork after the first few runs. Be careful if you run an aerial down the tail boom as it is too easy to get metal to metal 'noise' off the drive shaft.

A good tip I use if building a Japanese machine with ready bonded-in woodwork, (beautifully done but sparse on the glue) I fill a large syringe with the fibreglass strands type propriety paste and neatly syringe a fillet around the wood/glass reinforced plastic join.

Anybody still using a pressure fuel system? Not so clever on a helicopter, a three tubes chicken hopper system is better (aerobatics excepted).

Anybody had trouble fixing windows in a GRP scale job? I find that I usually manage to mess up the job and the nestest solution is to attach the windows with tiny screws or nuts and bolts, added advantage of being removable.

Another useful tip for setting up engines. If you blow down the fuel pipe into the carb. whilst operating the throttle you find you can barely blow in with throttle closed and can blow in quite easily with throttle wide. If you try this with a known set-up and get used to the different resistance between throttle open and closed, you can set up a new engine quite accurately.

Now for a spot of 'Falconry' from a reader.

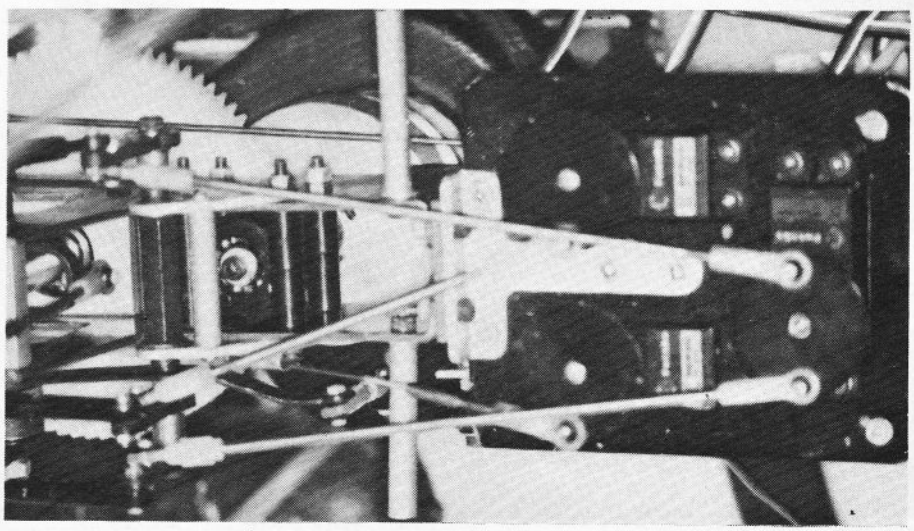
"The *Falcon* helicopter has proved to be reliable and good fun to fly. The cyclic and collective control of the rotor head is achieved by direct mixing between the swash plate and the rotor blades. This system had proved to be reliable and easy to repair when it comes to replacing a bent shaft or any other parts. However, recently some modellers have tried to increase the rpm of the rotor head by using symmetrical blades and/or reducing collective pitch. This resulted with some under-control of the machine due to slight play in the swash plate. To overcome this the following modification was carried out:

The forward and backward bell crank was removed and fitted on the other side of the main frame and another side cyclic bellcrank was added in its place. An extra ball had to be introduced on the swash plate as shown in the photographs. To reduce flexing, 2.5mm pushrods were used between the servos and the bellcranks. All pivot bearings for the collective pitch mechanism were fixed with Loctite adhesive. This removed all play and the only movement remaining was that of backlash in the servo gears.

On the first flight the helicopter proved to be very sensitive on the controls and the rate switches had to be introduced. The helicopter was particularly responsive on collective pitch change. The rpm was increased to the maximum possible so that lift-off occurred at full engine speed. During the second flight full servo throw was restored and the helicopter became very manoeuvrable in forward flight. (By the way, watch out for fuel consumption at such high engine speeds. The model ran out of fuel and the engine cut out sooner than I expected. The forced auto-rotation landing saved the model yet again!). The metal bell cranks with ball bearings, the new type swash plate and FM rotor head are not needed for this modification, but if used will provide that extra degree of precision and smoothness of control.

As mentioned before, I prefer lower rpm helicopters, but for those who opt for higher rpm and enjoy the adrenalin in their blood I hope this modification will be of interest to them."

Well — to my mind a thoroughly pointless exercise. One which completely negates the advantages of a modern helicopter i.e. efficiently sectioned blades — gentle rpm, docile responses etc., good fuel consumption, low noise. But it takes all types and I thank the reader concerned.



Plan view of servo installation in the *Falcon* showing tougher linkage and its revised position — see letter.