



# ELI-PAD

by John Heaton

SOME INTERESTING correspondence has come from Vago Nordigan of the Watford Model Centre regarding the *Helimax* described a couple of issues ago. He has experienced the nodding motion I described and says it can be cured by sweeping the blades forward a few degrees and tightening the single bolt fixing so they remain in the swept forward position. It would be important to sweep both blades at the same angle or vibrations would result.

Incidentally, after getting used to the *Helimax*, I replaced the original lightweight paddles and tried some aerobatics. The machine didn't seem quite so hairy this time and I had an enjoyable time looping and rolling all over the place. I could manage a presentable loop, but it seemed difficult to get anything like an axial roll.

Later on that week Ian Shepherd came into the workshop with a smart Hirobo *Jet Ranger* and he showed me an interesting little modification which other *Ranger* owners might be interested in. The standard arrangement has the collective and throttle servos actuating their respective functions through a fairly torturous route from the cabin top through two bell-cranks to the mixer on the main gearbox. He cleverly turned the collective and throttle servo on to its side and fed the link straight onto the parallelogram mixer unit, which did away with the bellcranks and removed a lot of slop and play from the system.

## Schluter DS22 Special

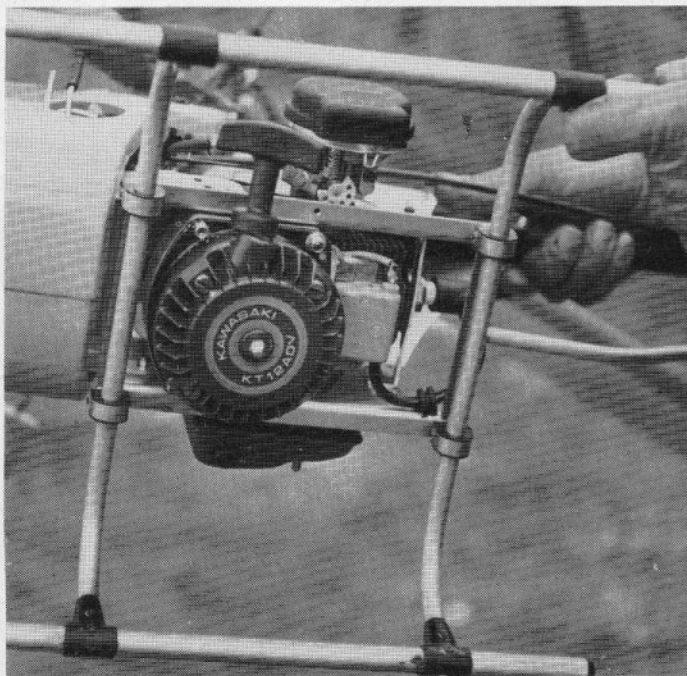
This model is taking shape in readiness for the summer rallies. I have for some time now fancied one of the old Schluter DS22 models as they are extremely large and impressive looking and it would be novel to go back to an original from 1972. With some extra work I might end up with a reasonable scale competition contender.

For the benefit of those not acquainted with early model helicopters, the layout of these early Schluter mechanics is very like the current Kalt or Hirobo gearbox type models, but the gearbox casings are in plastic rather than metal. Collective pitch had not been developed, so simple fixed-pitch heads were used, although in the DS22 flapping hinges are an added refinement.

Incidentally, the designation DS22 seems to be just a whim as the model is actually based on the *Enstrom F28*.

A more realistic looking undercarriage was fashioned from bits of alloy tube and rod. This was just screwed onto the fibreglass shell in the correct scale position, which is somewhat weak, but I intend to avoid heavy landings. (On the standard undercarriage the landing loads are fed into strong points in the structure, i.e. engine bed plates). This modification makes the model look infinitely better. I then made a simple rigid three-bladed rotor head using Hirobo blade holders on a machined alloy hub and the model really took on some character.

On the left is Sean Wiles' modification to the petrol engine powered *Baron*, as described in the text. Below: Ian Shepherd with his Hirobo *Jet Ranger*.

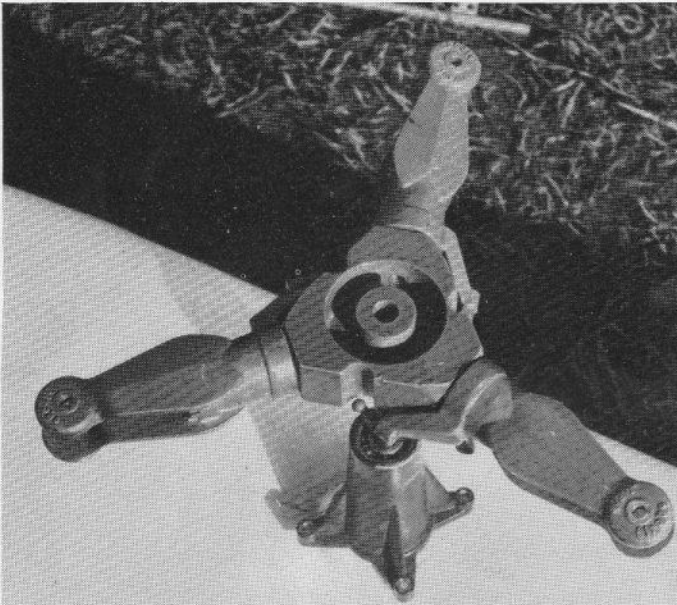


This is about as far as work has progressed as we go to press, but I have manufactured a batch of flybarless blades. These are standard type blades with a slot machined in the outboard tip with some specially cast lead weights Araldited in position.

I fitted my flybarless *Falcon Hughes 500* with a set of these blades and it is flying very well indeed. There is no real difference between a two, three, four or five bladed rotor once you have done away with the flybar and gone on to direct cyclic blade control, for each blade is being controlled individually and in fact I have found that the more blades you have the smoother and better they fly. They are, however, a more time-consuming task to make, set up, balance and track.

People who are interested in flybarless flight may be interested in a recap of my experiences about three years ago when I first got the system sorted out. Purely coincidentally I did my first experiments on another *Falcon Hughes 500* model. I removed the flybar, connected the links straight from the swashplate to the blade holders, just like a full-size *Jet Ranger*, bolted on a set of Graupner weighted blades (about one ounce weights) from the old 222 model and had a go. It was flyable, but the cyclic response had to be seen to be believed, very touchy and with bad pitch up tendencies when coming into wind.

My advice to anyone wanting to have a go is to fit very light weights, pick a calm day, make sure you don't rev too high and give it a try. Basically, the heavier the tip weights the better the characteristics are. In fact, the blades on the present Hughes are the heaviest I have ever used and the characteristics are really good. I can do slow pirouettes in very strong winds, which is quite a feat with a rigid



Above: the three blade hub for fly-bar-less flying built by your columnist for a scale *Enstrom F28*.

rotor. It's necessary to reduce the rotor rpm with each increase in weight to keep a check on the centrifugal force which is trying to pull the rotor head apart. All this is somewhat questionable from a safety point of view as it could be said that the risk of a structural failure is being increased, but safety precautions must be increased to match.

Some photos of another extremely nice *Jet Ranger*, a Kalt this time, are shown this month and the proud owner is Mick Henstridge from Salisbury. Mick has been flying just over a year now, having started with a 707. Steady progress was made over 5 gallons worth of flying time, and the 707 was part exchanged for this second-hand *Ranger*. Mick made it his business to restore the model to absolutely perfect condition this winter and I must say it looks a picture. The unusual decor is scale by the way, I believe some sort of round the world attempt by an Australian. After spending such effort on the finish, Mick fitted a new radio set (Acoms AM) and an OS 45H. I was lucky enough to carry out test flying and it was like a dream, very smooth and very realistic.

Interestingly Mick found that initially he had difficulty in positioning the model accurately as he had become so used to the behaviour of his first model, but says that he now feels completely at home and can fly 'hands off'. He is justifiably very proud of his creation.

Finally this month, Sean Wiles describes fitting a recoil start to the petrol *Baron*. The

Below: John Heaton's current project, an *Enstrom F28* modified from the Schluter kit. Modern 'sports chopper' placed alongside for scale.



Right, above: Mick Henstridge with his refurbished Kalt *Jet Ranger*.

unit that Sean used is a Kawasaki starter as fitted to small Flymo lawnmowers, but I imagine that any small recoil start unit would fit the bill. Attachment involves bolting the pawls of the starter to the existing slotted disc and making up spacers to bolt on the re-winding mechanism. A bit of a machine job admittedly, but a convenient modification nonetheless.

The mechanics are destined to be clad with one of the big *Augusta 109* shells, which should make quite an impressive machine. It will be interesting to see if the petrol *Baron* mechanics are up to the job.

### New Company

There always has been a close association of ideas between the remote piloted vehicle industry and radio-controlled modelling but in recent years, the sophistication of the RPV has leapt ahead by light years leaving us to wonder at the achievements which are revealed, and to speculate on what might be happening behind the scenes. Readers will recall that it was Eric Falkner who established the pioneering company RCS Ltd., the first to produce commercially available proportional R/C equipment in the U.K., and for that matter, the first ever to manufacture all transistorised equipment. For the last 15 years Dr. Falkner has been designing and manufacturing RPV's which have been supplied to several governments. They include long-range variants with RCS's own design tele-

Right: this 'flying peanut' is the Canadair CL-227, a military reconnaissance RPV which has just completed its test period.

vision transmitter or auto-pilot system. Currently the company is producing fixed and rotary wing pilotless aircraft for use as military targets or surveillance.

Now a new company has been formed by Dr. Falkner with the appropriately direct name of *Remotely Piloted Vehicles Ltd.* in association with J. Shapiro, the aircraft designer with long associations in the rotary wing industry and Fred To, who will be remembered for his "Solar One", Britain's first ever solar powered aircraft and several remarkable inflatable manpowered machines. Among them the huge *Phoenix* which can fly at less than walking pace.

We look forward to hearing more from RPV Ltd. as they develop civil machines for a new method of electrostatically charged droplet crop spraying.

Meanwhile from Canadair Ltd. we have very practical evidence of the advances in rotary RPV's now that the CL-227 has apparently passed through its test period. Similar machinery is under development in Germany through Dornier who are also working on other mini-copters of more conventional appearance.

