



by John Heaton

**L**AATEST ADDITION to the wide range of Graupner helicopters is the *Helimax*. Upon receiving the first batch of these kits from Ripmax, the UK distributor, I wasted no time in assembling one. (Photos appeared last month.) Essentially it is a trainer-come-sports helicopter in the modern style, similar to the *Falcon* or *Baron*. First impressions are extremely favourable, as the box top is to Graupner's usual colourful standard. Instructions are fairly comprehensive and the model quickly takes shape. The main frames are conventional in shape but are spaced out twice as wide as normal by wide bearing blocks and spacers, conceivably to accept a two-stroke petrol motor, which is one of the possible alternative power supplies. The engine mounting brackets have to be drilled to suit the engine used, another necessity demanded by the two-stroke, four-stroke or petrol engine options. The clutch is excellent, a plastic leading shoe job, a la Hirobo but having weights for firmer engagement already fitted (as I have been doing to Hirobo clutches for some time). A top-mounted starter is provided for a direct start up. The alloy tail boom houses the aluminium tail drive shaft guide tube and three plastic formers support this tube within the boom. The clear plastic cooling shroud fits in two halves and gives no problems.

Tail fins and horizontal stabiliser are plastic ready to fit items, as are the tail blades which appear to be just about unbreakable.

The tail rotor's pitch change mechanism is a very sophisticated affair incorporating a ball raced pitch change plate, plus would you believe, a rubber damped teeter hub.

The smartly styled canopy goes together quickly, I screwed two halves together with small self tappers and then ran superglue around the join by which the clear part of the canopy is secured with four screws. I dressed the canopy up with auto-shop touch up aerosol sprays in roughly the same fashion as the box top picture and fitted an Action Man into the cockpit, (after taking a hacksaw to his bottom!). The overall effect is superb and is remarked upon by most people, their comments being very complimentary about the model's finish and professional looking appearance.

Futaba's latest remote-pot servos fit easily into the ready shaped trays and the control linkages are a stroke of genius, quite the simplest system I have seen on a moving swashplate for collective system, with the possible exception of the KKK Hughes 300 with its moving servos.

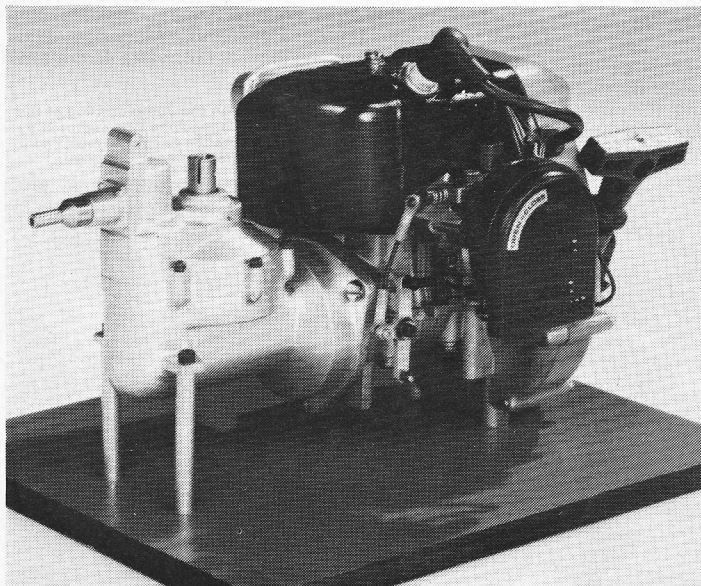
And so to the rotor head. This is possibly the most interesting part of the whole model. The head seems to be a pure Hein *Star Ranger* item which I think has won most of the European competitions. It is constructed of extremely tough plastic and seems just about indestructible. A small amount of

Petrol motor, gearbox and cabin detail of the eagerly awaited Bell VH-1B *Iroquois* by Hirobo.

teeter is catered for by O rings around the joining spindles of the blade holders and there is an adjustment for static tracking which is an unusual feature.

The collective control is an absolute work of art and works without a trace of play or lost motion. Flybar paddles are lightweight, high aspect ratio (i.e. long and thin). The swash-plate is a fairly normal affair, in fact looks like a 47G item with extra ball pillars. Semi-symmetrical rotor blades are used milled with wooden reinforcements at the root end which have to be glued on. The overall feeling is that the model has been designed with extreme finesse, nothing is left to chance and the completed model is extremely light, mine balanced correctly with the cut down Action Man.

I used L-series Futaba radio with the new remote pot servos and the engine is an OS45 with a standard aero silencer attached with a right angle adaptor. I set the collective up according to instructions, that is low throttle  $-2^\circ$  pitch and full throttle  $+16^\circ$  and looked forward to the first flying session. Start up was uneventful although it is necessary to use a starter extension as the starter cone is very close to the rotor head. This is offered as an accessory although I made mine up using a bit of alloy and rubber tube. First hops were unbelievable; engine and rotor rpm were high and I swear the thing had enough control power to loop in about a 4ft. diameter circle. Believe me, nobody could ever want





for a quicker control system! Mind you, I would think the average beginner could not cope, for the *Helimax* is just too quick to respond to cyclic. Strangely, the tail control is quite docile. If asked to put a figure on the roll rate I would guess at about  $360^\circ$  sec., which is extremely quick even by pylon racing standards. Increasing the pitch on the main blades slowed the rpm and made things more manageable and I flew it around for a while. No teething troubles at all but control response was still extremely quick, even with the rpm so low the engine was barely ticking over. I screwed on a set of metal paddles from a 505 and the model was transformed, performing beautifully in my preferred way of flying. The engine was running quietly and the model was flying extremely smoothly and gently, the biggest impression is that of lack of effort, the engine burbles just off tick-over and the *Helimax* drifts into the air. There is no sign of sloppiness in the control response at all. Mind you, the main rotor speed is quite high even with a low motor rpm as the reduction ratio is seven to one as compared to a

The *Iroquois* has auto rotation built into the integral gearbox unit — expected soon, watch the shows. Photo: courtesy of Hirobo.

usual  $9\frac{1}{2}$  to one on most models. The model copes very well with strong winds despite being extremely light (3.2kg) and as a free-wheel is fitted I would like to think auto-rotations would be a snip.

I haven't, as yet, got around to that aspect of testing but a colleague, Nigel Freeman, tells me that he had a flame out on his model's second flight and he had no problems. When I talked to Nigel about the model's fast response he said that all aerobic helicopters are like that and he hadn't noticed! One strange little habit is that at a certain rpm you get a nodding motion. This can be eliminated by flying with a higher rpm, as Nigel does, or in my case, by keeping below the critical speed. This nod is however, diminished by letting the rotor blades fly loose (as described last month) and is caused by a stiff teeter mechanism, it is apparent that as flight time increases, this tendency is

decreasing. I imagine that the rubber O rings are giving a bit more, allowing more teeter.

I measured the adjusted pitch angles and they are: low throttles, low trim =  $\frac{1}{2}^\circ$  low throttle, high trim =  $3\frac{1}{2}^\circ$ , high throttle, high trim =  $11^\circ$ .

The way I have adjusted the *Helimax*, fuel consumption is extremely frugal and vibration, main rotor or engine induced, is very low. By repute the Heim head is very strong and I have never heard of one flying apart, even when revved unmercifully and violently aerobated so with sensible use we could last a lifetime.

Perhaps one of the biggest advantages is that the model will fly on any two-stroke .40 motor, or even a good .30, which a lot of people have got, whereas most of the modern choices really need a .45 or .50. I think we have a definite alternative in the *Helimax* and feel that it is perhaps the most versatile of models both in the motor choice and although it can be adjusted to be very aerobic, or extremely stable, it never becomes sloppy.