

KIT

REVIEW

No. 78

Schlüter

Heli-Baby

**BY
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BARNARD**



"The Heli-Baby was designed to be as simple and unproblematic as possible in assembly as well as in action, and makes no pretext to scale to any full size helicopter. The resultant model is, however, a typical helicopter in looks, and the wide cockpit, seat and instrument panel, complete the picture and allow individual styling and insertion of detail."

The foregoing paragraph was compiled from extracts in the introductory page of the manufacturer's building instructions for the Heli-Baby. Our test model is now complete, and we can confidently open this review with the statement that in our opinion, as far as building the model is concerned, designer Dieter Schlüter's intentions were fulfilled. The Heli-Baby must surely be the nearest to the ideal beginner's model helicopter which has as yet been produced. It is extremely easy to build, and of very strong construction. All parts are accessible for ease of maintenance and replacement of individual components. The model can use practically any of the current popular .40 cu. ins. motors, and this size of motor allows the Heli-Baby to fly with power in reserve. The motor is not included in the kit, allowing the builder to fit the engine of his choice. Beginners should note that good throttle characteristics are absolutely essential in any motor used in a helicopter, plus, of course, reliability.

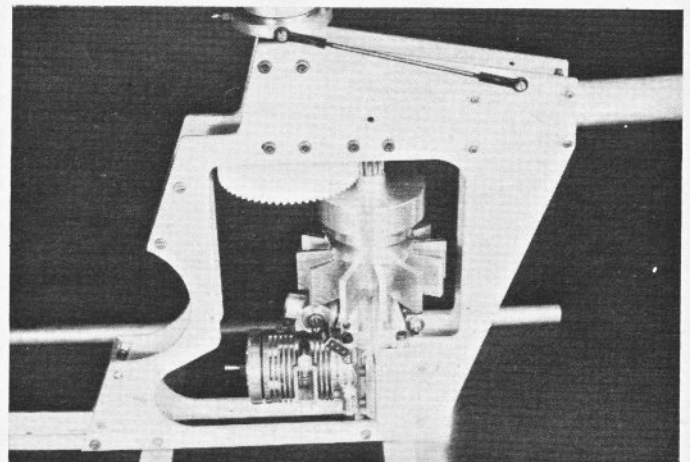
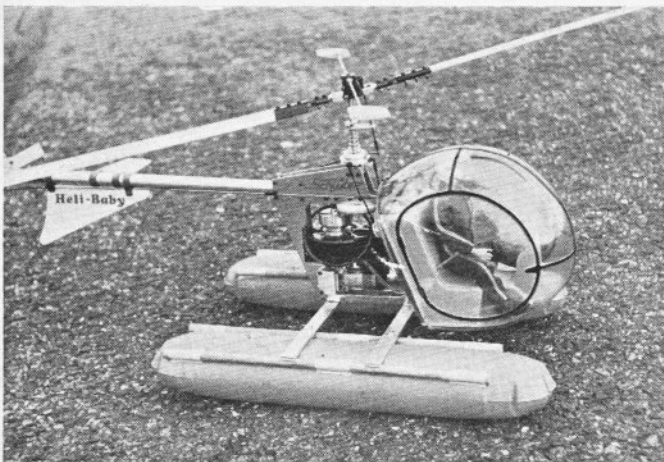
We have already stated that this model is extremely easy to build. It also builds very fast, and rather tempts one to 'slap it together' and get it airborne! This temptation has of course to be resisted, as the mechanical

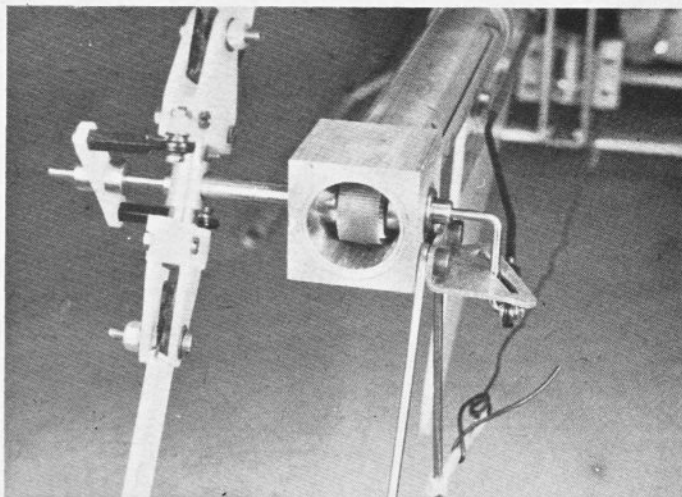
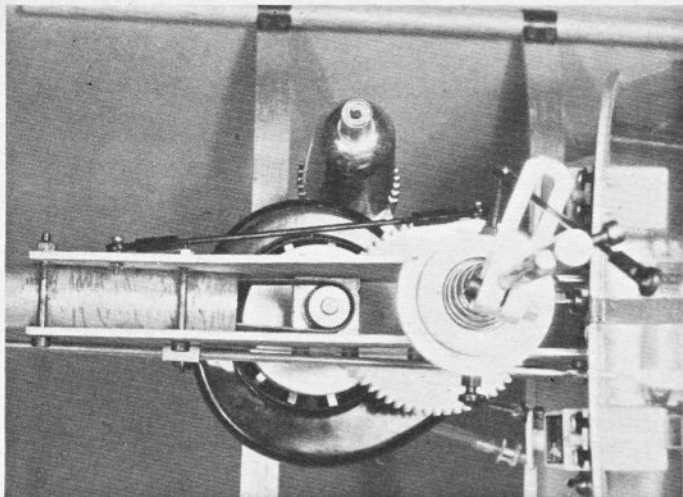
parts have to be carefully aligned with a degree of cautious 'eyeball' engineering. Alignment of components is quite straightforward and the written building instructions are easy to follow, helped by a large sheet of step-by-step construction pictures.

Construction of the Heli-Baby commences with the building of the centre frame, which consists of two metal side plates and brackets. These are bolted together to form the very strong frame. The building instructions do not mention the use of 'Torqseal' or similar locking compound on the nuts and bolts of the centre frame, but it is certainly advised to avoid the possibility of the nuts loosening through vibration. This will only apply to the centre frame, as locknuts are used on other components.

The centrifugal cooling fan is now attached to the chosen power unit, followed by the internal clutch assembly, and this complete unit bolted loosely into position in the centre frame. The outer clutch casing with the main drive shaft, and the main rotor shaft with nylon gear wheel (both complete with bearings) are also loosely bolted into the frame. The bolt holes in the centre frame are elongated to allow correct alignment of components before the final tightening of all bolts. A small amount of filing of engine mounts and further elongation of the bolt holes in the centre frame may be required in order to accurately position and align the particular engine which the builder has chosen to fit. We fitted an HP .40 and found that it was necessary to alter the position of the engine bearer bolts to enable the motor

Top: the R.C.M. & E. Heli-Baby ready for its test flight. Above: Our test pilot, Dave Nieman, demonstrates the manoeuvrability of his own Heli-Baby. Below: close up view of very nice Schlüter floats fitted to Dave's model. Below right: centre frame of model, with motor, cooling fan, clutch, 6 to 1 reduction gear and swash plate installed. Note very strong construction.





to be raised sufficiently to insert the clutch completely into the clutch case.

Further repetition of the step-by-step construction details would be superfluous but some points of interest will be of value to future builders of the Heli-Baby. All the mechanical parts are of a high quality. We particularly liked the strong teeth of the nylon gear wheel, the tough centrifugal clutch with its large driving surface area, the high quality ball and needle race bearings (11 in all), plus the overall impression of strength and crash damage resistance of all components.

An obvious point of interest is the rear rotor drive which is via an endless belt enclosed in the boom, driven from a pulley on the end of the main drive shaft, and driving a pulley positioned at the centre of the rear rotor drive shaft. The method of controlling the rear rotor pitch is a somewhat unusual arrangement with the control arm moving in an angled slot to effect the required change of rear rotor blade angle. We bent the rear corner of the slotted plate down and bent the front corner up in order to angle the edges of the slot and align them with the control arm, to give free movement throughout its range. Edges of the slot could also be filed to an angle to give the same effect. The rear rotor assembly with its nylon blade holders has to be assembled by the builder, not a difficult task, but one which calls for careful reading of the instructions and a study of the instruction pictures first. Rear rotor blades require only a light sanding before covering with the material supplied. The main rotor blades are also ready for light sanding and covering, before bolting into position.

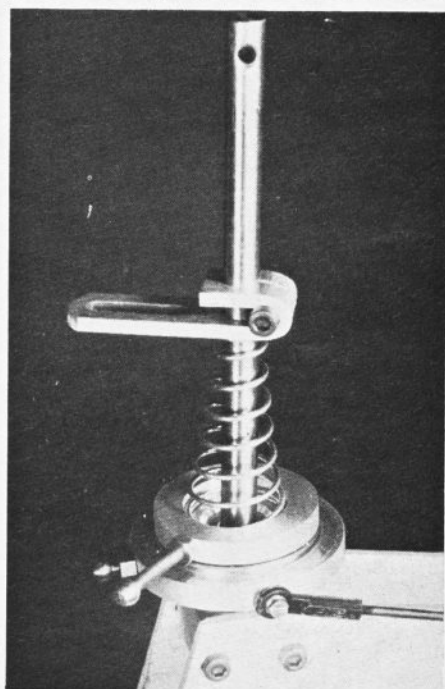
The main rotor head, which is a full teeter head, has its coning angle built into the design, and the blade angle is adjusted by loosening the bolts which clamp the blade

holders to the head, and so turning the holders (the bolt holes in the blade holders are elongated) to obtain the required blade angle. By blade angle we mean of course the angle at which the blades are set relative to the airflow, or, as the experts would no doubt prefer, the angle of attack. This, is a mere 2°, and we have to admit to surprise at such a small angle, until it was discovered that the main rotor blades of the Heli-Baby reach a speed of around 2000 r.p.m. — almost twice the speed of the rotors of similar models. Thus it is not surprising that the manufacturers have produced a rotor head of such obvious strength, and include a warning in the instructions regarding the use only of original components throughout the rotor head, pointing out that the centrifugal force on each blade at maximum r.p.m. is approximately 120 lbs.

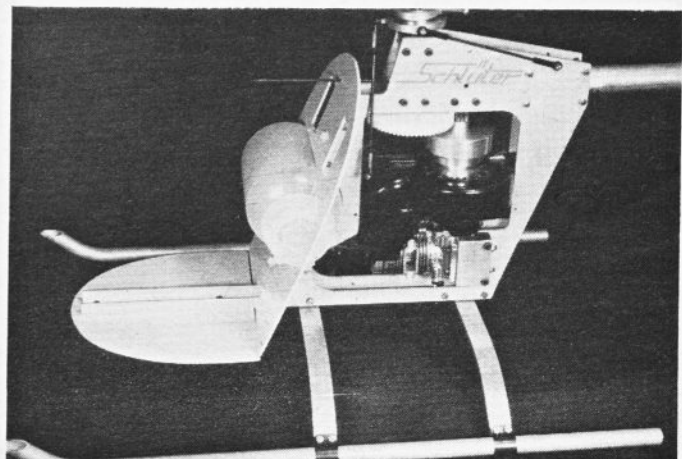
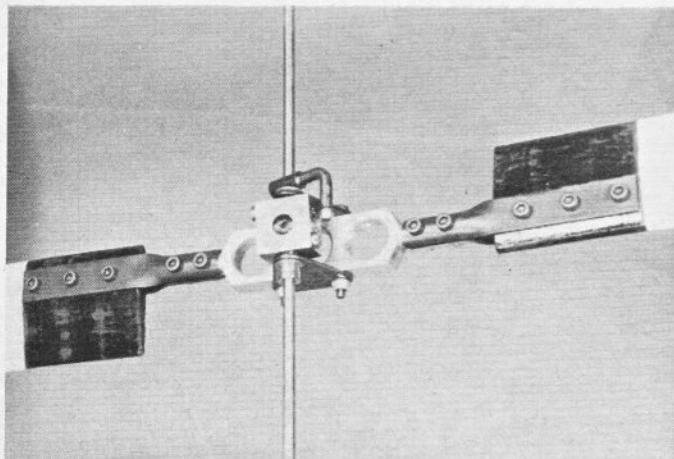
The all metal swash plate has a ball race bearing and metal ball seat, on which it is held securely by a cone spring positioned between the swash plate and the collector clamp. Correct tension of the spring is obtained by moving the collector clamp along the rotor shaft.

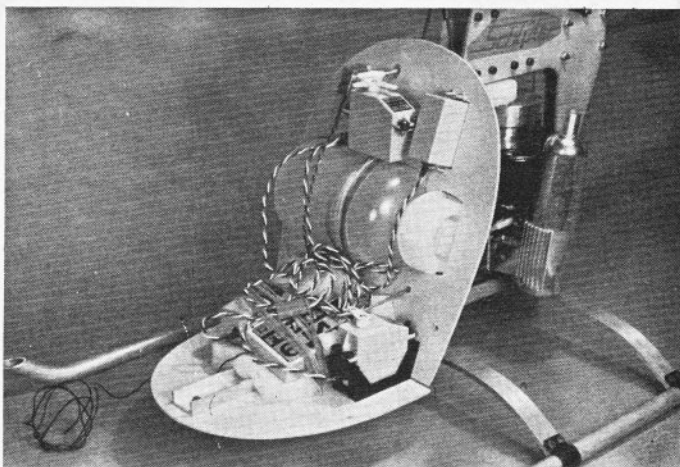
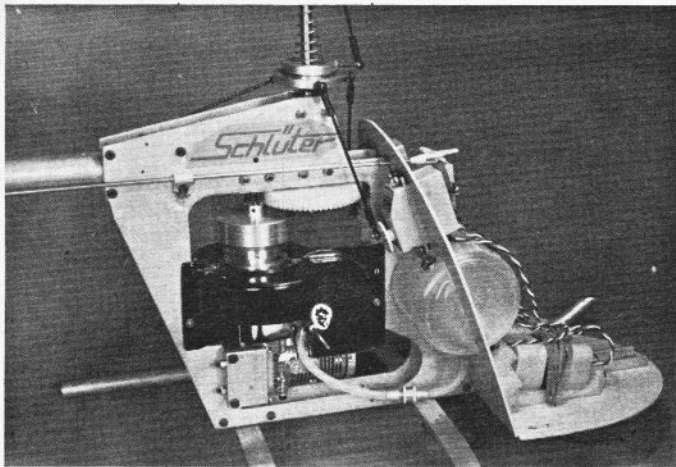
Most difficult part of the construction was the cutting out of the plastic engine cooling duct. This is fairly thick, hard plastic, and a strong sharp knife is essential. It is in two parts, held together, and onto, the centre frame by two small bolts. We were a little concerned that the duct actually touched the engine cooling fins and would perhaps be damaged by the heat, but our fears were groundless, the cooling fan really blasts the air through, and the engine finning is kept too cool to damage the plastic.

Other than the rotor blades, there are only two pieces of wood in the kit, the cabin bulkhead and floor, and since these are cut from one plywood sheet one could say that only one piece of wood is supplied. Cutouts



Top left: view from above of rear rotor drive pulley and belt. **Top right:** rear view of the rear rotor assembly, note belt drive and method used for rotor blade pitch control. **Above:** swash plate assembly with tension spring and collector clamp. **Bottom left:** main rotor head, note the very strong construction. **Bottom right:** ply cockpit floor and bulkhead fitted, showing position of fuel tank and servo cutouts in bulkhead.





have to be made in the bulkhead for the fuel tank and cyclic pitch servos. The bulkhead and cabin floor are bolted to the metal frame. The canopy is in two halves and these have to be trimmed before joining with the glue supplied. Installation of the radio (four function of course), is a simple operation, since there is plenty of room on the bulkhead and beneath the pilot's seat for any modern gear. We fitted 'Futaba Series M' and had only to make up one servo tray, for the tail rotor control servo - using a Futaba tray for the motor control servo. Two cyclic pitch servos are seated on the bulkhead. Collective pitch is not used.

We are very impressed with the Heli-Baby kit, and also with the section of the building instructions booklet which deals with trimming and flying the model. This is by far the most comprehensive set of instructions on the art of flying model helicopters we have yet seen. One is taken through the *ab-initio* flying stage to advanced flying. Admittedly, the translation to English, does, in places, leave something to be desired, but nevertheless, the manufacturers are to be congratulated upon the compilation of these flying instructions.

Flight test

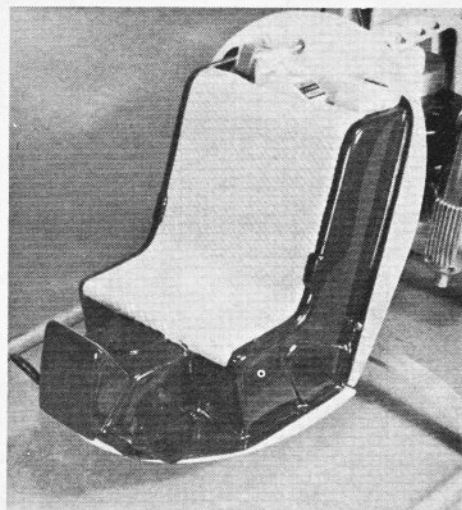
An electric starter is not required, as the model is designed to be started with the starter cord supplied. If one wished to use a starter motor, a starter belt can be positioned over the pulley during construction of the model. We decided to use the starter cord supplied, but it was unfortunately too short to give the motor a good 'pull over', a length

of nylon cord did the trick, and once we had found the correct needle valve setting, the engine started quite easily.

Dave Nieman had kindly consented to carry out the test flight, and after an adjustment to one of the main rotor blades, *i.e.* a slight increase in angle of attack to align it with the other blade, all was ready, and Dave lifted the Heli-Baby into the air, hovering for the photographer's benefit. Dave reported that all was well, he was quite happy with the model apart from the motor, which tended to tighten after a short flight, and required a good 'running-in' session before attempting to fly the model for any length of time.

Dave had also brought along another Heli-Baby, fitted with the specially designed Schlüter floats. These floats are said not to effect the stability of the model, in fact, according to Dave, the model is even more stable with them fitted. They are ideal for the learner, cushioning the landings and providing a wider track for greater ground stability. The engine of Dave's model had completed its 'running in', so he gave us a fine demonstration of the Heli-Baby's capabilities (and his own). There is no doubt that this is a very manoeuvrable model, which, according to Dave is very easy to fly. We put this last remark to the test a few days later, and how right he was, this *is* certainly an ideal beginner's model, very stable indeed, easy to build, easy to start without an expensive starter, all the necessary information for the beginner in the instruction booklet, and comparatively easy to fly.

Distributed through RipMax. Price: £99.50.



Top left and right: installation of Futaba radio gear, with pushrod connections to controls. Above: pilot's seat fitted, enclosing the greater part of the radio gear. Below: Dave lifts the R.C.M. & E. Heli-Baby into air for its first test flight, and, below left, poses the model for an 'action shot'.

