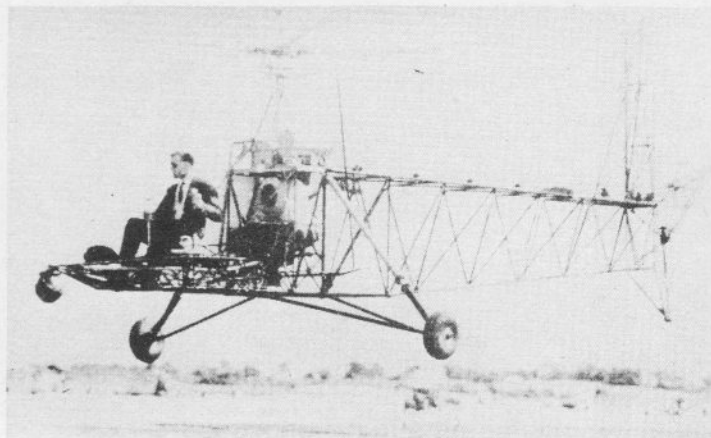


EVERYONE HAS TO START SOMEWHERE! Left: helicopter pioneer Igor Sikorsky testing his VS-300 in tethered state during 1939-40 period. Below: C. L. Morris, test pilot for Sikorsky with VS-300 in hovering flight, about 1941 period. C. L. Morris eventually published a fascinating book, based on his test pilot experiences called 'Pioneering the Helicopter'.

STRAIGHT UP

A new column for R/C helicopter enthusiasts
By DAVE NIEMAN



IT is just a year since Dieter Schluter introduced his Heli-Baby at the Nuremberg Toy Fair, but during this time it has become so popular that at present, demand exceeds supply. Being small (.40 powered) and of mostly metal construction, this pleasant looking little helicopter is quite a departure from its larger, more complex predecessors from Schluter's stable. It is an extremely versatile model which can suit the requirements of both novice and expert alike. For the novice it is easily put together and is a stable flyer, although a little twitchy on the tail, but this is characteristic of all small helicopters. With a few minor modifications, the more proficient pilot can transform the Heli-Baby into an aerobatic ADULT. It can be made livelier than some of the bigger models and promises to be better still as it will soon be available with collective pitch.

The kit contains a clear plan and very good building instructions which are supplemented by a separate sheet with pictures of various stages of construction. But even with all this information there are a few points not covered and some which I feel could stand mentioning again, particularly for the first time builder, judging by some of the basic mistakes I have seen on quite a number of Heli-Babies, I couldn't very well say that some of you are doing it all wrong could I? Hence the subtle build-up!

One of the most outstanding features of the Heli-Baby is its ability to survive a nasty crash and sustain very little damage. However, there is one part of the main rotor head that is pretty vulnerable. The round ends of the aluminium See Saw to which the blade holders are attached are liable to bend even if the blades just touch the ground. Although this is quite a costly item, any attempt to straighten it could weaken it further and is asking for trouble.

The main rotors should be fitted to the blade holders with *all three* screws. On two occasions I have seen models where the rotors have been attached to the blade holders with only one screw to enable the blade to swing back on impact and minimise damage to the head. This practice is Dangerous! The blades are not reinforced at the root and could easily split and part

company with the model. The idea is good, but the method is not. The fact that the rotor head is a weak point has not gone unnoticed and latest kits have a modified See Saw with a single screw fixing for the blade holders, but the rotors are still retained by three screws. (Photo—Nuremberg report last month.)

The main rotor hub is pre-assembled by the manufacturer and is ready to build into the rotor head, but there is one small precautionary measure to take before doing so. There is a socket head screw in the centre of the rotor hub which retains the transverse shaft on which the rotor head teeters. This screw does vibrate loose and can drop out, allowing the rotor hub to move about between the two triangular side plates. This results in severe imbalance and could allow the aluminium See Saw to foul the link between the swashplate and the stabiliser control lever. At best this could mean some bad vibration, at worst a crash, either way you will notice if you have lost this screw! The stabiliser bar passes through the centre of the transverse shaft and must be able to rotate freely to effect cyclic control. As the hole for the screw is drilled all the way through the transverse shaft, tightening the screw will simply lock the stabiliser bar. Permanent cure is to take out the screw and if it has a point, carefully remove approx. half of it with a file. Degrease the hub and screw, then replace the screw using Loctite, but sparingly. Check that the stabiliser bar is free and don't forget to lubricate the two bearings in the rotor hub. (Fig. 1).

Unfortunately it appears that not all of these small metric screws are of uniform length and a similar problem can arise a little further down the rotor shaft. The retaining screw for the brass ball which forms a bearing for the swashplate is an example. In some cases, the head of this screw protrudes just enough to cause the swashplate to bind. Should this happen, either fit a shorter screw or trim the existing one to fit.

The rotating part of the swashplate is driven by the pushrod linking the swashplate to the stabiliser control lever. This control lever should be fitted with the ball pointing anti-

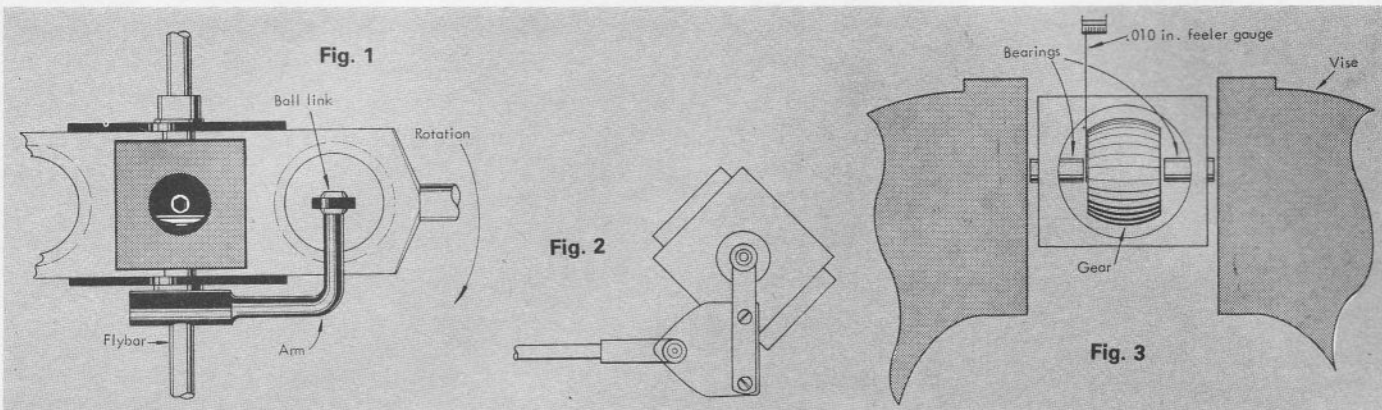
clockwise or against the direction of rotation, so that the ball link is being driven onto the ball. If the lever is fitted the other way round, there is a bearing possibility that the ball link may be driven off the lever, should the swashplate become a little sticky due to the ingress of dirt, or if the ball link is not in good condition.

Because the motor is fitted with the crankshaft vertical and the throttle linkage is almost horizontal, this poses a small problem as the angle between the throttle servo and the carb is too great for proper throttle control. If the throttle arm on your carburettor is secured by a nut, or is otherwise adjustable, then it is just a matter of swinging it back until the angle is more acceptable. But if the arm is permanently fixed to the throttle, barrel don't just bend it back – make a small aluminium quadrant and fix it to the throttle arm with two screws and nuts using Loctite. (Fig. 2). Fit the brass ball for the throttle link in such a position as to ensure correct travel between idle and full throttle.

Take care when lining up the motor, fan, clutch assembly with the clutch bell and ensure that the clutch is free to turn with no tendency to drag. Check the alignment occasionally, especially after a heavy landing as the motor mounts can slip on the side frames. Just prior to fitting the motor, lubricate the needle roller bearing in the centre of the clutch with just a smear of high melting point grease. This is not mentioned in the building instructions, but I feel that this is necessary as the shaft of this bearing carries has been known to seize, mainly due to misalignment.

When cutting the plastic cooling duct, trim the flanges so that the mating surfaces are dead flat and do in fact touch. To ensure a snug fit, I add an extra clamping screw at either end.

Make sure that the tail rotor drive belt is adjusted tight enough to prevent it slipping and that the front drive pulley is positioned so that the belt does not touch the tail pipe. If the belt rubs, there is a considerable loss of power, belt life will be shortened and worse still, it could jump off the pulley. At the rear end of the tail pipe, the two needle roller bearings that carry



the tail rotor shaft should be lubricated with a drop of oil, taking care not to allow oil to come into contact with the drive belt. These two bearings locate the rear drive belt pulley and govern the amount of axial movement on the rotor shaft. In some cases this movement may be excessive and result in a lot of lost motion in the tail rotor pitch change. To eliminate this problem, slacken the belt and remove the rotor shaft, but leave the drive pulley in position and place a 10 thou. feeler gauge between the pulley and a bearing. The tail pipe is put in a vice and the bearings gently squeezed together until all the free play is taken up. (Fig. 3). If you do not use a feeler gauge or a suitable spacer you will almost certainly clamp the pulley between the bearings, creating excessive friction, if it rotates at all. In later kits, the tail rotor shaft is carried in two shielded ball bearings. The drive belt is adjusted by moving the tail pipe rearwards, but remember by doing so you will effectively shorten the tail rotor pitch change

rod, which must also be adjusted accordingly. This adjustment should be allowed for when making the pushrod by leaving sufficient thread either end.

The Heli-Baby is extremely stable in the hover, making it an ideal trainer, but coupled with this stability is a relatively slow response to cyclic control inputs. I personally think that response is too slow even for a raw beginner, who, not seeing any reaction to a given control input will naturally take a lot longer to get the feel of actually controlling the model. Much damage could be alleviated when the inevitable mistakes are made if the model were to respond faster to corrective action. This is quite easy to achieve and a noticeable increase in response will result from lightening the paddles. If the existing paddles are lightened there is a very slight loss of stability, hardly noticeable, which is more than offset by the improved response. A good method is to drill a couple of holes at a time until the model is

'TUNED' to your own requirements. After extensive trials with a range of paddles modified by Tony Bray, it was found that stability was virtually unaffected but response was substantially speeded up by keeping the paddle weight as standard (30 grms.) but increasing the area by 50 per cent. This was done by using the longer Schluter paddles cut to a length of 60mm and lightened to 30 grms. After lightening, the holes are filled with balsa and finished either with a self adhesive covering or Solarfilm. The benefits of increased response and a more noticeable link between stick movement and model reaction make some form of paddle lightening on this model a very useful exercise, especially for the novice.

Tailend Fanny!

This miniature Fenestron Fan is part of a new .61 powered scale Westland/Aerospartiale Gazelle from RipMax. The fan has six blades with collective pitch and runs at engine speed. The unit is cleverly engineered and should appease scale builders who were a little upset with the tail rotors on the Schluter Gazelle. More details will follow as building progresses. (See pictures).

Odds and Mods

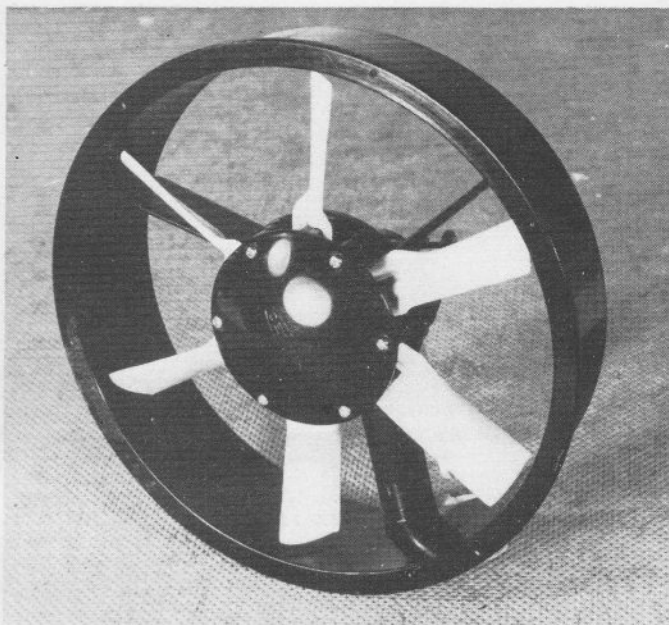
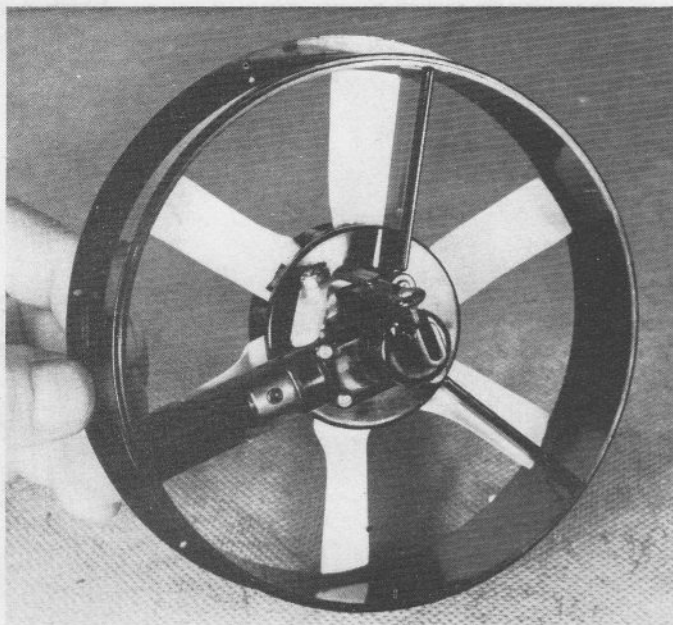
If you have any modifications, handy hints or any other startling revelations that make life easier or safer, don't keep them to yourself, let's all learn about them please. An alteration you have made and maybe taken for granted, could be beneficial to the less adventurous builder. The only stipulation I would make is that any structural mods. to the airframe or dynamic components of a model should have been thoroughly flight tested and proven successful.

The competition scene in this country to date has been virtually non-existent. Now I realise that helicopters are still relatively young and that competition is not everyone's idea of the ultimate in our branch of the sport. But I feel that it certainly helps to develop a better model and at present it is the only chance that enthusiasts have to get together and show a common interest. There is only one annual meeting, the Helicopter Fly-In held at R.A.F. Odiham, which last year produced more models than had ever been seen at any previous gathering, worldwide. This enjoyable event, which was organised by some of the more enlightened officials from our governing body, is to take place again this year, so let's hope it is to become a permanent fixture.

I don't propose to clutter these valuable pages with endless reports on who won what, where and what he ate for breakfast, but at a competition there is a lot of activity and interesting models and I feel that if somebody has made the effort to travel to a meeting, sometimes hundreds of miles, then he deserves a little recognition. As if they anticipated my words, the Leicester Area R.C.S. (LARKS) organised a competition at their club field near Market Harborough recently. Unfortunately, it was arranged in a short space of time and received no prior publicity, consequently en-



New collective pitch mechanism for the Schluter Heli-Baby introduced at the recent Nuremberg Toy Fair will be available in a few months.



trants numbered only five. This was the first helicopter competition that the club had held and was something of a trial run, but even so, the standard of organisation and judging was second to none and would have put many larger events to shame. The schedule consisted of hovering at head height, flying to three boxes, hovering over and landing in each one and back to the ready box, plus an overhead figure eight and stall turn. Final manoeuvre was the limbo, the opening of which was five feet high but only two feet wider than the main rotor diameter of each individual model, light relief came as Dave Wright completely demolished the limbo when the motor in his Heli-Baby went sick. He was overheard muttering something to the effect that 'if I can't get through it, nobody else will'. The event was so successful that the club plans to hold three more during the year in May, August and November, open to all comers, non SMAE members included. Points scored in all four competitions will be added together to find the overall winner. So there is still time to have a go. Prize giving will be at the club's annual end of season shindig. For further details contact Aubrey Sharman, 8 Bennion Road, Bushby, Leicester.

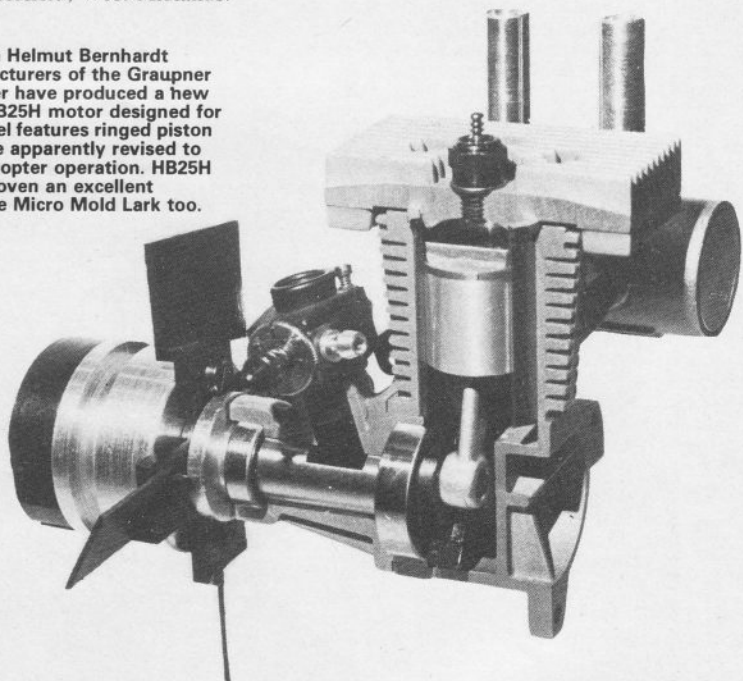
Results: 1, Dave Nieman 115 points; 2, Aubrey Sharman 78 points; 3, Roger Price 45 points; 4, Dave Wright 32 points. Geoff Franklin retired.

A competition which should prove very popular is to be held on August 14th and 15th at Weston Park near Birmingham as part of a Model Spectacular, organised by the Jim Davis Display team. Apart from a whole new range of super size scale models, there will be three classes of competitions over the two days.

Helicopters, Scale Class 2 and Fun Aerobatics. Entries will be limited and the fact that prize money to the tune of £300 is being offered should attract many of the country's leading flyers. Details and pre-entry forms are available from Colin Grice, 47 Western Road, Wyde Green, Sutton Coldfield, West Midlands.

Above: scale size blade ducted tail fan for model of the Westland/Aierspartiale Gazelle is part of kit by Japanese Hirobo company. Should satisfy those who object to the Gazelle without the correct back end.

The West German Helmut Bernhardt company, manufacturers of the Graupner Bell 47G helicopter have produced a new version of their HB25H motor designed for the '47. New model features ringed piston and tolerances are apparently revised to best suit R/C helicopter operation. HB25H has apparently proven an excellent powerplant for the Micro Mold Lark too.



DAVE NIEMAN ... about the author

Our new columnist's interest in R/C helicopters stems from Dieter Schluter's first demonstrations in this country at the Sywell Expo some five years ago.

Dave ordered his Schluter Huey Cobra there and then, took delivery of a kit from the first batch imported and, like others of the period, took the completed model off to a quiet field to spend many hours of self-education in the art of R/C helicopter flying. That he mastered it well can be in no doubt. Totally committed to the R/C helicopter hobby, Dave now has experience of most of the major 'brands'. Dave sets himself a very high personal standard of workmanship in his models and has a meticulous 'engineering approach'. He also has very strong opinions concerning the safety factors necessary for operation of R/C helicopters - all reflected in his workmanlike approach to the sport.

We are sure that, in the months to come, Dave's experience will prove invaluable to R/C 'copter enthusiasts.

