KIT REVIEW

No. 68 **By Jack Barnard**

MICRO-MOLD LARK

I FIRST saw this very pretty little model at the Sywell Expo early this year and, I was about to say I fell in love with it, but on second thoughts, that term is strictly for the 'Birds', so I will place it next in line along the admiration channel. I was determined to have a kit. I know the manufacturer has had numerous other would-be owners clamouring for the model and it is to his credit that he has not released it until both he and the designer were satisfied with the production kit. As with any new venture of this type, improvements will continue and modifications made as more kits are built. Many of those reading this review will have seen prototypes in action at the major modelling events around the country and will no doubt agree that the models have flown extremely well, so all we have to check now is that the kit builds as well as it flies. On opening the box, we find a really well illustrated instruction booklet, this gives a brief explanation of how a helicopter flies, hints on flying the model and a step-by-step sequence of building instructions. There is also a complete check list of all parts of the kit, numbered to make re-ordering of parts and identification as simple as possible. There are no pre-assembled mechanics in this kit, everything has to be put together by the builder. Parts for all major components are in individual packets and content of each bag is shown in the parts list.

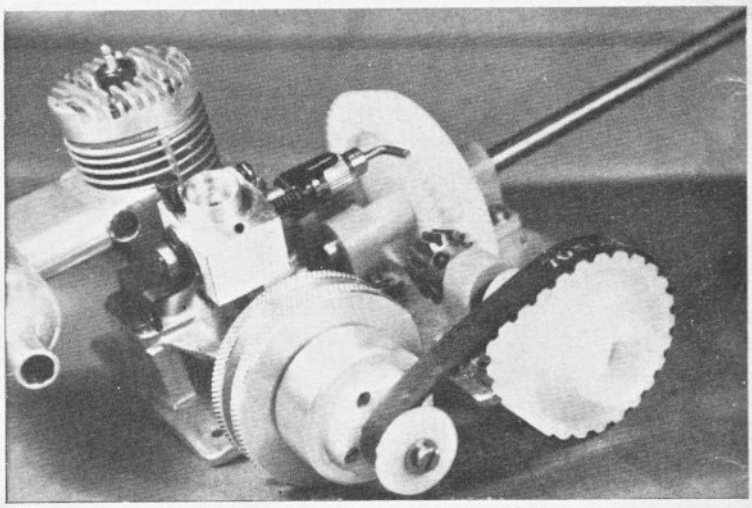
I will bring out one point before we start to build which is not clearly pointed out in the instructions, that is, the correct use of 'Torqseal' which is used to stop bolts and nuts vibrating loose. A tube of this is supplied with the kit on its own mounting card of instructions. These instructions do point out that protective grease or oil on nuts and bolts must be removed before using Torqseal. This instruction is not repeated in the kit instruction booklet and could be overlooked by those not having used the product previously, so a quick wash in petrol or other solvent for those parts which have to be locked with Torqseal is required.

On with the building and first we construct a ply and balsa frame which has as its centre-piece a five ply former. The five ply former is the mount for the alloy plate on which most of the mechanics are fitted, all parts are cut to shape, but accuracy in joining the parts together is essential, as it is indeed for the rest of the kit. All we need to build an accurate wood frame is the correct glue as instructed, a small set square and the ability to read and follow the simple instructions and diagrams. When built, the wood frame is inserted into the A.B.S. fuselage base and fixed with a contact glue. My first photograph shows this assembly complete. The cockpit base complete with pilot and instrument panel and the canopy are fitted later in the building sequence, our next stage is the building of the mechanics.

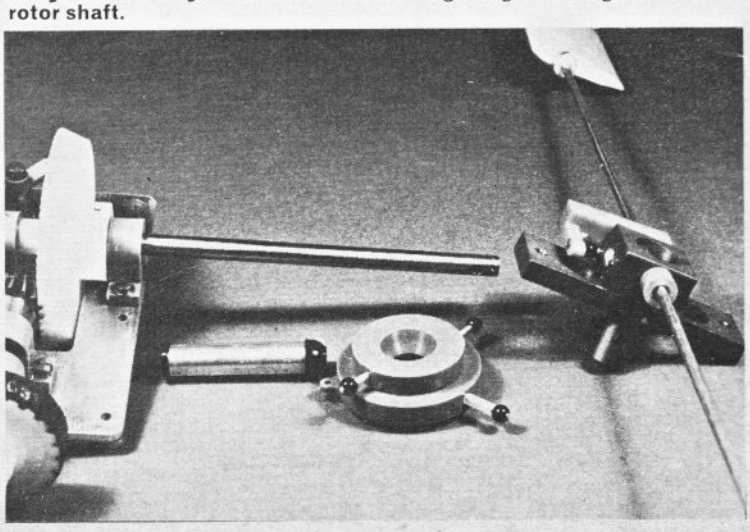
I quote the building instructions when I say 'The ensuing operations are very important and call for probably the most patience and care of any of the assembly.' For my part, I say thoroughly read the instructions and study the diagrams, it's all there. I took half a day to line up the bearings for the rotor shaft and drive pinion shaft. Horizontal movement of the bearings for lining up and obtaining the correct mesh of the gears is simply carried out by using a needle file to enlarge the mounting holes as required, no problem, just a little patience, but you may find as I did that adjustment is required in the vertical line up. I had best explain here that the bearings for the shafts are Oilite bearings in nylon mouldings. In order to line the bearings vertically I had the choice of removing material from the base of the higher bearing seat, or placing a shim between the lower bearing seat and the alloy plate. I did not like either choice, as I felt that any attempt to remove material without a jig of some kind would only result in the removal of too much from one edge with a resultant tilt of the bearing. I have to emphasise that I was only trying to eliminate tightness in the shaft and obtain free rotation, so the making of so fine a shim for the lower bearing was out of the question.

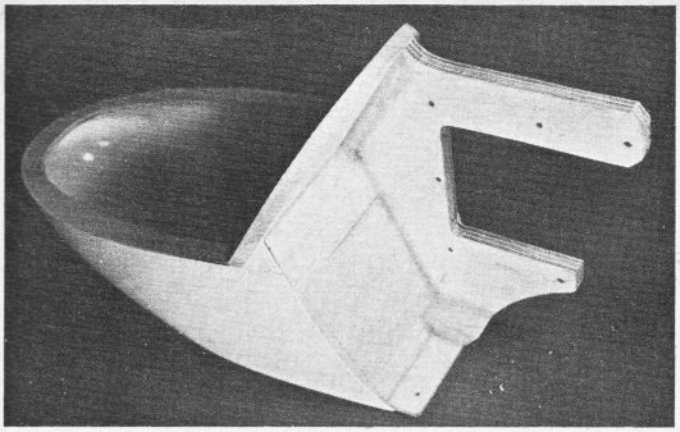
After a lot of thought the answer arrived. I lined up the bearings horizontally with the shafts in place, tightened the bolts holding the higher bearings, removed the lower bearings and bedded these on the plate in five minute epoxy, dropping the bolts through the holes and gently easing the shafts into position. I placed the assembly on one side for half an hour, then tightened down the bolts and lo and behold, a completely accurate line-up and free movement of the shafts. If you have difficulty in understanding this, wait until you start to build your kit, then read it again and all will be clear, one merely allows the shaft to position the bearing to its own satisfaction on a very thin shim of epoxy. The remainder of the mechanics fitted like a glove, so you won't be forced to puzzle over any more of those complicated explanations (and I won't have to write any, thank goodness!)

On now to the engine. I chose a Veco .19 and to this fitted the flywheel, centrifugal clutch and a light tooth nylon pulley which transmits the engine power via a toothed belt drive to the 25 toothed pulley on the drive shaft. The flywheel is grooved to take a starting cord with which one starts the engine in a similar manner to the way a smaller outboard motor is started, or one can use a V-belt and electric starter. The clutch is easily assembled, a thin cork shim is epoxied to the inside of the clutch housing and spring loaded weights similar in form to drum brake shoes are fitted to the rear of the flywheel inside the clutch housing. These weighted shoes open out against spring pressure as engine speed is increased from idle and make contact with the cork lining of the clutch, so driving the pulley and therefore the rotors. The rear of the 25 tooth pulley is moulded to fit the square section drive shaft coupling which connects to the tail rotor assembly via a length of 16

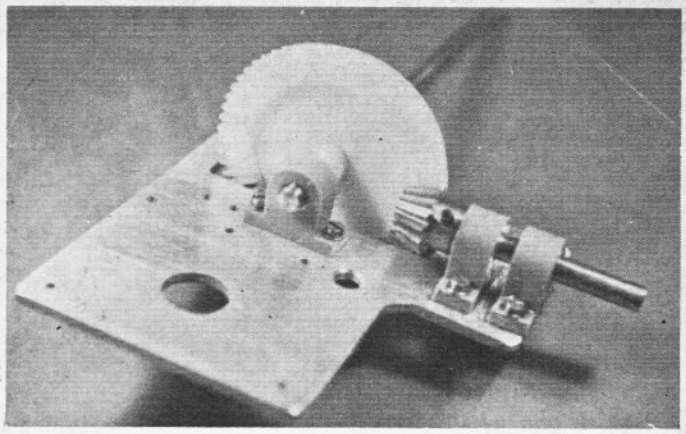


Above: the completed power pack ready for installation on 5 ply former. Note starting cord groove in flywheel. Below: the swash plate bearing, swash plate and rotor head. Bearing is the alloy tube with nylon end inserts. Bearing is tight sliding fit on rotor shaft.





The wooden formers and ABS fuselage base joined. The holes which have to be drilled for fixing the power plate and undercarriage rear cross brace can be seen. A light, but very strong assembly.



Alloy power plant plate with main rotor drive installed. The lower bearing of the rotor shaft can be seen, also both bearings for the drive shaft. The outer bearing of the drive shaft has a wafer thin layer of epoxy between its base and the alloy plate.

swg wire. The square coupling is free to slide in its housing fore and aft. The 16 swg shaft passes through two nylon bearings which are positioned along the tail boom and has a positive connection to a fixed coupling on the tail rotor assembly, but more on that later. For the moment, we will return to the engine assembly which has yet to be fitted to the alloy plate. The correct positions for drilling the engine mounting bolt holes are determined by a little accurate measuring and the engine is mounted on alloy pillars clear of the mounting plate. A little care is needed to obtain the correct position of the engine and so line up the drive pulleys and ensure the correct drive belt tension. With everything lined up and all nuts checked for tightness, we make a final check for freedom of movement of the drive through belt and gears and if satisfied, we move on to the tail rotor assembly.

The tail rotor assembly transfers the drive from the 16 swg shaft through right angles to the tail rotor blades via two metal gears, while a sliding control on the rotor shaft varies the pitch angle of the blades as required via a pitch crank fitted to the nylon body of the assembly. The whole of the tail rotor assembly is very quickly and easily assembled and here again the diagrams and instructions are very good and easy to follow.

Back now to the main rotor drive and so up to the swash plate which is made up from three nylon mouldings, upper disc, lower disc, and base plate. Its bearing on the rotor shaft is an alloy tube which has nylon inserts at either end, the oval nylon insert at the top of the bearing tube is the main swash plate bearing. The two ball sockets on the lower disc of the swash plate connect via push rods and bellcranks to the servos and the ball socket on the upper disc connects to the rotor head. The upper disc is free to rotate with the main drive shaft while the swash plate provides the cyclic pitch control. Collective pitch control is not used on this model. The lower disc of the swash plate does not rotate. It is held steady by means of an 18 swg wire loop connected to the main engine plate. The main rotor head is a little difficult to photograph, but is very easy to assemble. The pivot tube fixes on to the top of the drive shaft and is in turn joined to the rotor head by means of a steel 10 swg shaft. The centre of the steel shaft is clamped to the pivot tube with an Allen grub screw and the rotor head pivots on the shaft. The flybar with aerofoil paddles is temporarily fitted into position. Final adjustments are made when the main rotors are fitted and the whole assembly fixed into position.

All mechanical parts are now assembled and ready for fitting to the model. I have now to complete the assembly of the rotor blades and fin. These have merely to be glued together and shaped to aerofoil section. Other parts not so far mentioned are as follows:

Fuel Tank – this has to be fitted to the engine plate, by means of an aluminium strap, on the opposite side to the engine, a fuel filter should be fitted between tank and engine, the filter is not supplied.

Heat Sink – this has to be fitted to the engine cylinder head. It is the last part of the mechanics to be fitted and is complete with fittings for different size engines.

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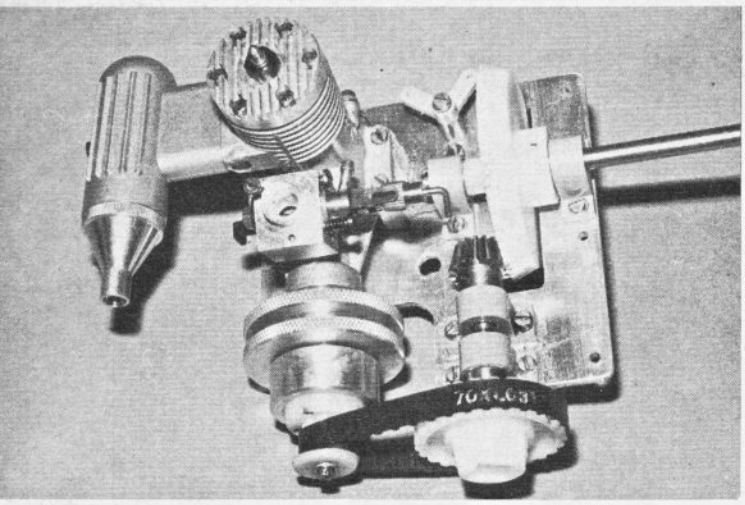
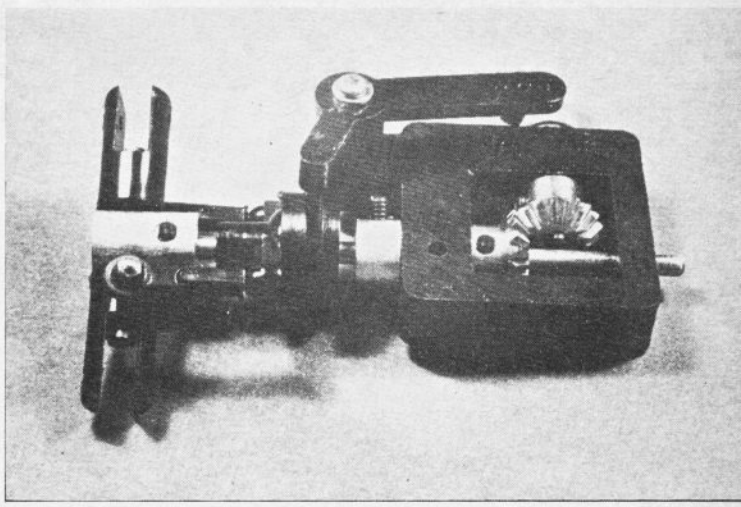
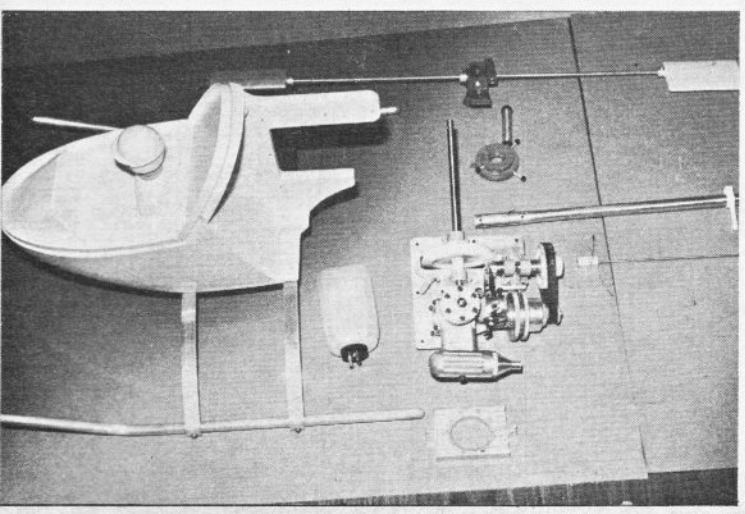
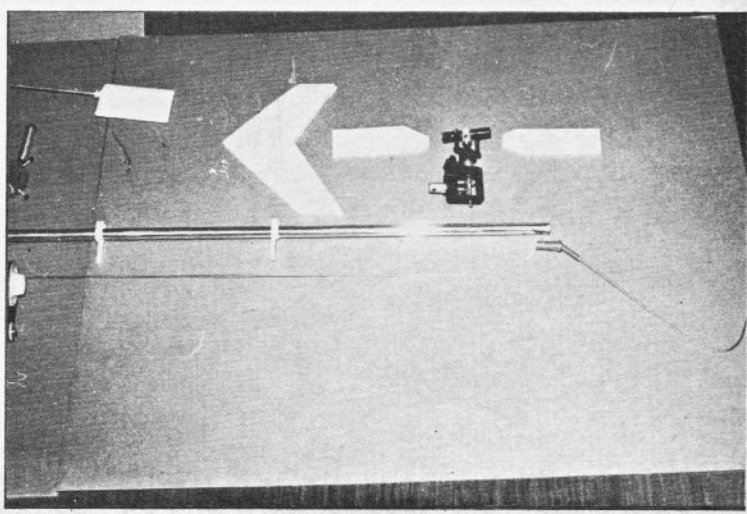


Above: another view of the power pack, here showing the method of mounting the motor on alloy pillars. Square socket in end of large drive pulley fits forward end of rotor shaft. Below: major parts of kit assembled and ready for painting.



Above: rear rotor drive assembly. Fixing point of the drive shaft is hidden behind long arm of slider crank which will be connected to a servo via flexible push rod. Below: components of tail boom and rear end assembly.





Cockpit Canopy – this is trimmed to shape and fixed to the cockpit base. The complete unit is held in position on the fuselage base with strips of Velcro.

Undercarriage – the skids and struts of the undercarriage unit are easily assembled and fitted to the fuselage base.

I have now to join everything together and fit the radio and hope by next issue to have a full report on the completion of the kit and its flying test. My assessment so far on the kit is that it is an excellent effort and I have had a tremendous amount of fun building it. The final assembly of all parts is quite straightforward and the areas to be painted are quite small, transfers are provided for fuselage decor and there is also an instrument panel to complete the interior trim. I would like to add here that if anyone is interested and intends building this kit and who would like sections explained more fully, I will be only to pleased to answer letters.