Jack Barnard, now on RCM&E staff, traces progress with Britain's popular little R/C egg beater!

MICRO-MOLD'S LARK revisited

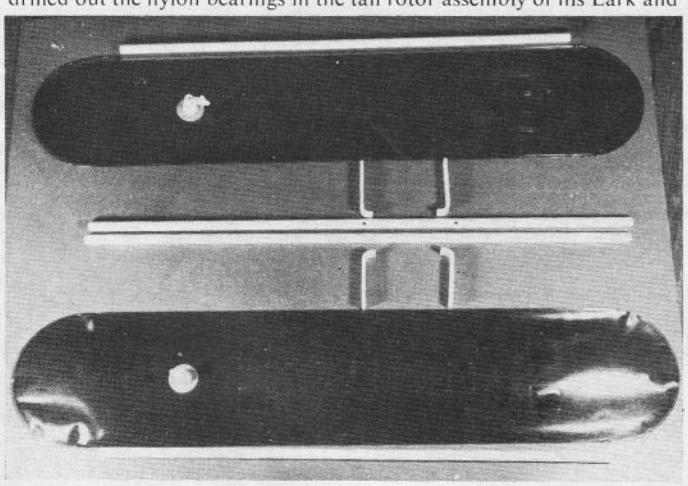
MUCH has been written regarding the progress of Micro-Mold's popular little Lark helicopter model in other columns of this magazine and in many overseas magazines, since we first reviewed the 'Lark' in our Jan./Feb. 1975 issues. The low price of the Lark makes it truly an R/C helicopter for the masses and consequently draws the interest of many modellers with a wide spread of abilities.

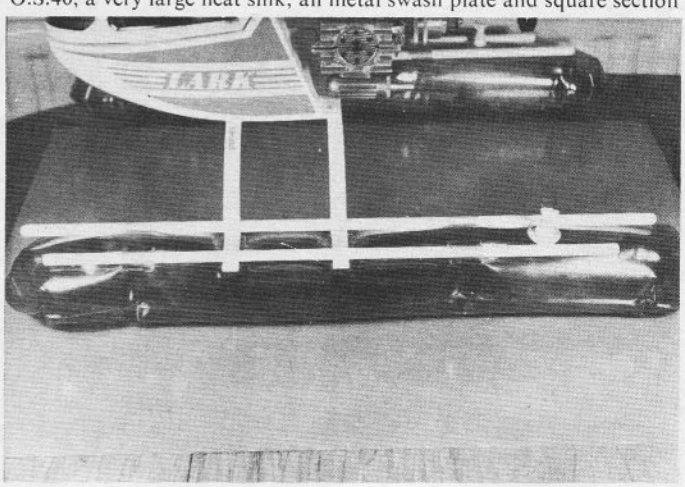
Our aim in this short re-cap is to lay a few ghosts and to show how this little British helicopter can be made to perform at its best. In his '*Chopper Chatter*' column of the July '75 issue of the American magazine '*Model Builder*', John Tucker is full of praise for as he describes it, ". . . a Tinkerer's dream, perfectly suited for minor or personal modifications which every builder wants to add to his dream machine". He goes on to say that his own 'Lark' flew "right off the board", and describes in detail some of the tinkering and modifying carried out by American 'Lark' owners. For instance, John Gorham, of Thousand Oaks, California, thought the tail boom was insufficiently rigid, and his solution to the problem was to add a short brace from the floorboard to the boom. The brace, he says, can be constructed of alloy rod or tube. John Tucker anticipated a Micro-Mold modification when he drilled out the nylon bearings in the tail rotor assembly of his Lark and replaced the nylon with brass bushes. The two Johns also fitted a Kalt (or Schluter) swash plate in place of the nylon plate supplied with the kit, but do not state what effect this had. They also tried a Kalt teetering rotor head, but this made the model unstable. Replacing the Kalt with a Schluter 'Cardon' head again, made the model unstable. The Veco 19 engine used in their review model was then 'hotted up' with a McCoy conversion kit originally intended for model racing cars and the extra power made the Lark 'scat' around the sky like the spirited bird it is named after. With all this tinkering one could perhaps conclude that John was not very pleased with the basic kit, but do not be misled, he has nothing but praise for it. A very interesting article, with some of the 'tinkering' shown clearly in action shots.

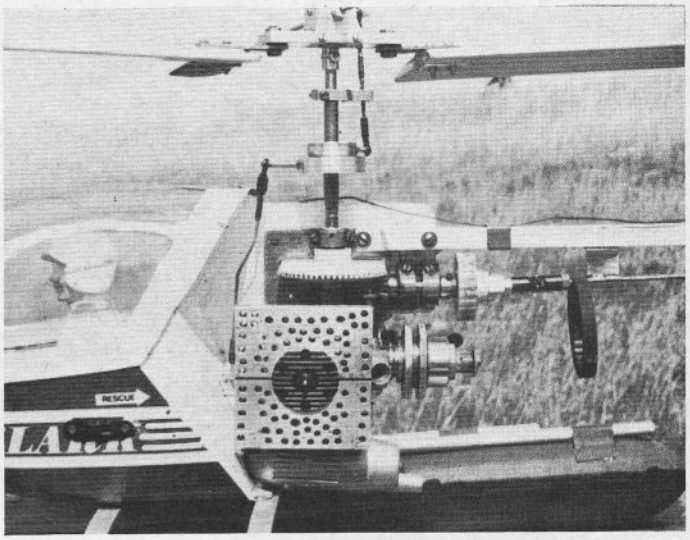
The manufacturers, Micro-Mold, have also continued tinkering, and have introduced several refinements to the original kit. New 'Oilite' bearings have replaced the original nylon bearings of the tail rotor gear box and the main rotor blade anchor plates are now fixed to the blades by *three* bolts instead of the original two. A very nice float set is now available as an 'extra', price £4.98. Originally intended for use on water, these are also ideal for general use, cushioning those 'drop-ins', and have the added advantage of raising the model to give the tail rotor greater ground clearance. Micro-Mold have also produced a new main rotor head which can be used as a fixed or teeter head, price £3.49. Some Lark pilots prefer tapered main rotor blades and Micro-Mold have produced a kit for these (Price £1.47).

Larks were much in evidence at the AeroModeller Scale Day at Old Warden including a .40 powered 'Lark' flown by Geoff Thompson of the Nene Valley club, seen looping and rolling all over the sky. Geoff has fitted an 'all moving' tailplane, or elevator, on the tailboom and has coupled it to the fore and aft cyclic pitch control to assist in the aerobatic manoeuvres. I understand it also improved control in normal forward flight. Geoff has been responsible for much of the flight testing of the production 'Lark', and in fact he flew the test flights on mine and gave me my first helicopter flying lesson. The .40 powered 'Lark' will be available to all, as Micro-Mold are producing a conversion kit. It was during the flight testing of the .40 Lark that another useful modification came to light, when tail rotor vibration was cured by substituting all balsa tail rotor blades in place of the hardwood/balsa ones provided in the kit. Geoff tells me he would recommend all-balsa tail rotor blades for all Lark models.

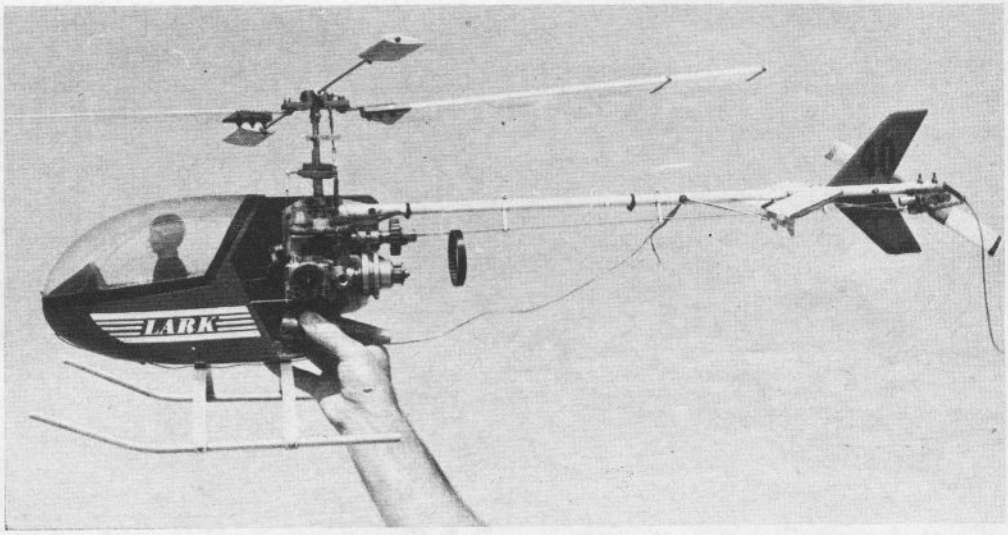
At the Odiham Helicopter Fly-In on July 27th, Joe Stafford of the Bickley Model Flying Club produced his modified Lark which uses an O.S.40, a very large heat sink, all metal swash plate and square section







Above: Joe Stafford's modified Lark uses O.S.40 power and square section tail boom. Note the number of supports along the boom for the rear rotor drive. Large heat sink to dissipate heat seen in close-up top right.



Right: Geoff Thompson's .40 powered Lark featured all flying tailplane linked to cyclic fore-and-aft function (elevator, dum-dum!) to help with the aerobatic gyrations which Geoff enjoys so much!

tail boom. P. Christy of the Watford Wayfarers, having demolished the cockpit of his Lark in a 'very heavy landing', replaced it with a simple but effective cockpit of his own design and was surprised to find that with this new cockpit arrangement his Lark had a new turn of speed. Also at Odiham were Lark designer Peter Valentine and Roy Scott of Micro-Mold. Peter has a hint for Lark owners who find their model has a tendency to oscillate. Sweeping of both main rotor blades forward in relation to the fly-bar by up to 5° will effect a complete cure. Also, replacement of the cork clutch lining with leather will cure clutch slipping tendencies at high R.P.M.

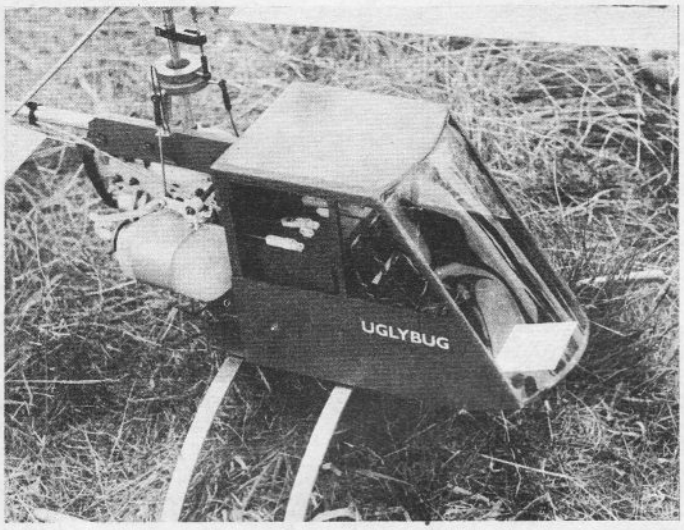
New 'extra' for the Lark is a float set from Micro-Mold which will absorb much of the hard bouncing to which embryo 'copter pilots will be sure to subject their Larks. Extra few inches of ground clearance at the back end also helps the beginner.

We spoke to several Lark owners who had fitted the new 'teeter' head and were surprised to find that a high percentage of these when asked to comment upon it were non-committal, unsure as to whether or not it had improved the performance. I fitted a set to the R.C.M. & E. Lark and am very pleased with the result, as both control response and stability show a marked improvement. I am still in the 'learner' stages and found the model much easier to control with the new head fitted.

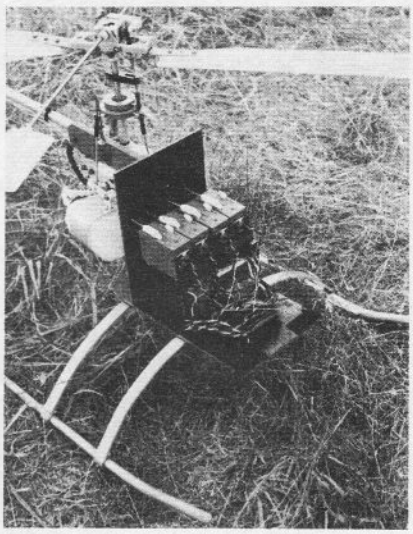
So, it sounds like a complete success story for the Lark, but not quite all builders would agree it seems, as I have received 'phone calls and letters from modellers in this country and overseas whose one complaint has been that even at full throttle their Larks won't leave the ground. Sorry to be so blunt, but if this condition exists, then the chances are it is your fault. In every case of this nature which has come to my attention, the fault has been on one (or both) of two points, insufficient engine power or insufficient angle of attack of the main rotor blades.

As far as lack of power is concerned I find the fault is mainly due to the fact the modeller has not bothered to run the motor in before using it in the model and I know of only one engine which is suitable for the Lark that would put up with that sort of treatment. Don't be tempted to break-in the engine in the model, unless you have an exceptionally free running, expensive type engine whose makers say running in is not required and even then I would advise prolonged bench testing in order to familiarise oneself with the starting and throttling characteristics of the motor. Run your engine in thoroughly and make sure it is developing at least a high percentage of its full power before putting it in the model. A four stroking .19 will not lift the Lark off the ground at full throttle, but the same engine, well run in and developing full power, will put daylight between the Lark and *terra firma* at half throttle setting.

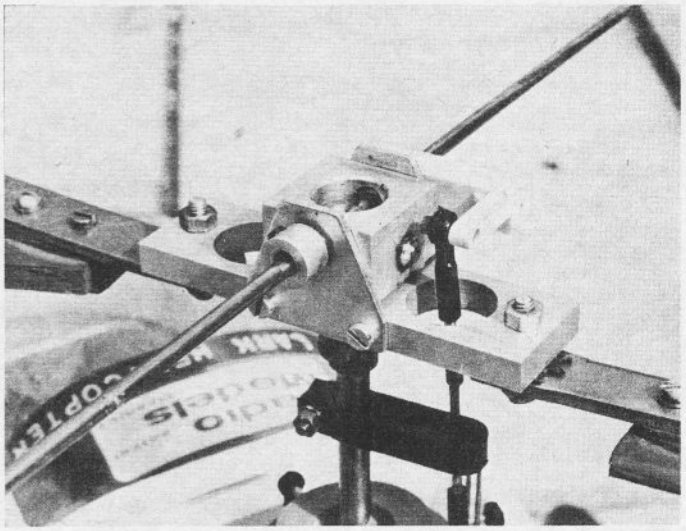
Now to the angle of the main rotor blades. The instructions in the kit are quite clear, and show how to construct a template to check that the blades are set at the recommended 6°. DON'T use the example of a template shown in the instruction book, it is less than 6°, and with less than 6° set on the blades, the Lark will not become airborne. It has been found that for a high performance, high revving .19 motor, a 6° blade angle is just about right, but for the average .19 to .25 engine, a blade angle of up to 8° is advisable. I know of one modeller using a 10° angle. My advice is to find the best blade angle between 6° and 8° which

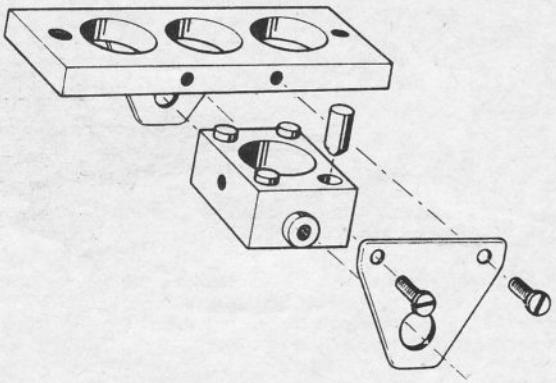


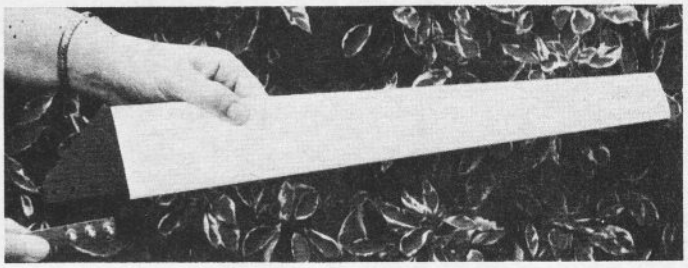
'Interesting arrival' led to this boxy cockpit arrangement of Peter Christie's Lark, which employs new Micro-Mold teeter head on main rotor assembly.



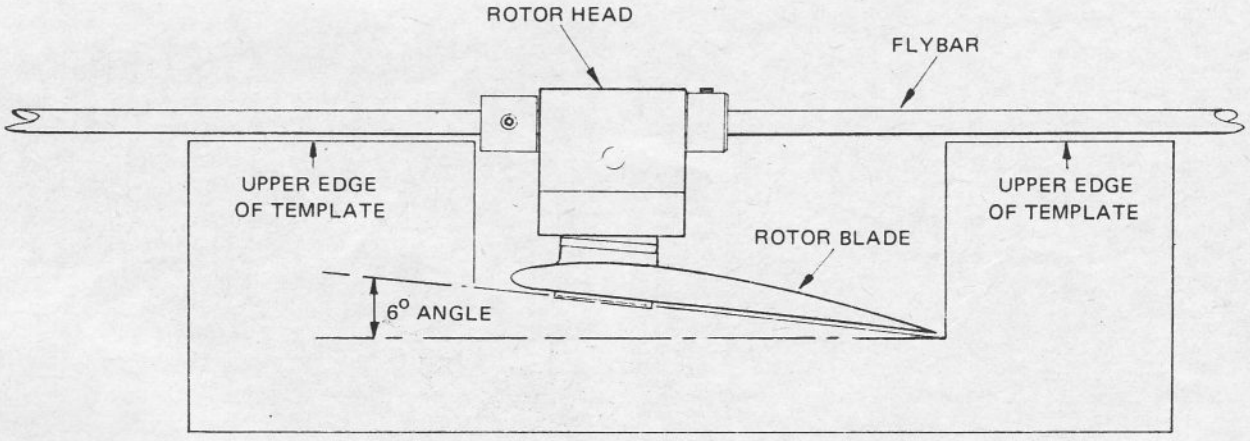
suits your particular motor, in the same way which you would choose the best propeller for it if it were fitted in a conventional type model aircraft. Finally, if you increase the main rotor blade angle, you must also increase the angle of attack, or diameter, of the rear rotor blades in order to overcome the increased torque. As a guide, I found that the largest diameter tail rotor blades described in the instructions were sufficiently large to offset torque of the main rotors up to 8° main rotor blade angle. Incidentally, Micro-Mold are reprinting the page of the instruction book on which appears the main rotor blade setting template. We have received copies of this, and with the kind permission of Roy Scott, of Micro-Mold, have reproduced here that part of the page which shows the accurate 6° template.







Above: exploded view of components making up the teeter main rotor head assembly, also seen above 2nd right assembled. Tapered rotor blade with three bolts to hub shown at right. Available now from Micro-Mold. Corrected full size rotor template with full six degrees shown below.



HOLD GAUGE UNDER BLADE AND SIGHT THE UPPER EDGE AGAINST THE FLYBAR.