

ANYTHING FOR A 'LARK'

By Mike and Gary
Western



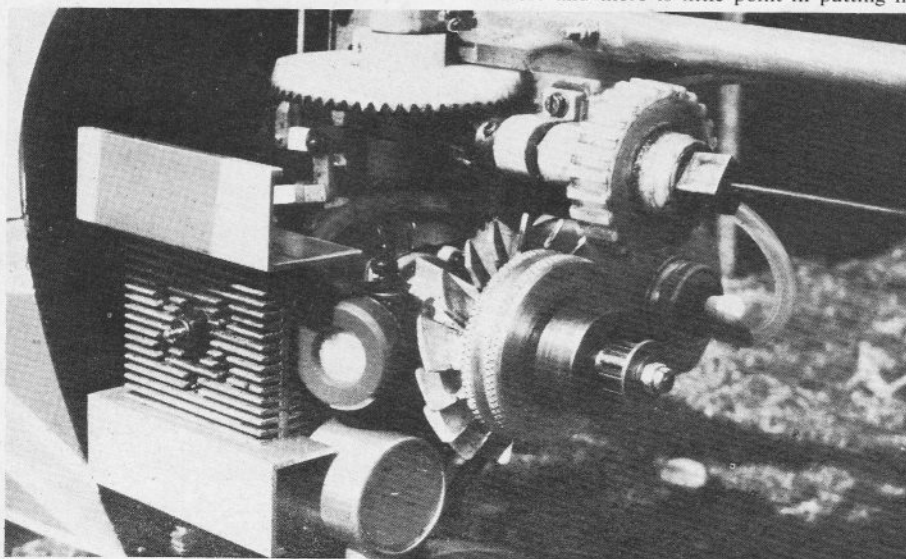
Mike and Gary discuss a few of the modifications made to this popular all-British helicopter since its review in our January 1975 issue. Plus a few of their own ideas and tips for Lark owners

HELICOPTERS – a fascination for many, a symbol of wealth perhaps, a *heartbreak* for even those who master them at sometime, *successful* for only a few.

Most modellers, especially the mechanically minded amongst us, have, (or will) at sometime, wanted to fly a helicopter. The sad fact is that only a very small percentage are ever flown successfully. There must be hundreds of helicopters all over the country in sheds, attics and model rooms just collecting dust. A newcomer might ask why, most of us know why, *it's difficult!* We used to crash and repair ours every weekend. Causes ranged from pilot error to mechanical failure. During this period it is easy to lose heart. Our advice is *don't ever give up*. The rewards when you finally make it, are fantastic! Apart from being one of the few, when you are experienced, all that is needed is a manhole cover and a reasonably clear area, and you have a flying site (*do make sure you are well clear of people and animals*).

If you have never flown an R/C model before, *don't* make a helicopter your first. We've seen many people try to and it hasn't

Below; power unit and gearing with toothed drive belt removed. HB.25 helicopter motor is fitted with alloy angle sections to provide larger cooling area. Cooling fan is authors own idea, described in text and Fig. 5. Clutch is PB car unit. Note air filter fitted to carburettor intake.



worked. On the other hand you don't have to be a top class aerobatic pilot either. We have seen one of the most senior members of our club teach himself to fly a helicopter very effectively and, by the same token, a not so experienced modeller who must now be rated as one of the top twelve helicopter pilots in the country.

There are several good helicopter kits on the market but nearly all the latest generation started on the little .20-.25 powered *Lark*, including ourselves. Like so many tyro chopper pilots we bought the *Lark* as being the only complete English kit on the market, apart from engine, that we could afford. *Larks* are very robust because of their small size, parts are cheap to buy, (it is almost inevitable that a beginner will break something). It's quite possible to rebuild a *Lark* and fly again the following day even after a bad crash. This means quite simply you get more practice, and practice makes perfect.

Peter Valentine must be congratulated on a creation of unique simplicity, the original *Lark* concept remains largely unaltered to this day. However, we will try and help the novice by giving hints and tips which we have found successful in 3 years, and hundreds of hours of *Lark* flying.

Engines

The *Lark* was designed for .19 to .25 cu. in. motors and there is little point in putting in

anything else, although it's quite simple to put a .40 motor into your *Lark* you do require the *Linnet* gearing. We will detail this modification in a future article.

For best results use a ball-race crankshaft motor, as the *Lark* drive-belt side-loads the crankshaft, which would not do a plain bearing motor much good. It goes without saying that the engine should idle well, and have good throttle response without fear of cutting in the mid-range. *Enya 19BB*, *Veco 19*, *H.B.20*, *Webra 20*, *Glow Star* and *H.B.25* have all been used to good effect especially the latter. This engine now has a Dykes ring and a heatsink head is available which fits in place of the existing cylinder head, giving better cooling.

Rotor Blades

Possibly the most common complaint is that the helicopter won't lift off. More often than not, this is because the builder has stuck the blades together as supplied without shaping of any kind. It is most important that the blades are shaped with a razor plane exactly to the Clark Y section shown in the instructions.

Very carefully balance the blades before and after fitting to the rotor head. (There was an excellent article on blade balancing in the September 1976 issue of RCM&E). For blade covering use black Fablon from the local hardware store. It is very easy to work with the aid of a heat-gun and gives a very durable, realistic finish to the blades.

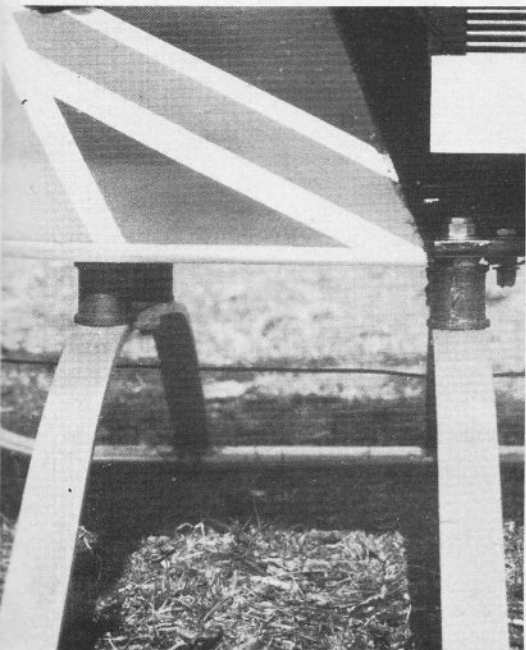
Alan Richardson came up with a good way to disguise the ugly seam that results when covering blades with Fablon, see Fig. 1. Starting underneath at the leading edge, wrap the Fablon right round, and overlap the entire bottom surface to finish at the underside trailing edge.

For those who don't like making blades, there are some excellent spindle moulded blades on the market which are strongly recommended. They are supplied balanced, and only require covering, we use nothing else.

Teeter Head

If your *Lark* has an older type fixed head, discard this as they tend to wear very quickly. One *Lark* became detached from its rotor in flight when its fixed head failed.

The teeter head is far nicer to fly with, it gives a much quicker response on the hover. These heads are supplied with hard and soft rubbers. Only use the soft variety. When the rubbers become squashed through use or over oiling of the head, replace them, they are inexpensive. Teeter head parts can be obtained direct from *Micro-Mold*.



Above; Radiospares chassis rubber's fitted between fuselage and landing skid legs will help to absorb the shocks of those heavy landings. They have a secondary advantage in providing extra ground clearance for the tail rotor.

Paddles

If you are just learning to fly a helicopter the standard *Lark* paddles are adequate. However, if you have progressed then try a set of *Morley* paddles. These will quicken up the responses being slightly larger and lighter. One word of warning - *Morley* paddles must be fitted with the collets on the *outside* otherwise they will fracture and fly off see *Fig. 2*. Don't forget to make the flybar wire slightly longer and you will also need to slide a piece of 10 S.W.G. brass tubing through the paddle (they are meant for an 8 S.W.G. wire flybar), and then do up the collet extremely tight).

Setting up the Head

Balance the flybar and paddles before fixing on the blades and when attaching them sweep each blade forward 3°. This stops the helicopter from oscillating at low rotor R.P.M. for example, when coming into land, see *Fig. 3*.

It's quite easy to make a 3° card template to set one blade and then move the other blade forward until the paddles balance horizontally. *Fig. 4*. Set up the coning angle as per instructions. Set up the angle of attack of each blade to exactly 6°. If you like all this can be carried out with the head on the helicopter.

On all our rotor heads we have drilled out the holes for the blade fixing plate to 2BA. If you are not able to replace the existing bolt with hi-tensile steel type, this would be far safer than a small diameter mild steel bolt.

Clutch and Mechanics

It's essential that everything rotates freely. If it doesn't, find out why and remedy. Oil the bronze bearings frequently and they will give no problems and are surprisingly long lived.

Clutches have been at times a source of annoyance and *Micro-Mold* have now produced a modified version see *Fig. 7*. They have completely redesigned the clutch which is like the *Schlüter* clutch. Epoxyed into the new type housing is a proper *Ferodo* friction material, which should be far better. If you want to modify your *Lark* and fit this clutch you will require a new flywheel and clutch housing plus of course the new one piece shoe.

On old type clutches the spring rubs against the rear housing causing a nasty noise, and can stop the engine when the belt is put on. This is

No-seam covering for all types of Helicopters

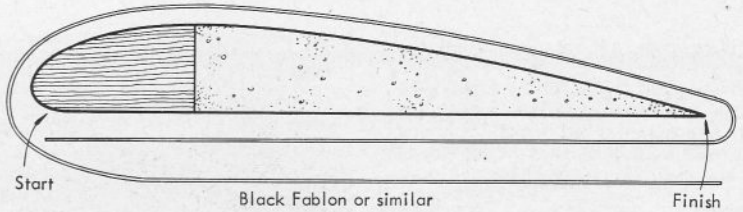


Fig.2

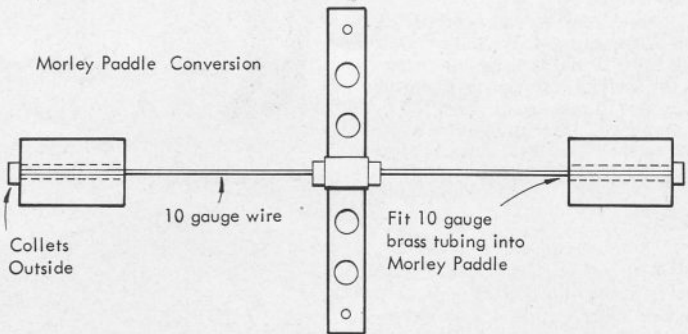


Fig.3

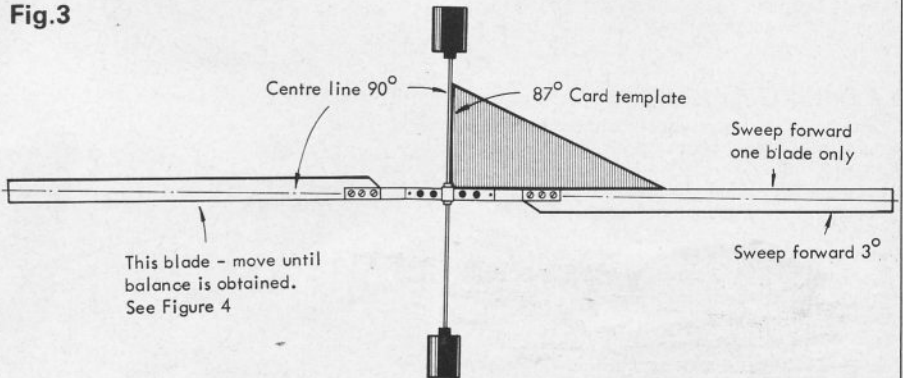


Fig.4

Tighten one blade with 2° - 3° sweep forward then move second blade to balance out Flybar as shown

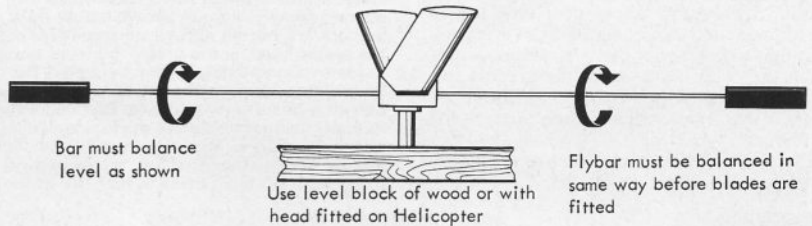
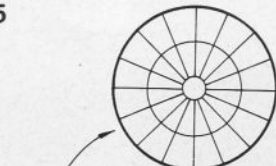
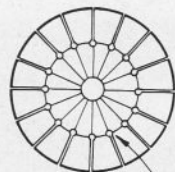


Fig.5

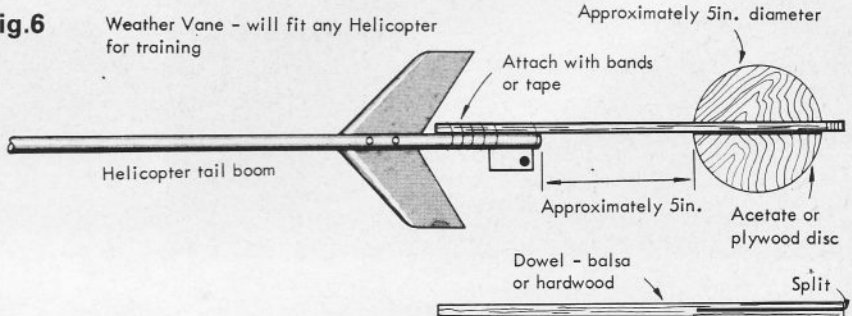


3/32nd sheet alloy or dural. Mark into segments then scribe circle slightly larger than flywheel



Dot punch on each intersection and drill 3/32nd or 1/8th holes then cut down to holes on each line and then twist with pliers

Fig.6



remedied by inserting a piece of mylar into the rear housing.

Another excellent clutch for the Lark is the P.B. 1/8 scale R/C car clutch. This doesn't use cork or friction material but is metal to metal and works really well. It also has the advantage of a roller bearing in the end and a metal 8 tooth pulley.

Cooling Fan

Helicopter engines tend to run hotter than their fixed wing counterparts. We have found that a heatsink head is just not enough, especially in hot, still conditions. For this reason we fit a cooling fan to our *Larks*. This fan is made of thin aluminium alloy and fits between the prop driver and the flywheel. Make the fan as shown in Fig. 5, do not forget to scribe the fan on both sides to stop it slipping and loosening the flywheel.

Swash Plate

If your Lark is fitted with the old type they can be a source of drag especially when gummed up with castor oil, so wash them out frequently. The new ones are still nylon but have ball bearings and are far better. Set up the swash plate to get maximum movement within limits.

Tail Rotor Gear Box

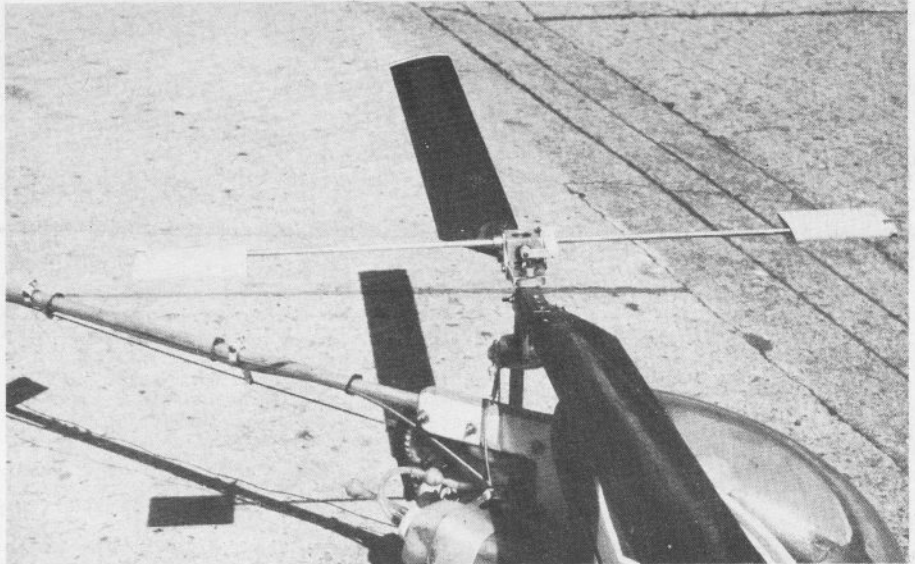
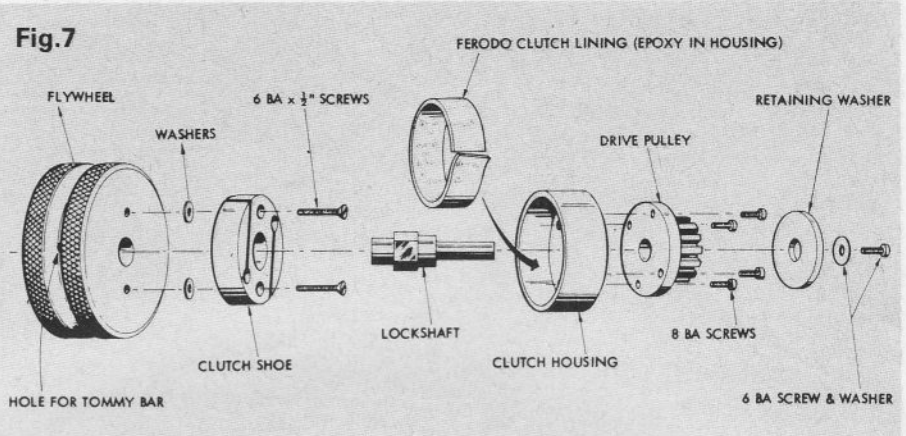
If you have the open type, clean, then epoxy acetate sheet top and bottom with a small hole in the top, and oil regularly. The acetate helps to keep the oil in and the dirt out.

Finally, run up your helicopter, check the blades for track and adjust the pitch of the blades to lift the helicopter off the ground at half or just over half throttle with the motor breaking into a two-stroke at 3/4 to full throttle.

We will discuss flying the *Lark* in a future article but if you want to go out and have another go (and we hope you do) one small thing that we have found that works like magic is a weather vane.

One thing that beats everyone when they start is tail rotor control. If you go out in a steady breeze with a weather vane on, this will keep the helicopter facing into wind automatically. See Fig. 6. These cost only a few pence to make and can be made in a variety of sizes and fit to any helicopter. As you improve you can gradually trim down the size of the vane until you can manage without it altogether. We leave you with one thought till next time.

Don't fly any higher than you are prepared to let your helicopter fall.



Above; author's *Lark* is now fitted with Morley paddles, latest 'Lark' teeter head and ball-race swashplate. Original fixed rotor head and plain bearing swashplate are shown below right. (Lark owners are not all agreed on the advantages of the teeter head, some prefer the fixed type, having returned to using it after trying out the teeter head. None dispute the advantages of the new ball-race bearing swashplate. Ed.) Note the fuel filter permanently fitted to the fuel tank filler/vent which prevents the 'sucking-in' of 'foreign bodies' and a second filter, preferably of finer mesh than the first, fitted in fuel line to motor to

take care of the finer particles of dust, pollen etc. Below left; older type rear-rotor gear box is 'open to the elements and suffered badly from abrasive grit etc. adhering to the lubricating oil. A cover made from clear plastic is a worthwhile modification. We understand that the latest rear rotor gear boxes are factory fitted with dust-proof covers. Improvements to this very popular little 'copter continue to be made and we hear over the 'grape-vine' of a yet even more efficient clutch than that shown in detail above being tested at the factory.

