

In our Scout review (Feb/March issue) we mentioned the four blade rotorhead that is available for this model and the fact that we had got the conversion parts kit in hand at the time. It's taken a while but we have finally got round to doing it and here are our findings.

Conversion Kit Contents

The kit is supplied on the assumption that the purchaser already owns a two blade Morley head. Parts of the original head are common to the new one and the builder needs to strip the two blader of its feathering axle components in order to complete the new four blade version.

Otherwise everything that's required is in the kit, except for the extra pair of blades to complete the set.

We in fact, elected to make up a complete new set of blades — a matching set supplied by Neville Warby — making finishing and balancing much easier to undertake.

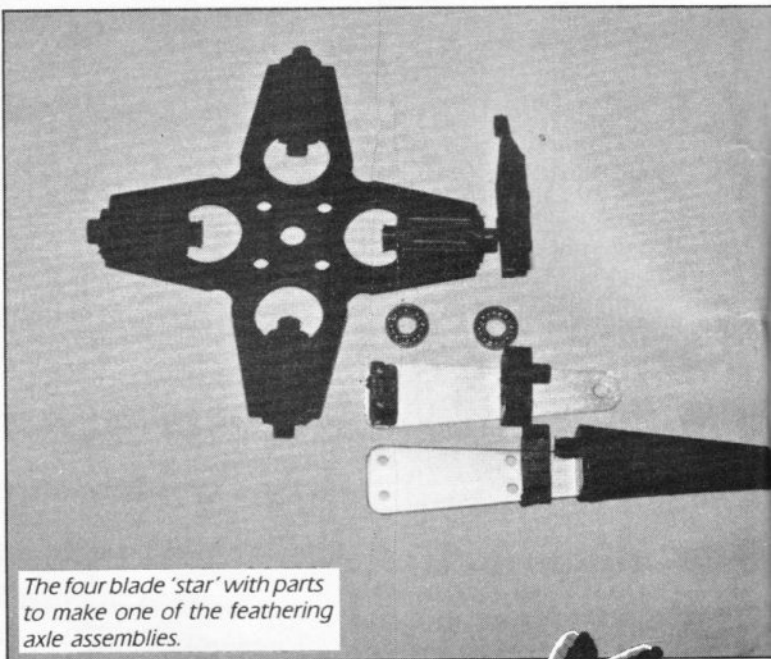
Construction and Fitting

Building the four blade unit is much the same as for the two blader except that it's made easier by leaving out all the bibs and bobs from above the head (the flybar assembly) therefore simplifying the whole thing.

Care needs to be taken when fitting the blade axle bearings as they are sometimes tight on their spigots. If they are too tight, what happens is that as the bearing is pushed on, it will 'pick up' on the plastic spigot

the next step with the

Scout



The four blade 'star' with parts to make one of the feathering axle assemblies.

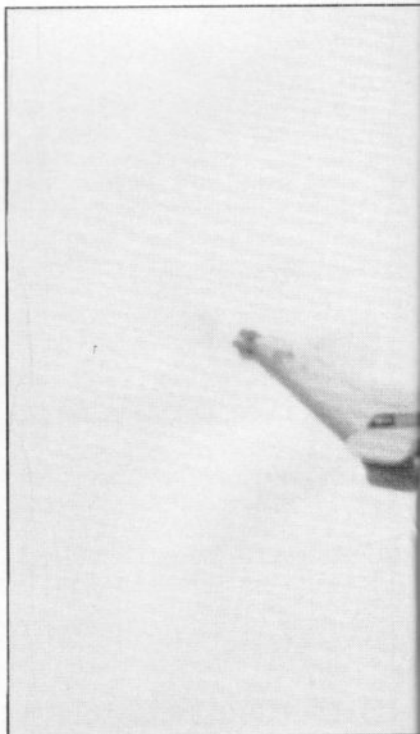
and then take the collected material on to the bearing seat thus preventing the bearing from going fully home. When the metal blade fingers are subsequently bolted on, the inner and outer races of the bearings are forced apart causing excessive binding or 'cobbling' as it's

known in some circles.

If this problem does occur, minor surgery with a sharp knife is all that's required.

During the building stage we cut off the pins which locate the lead/lag rubber damper blocks. We omit these dampers on multi-blade rotorheads prefer-

Morley's 4 Blade Rotorhead for the Scout. Checked out by M.B.



The Helimax we mentioned in the text with its Morley three blade head.

ring an unrestrained hinge at this point. In practice our models have shown improvements in vibration levels when flown like this.

To complete the head the top and bottom hub mouldings are bolted on with the two teeter rubber dampers clamped between them. These were tightened up evenly until all gaps were removed and then a further full turn of the bolts was applied. That setting for the teeter damping has remained unchanged in all subsequent flights and has proved to be about ideal.

With the head now completed and placed in position on the main shaft the problem arose — how to fit the retaining bolt — because with the head assembled it is impossible to fit.

What one does is to remove the four bolts which clamp the hub together and slide the whole assembly — except the top moulding — down the shaft. The bolt can now be inserted in the top moulding and tightened up and the head can be re-assembled as before.

Blade Construction

The supplied instructions for modification (from standard) to weighted multi-blades is quite specific and entails a considera-

ble amount of work. We, however chose to do this our own way. Not because we feel we know better but because experience has shown that our style of blades has proven to be very successful on the three bladed Hughes 300 and they are also very much easier to make.

First we cut a slot in the leading edge (as in sketch A) and fit a piece of lead ($\frac{1}{2}$ an ounce in weight) embedded in epoxy. Then the blades are finished in the usual way and balanced using the lightest blade as the master, while the others are drilled and lightened to match.

We covered the blades in white Fablon and marked the tips with different coloured strips of Solartrim for tracking purposes.

The original blade cuffs were discarded in favour of glued on ply reinforcements fitted during the early stages of construction. Again, a personal preference but probably not really necessary.

Setting Up The Linkages

Linkages up to the swashplate remained unchanged but the swashplate required a modification to the upper ring. Apart from the usual four balls (which

Our Westland Scout looks more convincing with the correct number of blades on board.



now drive the four blade pitch arms), we needed an extra ball to attach the swashplate driver to and this was placed equidistant between two of the others.

This done, we next made up four short pushrods which were adjusted to give about 4 degrees pitch at half throttle position. This may vary from one model to another but it proved about right for us.

The swashplate driver needs to be set so that it positions each ball 90 degrees in front of the blade it is operating. It should also be positioned on the main-shaft so that it is in a horizontal state at half throttle.

Before flying the static tracking had to be corrected by tweaking the blade mount fingers.

Flying

Initial flights with this model didn't prove to be very successful, very disappointing when compared to the Hughes 300 with its three blade head.

There seemed to be no logical explanation for this state of affairs, until later with the model on the bench it dawned on us that the Scout had in fact been flying in a very tail heavy state.

In its previous life with a flybar controlled two blade rotor head, this state of trim was acceptable. However, a flybarless head will not tolerate this situation.

We added ten ounces of lead to the front of the canopy floor and set off for the flying field again, this time with a very nose heavy Scout.

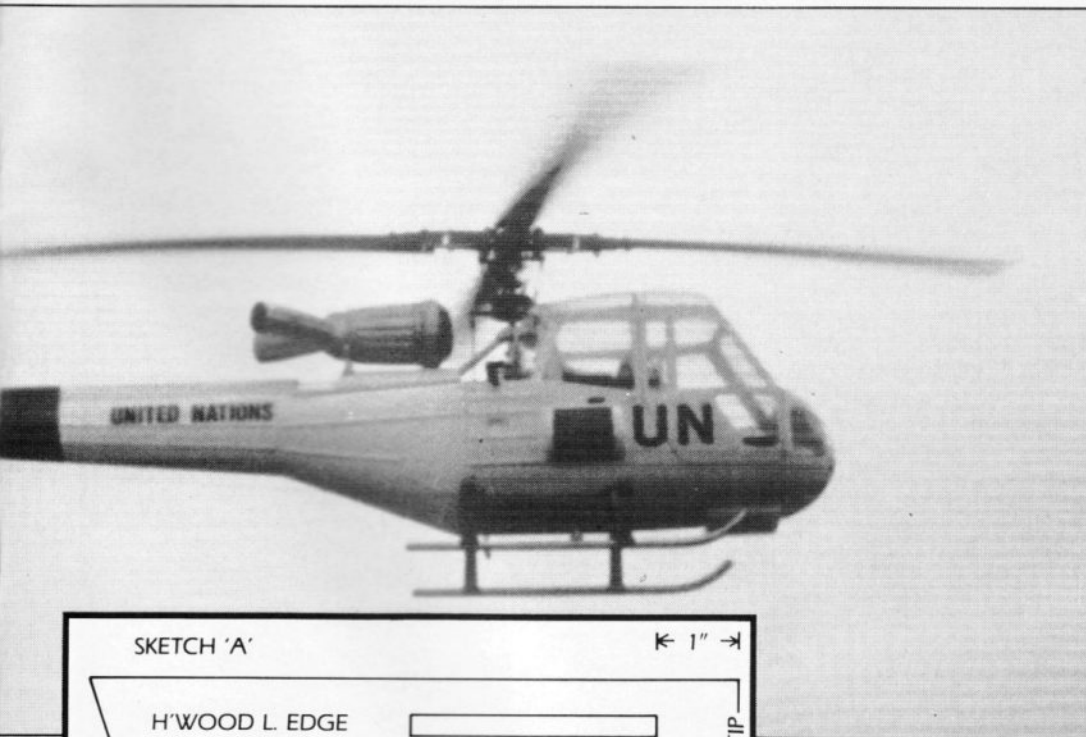
The model now weighs $8\frac{1}{2}$ pounds which is pretty near the limit for an OS 45 FSR. Nevertheless the performance was still quite spritely and the controls now respond in a more acceptable manner. In fact, the four blade Scout is now very pleasant to fly. It exhibits no nasty or unpredictable habits and we managed to get some nice flying in during that second session and much more since.

It's unfortunate that in flight the onlooker is unaware that our Scout is flying with the scale number of blades, but when it's parked in the pits it always creates considerable interest.

And Finally

The next step is to convert the controls of our Scout to a CCPM system. When we've worked it out we will show you how.

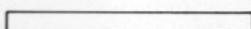
We recently Converted a 45 powered Graupner Helimax to this type of control using the standard head and also a Morley three blader. In each case the improvement in performance was really quite amazing.



SKETCH 'A'

← 1" →

H'WOOD L. EDGE



TIP

SLOT IS THREE INCHES LONG,
 $\frac{1}{4}$ INCH WIDE AND
POSITIONED HALFWAY BACK
ACROSS HARDWOOD LEADING EDGE.
WEIGHT IS $\frac{1}{2}$ OUNCE OF LEAD EPOXIED IN PLACE.

The camera managed to stop the rotors and identify the model in its revised state of attire. Although the weight is up yet again, the Scout is still a spirited performer.