

# MORLEY BELL

Part I of M.H.W.'s review of Morley's latest.

We received our review example of the Morley Bell UH-1 at the Sandown Show, and hoped to present the full report in this issue of MHW. Unfortunately (how many times have you heard that word before?) a number of unconnected circumstances conspired to ensure that we were foiled. The model is almost complete — only missing is some final detailing — and has flown. However, the amount of flying has been very limited, really amounting only to a trimming and photography sortie. It is impossible, therefore, at this time, to give a sensible appraisal of operating the model, or of detailed setting up. We are, therefore, presenting the review in two parts, as we have done with a number of other machines in the past. This first part will be largely confined to building notes.

We usually aim to complete a model as close to the kit as possible. However, for a number of reasons we have performed some mods to the particular model. These fall into two categories. The first are in the area of personal preference and scale detailing, and do not, strictly form part of the review. We will, however, cover them next time, as you might find them interesting. The second are in the area of detailed improvements (well, we think they are!) or easements in construction. These we will mention as we go.

The model is a 48 inch rotor diameter scale model of a Bell UH-1B, with a polyester glass



body. The mechanics will be familiar to those who have built Morleys before, but have received numerous detail improvements since I last built one, over three years ago. The particular prototype and attractive price is so well known that this kit will probably be bought by a lot of people who are not familiar with the breed, so read on.

### The Kit

The kit arrives in a large cardboard box, topped-off by a Burgess painting of what appears to be the original model doing its thing in the jungle.

Opening the box, one is immediately faced by the two halves of the fibreglas fuselage. This is split in front of the main shaft in the currently fashionable idiom. Although constructed from chopped strand matt rather than cloth, a very nice piece of workmanship has been done here and the join lines are easily lost, even by a non-scale buff like myself! Also, plenty of effort has been put into making it in a glass rather than filler fuzz! There is a good finish but the sides are satisfactorily thin and the weight is down to not much more than one pound for the whole body.

The rest of the kit contents are packed in the normal Morley fashion of plastic bags for

*The basic mechanics "cassette" before adding controls etc. Motor is supported by nylon bearers below gearbox.*

each stage of construction, with the relevant fasteners in separate parts of the bags. Apart from the mechanical bits and pieces and the fibreglass body shell there are also a number of vac. formed transparent plastic sheets which contain the various body details, windows, seats, etc., a comprehensive set of self-adhesive decals and die cut ply sheets for the wooden parts.

The construction manual consists of 22 pages of description and drawings, broken down into convenient stages of building. This is contained in a handy loose leaf binder so you can open up and set out just that section you are working on at the time. The start of each section is clearly titled and has a list of all the bits required for that section including numbers of codes for all the fasteners. For those who have built Morleys before, I should point out that this instruction manual is a very much improved document compared with some of the early ones, the drawings are clear, and every item is numbered so that you can track it back to the parts list and identify uniquely what bit goes where — it stands with the best. This is just as well, of course, as you are building quite a complex model here, and you fit every nut, bolt, and screw yourself, so there are a lot of bits!

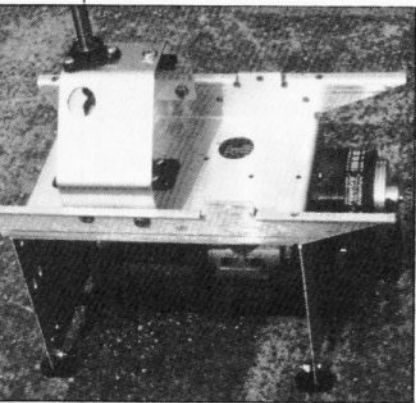
### The Machinery

Morley's UH-1 is based around

their Mark 3 mechanics set which forms the heart of the entire range of models. That is to say it consists of a two stage main reduction system where the initial reduction is by toothed belt and the second stage is by a grease-filled gearbox. The clutch is on the input shaft to the gearbox rather than on the engine shaft, and so is isolated from engine firing strokes by the toothed belt. The tail gearbox is driven by piano wire shaft running in a curved brass tube from the rear of the main gearbox, through the fuselage and up to the top of the fin. The Morley mechanics set uses a combination of ball races in high stressed areas and oilite plain bearings in the lower stressed areas. Experience has shown that the selection is sensibly made. Costs are kept down by this means without adversely affecting the longevity of the mechanics. This has been born out by the RCMW 47G which is still going strong after well over 300 flights.

The particular breed of mechanics used in this kit are based on that used in the Morley Agusta A 109 kit, which has been around for some time, but is modified to suit this application.

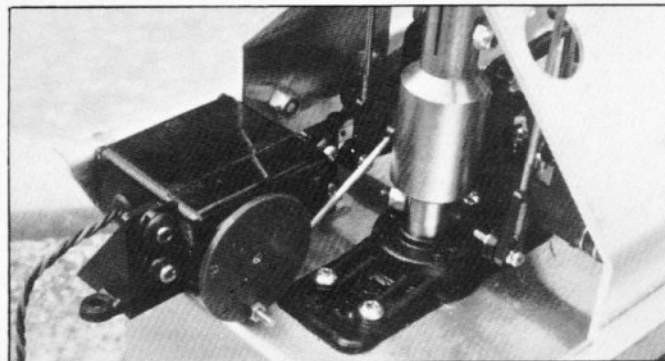
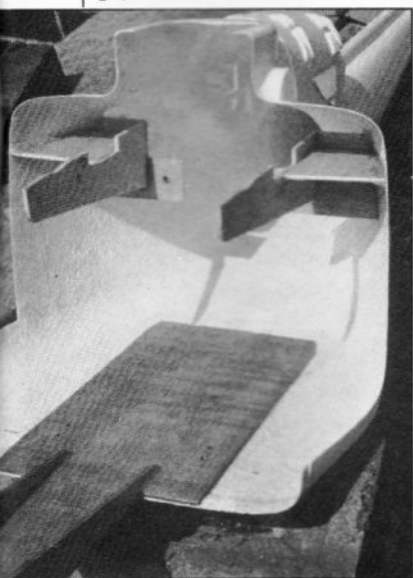
That is to say the main gearbox, clutch, engine and top bearing assembly are all mounted on a folded aluminium chassis. This chassis also carries all the servos for the controls and the receiver. Only the bat-



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tery and gyro are mounted elsewhere in this machine. The result of this is a kind of 'cassette' mechanism which can be loaded in and out of the model in a fairly straightforward fashion. I'll return to that later. These cassette mechanics are fitted with four moulded nylon feet at each lower corner. Each of these feet has two recesses to take pressed-in 3mm plain nuts. These are used to retain the mechanism into the fuselage at the bottom. The under-carriage mountings on the outside of the fuselage are employed at the other end of the bolts! These fittings are a particularly nice part and do a very neat job. The rear and top of the mechanics are retained to the top of the rear half of the fuselage by a wooden assembly which is built onto the mechanics before installation and then glued into the upper part of the rear main body. The result of all this is a very solid assembly when it is together. The nose of the body is then fitted over all this lot and retained to the main body sections by a series of small self tapping screws. A neat feature of the installation is an outrigger section

*Rear woodwork. Note captive nuts. These were larger than ply thickness. Problem solved with lashings of Stabilit to fill gap.*



*Rear view of mechanics showing collective servo and author's variation on push-rod position. Auto unit is Morley part but not standard in kit.*

from the main body which slots into the instrument console in the forward section when all is fitted together. This outrigger carries your nicad and gyro and thus the rest of the avionics. Interconnection between the main mechanics and the nicads and gyro are conveniently made by three plug-in connections down at the front of the mechanics set.

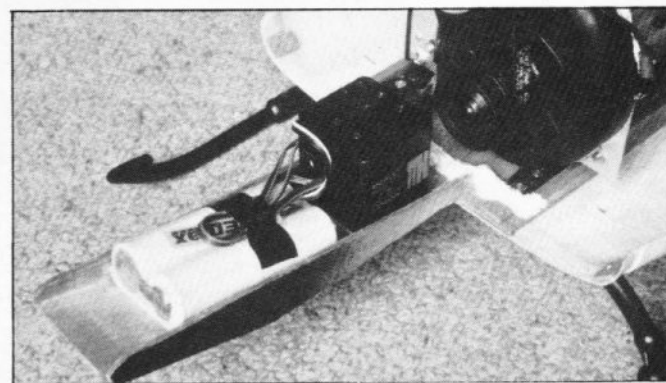
## Construction

The order of assembly called out in the instructions works well and I found no real need to deviate from it other than in a few minor areas so I'll must make some comments, now, about the construction as it proceeds.

The initial act is to assemble the main gearbox into the main chassis frame. A certain amount of mechanical feel is required here, as when you pull down the four screws which hold the gearbox halves together, the box does tend to go rather tight — as the instructions indicate. Before you assemble it, check that there is no moulding pip where the small plain bearing is retained. I have seen this pip on some examples of parts and if it is not removed before the gearbox is assembled you will distort the plain bearing with dire results on the life of said bearing! Don't forget to grease it, and provided it is correctly assembled, and that is to say slightly stiff, not rock hard,

when it's first put together — it will run-in over three or four flights to a very smooth running assembly.

The next stage of assembly completes the main chassis assembly, with the engine in place and the main shaft sprouting out at the top, through its bridge piece. It pays to take care here, that the engine is fitted in the correct position fore and aft or the fan will not line up with the fan shroud, the instructions are correct, and it's



*Front of main shell, showing gyro and nicad. Also visible are the neat U/C mouldings and primary belt drive. Cables for battery and gyro run down beside fan housing and are secured to frame by a 'P' clip.*

worth following them! Another point worth watching is the fitment of the bearing carrier at the top of the main shaft structure. There is certain amount of movement permitted here in order to line it up and you should take care that the shaft isn't pushed over one way, when its all assembled, as this will force the bottom bearing

and gearbox to run out of true.

At this point you move on to assemble the swashplate. Yes, you assemble the swashplate. I did say that you put in every nut, bolt and screw, didn't I? This requires cleanliness and a certain amount of care, otherwise you will be chasing ball bearings all over the floor — playing with toy helicopters is abberant enough without such complications! However, that care pays off with a very smooth running swashplate.

The clutch is next, and this is of the two metal shoe type, operating onto a cork liner and restored by two bent wire springs. It's a little bit of a juggling act to assemble, but again, a little bit of time at this stage results with a very smooth running clutch.

Now we get to the interesting bit. Attacking the body with a Dremmel and a cutting tool is best done outdoors, and wearing a mask, as you create a

fibreglass storm in the process, and breathing this stuff is not good for your health. It is a fairly involved task cutting out all the various sections of the body and windows tidily — but you are building a scale model, so you did expect some work, didn't you? It's worth pointing out here that if you are fitting the windows, take care not to overcut the side window apertures in the cockpit. I found that the cut lines on the kit would result in a slightly loose fitting window which is not the easiest thing to rectify, so it's not a bad idea to prepare the windows themselves before you get to this stage, and make



sure you're going to have a perfect fit later.

You now have to insert the mechanics into the body and to do this a bit of woodwork is required. It pays to mark very carefully where you are going to put the reinforcing plate into the body and do a good tidy gluing job or you're going to end up with a warped shell later. The method of fitting the rest of the woodwork is very



*Radio installation, showing receiver, cyclic sensor and switch. Author's crank arrangement is as follows from left of picture: angled, angled, 90°, 90°.*

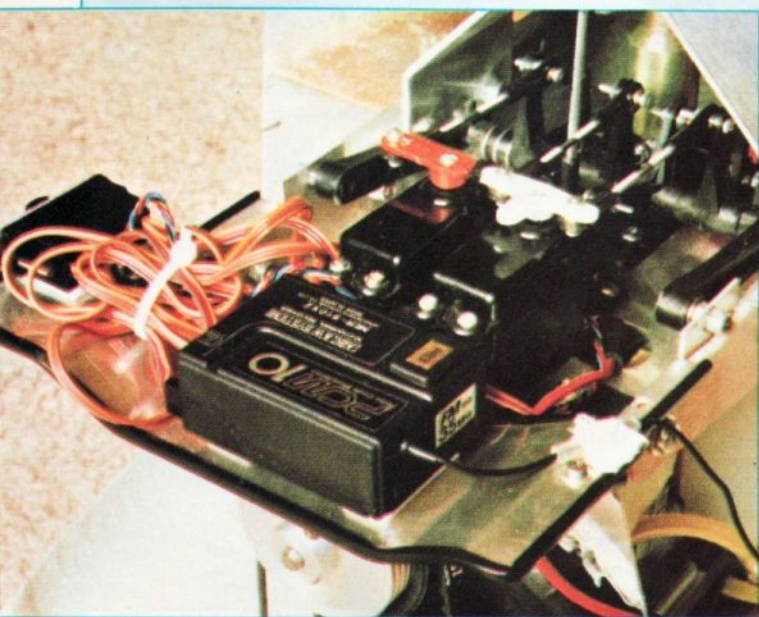
clever in that you build it onto the chassis, out of the model, then insert the chassis with it attached, and with glue in the appropriate places. This went

together very well in my case, needing only a very small amount of shaping the woodwork to get a tidy fit into the body. I did take care to sit the body on a flat base and very carefully prop the tail boom to the correct angle before doing this, as the body is pretty whippy before the mechanics are in. I would think that if you didn't concentrate at this stage you could make a very interesting body shape which you would regret later!

A similar woodworking exercise is performed in the nose section to fit the dummy floors and instrument panels. I did toy with throwing away the ply and replacing it with balsa wood as I had a feeling that the nose was going to be rather heavy. In the end, I left it as it was and a bit more flying will be required before I decide whether or not the C of G is in the right place — mine has come out slightly nose heavy.

Incidentally, the drawing on page nine of the instructions, at least in my kit, does not correspond to the woodwork in that items f and g are swapped. If you try and fit them the way they're marked, you will find you cut one away and regret that later, the body is not quite symmetrical. Before leaving this section it's worth trial fitting the front and rear together, with the mechanics in place. On ours, the extension that carries the gyro and Nicad slightly fouled the inside of the very nose, and needed slight trimming. I then added a piece of foam tape after painting to prevent rattling etc.

The next stage is to build the pitch-up system and controls into the model. This is a point where I did deviate slightly from the instructions, rearranging the cranks to allow for rather more clearance at the top of the pitch range. I also found that the collective was a



bit spongy at the bottom of its range, which I cured by taking the output off the bottom of the servo disk. Finally, in this area, my servos are a bit tall, so I fitted the balls underneath. All this should be clear from the photos. Having said all that, the result is a very smooth and interaction free system! The receiver is fitted at the front of the mechanics, and rather than use the specified ply plate, I bent up an ali. 'bath tub' to get a bit more head room.

It will be seen from some of the accompanying photos that I have deviated from the kit in the area of plumbing and silencing. I also chose to fit the throttle servo in a non standard position, but the jury is out on this for the time being. Since none of this is actually relevant, I will gloss over it here, but will return to this subject next time, with the reasons.

The tail drive is carried by a curved wire running in a brass tube. This tube is pre-curved, but doesn't quite line up. I have a dread of tail drive failure, so took a lot of time carefully flexing the tube in my hands until I had a perfect line up. The wire emerges from the tube now in such a way that it is centred at the exit when the hex drive joints are engaged. This way it should last, and certainly operates with very little friction.

Tail pitch change is by a wire in ali. tube, which I chose to replace with a 'snake'. Again, by dint of careful installation a very smooth and slop free operation has resulted.

Tail rotor blades are hollow moulded nylon, and the old Morley split pins have been re-

placed by nuts and bolts in this kit.

The main rotor system employs a Bell-Hiller mix, and the amount of Bell input can be set at high or low as desired. The head is not pre-assembled, and I found it necessary to remove flash from the bearing holders before assembly to ensure free operation. The blades provided are of a symmetrical section of 2 inch chord. These are of composite wooden construction and the builder is required to sand the roots before fitting the plastic root reinforcement and drilling.

### Finishing Off

The kit contains various scale details, and with the aid of these and the decals, a smart result should be easily achieved. As I have said, the basic finish is good, so not too much elbow grease is required to lose the join lines and get a decent finish.

As you are no doubt aware, many many Hueys were built, the majority in military guise. Regular readers will know that we aren't too keen on military colour schemes, here — the camouflage can be a bit too good — so what to do — civil Bell 204s are as rare as hens teeth it would seem. Salvation came from an unlikely source.

I was hanging around a colleague's lounge trying not to eavesdrop on a conversation about how come the car keys and the tidy suit were locked in the boot of the BMW that had just been dragged home on a lorry when I espied a book on the Vietnam war on the shelves. Leafing through this I



came across an Air America operated machine — every cloud has a silver lining etc!

Finish is by Solarlac, sprayed on, with flat Aerokote as a final coat — an all fuel-proof solution. At the moment, not all the available detail has been added, but, as you see, a very 'different' machine results. I think it looks absolutely great — but then, I built it!

### What Do You Think Of It So Far?

The final weight is just over 8 pounds — the instructions indicate approximately 8.5 so that can't be bad! There is a lot of work in there, but that would

hardly deter anyone likely to be considering such a model anyway! The resulting machine is certainly not class 1 scale, but it captures the character of the original well. Bear in mind the bulk of the original and you won't be surprised when I say that this is the biggest Morley to date. I'm very pleased with the appearance of ours and what little flying it has done is very promising — to the extent that I am itching to get it back in the air. This report will continue next time with a proper flying report, and some information on the little personalisations that our model has received. □

