

# HOVERING ABOUT

## WITH JIM MORLEY

WE FOUND OUT that it was the end of season at the Slough R/C Fly in the hard way! Had it been a week earlier it wouldn't have seemed like November but the cold didn't stop a lot of people from enjoying the event run by John Griffiths of Slough Radio Control with the help of the High Wycombe Model Club at their field near Chinnor in Buckinghamshire.

A really full programme comprising of scale, novelty and FAI competitions was well supported, in fact latecomers found they couldn't enter. As it was, the FAI event ran into the poor light of the afternoon.

The scale event comprised static and flying, scores added together. Intentionally it was meant to be marked with class II rules but not many of the competitors supplied literature to support their efforts, in fact some were not even scale colour schemes which didn't help their scores a lot. John Young who flew his *Hirobo* Jet Ranger superbly could well heed this point, and John Griffiths did well with this 'Sea King' in the static by taking advantage of the class II rule which allows a change of propeller before flying. A pity the two bladed head used to replace the five bladed unit fitted for static judging was out of balance and let him down in the flying. P. Kidson attained second place by having a good average score in static and flying with his *Kalt* 'Bell 47 G' but Len Mount took the premier position with his custom Bölkow 105 with *Schluter* 'Supreme' mechanics. His models won the *Hobby Pox* Concours Trophy, the *Digifleet* All Round Champions Trophy, the FAI event and the Novelty! Three first places and two trophies, a good day for Len.

The FAI judges did a commendably stout job to sit through the full two rounds flown by the 12 competitors. The event was complicated a bit by a swing round of the wind during the day, which caused a number of competitors to do their autorotation landing from over the crowd and hence score no marks, which leads me to the one criticism of the whole day. This was that as we were all supposed to park our cars on the far side of the field which dictated that there was a lot of walking across behind the flight lines and under the flying. This led to an undisciplined

atmosphere which encouraged some flyers to fly within the spectator areas, which shouldn't happen even if they are skilful pilots.

Organising an event of that nature is a mammoth task and it's easy to be wise afterwards, certainly the Slough R/C late season do is a major event in the calendar for helicopters.

### Indigestion

It interested me to read of troubles with 1:1 models of ingestion of turbine exhaust back into the engines with a corresponding loss of power, right when you don't want it, near the ground.

Apparently this can happen at speeds up to 30mph and can cause major headaches to the design department. Inlet and exhaust position is the major parameter of course, but one cure was found on one prototype by reducing the length of stub root to the blades. In other words make more of the disc have a downdraft. Another prototype was cured by having smaller and hence faster flow, exhaust outlets to jet the exhaust out into the downdraft.

This sort of loss of power happens on our models more than you might think, though normally our problem is to get the oily fumes clear of the airframe. Most people opt for a straight down exhaust, which doesn't help on take off and landing. I'm not allowed to use that arrangement because of the round brown marks appearing on the lawn a couple of days after a test flight (you can't get away with blaming the cat forever) so what I like to do is jet the exhaust across into the induced draught of the tail rotor. Unfortunately it isn't always easy and you also get mess from some engines spitting back out of the carburettor. That must be easily solved but there always seems to be more interesting things to do.

One of them one day will be to model one of the future LHX machines. These will be the

type of helicopter designed to replace many of the military aircraft now flying and are likely to have a single lifting rotor and no tail rotor, torque counteracted by the ducted and directed exhaust of the turbine engine. How do you model that?

### Tail Ends

Whereas the Bölkow 105 is a bit too practical to be attractive the Messerschmitt-Bölkow-Blohm (MBB) Kawasaki BK 117 is aesthetically pleasing and practical. If anybody was to make a scale model I am quite sure that a lot of people would think they've spotted a mistake at the tail end. The tail rotor, on the left hand side, has a tendency to be a right rudder while the two large vertical fins at the ends of the tailplane have a very distinct left hand set to them.

Of course the tail rotor clearance of the tail boom is helped by this but it's unlikely to have been done for that reason.

As I have said before, 1:1 helicopters are made really for going places with maximum efficiency and allowing the tail rotor to travel with translational lift efficiency (even if it is sideways) will reduce power requirement and reduce drag. To correct the right hand rudder effect that this would produce with forward speed, the tail fins compensate with the left hand influence.

Another 'funny' done with tail rotors these days is to lean them dramatically over from vertical. This is to help the pilot cope with a shifting C.G. and is particularly useful in military helicopters.

Or can somebody suggest better reasons?

### Kobe Kiko Robinson R22

Sometimes a model of quite a nice looking helicopter doesn't look right and is not so aesthetically pleasing. It takes a very small deviation, or lack of one, to do this. A model sometimes needs to be a caricature of the 1:1 equivalent, there have been a number of not-right 'Jetranglers' made for example, but sometimes the model is more pleasing than the real thing. One such is the KKK 'Robinson R22'.

The first in the country has been shown off

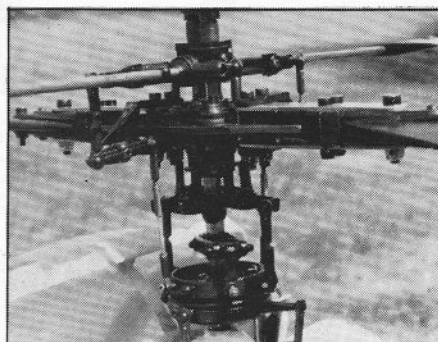


Above: Dave Nieman hovers the new Robinson R22 by KKK. Most innovation 'copter for some time. See text.





Above: Dave Nuthall flew his .60 powered custom Chinook at Slough event but didn't compete. Excellent effort but has usual tandem rotor flight characteristics. Below: underside view of the 'Chinook' reveals the mechanics.



Above: Martin Briggs flew FAI schedule at Slough using new mixer unit for Morley MkIII AT head shown here.

Other features include aluminium sheet tail cone, fin and tailplane, and the cowl round the mast. The free wheel device for autorotation is in the first stage transmission, leaving the tail rotor still connected which is surprising. I would think a dramatic collective/tail rotor mix would be essential but it worked in the demonstration without problems.

The rotor diameter is 1.5 metres, quite big for the 40-50 standard motor which is mounted inverted (the one detrimental feature) with room for 60s and four-stroke engines. A refreshingly different helicopter. The price was unannounced.

### Digifleet and gyro

Since writing the screed on the *Fleet Control System* helicopter outfit a few months back I have fitted the gyro unit to go with it. This is the *Sanwa* unit and it works very well.

Having a peek inside I was surprised at how stiff the rate springs were, I suppose having a super sensitive infra-red movement detection system enables a more robust motor/flywheel mounting to be used. The outfit comes with a separate battery pack, considered essential, and two black boxes besides the gyro unit. One is the amplifier/junction box and the other a box for control, having the on/off switch and gain/sense pots. It can be difficult finding somewhere to put all that lot, and in a small 'copter the 500 mAH battery is significant too but it is not good to run out of volts for your receiver. This can happen surprisingly quickly if all the avionics run from one battery, particularly as the gyro keeps the servos working quite a bit harder.

If you run out of gyro battery volts it is very desirable to be able to switch off from the transmitter. An incorrectly running gyro plays havoc with the controls. With it correctly set up, the gyro reduces the work load tremendously. Remember, small models need the gain turned right down.

### Conclusion and predictions

1983 was a good year for helicopters with considerable increase in interest and a good number of newcomers attempting to 'Hover About'. It is particularly noticeable how many more really good flyers there are now, a trend which I am sure will continue.

Apart from a better selection of kits there are also signs that some very interesting models will be around this year. Scale events will see a much better variety of models and I hope the judges will have the education to appreciate individuality. I of all people know how much work there is in a custom built job.

Also we are likely to see a serious drive on the aerobatic side of helicoptering. A certain band of followers is keen to promote the FAI competitions, not before time in this country.

A young lady I know informed me she wanted to do aerobatics. Pity she meant to say aerobics! All the best for 1984.

recently by Dave Nieman and I think it is the most innovative helicopter for quite a while. To begin with it is flybarless with several features to make it more manageable than they usually are. The only unusual visible feature is the offset pitch bearing being ahead of the line pointing to the mast. This is sometimes done on tail rotor blades to allow the outward force on the blade to compensate for drag and so leave the blade in line with the bearings. The blades are mounted on rubber which allows flap and drag motion but there is teeter also. Plus, although you can't see it, a connection or influence from one blade boss to the other. I was told that possibly this is what KKK have applied to patent in the rotor head but how they expect to patent tapered blades with washout I cannot imagine. Several manufacturers have tried these and found that the improvement hardly justifies the extra effort in manufacture on most rotor heads.

Yet another patent is applied for, this one on their 'MCS' (Micro Control System) for pitch control. This is very neat indeed and supports the swashplate on three points in place of the usual four. It also leaves the cabin well clear for scale detail.

Left: Len Mount swept the board at Slough R/C meeting. His BO 105 fired rockets in scale event. Len has proved to be a formidable competitor in R/C helicopter events over recent years, always with beautifully prepared models.

