

HOVERING ABOUT

by JIM MORLEY

HELICOPTER enthusiasts at Sandown Park should have spotted an attractive poster announcing an event to take place on 16th September. This week I have received a letter which I am pleased to include in full, from Pete Reay of Bretons M.F.C.

'Dear Jim,

I am very pleased to see your column giving encouragement to Scale Type models. The very basic aerobatic models which have been developed during the last few years have certainly helped to push the technical developments forward. Nevertheless, I feel that helicopters looping and rolling, look ungainly but, everybody to his own thing.

My own interest is flying stand-off scale helicopters in a scale-like manner, when talking to other enthusiasts this view gets strong support. The original *Cobra* when given a scale finish and flown with military dash, still looks as impressive as any.

To help promote this aspect of the hobby a small group of 'chopper enthusiasts' are arranging a Helicopter Scale Fly-in.

The aim is for an informal day for modellers to meet and fly Scale Type machines. There will be a Class II Static and Flying session in the morning, Fun flying 'on the peg' during the lunch break, and some novelty fun events such as Air/Sea Rescue during the afternoon. We intend to keep the risk of damage to the models to a minimum, and to arrange that hover only flyers also have some fun. There will be a Static Concours event to encourage people to bring out those beautiful models which they haven't learnt to fly yet. We also hope to offer prizes for Concours, Technical Development, Scale Most interesting prototype, best of any type (with 5 or more models present) plus others. (How about a prize for Morley 47 'Gs', Jim?)

The event is to be held at 'Bretons M.F.C.', Bretons Sports and Social Club, Upper Rainham Road, Nr. Hornchurch, Essex.

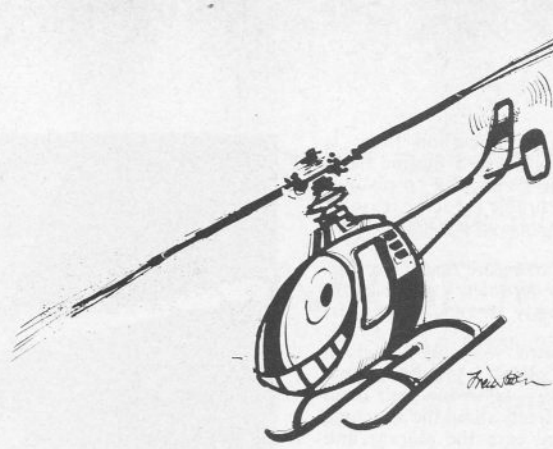
The Club is newly formed by a group of experienced modellers as part of a Council backed sports complex and offers flying and social facilities which are first class. They include ample car parking, a licensed clubhouse, and grass flying areas; spectators are also welcome.

We hope to make this an annual event and the date for this year is Sunday 16th September 1979. For further details anyone interested can contact Ron Rees, 1189 High Road, Chadwell Heath, Essex. Tel. 01-590 2642.

Sounds great, I certainly intend to be there and will be pleased to donate the suggested prize. Let's hope that there is better weather than plagued the Odiham SMAE Spring Gala. Although a good crowd turned up it was undoubtedly smaller because of restricted entrance to the military airbase and because of only being allowed three frequencies.

Unfortunately with the gusty wind and bitter

Below: Pat Dubock at the RipMax Trophy at Leicester. Poorly supported meeting.



cold no attempts were made to try the SMAE certification scheme and all that happened was lots of talk and freelance flying. We are promised that the 1980 event will be later in the year and not restricted to three frequencies. Don't forget the September 23rd meeting at that venue.

The *RipMax* trophy meeting at Leicester didn't fare to well for crowd or weather. Only six entrants battled with the new SMAE rules in rather too windy conditions. Len Mount and Ken Ford flying *Heliboy*s were first and third respectively separated by Gary Richardson with a *Jetranger*. Apparently the 40 powered *Lark MkII*, with teeter head locked and *Heliboy* paddles was very competitive.

Sandown Park on the other hand had excellent weather and a good crowd to watch the Elmbridge Model Club public relations trade show and display. It seemed to me that for the first time helicopters were part of the scene and not objects to be treated with awe and suspicion. During the two days helicopters of all types were taking off, doing their thing and landing in their allocated ten minute slots with an assumed reliability and not only flown by the usual experts.

There were faults, Mick Harris (Morley) had a flame out shortly after take-off, Graham Brown (*Revolution*) also had a flame out but more spectacularly when attempting an inverted loop, Andy Hopkins (Morley) broke

Above: fair turnout at Odiham SMAE meeting. Pity about the weather.

some blades tripping over in the long grass, Dave Nieman did an *Icarus* (flying into the sun) and lost his banana — yes banana, which disguised *Heliboy* mechanics for a publicity stunt and Mike Young was said to be doing a nice autorotation. (Well it was, work it out) when the tail rotor drive went on the (non-Kavan) *Jetranger* that he was flying. Even then Mike got it down in the right place in his usual skilled manner; I believe the technique is to 'pulse' the throttle so that the rotation doesn't build up speed.

Considering the number of helicopter flights made over the two days I don't think that too bad. It was a very good weekend and my only regret is that I didn't have longer to wear my 'Hovering about' hat and enjoy the exhibition.

Errors

I have noticed how tactfully people avoid pointing out my mistakes. I suppose sooner or later I shall stir up some controversy like the aircraft carrier in a wind episode when everybody knows the other chap is wrong, but even though only one person told me, let me apologise for leaving out a couple of words.

When discussing vibration and lead-lag hinges I remarked that the only time the rotor is normal to the mast was in backward flight. Somewhere between my rough draft and the typing the words 'transition to' got left out but anyway there must be other instances, not many though, and we were talking about vibrations in flight.

Also, stupidly, I used my pet name *DS 222* for the *Heliboy*, which doesn't make a lot of sense. A hang up from the old *DS 22 I* suppose but it's not a 222 until it has the Bell fuselage on it, sorry.

And further, I said *Revolution* had come back to using the fly bar for the *Commander*. They never left it of course except for the one model.

Wooden spoon department

Tell me, doesn't a rigid rotor head become a semi-articulated one when you add lead-lag hinges? A rigid rotor, to me and I believe Lockheeds the originators, is one where the blade is only pivoted in the longitudinal (incidence) plane, and it can have a fly bar too.

Of course nothing, even carbon fibre, is totally rigid, and designing in a desired flexibility is the art of the game. But to pivot is different and, while desirable for some reasons, as discussed in previous *Hovering About*, can't be called rigid.

I note with interest therefore that in *Kavans* 1979 'news about the *Jetranger*' when listing parts required to modify to rigid rotor, Mr. Kavan writes:

'During the past two years we observed several *Jet Ranger* pilots — even people claiming to be experts — allowing their main rotor blades to swivel freely about the attaching bolts. While this may ease the storage and transportation, it might on the other hand, completely upset the dynamic behaviour of the rotor. Rather than designing lead/lag hinges, we made provisions for super-free blade adjustments which assure a vibration-free operating rotor system when properly set. Therefore, by all means, level your main rotor as described and instructed. Do not pivot your main rotor blades.'

Several people asked why I don't totally approve swinging blades and I simply stated in *'Hovering About'* that there is a great deal to be said for having the blade in the right place. Well there it is from someone else, and Mr. Kavan really tries to achieve the best, so amongst other things watch those servo loads. A servo, the sort attached to your receiver by bits of wire anyway, is a position finding system, not a force or load system. On the full size choppers you have at least double acting spring cartridges if not a hydraulic servo system between your pilot and your rigid rotor.

Mr. Kavan also has something of interest to say on autorotation. I quote:

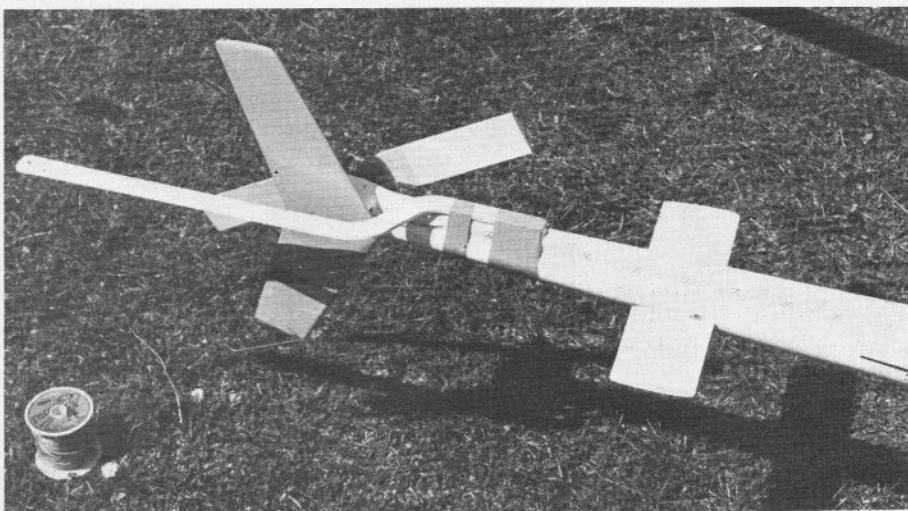
'Autorotation

Much information has been learned about autorotation. A widespread opinion is, "a built-in autorotation device would always save the helicopter in case of an in-flight engine failure". In fact — it is not that simple! We have been exploring this problem for years. Besides other measures, we had a free wheel unit installed in the power train which released the rotor system when the engine started to 'sag'. Recently we found a completely cost-free solution: by simply shortening the *tension spring*, art. no. 2107 (which retains the clutch shoes) by 5 to 10mm, the clutch releases sooner, setting-free the rotor system at an earlier stage of decreasing propulsion. If the rotor blades are also loaded with lead weights, they will even speed-up, exceeding the normal operating RPM. This provides for a controlled descent, leaving sufficient motion energy for recovery near the ground and hopefully, smooth landing.

Prepared like this, future autorotation will be less a matter of luck, and they could even be practised at will by the experienced pilot."

Food for thought to say the least, and I gather that Pat Dubock, flying his *Heliboy* at Leicester had a flame out at about 50ft, and merely bent the skid supports. He heard the

Below: double silencer fitted to Morley 2c to test full-size practice of exhausting up into rotor.



Above: first reader to report using the 'Hovering About' string training aid on a Jetranger used this ply dog-leg to clear the tail rotor.

'dustbins' usually are able to leave the outlet refixed pointing upwards.

A silicone rubber pipe joined onto a specially made 'swirl' box made from a metal spray can cap, a circle of tin and two lengths of 1/2 in. pipe soldered all together and bolted onto the chassis.

It worked fine, the noise level being really low but although the cabin and forward tail boom remained clean the fin and tailrotor became covered in oil. Subsequent to the photograph the outlet pipe has been moved to point upward and downward.

I don't think there could be a better system now, though there is some power loss and a similar mod to the *Merco 61* powered 1/7 scale *Bell 47G* resulted in too much power loss and a melted mass of solder on the swirl box.

engine stop, whilst flying into wind and being Pat caught on pretty smartly, i.e. did the right thing quickly — full forward and go to closed throttle (negative incidence on collective) and try a little positive at just the right instant near the ground.

I still think that if the thought of engine failure really worries you there are several courses open:

- (1) Don't fly.
- (2) Have more than one helicopter.
- (3) Be incredibly careful on maintenance, etc.
- (4) Practise, and hope you can use the autorotation facility so far existing.
- (5) Wait until some automatic autorotation system is invented. Unfortunately it can't be as simple as the alpha hinges used on the old free flight model helicopter attempts. Any comments?
- (6) Fit two engines, that's my approach.

CAA Licence and MAP Insurance

A reader from Coventry building a *Bell 212* writes quoting the maker's figures of 9lbs. airframe weight and 5lbs. payload and asks if, carrying the payload and consequently over the SMAE 5Kg limit, a CAA licence is required. Does the MAP insurance cover a helicopter and if a CAA licence is required what about the failsafe rules?

Well, I'm no legal expert but the MAP insurance is to cover model aircraft and a helicopter is that. They appear to be guided by SMAE rules and this defines a model aircraft as one 'which, owing to size is not capable of carrying a human being and which is constructed purely for sporting purposes'. So watch the payload!

I suspect the weight figures, as sometimes manufacturers on the continent consider the engine and radio as payload, but in any case the 5Kg (11.023lbs.) rule is mandatory so if over you need the CAA licence — and that's flying weight, even including fuel.

On the failsafes, well you could argue that a helicopter is no more dangerous than some fixed wing jobs with locked controls: I can only say I hope this satisfies the queries, any other views?

Silence

My demonstrator 2c, with *Irvine Sport 40* power, had power to spare so a few experiments were carried out on silencers. On this model the standard aircraft silencer hits the ground before the skids so a 'dustbin' silencer is normally the order. However, looking at the full size equivalent one day I decided to follow their example and send the exhaust upwards into the centre of the rotor. Noise is then projected away from the earthlings and fumes dissipated rapidly by the 'mixer'.

On the model the first stage 'dustbin' was made from the *Irvine* silencer, upside down and with a new end plug made, although standard

Learner's Dept.

I was most pleased to hear from an Isle of Wight reader who reported that my string method was a great help with his *Jetranger*. He had fixed a plywood 'dogleg' to keep the string clear of the tail rotor and obviously some helicopters need an extension to the boom.

This reader also coyly admitted that, not having a helper, he had tied the cord round his hips and that a sort of hoola dance had the desired effect! I like that one, but I think steps to run up and down wouldn't help with the most important height adjustments!!

I also heard of others who used wives and off-spring with success, but I still emphasise caution, the system isn't foolproof.

Dates

Helicopters all on one day at the Nationals, Saturday, 26th August.

Graupner Challenge Trophy, Lausanne, Switzerland, 1/2 September.

International, Vilvoorde, Belgium, 8/9 September.

Breton M.F.C., Hornchurch, Essex, 16 September.

SMAE Odiham, 23 September.

Any helicopter groups or individuals want contacts? Let's have news from various parts of the country — or world come to that. Letters to R.C.M. & E. for forwarding please.

News of the Preston Helicopter Gala

Saturday, August 4th (go to Woodvale the following day!) at the Great Northern Show Park Hall, Charnock Prichard, south of Preston. The Gala sounds as though it will be similar to the Breton's event and is being sponsored by the Brewery organisers of the show — so promise of liquid prizes and also plenty to occupy the family. Further details from Chris Garside, 111 The Hawthorns, Eccleston, Nr. Chorley, Lancs.