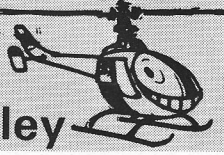


HOVERING ABOUT with Jim Morley



IT'S NICE TO THINK that by the time you read this some real hovering about will be a little more practical. The Winter months don't exactly encourage activity, and if there is a lot to do you don't seem to get around to flying.

First event of the year (Diaries out) is the Southampton MAC fly-in on May 1st at Beaulieu Aerodrome in the New Forest, Hampshire. Start at 10 a.m., 1 mile from the motorway to the Beaulieu to Lymington Road. Organiser Trevor Butcher tells me that the intention is to have a good day with novelty events, especially with beginners in mind, and a stand-off scale.

Further ahead, Len Mount tells me that the S.M.A.E. Nationals will feature a Class II scale competition for helicopters this year. On August 27, 28 & 29th when Saturday will be scale only, with static and flying being judged to Class II rules. Frequency channels 72-74-76-80. Overweight models will need certificate of exemption and insurance proof.

The Sunday and Monday will be a competition to the FAI regulations. New for '83 — no metal weights in the rotor blades!

Still on the subject of Diaries, don't forget May 14th and 15th, Sandown Park followed by the Model, Craft & Country Show, Stoneleigh, near Kenilworth a fortnight later. See you there.

Hiller HTE2

It was most pleasing to receive photographs and a description of John Ransom's model of the *Hiller HTE2*.

John must be typical of many modellers who have learnt the basics of helicopter flight on a model that is available to anybody and then wanted something more individual and personal. He, unlike most, has actually done something about it and chosen for his subject the example used by the Royal Navy and now kept in the Yeovilton RN Museum.

The first job, presumably after sketches and a full-size model drawing, was to make a wooden mould for the canopy. This was split into two parts for the forming process and required 'a fantastic amount of planing, shaving, sanding, etc. to complete.' He was then lucky to have a contact able to vacuum-form the plastic sheet over the mould, which could be cut and joined to make the canopy. I suppose it would be possible to make such a canopy from existing mouldings, but it is unlikely to be as effective as a custom job and probably very wasteful, only using small parts of different shapes.

The underbelly mould was made from 1/16th ply so that the necessary tapers were incorporated, a fibreglass moulding was easy to make but difficult to release. A spare was made after the first one. A dowel tailboom was then turned undersize and covered in 'Solarfilm'. 'Miralite', 0.02in. ply was then rolled three times round it with a 'wave' of PVA glue and left to dry for two days. Once the dowel was removed, an immensely strong tailboom resulted that fitted snugly over a spigot on the underbelly moulding.

A thin wall brass tube stay was fitted at the rear. An OS50 engine was mated to standard helicopter mechanics and then grafted into the hull. Two home-made silencers, *Futaba* radio with 1000 mA Ni-Cads and a *Century Systems* gyro complete the model which sits on working suspension.

John has demonstrated that without an impossible amount of work and with a little imagination, a unique and interesting model can be built.

It would be nice to report that flying proved faultless, but we have to commend him on continuing with honesty to admit that in the trial hops it was discovered that the four captive nuts had not been pulled fully into the



Above: the Jim Morley stand at the Model Engineer Exhibition, prospective enthusiasts were entertained with a video show of flying shots for the whole nine days.

recess on the head mouldings, allowing too much teeter. The result was that the main rotor blades tied a double reef knot in the tail rotor drive.

Next step, after repairs, was to have the model checked out by Gary Weston of Galaxy Models. After trimming and at some distance Gary calmly announced that he had 'lost it' and the model proceeded to fly about the sky like a thing possessed.

Only having partial control, Gary was having a terrible job and visions of parts spread all over the grass were conjured up, but in true Biggles tradition the model was landed and the fault diagnosed as the receiver aerial wire being too close to the mechanics and inside the tailboom. The obvious cure was to let the aerial hang below the chopper, and successful flights were then completed. The OS 50 has more than enough power for the 8lbs. model and it can be taxied with the castoring wheels on tarmac. Congratulations John and thanks for the information. We look forward to seeing it in the flesh.

Readers' write

One of the nice things about writing this column is receiving letters from readers telling me of their experiences. The only nasty thing is having to meet the copy deadline when it doesn't suit me!

To go back to the letters, and the reason for this item. Over the years, and particularly recently, as a result of the request I made some time ago to tell me how you learnt to hover, I have reached a few conclusions, some of which are completely contradictory. This of course, is because people are different and do things for different reasons. About the only thing we really have in common, apart from two eyes, ears, arms, etc. (and that doesn't always apply) is the desire to fly a radio-controlled helicopter, and those vary enormously too.

Learning time varies from about three months, to reach the hovering and gentle circuit stage, to never being able to. With perhaps most taking about six months given a reasonable degree of persistence. I mean, of course, reliable hovering and a controlled circuit and it can be achieved quicker with a lot of determination. It can be achieved without even breaking a rotor blade with a very cautious and methodical approach. It can be achieved from scratch without any previous experience in radio control, but this does mean you have a lot to learn. I think car and boat (the fast sort anyway) types stand as good a chance as any of achieving success quickly, possibly because they are used to orientating from rotation and also used to chassis, gears, shafts and couplings, etc. Glider pilots perhaps tend to be more forward speed conscious, and also take to helicopters.

Whatever the background, it is certain that now a helicopter is an easier challenge than it was. The models themselves behave better (collective pitch and following rates etc.) and also you stand a chance of finding someone who can adjust and trim so that you are learning on a model that will fly.

It is a fact that finding the right person in some areas is still very difficult. On your own you have to try that much harder to understand what it is all about. There are a few books on the subject, all very useful.

Which model? I have letters to prove that whether you choose a 'Schluvan', or 'Zenley' you stand a good chance of learning successfully and also of thinking you chose the wrong one because you didn't, or needed to modify it to make it fly.

On training aids, it does seem that some people reckon to have gained a lot by their use, although from my own experiments some time ago I have always felt that any restraint on a helicopter can cause all sorts of problems. As regular followers of the column will know the only training aid I think worth

the cost is a piece of string on the tail, held by someone who knows what it's all about.

This does seem to have helped a lot of people — much to the surprise of others. Floats are a good thing if flying from rough grass, and a gyro to help tail rotor control helps a lot.

Do not be put off by early irritations, and, if you join a club or have company, then do be sure it is of the type that laughs with you, not at you, as one very interesting long letter put it.

This same fellow was firmly in favour of a simple plywood frame fixed to the skids and free to rotate through 360° on a single central bolt which also allowed about 20° tilt and an inch or so of vertical movement. The whole is then clamped to a 'Workmate' portable bench to allow easier access and re-fuelling. It would also reduce some of the ground effect problems, and dust, but I can imagine some helicopters pulling the whole lot over with over enthusiastic control operation. Anyway, his idea is that if the tail rotor and throttle/collective can be mastered to the point of conditioned reflex then the battle is half won.

I'll go along with that, it's similar to the 'String Method' where you're fed into throttle/collective and lateral cyclic before the other two (forward cyclic and tail).

The same writer honestly continued his saga beyond the successful first stage on his training stand with an account of the first free-flight. "It was fantastic, a classic



Above: John Ransom's model of the Hiller HTE2. See text for details. Doing an early Hiller makes the rotor head scale too.

about increasing the pitch while my colleague had another attempt with his model. We continued like this through several tankfuls when suddenly a hover was managed at about three feet for several seconds at a time and the machine appeared more stable once it was clear of the ground. Greatly encouraged, I decided that if I got well clear of the ground, things would be easier, so with engine running, a full tank and trembling thumbs I pulled in collective pitch. It's amazing how quickly these things can climb, I found myself fighting a very lively helicopter at six feet up and drifting back towards my head with evil intent.

"Now the book says that if in trouble push both sticks forward. I did, the model dipped its nose and moved off quickly in a graceful arcing climb in a most stable manner. I had a few milliseconds to admire it before it was 50 yards away and 75 feet up. I realised that I was controlling it like a fixed wing model and banked over into a right-hand turn with no trouble and eventually completed the first circuit in great style. The model looked very scale-like in the air and I was pleased with both it and myself. During the second circuit I became convinced that helicopter flying was a lot easier than I had been led to believe. During the third circuit I became convinced that I couldn't land the damned thing. I mentally flipped through the book trying to remember how it was done and somehow got it all wrong. I eased back on throttle/collective as I came into wind and the model started to come down rapidly, I eased back on cyclic to lift the nose and the fall rate increased, the model eventually striking the ground at 45° to a height of about 100 feet. When the wildly thrashing blades finally came to rest I was surprised to find the only damage was a broken skid tube, a shattered canopy and a cracked servo mount."

The thing to remember is that as you cease forward speed you come out of translational lift and have to pile on the power again. The equivalent to flare out.

I really do appreciate the letters even if I don't quote from all of them. One final one appears in several letters:

"To say the least I am now thoroughly impressed with these flying machines and I wish I had started a lot earlier."



Above: unusual 'Jet Ranger' built by P. G. Noel of Hertford and exhibited at the ME Exhibition features a Schlüter type four-bladed head.

gust of wind under the tilted rotor plane caused her to sedately tip sideways and break ANOTHER set of main blades! If I had stayed on the controls until everything had slowed down, I could have taken preventative action."

That particular writer has since progressed to accrue some worthwhile flying time I am glad to report. Later on, no doubt, he'll discover that with positive pitch at closed throttle there will be times when the model won't come down. Also he might just as well have not had the autorotation unit. All a great experience and most interesting isn't it?

"The engine was screaming and the model was only just on the verge of lifting. I set

training hover two feet above the ground, straight as a die, smooth as silk. The landing was good and gentle, I swear. I was so ecstatic and scared of spoiling things, I snatched the throttle shut and the whole tail end BLEW UP! . . . with an autorotation unit the main rotor is loaded with momentum for a remarkable length of time, well a couple of seconds. In closing the throttle I also drove the rotor to negative pitch. Further I don't remember doing so, but I was probably holding slight aft cyclic I had used during the landing . . . since then my collective has never been below plus one degree even with low trim and the throttle stick bent backwards."

"The second flight, after major repairs, was as ecstatic as the first. Good landing, but one skid on the remnant of a molehill. As I took my first step, hands now off the Tx, a