



HOVERING ABOUT

First things first, two dates for your diary: August 10th BRCHA Fly-for-Fun at Woburn Abbey, turn off junction 13 on M1, all comers welcome, have a helicopter in the car to take part in the event entitles free entry to the grounds. Start at 10 a.m., trimming for beginners and simple competitions for scale flying.

September 7th. Bretons M.F.C., again presenting their very successful Helicopter Scale Fly-in at Bretons Sports Club, Upper Rainham Road, near Romford, Essex. Mixture as in very successful 1979 event, that is; static concours, eyeball type scale flying competition, air-sea rescue and novelty events, first class facilities including licensed clubhouse and ample parking.

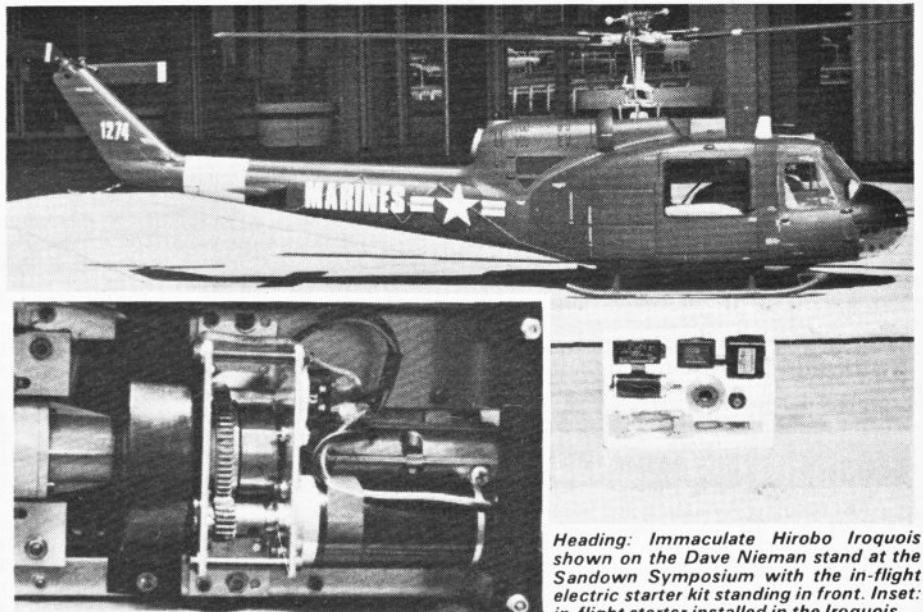
Opportunity Missed

It wasn't until the actual day that I realized that it would have been a splendid occasion for all, to have a general "fly-in" at the MAP Primrose Valley modelling holiday in May. Everything was laid on, the venue, the audience, the enthusiasts and even the weather, though a bit windy on the Yorkshire coast. The only thing missing was the helicopters! A few locals had come along without models thinking it was a closed event, and most of the holiday customers had been forced to leave their helicopters at home in order to get the family in the car. Thus the fly-in became a Morley 2c demonstration, but the interest was there, evidence being the 150 persons attending the evening showing of my four year old film. Must get the new one made for next year and see if an all-comers fly-in can be arranged. The facilities provided at this sort of holiday, particularly the Primrose Valley one, are most deserving of using to advantage.

Sandown Park 1980

Once again the Elmbridge club annual symposium has come and gone, with, as an exhibitor, its usual frantic rush to prepare a stand and stock, arrange help for the demonstration, prepare the models and chase up promised items that are late. The two days come and go with unbelievable haste, a lot of intended chats get left out and the principal impression after clearing up is fatigue.

This year went as smoothly as ever, the organisers are probably right claiming it to be the biggest and best of its type in the world. Helicopter enthusiasts were catered for



Heading: Immaculate Hirobo Iroquois shown on the Dave Nieman stand at the Sandown Symposium with the in-flight electric starter kit standing in front. Inset: in-flight starter installed in the Iroquois.

principally by yours truly of course. Dave Nieman Models and Watford Models. Micro-Mold showed the Lark II and Autogiro and Ripmax introduced the Italian Zenith the design of which I think I have seen before somewhere. Didn't see it fly but it looks good at £89.50.

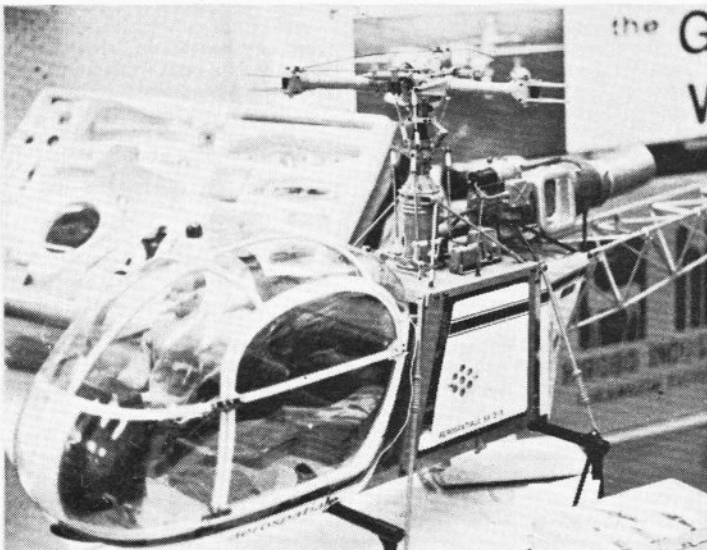
Dave Nieman again presented immaculate examples of the Hirobo range. With good effect he was keen to show off the 'in-flight' starter, this outfit at £114.95 weighs about 1lb (0.45kg) but saves having Rx nicads by supplying through a voltage controller. It comes with flywheel for Hirobo helicopters and must be the ultimate in snob value, I think, your model springing into life at the touch of a button. Starting can be from your flight box battery initially, if you want to, and then the in-flight batteries are good for several restarts, this ability being demonstrated several times during the show 'IN-FLIGHT' — and in a helicopter too! Afraid I upset Dave though by saying that I still thought of auto rotation as a party trick rather than a saver of models with engine failure.

The Morley stand exhibited again the 2c and 1/7 scale Bell 47g models, the version of

the latter with two Irvine 30 motors being not quite ready for flying, and the experimental 'Chinook' tandem rotor job. The 'Chinook,' although lifted off on the Saturday, wouldn't behave itself in the high winds so the demonstration was left to a flock of '2c's'. New items to make the '2c' better and easier to build were the preformed wire pack to make the tail boom, glass fibre cabin moulding and ballrace tail rotor hub. Items at £5.75, £6.90 and £5.18 respectively.

Disappointment was felt at not seeing the electric helicopter fly. I understand that duration of about 2½ minutes is practical on the battery pack, (if you're up longer than this due to height gained then you can't hover to land!) but hovering practise can be abundantly indulged using a car battery and

Below left: the really scale Hirobo Lema - very nice if you happen to have a spare £1,150! Below right: Vago Nordigian of Watford Models hold the interesting electric powered helicopter displayed on his well-stocked stand. Not shown at the show with on-board batteries.



R/C HELICOPTER NEWS FROM JIM MORLEY

long lead. Useful for learning indoors in the dark evenings, but I don't think the model would last long after fighting with furniture. The model comes at about £90 with both motors and speed controller (how else would you control height on a non-collective model) but battery pack is extra.

Vago Nordigian of *Watford Models* was showing a new tail boom for the '212' which, being the full length, allowed better access for jointing. Range of rotor blades were nicely made to suit various makes.

Beginning

By far and away the most frequent conversation is on how do you learn to fly a helicopter, the following letters are of interest.

Neil Grace from Oxon writes that he let work interfere with learning to fly a helicopter in 1979 but he intends to have an intensive course in the near future. He has made ten sets of blades ready for the 'prangs,' clearly a man who likes to anticipate and he should therefore do well with a 'copter. He could be wrong with the number of blades, I hope so.

Some people go for several months without breaking a single one when learning, but they are the exception. Neil says he has tried very hard to learn from books. Well, the knowledge of what is going on is very good thing, but there is no substitute for experience. Initially, in order to get the model to go up after demonstrating its reluctance, everything was checked and blade incidence adjusted, all to no avail. A change of glow-plug and near heart failure — it went up. What incidence on the blades? At what power setting? And what about angle, is it important?

Difficult questions really, except coning angle. That doesn't matter much except for the comfort of the rotor blades and models seem pretty tolerant in this respect. Power setting, of course, depends on power

Below left: Morley stand at Sandown Park Symposium showed the well proven 2c and scale Bell 47g again. New items were the fibre-glass cabin and preformed wire pack for the tail boom. Introduced to confound those who say the model is difficult to build. Below right: New venture for Ripmax. The fixed pitched Garbo Zenith helicopter from Italy.

available and blade incidence depends on so many factors, primarily helicopter weight and blade section, making it impossible to give precise answers.

With collective anyway it is so easy to adjust you must expect to experiment.

Neil has now flown his model into wind across the field at walking pace, he now finds that when it lands he has not been breathing since it left the ground. Cure this fault before you ever go to a long field is my advice!

Occasionally, apparently, an oscillation sets in and the model has to be landed quick — maybe that's why he is still alive, but this is probably due to too low rotor rpm.

Friction at the teeter, or complete freedom with stops rather than progressive dampening, can also cause this. It sounds as if the model has very marginal power, shorter blades may help. Too high rotor rpm will cause a twitchy and uncontrollable model.

Another question is whether to take the springs out of the transmitter sticks. Most experts say no, but it is a matter of personal taste. I find no "feel" at all to be absolutely hopeless, but you certainly don't want strong springs, and the throttle/collective ratchet should be very fine or free.

Good luck Mr. Grace, I hope you don't need the ten sets of blades and keep clear of long fields.

On Mixing and Learning

Had a letter from a Dave Bould in New Zealand who is building and anticipating the problems of learning to fly a helicopter. He writes that he has found this column most enlightening but tends to feel some of my comments a little tongue in cheek and says "surely having the machine tethered and only able to move a small distance both vertically and horizontally, would be preferable to having a misguided screaming collection of mechanics contorting itself on the end of a — dog lead".

I include Dave's words because I enjoyed them, but for the benefit of the uninformed he was referring to my training system of having the model tied by the tail on a 10' length of string held by the tutor anchor man.

I can assure you that my tongue was firmly behind my teeth when writing that article (Feb 1979) even when I said the system wasn't foolproof and the best dress for the anchor man was motorcycle leathers and full

face helmet, but the system does work with some people and is cheap to try. Any other form of restraint has a very dramatic effect on the flying characteristics of the helicopter and any sudden restraint, like coming to the end of free distance, can generate enormous loads on the rotor system through gyroscopic precessional forces.

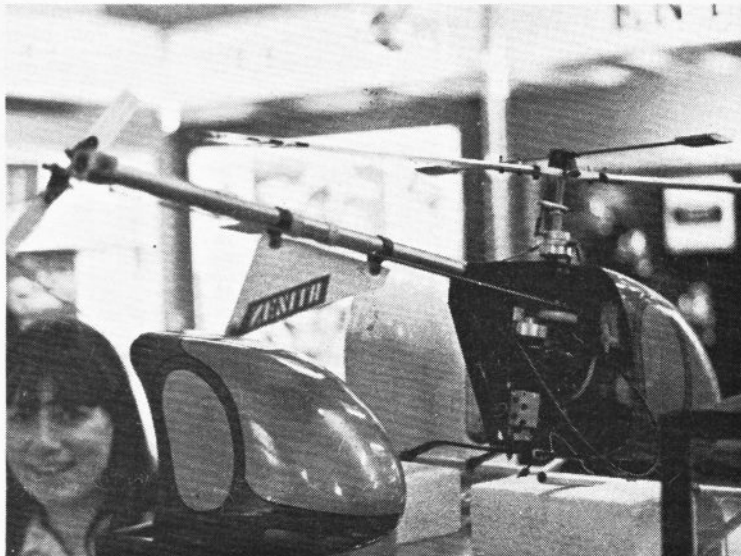
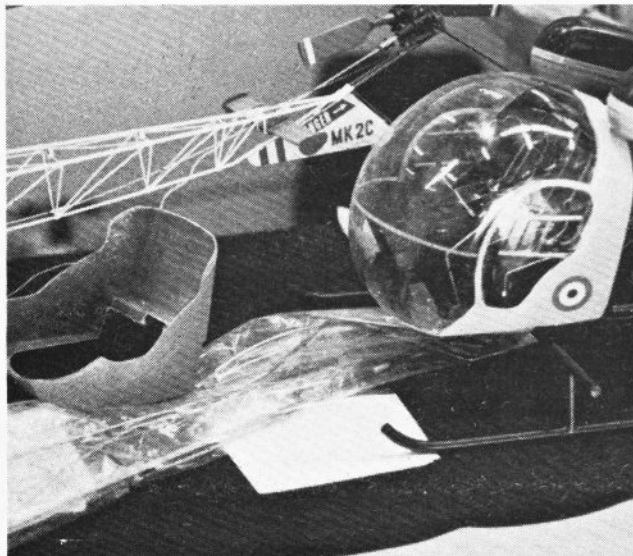
The other problems worrying to Dave is the coupling of throttle and collective pitch on the same servo. "Presumably", he says, "the turning moment around the mast increases in pitch. Therefore would it not be an advantage to have the engine revs fairly constant and then you would not have the added "brain load" of varying tail rotor pitch to compensate for increases and decreases in motor speed. This would necessitate the use of a fifth servo or channel to give separate control on collective pitch, to the throttle."

Deep thinking maybe, but not deep enough. First, the tail rotor revs are controlled by the main rotor revs, so the turning moment change due to rotor speed change is compensated for — within reason — and we are left with the turning moment change, due to the change in drag, due to incidence change with collective.

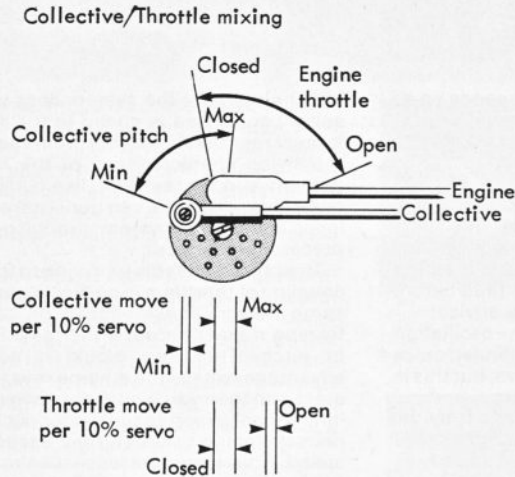
Second, the collective is not exactly "coupled" to the throttle. More "mixed" because of the differential movement on the servo disc. See sketch 1. It can be well worth while experimenting with various differential movements because the power curves (torque with rpm, and power with rpm which is something else) is very different on different engines, and drag on the rotor isn't linear with incidence either. Very often the last bit of throttle opening doesn't make a lot of difference to some engines and the rotor will speed up as you take incidence off, so giving you just as much lift and hence no sink, which is presumably why you took the incidence off.

Some models, the hairy ones, are flown with so much power that the engine will peak regardless of rotor incidence and then your tail rotor/collective compensator becomes more important. A mixing system for this is shown in Sketch 2 supplied by Mike Meachem and fitted to Morley 2c.

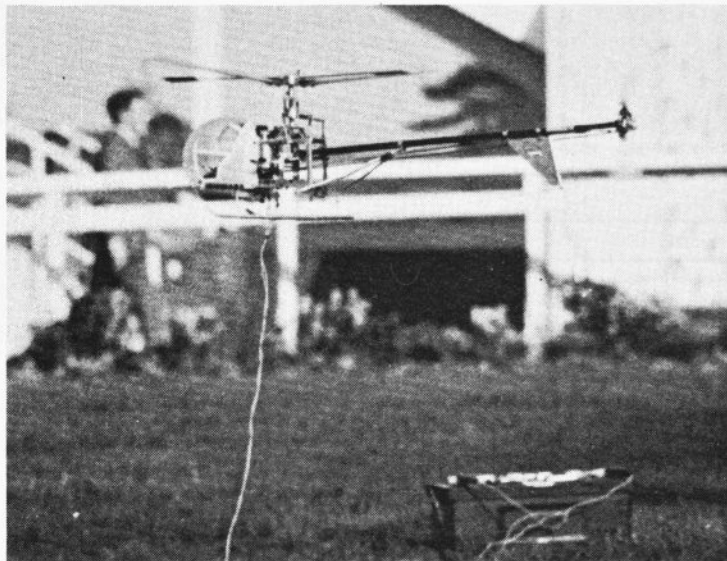
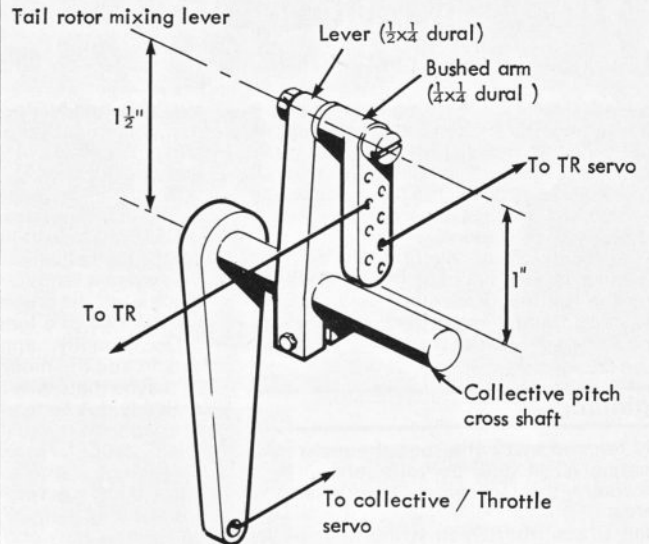
The annoying part about such good ideas to make control easier is that they can never be right. The trouble is you need to close the throttle as well as open it! I don't think a five



Sketch 1



Sketch 2



Left: the Watford Model Centre electric powered helicopter was flown with "umbilical cord" to a 12-volt accumulator during the Sandown Show by John Griffiths of Slough.

servo system is infinitely better than four, except perhaps for operating force, but it does offer scope for "on board" and "transmitter" electronics.

Governed rotor speed could be the next way to go, but its a long way from "keeping it simple".

Sanwa Black Custom (H/C)

Now, for the other approach, a note on mixing in the transmitter by Mike Young.

When the neat and functional packaging was first opened, the impression was of an outfit built with camera like quality.

The transmitter has a digital timer with a L.C.D. display which can be used to give an aural indication at 4, 5, 6, 8 or 10 minutes from setting. The 8 min. setting could be used as an indication of time in a 10 minute SMAE contest flight.

The sticks are 'closed' open gimbal type and are very smooth and light in action.

There are two rate switches, one controls tail rotor movement and gives increased throw in the 'on' position, the other controls forward/reverse and left/right cyclic. If not required both controls can be adjusted to give no change in control movement if the switch is accidentally moved.

The tail rotor compensation can be switched on/off. Coupled with tail rotor compensation is an acceleration control and a

'direction' switch which caters for direction of compensation required. In use, I have found that it is better to use mechanical mixing than use the transmitter for 'fine tuning' of the model, this prevents non-linear tail rotor control caused by the non central position of the O/P arm of the servo.

A balance control called 'acceleration' can be used to over balance the use of fast collective control. Both balance and accelera-

tion can be fine tuned to give very little tail swing for moderately fast changes in collective control.

The 5th function is a switch on the right hand side of the Tx. This can be used to switch function 5 onto the throttle/collective control. It allows the 5th function to be switched on and off. When in the off position the servo remains fixed in its last position. This sounds odd but it allows channel 5 to be used for motor control i.e. the model can be slowed in fast forward flight. (Throttle back, reverse cyclic) switch off motor in 'slow' position then use collective for auto rotation control. Coupled with 5th channel switching is a 'kill' button which gives extra throw to the 5th channel enabling the motor to be stopped in flight.

The receiver appears to be similar to the Custom FM6. It has extremely good 'CB' rejection as I found out whilst flying in Spain - even modellers in Spain use CB in their cars!

The ballraced servos are fast and powerful, fitting being helped by the very useful mounting which prevent servos scuffing on the model mounts. One annoying point being the O/P arms are on the thin side and, if used with metal links, the links have to be brushed with wax to prevent 'slop'.

In use, the outfit has more than adequate range, (with the aerial half collapsed)! At the present time full use of all possible combinations have not been yet explored.

Coming from Mike Young, that last remark is a real indication of the advanced specification of the outfit.

Right: the Irvine Sanwa Black Custom outfit as described in the text above. Excellent servos and a choice of flat or square battery packs.

