



ELI-PAD

by John Heaton

A VERY informal and friendly fly-in was held by the Torbay Flying Club on the 2nd August at the Torquay Aircraft Museum, courtesy of Keith Fordice. The flying site appeared to be his private lawn complete with surrounding rose garden, and perfect weather completed the idyllic scene.

I arrived a bit late and missed the first rounds of competition, but such was the friendly atmosphere it was suggested I should have two goes at everything to make it fair. As the afternoon progressed we all, I feel, enjoyed the competitions which consisted of skittles, picking up a weight with a hook then doing a circuit before depositing it on a board, and a scale competition.

The skittles competition was well planned, with a small marked patch to take off from before flying the model to knock over skittles placed at various distances away (the further ones carrying higher marks) then returning to the landing pad and trying again. I felt this was ideal because the closer skittles didn't tax the newcomers too much and the further ones gave the more experienced ones something to chew on.

The next competition was the 'rescue' of a weight with hooks fitted to skids. It is amazing how difficult it is to manoeuvre a helicopter with 2 inch precision. If you got two weights, one on each skid, you got double marks but only I noticed that once and I can't remember who achieved it — well done anyway.

Finally the scale competition. The judges wandered round the models and did static judging and called us round to discuss how flying would be marked. I interpreted this as simply getting high marks for authentic scale pattern.

Results of Competitions as follows:

Skittles 1st John Heaton, 2nd Dave Nieman, 3rd Ken Ford.

Rescue 1st Dave Nieman, 2nd Geoff Bell, 3rd Steve Hubbard.

Scale 1st Pete Ashford, 2nd Dave Nieman, 3rd John Heaton.

Afterwards I wandered round pen in hand to take a few details from the prominent pilots about their models.

Pat Dubock

Kavan Jet Ranger: 10-1 transmission, zero coning head, servos fitted up front of cabin. 11lbs all up weight, Webra Speed 61, special silencer, high tensile axles, wooden paddles, stops on flybar to prevent paddles hitting fuselage, mechanical tail/collective mixing as per standard, main shaft supported on metal pillars, wide Expert blades and little teeter. I support this was the most modified model in the

Jeff Bell, owner of the Torquay Model Village, hovers his model of a Royal Navy Sharks display team *Gazelle* at a display at Tavistock. (Photo by Chris Wool).



meeting. Pat certainly seemed to like Kavan *Jet Rangers*, my only comment is that I couldn't, by just seeing it fly, understand the advantage of the very high revs he was using. Any comment, Pat?

Dave Nieman

Dave had three models plus the full size *Hughes 300* he flew down in. I felt very envious in view of the perfect weather conditions and remembered the Bretons event last year when we both turned up in full size. I think it is the most enjoyable mode of transport yet devised and I don't think the thrill of wafting oneself from lawn to lawn will ever dwindle. Some of the pleasure I find is in the way things change when flying a helicopter. For example, on a clear day in the country you can really enjoy poling around the sky but consider the very different workload which might appear, as on my trip to Sandown earlier this year. I took off from Blackbushe in pouring rain with a 400 to 500 foot cloud base and immediately called up London Heathrow. Believe me, just changing frequency that soon after take off while you are sorting yourself out in bad visibility is not easy. I was told that my request to route via H3 was a negative, due to the runway in use, and I must go via H9, which is the Gatwick-Heathrow link, entering the link at Oxshott station. This sort of change of plan immediately put up the workload considerably, as you are trying to hold a heading, get ground references and then have to study a map. That's the time the controller comes through and say "Change to Heathrow approach on 121 decimal" whatever it was. Are you getting the idea? I think the workload on the particular flight was the maximum that I could possibly cope with. Funnily enough, going back to Thruxton when the sun came out was an absolute doddle.

Anyway, back to Dave's models *Falcon 808*, O/S 50, J series with 5 servos, zero coning, new gear ratio (spin up tail, slow down head), transmitter mixing used. *Cobra*, O/S 60, J series 5 servos, no free wheel.

Gazelle, same specification but interestingly this model was made by the factory and left by the Japanese demonstration team after Woburn last year — nice paint job.

Steve Hubbard

1st model, *Hirobo Jet Ranger*, Webra 61, 5 servos Sanwa helicopter set — transmitter mixing used.

2nd model, another *Ranger*, same basic specification but tail speed up — 808 head parallelogram pitch up — not much flying time yet but hopes for aerobatics.

Geoff Bell

1st model — *Hirobo Gazelle* — Webra Dynamix — Robbe radio with 5 17 M servos — throttle hold facility but no mixing.

2nd model, *Lama*, HP 61, 5 17 servos. 61 is a bit too much he reckons.

Pete Ashford

Pete, having a welcome return to flying after a two year layoff — old type *Iroquois* — 5 servos J series, transmitter mixing, autorotation free wheel, heavy duty tail blade holders. Pete has recently changed to a O/S FSR as he had two engine failures with the original tired lump, luckily with no damage either time.

Ken Ford

808, O/S 50, section of Kavan blade 4 inches long for paddles, zero coning angle head, Sanwa helicopter set with transmitter mixing, Hirobo silencer without baffles.

It appears that I am in the minority by not using a special set with mixing, etc., but I could not detect any advantage by watching these devices in action. In fact, when I trimmed out a chap's *Baron* recently, we nearly had a nasty because he had given me a transmitter and inadvertently knocked a rate switch on. Therefore no control. Still, a great day and thanks very much.

Coning angle topics

I read with interest in the BRCHA news letter that Ken Ford (who was doing some very smooth manoeuvres with a *Jet Ranger* with the Nats. last year but to my relief ran out of time, has been playing with an *808* and found the handling to be superior to Pat Dubock's Mk. II. Apparently they put this down to the fact that the *808* has no coning angle on the rotor head.

Will, gentlemen, for what it's worth here is my view. If you consider that a helicopter is hovering the blades will adopt a certain coning angle. This will depend on; 1, weight of the model; 2, rotational speed of the rotor; 3, weight of the blades.

In other words the coning angle is decided by variable factors and not the way the blades stick out of the head. If you have a heavy model with a zero coning angle head, low revs, a lot of pitch and light blades, the blades bend up to a considerable angle. If you have a model with considerable built in coning angle, a lot of revs and heavy blades, then centrifugal force pulls the blades out and down to a nearly zero angle. It seems the best you can do would be to find the natural coning angle for your chosen set up, and then have that angle built into the head. However, I cannot detect the slightest difference between various coning angles, but find the things that do make a difference are:

- 1) paddle weight
- 2) paddle span (i.e. length of flybar)
- 3) geometry of the mixing levers
- 4) Leverage between swash plate and blades
- 5) swash plate movement
- 6) rpm of system
- 7) weight of main blades
- 8) main blade span

As a matter of interest, I usually find there is only one thing one would want to alter on head behaviour and that is the speed of response. To slow down the response; increase paddle weight, reduce rpm, reduce swash plate movement, decrease width of flybar, increase blade weight, decrease paddle area, increase main rotor span, and/or fit lighter rotor blades. The reverse applies if you want to increase response.

The one that I have left out is the amount of teeter. On a sophisticated machine this is usually in the form of a hinging main rotor with limiting rubbers. Within reason I would say that the more teeter is restrained, the more responsive the head becomes. The problem is you need a bit of flexibility to take out the judder of the advancing blade in forward flight. The exception to this is a machine like a *Heliboy* with a very high blade speed where the vibration is too fast to see.

In my opinion too much response is a bad thing as it frightens off newcomers and makes the helicopter fly in a less authentic manner.



Steve Hubbard shows off his helicopter flying skills with a *Jet Ranger* model belonging to the Torquay Model Village.

Only two machines that spring to mind as having responses that are too slow are the *Helibabies* and the original Schluter with the solid metal paddles. I think nearly all the machines on the market today have adequate response.

Collective choppers

A little dodge I have found during the last few weeks concerns newcomers learning to fly, who find a problem in that when they slam the model down a in a bit of a pickle the blades flex down and smash the boom. I found that by reducing the collective pitch range for learning you get a twofold advantage. One, when you slam the model down the pitch is not reducing as much so it comes down slower, and secondly as the blades are at a positive angle when the collective lever is fully lowered, they are always lifting, whereas if they are reducing to negative pitch, they are aerodynamically trying to force themselves downwards. If this combines with a heavy landing you get a boom strike. When you start landing with more finesse change back to full range.