



# vario PHOENIX review

## Martin Briggs builds the Vario Phoenix

Another way of putting Heim mechanics into a pod and boom format. This time with very little to do in the way of fettling and finishing.

sion into trainer configuration made for a very unusual appearance. For those that are unfamiliar with the model I will explain in slightly more detail. The relatively low position of the tail drive obviously determines the low position of the tail boom (which carries the tail drive wire). This in turn means that a

position, which is much higher and further forward than we are used to, this makes it impossible to fit a conventional silencer — without cutting large holes in the canopy. (That last bit was added just in case Dave Day reads this). Alternatively, if a tuned pipe and manifold are used, again if any kind of con-

ventional looking canopy is used, then the manifold would have to exit where the cabin window would normally be — not a pretty sight.

Next to appear was the Robbe Avantgarde. This was a more acceptable model because it had an all enveloping body of quite attractive proportions



### The concept

Ever since Ewald Heim produced his stunning Star Ranger design back at the beginning of this decade, many attempts have been made to transplant his mechanics into a pod and boom trainer layout.

The first commercial offering was by the designer himself which he called — not surprisingly — the Star Trainer.

Now the Star Trainer didn't exactly catch on in the U.K. because it was just a little unconventional in appearance — to say the least.

There were two reasons for this. Firstly, it was designed as a minimum fuselage with little thought given to aesthetics and secondly, because the position of the engine and tail drive output were (and still are) in a very different position to any other design. Therefore the conver-

long stalky undercarriage is required to gain the required ground clearance for the tail rotor disc. The alternative is a higher cross-strut at the back which makes the model sit on the ground in a nose down fashion. This gives the necessary clearance when the model is not producing lift but care needs to be taken during take-offs and landings. This is the usual way of doing the job but in most cases a long fin is fitted to protect the tail from careless handling.

On the point of the engine

*The new Vario sideframes. Also seen here is the 3 point C.C.P.M. swashplate linkage via ballraced bellcranks, optional ballraced clutch with larger pinion and three blade cooling fan.*



*The ungainly but characteristic nose-up appearance in the hover is due to the mechanical layout peculiar to all Heim trainer variants.*

which extended back to the horizontal stabiliser. As did the later Vario Starlight which appeared much more recently.

The latter two versions however missed one important point about pod and boom models. Which is that they should have easy access to the radio, fuel tank and glowplug etc. This is what must have been in the



*The removal of two small screws allow the canopy to split for removal without dismantling the exhaust system.*

### The kit

Like all the Vario's designs, the Phoenix is available as a full kit including the mechanics or as a body kit only. We had the latter but also obtained the new full length sideframes.

These new sideframes now provide all four mounting points which means that a wider variety of motors can now be fitted, since the engine cylinder head is no longer used as part of the front mounts. For example, how about a 90 or 120 four stroke, with of course the alternative and apposite 7 to 1 gear reduction that Vario offer?

Servo mounts are also incorporated in the new sideframes to accommodate all variations of C.C.P.M. swashplate control.

Another nice feature of Vario body designs is the moulded in cooling duct. First seen on their Long Ranger and now incorporated in the Phoenix (and others probably). The advantage here is that any residue from leaking exhausts or throttles is blown out to atmosphere instead of accumulating in the shoebox.

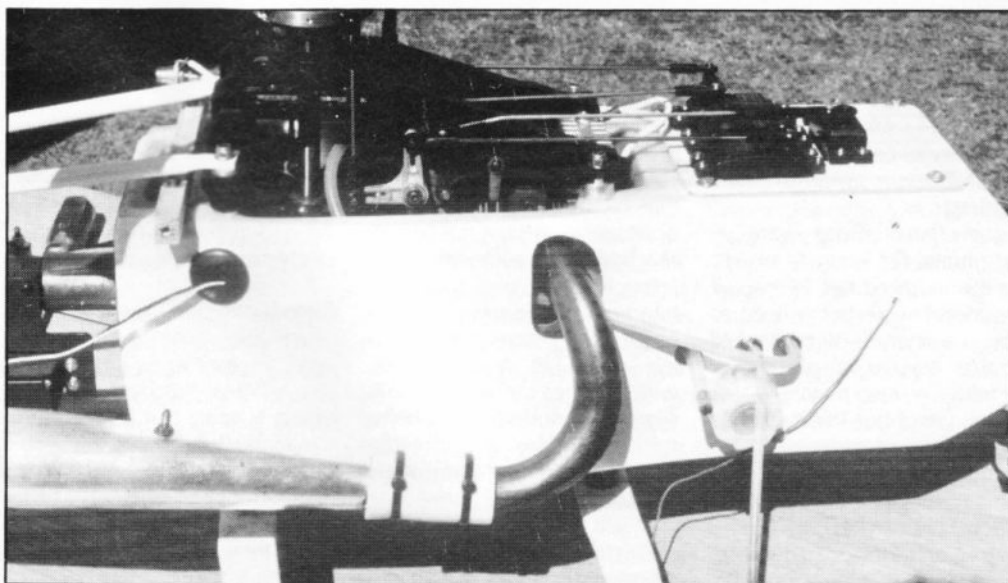
Talking of the shoebox, this is moulded in epoxy glass — in glossy white — with a surface finish that is so good that no painting is necessary. As is the canopy but here the windows, air intake and manifold holes need to be cut out to the clearly

mind of the designer of our Vario Phoenix.

Here we still have the basic 'shoebox' design that is peculiar to all the variants but the Phoenix is unusual in that it has

a more conventional canopy, both in appearance and method of attachment, i.e. can be removed quickly, undoing three knurled headed 4mm screws — except for (and this is one prob-

lem that Vario couldn't overcome) two small self tap screws which when removed allow the canopy to split and pull over the manifold. See photos.



*C.C.P.M. with conventional radio layout means that the mechanics can be withdrawn from the body without disconnecting the servos from the receiver. Remote glow connector can be seen beside the canopy beam mount.*



# Phoenix rising

Alfresco tailrotor servo position can be seen here along with revised boom support front anchor point and the provided support for the tuned pipe.

and accurately marked lines.

## Assembling the parts

Assuming that the completed mechanics are already at hand, the builder has very little to do. Which is just as well really, since no plan is included and the written instructions are in German. Jim Fox (our northern Vario distributor) is working hard to translate them into English, he tells us.

The options we chose and the alterations we made were as follows.

1. A 9 to 1 gear reduction (one of many variations available from Vario) was used in the



Black and red trim on the canopy is Solartim, u/c, tailboom and tail feathers are pre-coloured in red and white at the factory.

Phoenix, so that we could get a good rotor speed with a sensible engine speed. Approx. 1650/15000.

2. C.C.P.M. was used, but the servos were mounted remote from the sideframes and linked to the swashplate with 2.5mm pushrods via Kalt ballraced bellcranks.

3. The tailboom support tubes (front end of) were mounted on the rear mechanics mounts instead of the recommended position on the wooden beam canopy mount. We consider the latter to be a potential weak point.

4. The optional (Vario) 'Driven tail' autorotation unit was fit-

ted, to evaluate its advantages over the standard item.

## Finishing

No work was required here except to clean the canopy of grease marks accumulated during the construction sequence. This done, the striping was added using Solartrim followed by the decals provided in the kit.

## Flying

Flight characteristics were as per normal for Heim — except for the modified tail. Perhaps if the model were being used as a basic trainer, its owner would best be advised to use heavier paddles — Kalt maybe — or flybar weights. These would give a control response more suited to a beginner.

## The driven tail

By this of course we mean that the tail is driven constantly,

even when the model is in autorotation — which is why it is fitted.

The device was first conjured up by F.A.I. competition fliers who wanted to tidy up and make easier the 180 degree auto, the final manoeuvre required by the current schedule.

In practice the constant drive does improve this manoeuvre, especially if the required direction of the 180 degree turn is opposite to the natural turning reaction of the model, i.e., a Heim model which has a left hand rotation to the main rotor, has a natural tendency to turn left when in auto rotation, which makes a right hand 180 slightly uncomfortable in heavy wind conditions. With the auto clutch placed upstream of the tail reduction gear, this is no longer a problem as the rudder stick can still be used to steer the model round.

So, an obvious advantage in competition of course, but at a price. The added drag of the driven tail rotor has the effect of prematurely decaying the main rotor speed and care is required to ensure that too much inertia isn't lost too early in the approach.

To the sport flier, there is no real advantage, we felt that it severely reduced our autorotation repertoire — a condition we found intolerable and elected not to use it any further.

## Conclusion

Vario still haven't achieved what appears to be impossible, i.e., a really attractive Heim based trainer, but if you can overlook that then the Phoenix makes an ideal aerobatic trainer which goes together very well if built by someone who knows what he's doing or can read German instructions. □