

THE QUIET ZONE

R/C SCALE ELECTRICS BY PETER RAKE

be wondering just what you're going to do with that useful looking radio gear salvaged from the wreckage of your ARTF model you got as a gift. Even if it was a rotary winged devil (helicopter) it won't matter. Four channel helicopters have very similar innards to ARTF aircraft so you should still be looking at a PC board with integral ESC and servos that can be used in a three channel, fixed wing model. If so, you're in luck because that is precisely what you're getting this month.

Unlike my usual practice of only presenting half the plan per issue (the construction article will continue next month), this time you get the entire plan and just a little waffle from me. Okay, I'll admit it; I'm fed up with forgetting which part of the plan you already have. Just put it down to deteriorating brain cells due to age. It comes to all of us eventually, so it's pointless you smirking. That being the case, it means I have limited space here, so I won't waste any more of it waffling.

The White 'sport' Monoplane

The original aircraft was sold as a kit of parts for home assembly. You provided your own engine, usually in the form of an ex-motorcycle item. Being American, it would probably be stripped from a Harley or Indian.

As such, there is precious little information about the full-size aircraft. That in itself isn't necessarily a disadvantage because it gives us a pretty much free hand with regards colour scheme. With that in mind, I finished my model as I might have done

Yes, it's that time again, so it's no use you trying to hide. That b****y man is back again to bend your ear with more electric flight meanderings.

Now I'm trying to recall exactly when this will appear on your doorstep. Whenever that might be, it's likely to be some time after Christmas. Just about the right length of time after for you to

**NOTHING VERY COMPLICATED INVOLVED IN BUILDING THIS MODEL.
BUT FULL DETAILS WILL APPEAR NEXT MONTH.**



a full size machine built with these fair hands. Whatever, I like the way it looks and that's really all that matters.

The model

As is usually the case with these small models, this one is a scaled down, and lightened, version of a previously successful design.

The equipment used is a Vapor 'brick' (receiver, servos and ESC all in a neat, convenient size block), an AEO 7 mm motor unit and 160 mAh LiPo cell. Pushrods are nothing more complicated than lengths of 1mm carbon rod with bent pins attached at each end using a short length of heat-shrink tube and a spot of CA glue. No adjustment is provided but getting the length correct isn't difficult if you don't CA the control horn end until you have everything connected.

Those rather fancy looking spoked wheels are typical of the prototype but in this instance are something of a cheat. I could have spent more money than the rest of the model cost and bought a pair of lovely, but delicate proper spoked wheels but I'm too mean for that. Alternatively I could have made my own spoked wheels but wasn't in the mood for that sort of thing at the time, so I compromised. The wheels you see on the model actually came from a toy cycle. You know, one of those things that are intended to be used with ramps and jumps. *Finger bikes* I believe they call them. Actually you'll probably need two of them, because the front and rear tyres are different. However you do end up with two sets of very serviceable wheels for less than half the price of one set of less serviceable proper spoked wheels. If you aren't worried about the spoke pattern they can be even cheaper. Quite often our local pound-shop has finger bikes in stock and sometimes they even include an extra, different style pair of wheels. Just bear in mine that even hideously non-scale wheels can always have card 'covers' fitted to turn them into more scale-like wheels. Definitely worth searching out because I assure you there will be other models of around this size in the not too distant future.

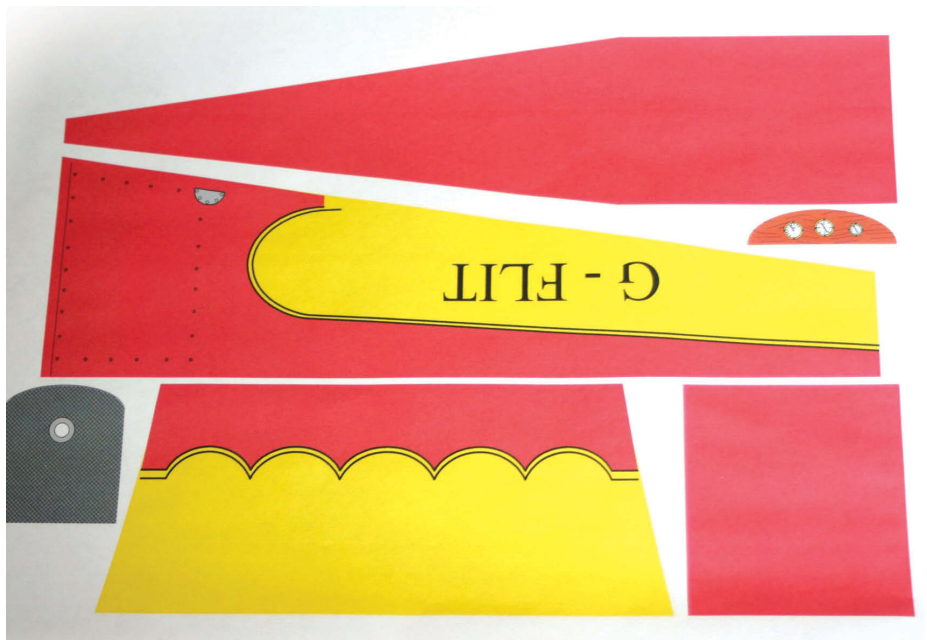
It's a cover up

Yes, pathetic isn't it? However, how my model was covered is worth looking at before I finish for this month.

Just recently, I've been getting fairly heavily into printed tissue finishes for my small models. At my first attempts, it seemed awfully complicated and prone to problems. However, I think I've worked out a method that works well pretty much every time now, so I thought I'd pass on my findings.

The first thing you need to be aware of is that if you intend to water shrink your tissue after it's applied to the model, your inks will need to be waterproof. I use an *Epson* printer and *DuraBrite* inks, so that isn't an issue. Much the same applies if you like to apply your tissue wet; waterproof inks are essential.

Next we need a means of getting our printer to feed the tissue without gumming up the works. To do this, we



A test print, on plain paper, of some of the tissue patterns. Should you want them I can supply files for the tissue.



A sample of the swirled Oracover before it is applied to the model. I got carried away and now have enough for several more models.



The 'spoked' wheels, stolen from a toy cycle, are reasonably light and much stronger than more expensive model wheels.

need a carrier sheet to attach the tissue to. I've tried various methods, with equally varying results. I could never get Spray Mount right. It's so smelly that it has to be used outdoors, and out there either most of it blows away or I get too much on the carrier sheet. A carrier sheet from which you can't remove the printed tissue is worse than useless.

Another method is to tape the edges of the tissue to the carrier and this almost works for me. Unfortunately however, as the ink hits the tissue, which is unsupported in the centre, it swells and bubbles up sufficiently to foul the print head. The end result is random patches of smudging on the printing. For some strange reason, these smudges always seem to be black, even when there's no black printing involved.

Far and away the most successful method I've used is to attach the tissue to an A4 size sticky label with most of the stickiness removed. Since we only need it slightly tacky, I find the easiest way of removing the stickiness is to apply to and remove the label from a carpet a few times. Do this until there is just enough stick left to hold the tissue in place, but without making it difficult to remove.

With the label prepared it's just a case of smoothing the tissue onto the carrier, shiny side outermost, trimming to fit and feeding it into your printer. What I have found is that the ink will penetrate the tissue slightly and, to some extent reactivate the adhesive. Therefore, the less ink you use the less is the problem. I like the 'text and image' setting on my printer, with it set for envelopes to just



The Oracover ironed onto the nose gives a very good swirled aluminium effect. Cockpit coaming is just insulation stripped from electrical wire.

slightly raise the print head.

Once the printing is done, carefully peel off the tissue and smooth the next piece onto the carrier. I've found I can print at least an entire model's worth of tissue using the same label.

As regards the nose area, that is covered using chrome Oracover that has been 'swirled' using a piece of green scouring pad and Dremel. I just

glue (CA) a small patch onto a little grinder and lightly move it over the Oracover prior to ironing it in position.

I can see I've run out of space again, but we can continue this next time, when we'll also deal with actually building the model. In the meantime, should you have any queries, you'll find me at PETERRAKE@aol.com ■

DOING HER AIRBORNE THING, THE LITTLE WHITE MONOPLANE MAKES AN ATTRACTIVE MODEL.





wrong correction and the model promptly shredded itself through a barbed wire fence.

Getting on

Anyway, that's enough inane rambling for the time being. As we left things last time I was detailing how I printed the tissue for my model. All well and good, of course, and extremely interesting stuff, but no use whatsoever unless you have a model to attach it to. That being the case, let's take a look at actually building the model.

Wings

There's nothing particularly complicated about building the wings; pin down the spar and trailing edge and glue the ribs in place before fitting the leading edge. However, there are some points worth mentioning.

As you may be able to see from the photos, I adopted a couple of 'belt-and-braces' techniques while building my model. Having previously seen just what damage water shrinking tissue can do to these little lightweights, I gusseted the ribs at the trailing edge. I was using laser cut parts to build from and decided the ribs might just be a little on the soft side for my liking. Similarly, and for the same reason, I didn't want the root rib to bow inwards as the tissue shrank. Therefore I trimmed it by 1/32" so I could add some sheet balsa reinforcing. I was watching the weight, so only 'capped' that single rib. There's nothing to prevent the entire root bay being sheeted, but it isn't essential. The partial sheeting on my model worked just fine, so it should work for you if you are watching the grams.

It is quite important that the root rib doesn't bow inwards because that's the bit you'll be gluing to the fuselage when you attach the wings. These lightweight models don't need hugely strong structures, but it is awfully nice if it's more than just the extreme leading and trailing edges that are glued to the fuselage. The struts do add a little strength, but are intended to be far more cosmetic than functional. Given flat root ribs, and a thin coat of epoxy retaining the wings, my model has proven more than strong enough - even, I might add, in some less

PETER RAKE CONCLUDES THE CONSTRUCTION OF HIS 17.5"(445MM) SPAN INDOOR-SCALE WHITE MONOPLANE FROM THE FULL-SIZE PULL-OUT PLANS THAT APPEARED LAST MONTH.

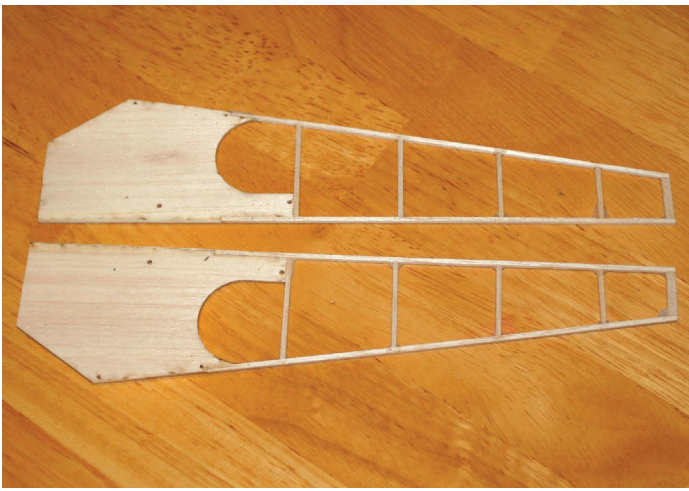
Here we are again, back for another dollop of electric flight nonsense. I'm sure you've all been awaiting this month's issue with bated breath. If not, why not? Even if larger models are what float your boat, there's been nothing preventing you enlarging the plans you got last month to whatever size you fancy. Since it was actually a scaled down version of a 45" span model, with only minor alterations along the way, it's a highly practical way of acquiring a much

larger model. Enlarge the drawings by 300%, reduce the thickness of the ply parts and wing ribs and you have the basis of a very nice 54" model.

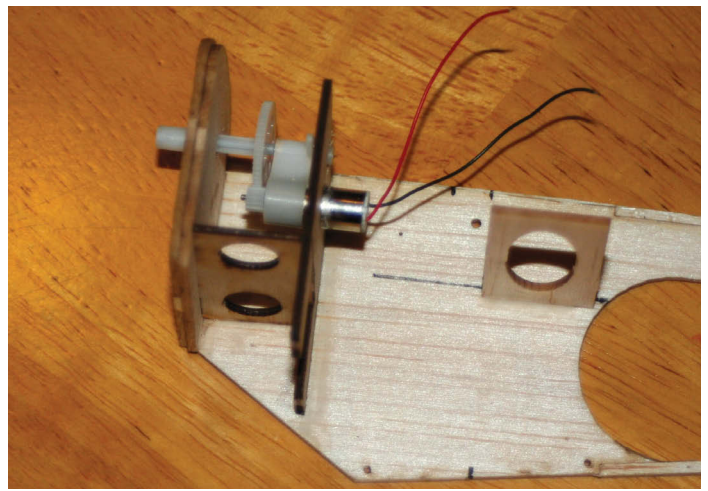
Because nothing much aerodynamically has changed from my own larger version, you can expect your enlarged version to be a smooth, gentle flyer. My original model only met its demise when, flying in the evening, I lost orientation as it passed across the low sun. I thought it had turned one way, but it had actually turned the other way. The result was that I put in the

COVERED USING PRINTED TISSUE TREATED WITH EZEDOPE THE LITTLE WHITE MONOPLANE IS ALL READY TO COMMIT AVIATION.

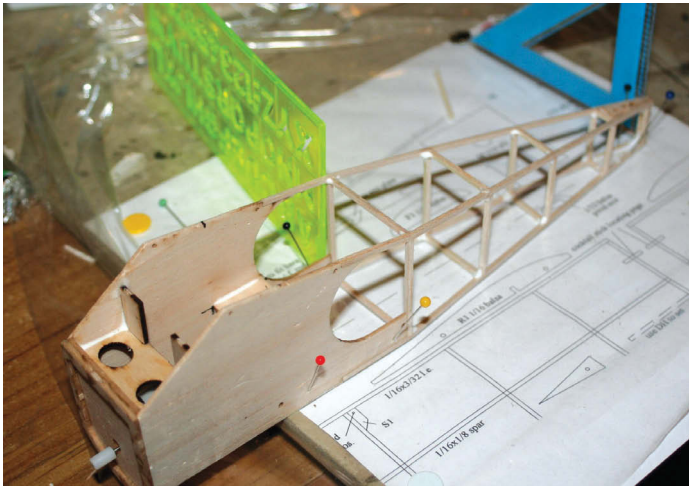




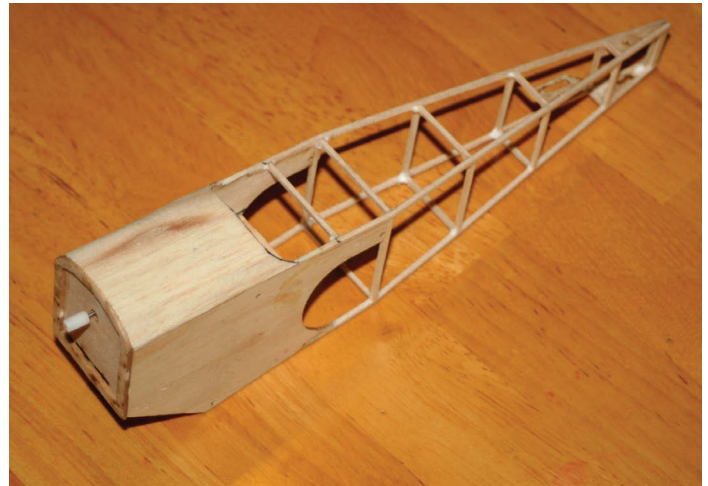
Starting in the traditional manner, two fuselage side frames are built over the plan.



The motor goes in quite early in the construction, along with ply formers, battery tray and a plate to mount the receiver brick to.



With the second side added the longerons are cracked, the tail pulled in and cross braces fitted.



Once the decking is added it's time for some sanding - followed by a final reinforcing of glue joints.

than perfect landings. True, a full power dive into the ground, and ensuing cartwheel, would probably do severe damage but in normal use the low inertia of a light model does very little by way of harm.

Tail surfaces

Building the tailplane and elevator is simplicity itself. If you need instructions to glue a few balsa sticks together I would suggest that just possibly aeromodelling isn't the best hobby for you. They tell me that stamp collecting is quite relaxing.

What I will say is that, once again, I deviated slightly from the plan. Although the sewn hinges shown work very nicely, I'm not that good at them. Therefore, I opted for small strips of sanded floppy disc material and hinged the elevator in the usual way. Any thin, flexible material will work, but I had the discs available, so that's what I used.

Something I have found really good for fitting this type of hinge is a tube of CA gel type glue. The one I actually used is from *Deluxe Materials*, but I suppose others are much the same. What I like about it is that it has a specified ten seconds setting time; just long enough to partially slot in the hinge, apply a spot of gel and slide the hinge into place. Once you have all the hinges glued to one part, the tailplane say, you can position the elevator just onto the hinges, apply a spot of gel to them all and then slide the

elevator home. The beauty of it being a gel is that it can't run where you don't want it - like along the hinge line.

The hardest part of building the rudder is probably laminating the outline. For this I used a continuous strip of 1/16"x1/32" balsa with one end sanded so it feathers to nothing. This will allow the strip to simply be wound around the former (2mm Depron) without forming a bump. The outside 'step' can be sanded away during the final shaping stage. So, the outline strip was well soaked in warm water, had white glue applied along one surface and was wrapped round the former and allowed to dry completely. The excess strip was then trimmed off and the rudder built over the plan.

It's worth mentioning that I rub the edge of the former with a candle, to prevent the laminated outline sticking to it. I'm not keen on using pins to hold the laminations in place while they dry because wet balsa tends to be very soft and is likely to be marked by the pins. To hold it tight to the former I use scraps of balsa strip, which are also waxed, pinned against the laminations. Although it takes a bit of care on this particular model, it helps if you keep the strips under tension as you work around the former. By pulling them against it, pinning scrap bits of balsa as you go (yes, I do think only having two hands is a design flaw when it comes to modelling) it helps getting the strips

around tight curves without them cracking. Even if you do get the odd one crack, the stresses on this type of model aren't likely to make it a problem; it's just much nicer if you can avoid the cracks.

The other part that needs care is drilling the rudder to accept the 0.7mm carbon rod hinge post. I did this before finish-sanding the rudder and then used CA to glue the rod in place. A 1/32" drill and a pin vice gave the control needed to keep the hole central in the outline. If you're very sure of your drilling skills the carbon rod can extend into the cross piece. I'm not, so just drilled the outline and glued the rod to the upright.

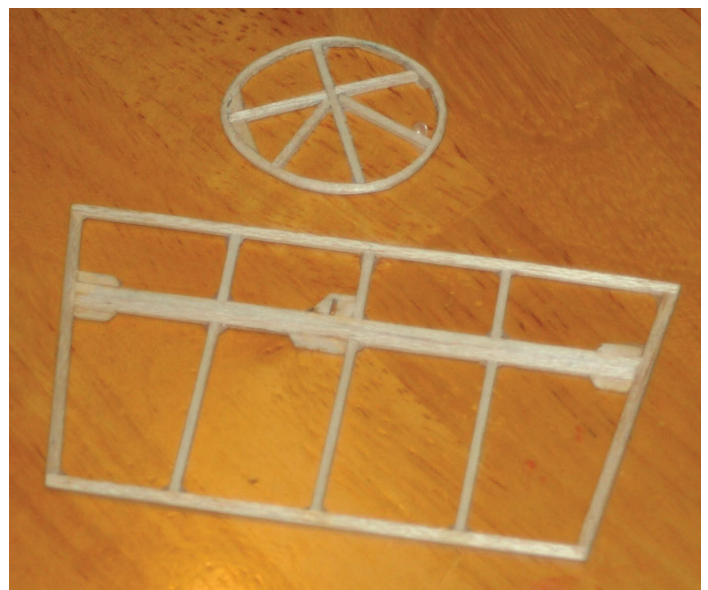
The control horn gets glued to the hinge post after the rudder is covered, so you can still pin it down while the dope dries.

Fuselage

Okay, with the easy stuff out of the way, let's take a look at building the fuselage. No, no need for panic, it really is very straightforward. The only things you really need to watch out for involve positioning the receiver brick as shown and getting the pushrod exits in the correct place. As shown, these were worked out to be precisely right so the pushrods don't bind as they exit the fuselage, so you have been warned not to play around with the receiver location unless you want to work out where the pushrods will exit on your particular model.



The wings are easy to build but if your ribs are soft you'll need to reinforce them with gussets at the thinnest point.



The only difficult part of the tail surfaces is the laminated rudder outline - and drilling it accurately for the hinge post.



You just have to have at least one naked model photo in a construction article, so here it is.

Begin by building two side frames over the plan and allowing the glue to dry. When doing this, I like to build one side, allow it to dry and then turn it over before building the second side over the first. Balsa is well known to be only approximately the claimed size, so it's quite likely that the surface that wasn't against the board will be less than completely level. If you just build directly onto that, your second side will end up with both sides uneven. Theoretically, by turning over the first side, you'll have a completely flat surface onto which the second side can be built. By making these the inner sides, all glue fillets will be away from the surface you need to sand and any unevenness can be sanded away when you finish-sand the fuselage.

I'm sorry if this is all 'old hat' to many of you. There's just a chance it may be new and useful to less experienced builders. The model is certainly simple enough to appeal to just such neophyte modellers.

From here on, it's all basic building. Mark the former and receiver tray positions onto the inside of both fuselage frames. Score and crack the frames as indicated on the plan (where they suddenly bend inwards) and glue

the formers, receiver plate and battery tray to one side. Fit the second side, ensure everything is square and join the sides at the tail. Don't fit F1/N until after you have your motor fitted or you won't get it in. These steps can be accomplished with the fuselage inverted over the plan - the beauty of having a perfectly straight fuselage top line. While the fuselage is pinned down, you may as well fit the 1/16" sheet at the undercarriage position and the tailskid mount.

When it comes to mounting the motor, you'll notice that no down thrust is shown. With the relatively high thrust line it isn't needed and could actually prevent your model flying. The first White Monoplane I built, a 30" version, had down thrust initially and point-blank refused to do any more than a protracted glide to earth. No amount of up elevator or tail weight would persuade it to do more. Then the penny dropped that the centre of thrust is above the centre of drag, so I added about half a degree of up thrust and the model was totally transformed.

Once your motor is installed (I epoxied mine in place), the F1/N assembly and battery tray can be fitted. Follow that with F2, the 1/32" sheet decking and TP

and you have a basically finished fuselage. Now you just have to finish sand all the components and get your model covered.

More on covering

Last month we looked at how I print the tissue used to cover the model, now let's consider applying it and finishing the covering. Until recently I've been using a glue-stick to attach the tissue, but this can be a little imprecise when trying to line up printed tissue panels. It can be done, but tends to become something of a chore to get right. Since the tissue I use has wet strength, and is printed using waterproof ink, good old tissue paste is a much better option. It allows a certain amount (quite a bit actually) of 'slip', allowing accurate alignment and precise location of the various pieces of tissue. You can also tease out all the wrinkles, so that your tissue goes on very smoothly even before you do any water shrinking or doping. The more evenly you get it onto the model; the better will be the end result.

Cover the entire model, but leave the fuselage bottom until after you have your receiver and pushrods installed.

A real boon to 'coffee table modellers' that I recently discovered is a product called *EzeDope* (another *Deluxe Materials*

product). Unlike smelly old cellulose dope, that really does need to be used outdoors, *EzeDope* is virtually odour free and can be used in the house with impunity. I absolutely hated the product when I first tried it, but now use nothing else. The secret is to thin it at least 70% with water, and then apply it using a sponge 'brush' about an inch wide. Take care not to leave any droplets or runs on the surface and it gives really good results - without stinking out the house.

The *Oracover* irons onto it very nicely.

Installation

As described last month, the pushrods are 1 mm carbon rod with ends Z bent from pins (being the mean so and so I am I use modelling pins that are bent or have lost their head). These pins are secured to the carbon rod with a piece of heat-shrink tube and a spot of CA. However, I like to leave the rods very long, and fit the horn end pin after they are installed in the model. I make one rod longer than needed and the other a lot longer than needed and trim them to length once the linkages are completed and adjusted.

So, begin the installation by fitting the pushrods to the receiver brick and, working from the fuselage bay immediately aft of where the sides break inwards, slip the very long pushrod through the fuselage and out of its' exit plate. Because it was so much longer you can work it into place without the risk of putting the other pushrod through the covering. Now, with the first rod safely



Swooping in (?) for a low pass the model shows off its' simple, but attractive lines.

located, you can repeat the process with the second pushrod. Apply a small amount of Uhu Por to the brick, taking extreme care to keep it well away from the servo gears, slip it into the fuselage and attach it to RT. Allow the glue to dry completely before proceeding.

Slip the heat-shrink tube onto the pushrods, but don't glue them yet. Fit the control horns (epoxy) and insert the Z-bent pins (the rudder needs to be in its' hinge tube for this). Slip the heat-shrink over the pins, centre the servos and control surfaces and apply a spot of CA to secure the pushrod ends. Now trim off the excess carbon rod. I find nail clippers extremely handy for this task because they can work in restricted spaces and cut the rod cleanly.

Now you can finally cover the lower

fuselage and fit the u/c to complete your model.

Flying

Well, what can I say? Being just a reduced size version of a proven design, the model flies much like its' larger sisters. There's ample power available for gentle cruising around and, despite that strange rudder (about the only curve in the entire model), it responds well to control input.

It isn't, or intended to be, aerobatic, but does put an interesting, unusual shape into the air. It may well be suitable for indoor flying too, but that rather depends on how big your flying venue is. The one we use is nowhere near big enough for anything much more than a Vapor or Nano Stik, so I fly outdoors on calm days. ■



**WAFTING OVERHEAD,
THIS LITTLE MODEL
HAS PROVED QUITE
EASY TO FLY.**