

ADONIS



**This stylish F1A
displayed lots of
potential at the
Nationals. Over to
Geoffrey Archer for
the reasoning behind
the project**

ADONIS WAS conceived out of an idea to create a model capable of performing respectably in an 'average' contest with the minimum amount of practice necessary on the part of the flyer. Although aeromodelling is thoroughly in my blood, I have relatively few opportunities to fly, especially at all-day rallies...

The model has achieved all that it was assigned to do in most cases better than expected. In particular, its thermalling abilities can only be described as outstanding. I have not bothered to incorporate a circular tow system, but in most cases this is no real disadvantage except in very still conditions.

To help you understand how the design came about, here is some background. I started modelling at ten years of age and have always concentrated on free-flight. Adonis is the product of an eight-year rest from the hobby, or more truthfully, this amount of time with no flying and building, but with brain still thoroughly involved. My 'second beginning' came in

1977. Now having a young family, I found that time was scarce, so in order to give my family the fairest deal, my modelling had to be concise and effective. To achieve the best results I considered it essential to set about the design of my new contest A/2 as one would design a piece of engineering machinery - by understanding first what the model had to do and then establishing the design criteria.

I will now explain the principles as I believe that even the most experienced modellers sometimes miss this fundamental reasoning.

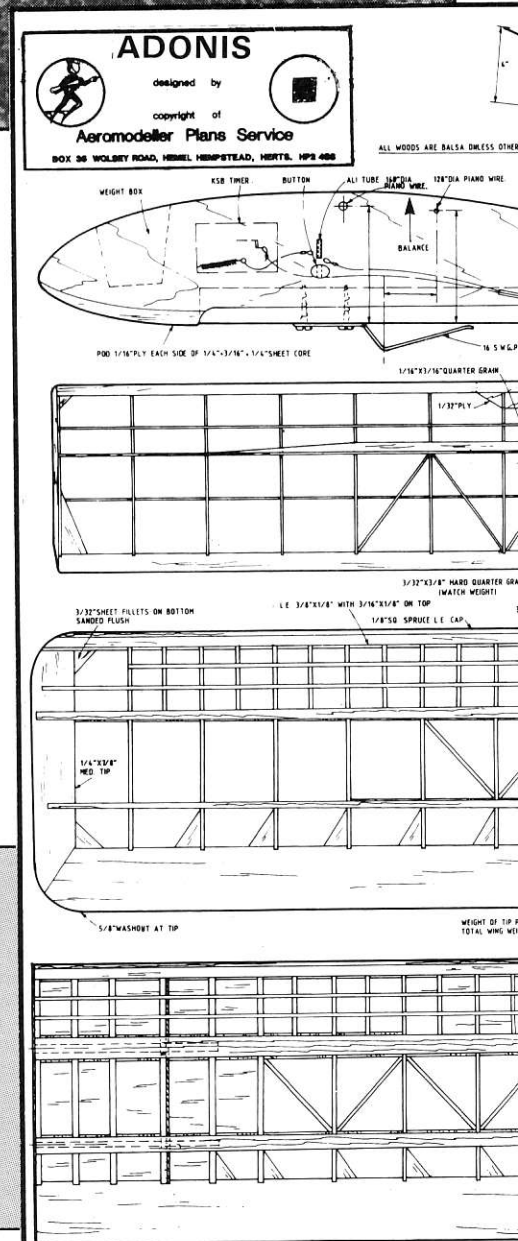
Design considerations

My design criteria for Mk. 1 Adonis were as follows:

Objectives

- 1 Model had to thermal freely, and...
- 2 ... perform well without circular tow (circle tow requires practice); must centre thermals early
- 3 Good glide performance
- 4 Model robustness; to be capable of withstanding most weather conditions without breakage; also to last a long time and maintain trim.

Full-size plans of Adonis are available from ASP Plans Service, 9 Hall Road, Maylands Wood Industrial Estate, Hemel Hempstead, Herts HP2 7BH. Price is £3.80 including postage; please quote AM 1557 when ordering. Ronytubes for the fuselage are supplied by Ron Pollard, 23 Ivy Road, Newcastle-upon-Tyne NE6 4PO.



Requirements to achieve objectives

1 Thermalling - The model must bank easily and not fly on 'railway lines'; the dihedral system is thus of prime importance. The mechanics of turning the model are critical.

This meant:

Necessary features:

- 1.1 Polyhedral wings
- 1.2 Large wing tips to support trim
- 1.3 Turn to be achieved by warps and all-moving fin (this does not tighten turn as model speeds up).

2 To perform without circle tow

This is again a function of dihedral and general trim. Model must indicate clearly the difference between a gust of wind and thermals when towing. The wing section plays a part here. The choice is a compromise to accommodate other criteria.

Necessary features: similar to above; reasonable tip washout prevents tip stalling on the line.

3 Glide performance

Most consider this to be of prime importance. It is not! What's the use of a

good glide if your model flies through weak lift? Also, a light model does not guarantee a good glide; remember, mass is relative to velocity. Velocity is fundamental to the creation of lift over an aerofoil. Adonis Mk.1 weighs 19oz. and glides very well. Mk.2 (as featured here) was designed to weigh slightly less at 17-18 oz.

Necessary features:

- 3.1 Good accurate building, clean and tidy presentation
- 3.2 Do not make one trim feature fight another
- 3.3 Understand the principles of lift in model aeroplanes. Most important: do not use a section just because everyone else does - think about your choice and how it will give its best performance
- 3.4 Think about your wing construction - can you improve the wing's performance by building in special features? There are some in Adonis; maybe you can find them!

4 Robustness - make sure you think very hard about this! Adonis is not for the fainthearted to build, but I can tell you it is worth every effort.

Necessary features

- 4.1 Wings must not warp when stored or

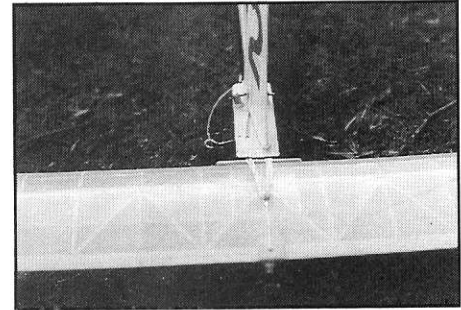
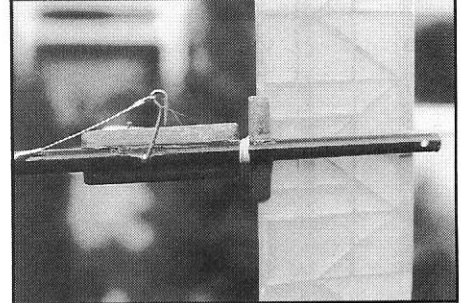
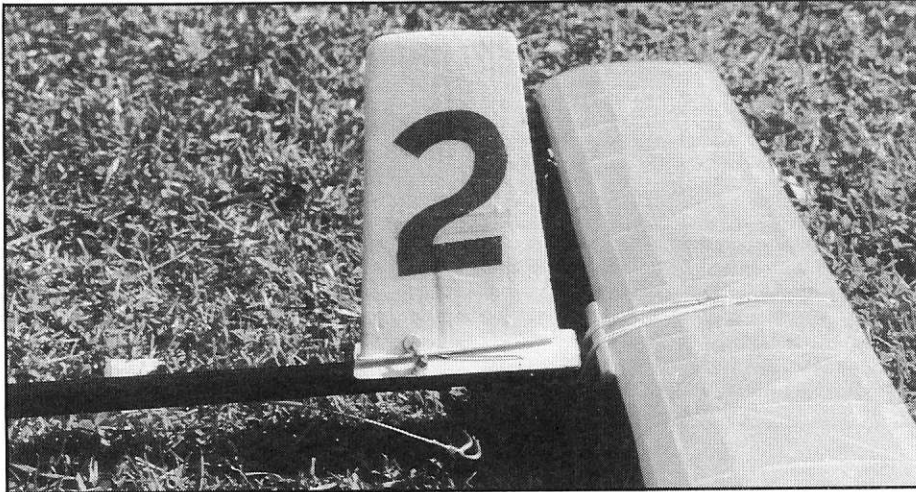
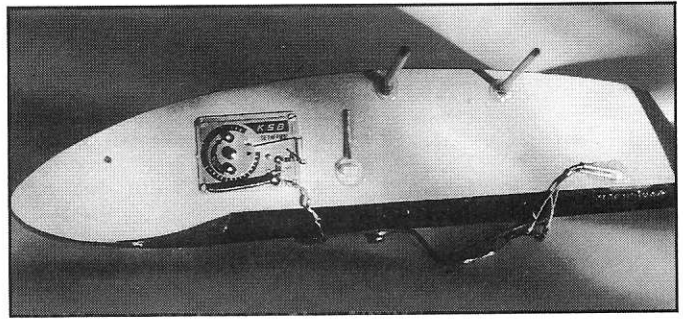
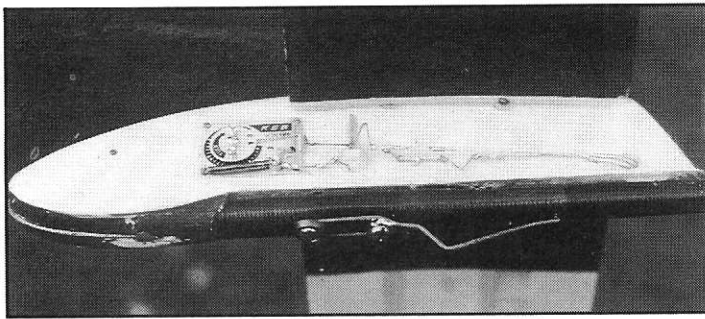
when on a sunny airfield. They must bend, but in a controlled manner. Adonis' wings are very strong, and as you will see, are designed to bend progressively. The wing dowels in Mk. 1 were too flexible. Those in Mk. 2 are enormous and do not bend, so here as you will see the design accommodates this.

You may have found the above controversial and presumptuous, but it is meant to help in good faith...

Having made a list of criteria and design features, the next stage is a layout plan. I usually only make a 'layout', not a detailed plan, so producing the drawing for this article was painful!

Next come templates for wing and tail sections - including 'female' templates for the leading and trailing edges. These are fashioned to the true section before notching out spar slots. Accuracy is vital!

At this stage, I had at least analysed what I was looking for. Results proved it was very worthwhile, for Adonis is a very good performer. In the hands of a well-practiced flyer it will outperform most. I only manage to fly at one or two contests a year; once at the Nationals when during the seven rounds I achieve four or five maxes, usually early on before my fitness



Top left: Timer details, simple towhook and nose-skid shown here. Top right: Fuselage pod with wings detached and timer linkages disconnected. Above: All-moving fin and warp-resistant tailplane are features of the Adonis. Above right: Auto-rudder linkage details. Right: Substantial fin platform allows space for adjustment screw housings. Below: All the bits ready to-go! Adonis has shown the capability to be among the winners - could this be you?



fails. My good friend and neighbour, Mike Page, endorses all of these comments and states that having given you all the plan, I will now lose what advantages I had. But at least I should have encouraged those that are put off by the experts. Adonis will climb through a stack of models, experts' or not, like an express train.

Now for putting it together: wings first

Wood choice is very important. Always use the lightest grade at the tips and the most dense at the root. Cut the ribs and grade them; then make spares and sand as plan, using a micrometer for accurate thickness taper. Build all panels flat to start with. This ensures sectional accuracy. Sand leading and trailing edges to the female

templates. I always sand the leading edge after assembly to achieve neat transition to ribs and centre panel undersheeting.

For covering the wing I use Mike Woodhouse's 'heavy' tissue with the smooth side outermost on the lower surface and the rough side outermost on the top of the wing. Six coats of 50% dope/thinners are used; warps are coaxed at 'coat No. 4' using a good hairdryer.

Important. Do not alter the warps as stated. They are a vital part of the trim concept.

As for the rest...

While the tail must be light, it must also be strong enough to resist unwanted warps. The design as shown does a fair job but

remember to choose a nice light piece of spruce for the centre spar.

The fuselage is relatively straightforward. The all-moving fin is essential. A very safe turn trim is the result. Some thermals will cause the model to tighten its turn, but it won't spiral in; instead it just stands on a wing tip and goes up.

All that is left is the trimming. If you build as per plan, this will be simple; just don't make the glide turn too tight to start with. What looks right usually is.

I shall continue to develop the design. Maybe one day I shall try circle tow. Adonis number three will be built this winter. This may not be Mk. 3; how's that for confidence!

If you have any problems, I will only be too pleased to help, so drop me a line via *Aeromodeller*. Enjoy your modelling; and remember, always question your motives and analyse the objective...