

## WOLFGANG MATT'S

## ATLA

THE WORLD CHAMPION  
R/C AEROBATIC

in aerobatics



Text by  
Ron Chidgey

THE Atlas is not a model that just reaches out and grabs you at first glance. Rather, it's one of those very functional designs that grow on you over a period of time; I believe it is destined to be a classic like the Taurus, Citron and Kwik-Fli. If you are a competitor, you grow to admire the Atlas fairly quickly as you watch it perform, probably in the process of beating the socks off your own model.

I personally developed a deep respect for it at the 1974 Las Vegas Tournament of Championships meeting. Wolfgang placed second, just missing first by a slip of the tongue. I'm sure most of the competitors at the 1975 World Championships in Bern share my feelings, after Wolfgang's convincing win there. The more you study the Atlas, the more really outstanding features you discover.

In order to give you the straight scoop concerning these advanced design concepts, I asked Wolfgang some pointed questions. Here are the questions along with Wolfgang's answers:

**Question:** the Super Star design which you flew previously was a good model for you. What characteristics of the Super Star did you hope to improve when you started the Atlas design?

**Answer:** to get a more even, smoother flying style. Also better performance in the roll figures due to the new FAI Pattern programme which contains more rolling manoeuvres.

**Question:** how many design variations did you go through in the Atlas development?

**Answer:** the third prototype of this design proved to be what I expected. This prototype was used as my 'A' model on the World Championships.

**Question:** is the Atlas everything you hoped it would be? Are there any particular characteristics you would like to improve?

**Answer:** I am satisfied with it and at the moment no additional improvements are necessary.

**Question:** is the airfoil of your design? If not, where did it originate?

**Answer:** it is my own design.

**Question:** you obviously like strip ailerons. Do you feel they are easier to build?

**Answer:** the mechanical part (linkage) of the conventional ailerons is more difficult to build

in order to get precise movements. In addition, in my experience, the strip ailerons do not have any aerodynamic disadvantages.

**Question:** swept wings are becoming popular in U.S.A. You seem to prefer a straight taper configuration. Any reason for this?

**Answer:** I tried swept wings, but this design needs more speed which requires a faster flying style. I do not like a fast flying style that much.

**Question:** the elevators on the Atlas seem to be a little larger than most. Any particular reason for this?

**Answer:** yes, I wanted to get softer reactions.

**Question:** any advantage to the side-mounted engine other than to clean up the profile?

**Answer:** you get a better distribution of the motor vibrations with a side-mounted engine. The side mounting brings the vibration more directly through the wing and fuselage, thus dampening vibrations to the receiver and servos.

The Atlas has already established quite a record on the world contest circuit including of course a 2nd place at the 1974 Las Vegas Tournament of Champions and a 1st place in the 1975 World Championships. The entire Leichtenstein team flew the Atlas in Bern and finished 1st in team placing. This is an outstanding accomplishment when you consider that the population of that little, magic kingdom is only 35,000. I'm sure the superior performance of the Atlas helped the team immeasurably.

### Construction

The Atlas is not an easy model to build and is not a project for the inexperienced builder. Wolfgang and his brother Gunther designed into the Atlas everything necessary for a championship model, but ease of construction definitely was not on their list of requirements. The plans are good and well detailed, so step-by-step building instructions are not required for experienced builders, but a short discus-

Wolfgang Matt, from Leichtenstein, is a banker, married with two children. We first encountered him at the 1967 World R/C Championships in Corsica. He was placed 6th and has been in the forefront of world class R/C aerobatic flying ever since, placing 6th again at the '69 World Championships in Germany, 2nd in 1971 in U.S.A., 3rd in Italy in 1973 and finally became World Champion in 1975 at Bern Switzerland. Consequently, Atlas is an R/C aerobatic design resulting from more World Championship class competition than any other design hitherto and we are confident that Atlas really does represent the very best in R/C aerobatic design available.

sion of the major components should help most builders.

The stock list describes all the various wooden parts. Bear in mind the model was designed for metric balsa. The nearest equivalent wood size available in your local shop should be selected to suit.

### Fuselage

Actually, the Atlas fuselage is a beautiful subject for fibreglass, so much so, I believe that Wolfgang must have had this in mind when he designed it. At any rate the wooden version, as shown in the drawing, requires a simple building jig for assembly. The jig should support the bottom of the 2 in. balsa fuselage sides to hold them in alignment. At the same time, the stations should be located to support each former in its proper location. Keep the area above the fuselage sides clear because you will want to install the top planking and rough-



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## CHAMPION'S MODEL

### every best design



shape it before removing the fuselage from the jig. When you get this far, you are home free.

Make left and right fuselage sides complete with the plywood doublers. Mark the zero-line on the outside of the sides as this reference line will help in lining up the wing and stab. Assemble the sides and formers in the jig. Install the engine mounts and blocks in the nose area carefully to maintain the 1° downthrust and 2° right thrust. Install the tank compartment top and bottom, the engine compartment top and bottom and all of the top planking, before removing the fuselage from the jig. It should be fairly rigid at this point.

Installation of the bottom nose blocks and bottom planking will just about complete the fuselage.

#### Wing

Wing construction is straightforward and is simplified greatly with the use of a good wing

jig. If you don't own a wing jig, the plans show how the leading edge and rib trailing edges can be blocked up for assembly. Note that the  $\frac{3}{8}$  in. thick trailing edge support must taper, getting progressively wider towards the tip. This is necessary to allow for the tapered airfoil.

Assemble the  $\frac{1}{4}$  in.  $\times$   $\frac{3}{4}$  in. leading edge brace, the ribs, the trailing edge and top spars in the jig. When this is dry, sheet the top, allow this to dry overnight, and then flip the wing over and block up again. Add the bottom spars, spar webbing, landing gear braces, landing gear mounting blocks and wing dowel blocks etc. Now sheet the bottom. Remove the wing from the jig and trim the leading edge brace flush with the front of the ribs. Then glue on the leading edge. Shape the leading edge carefully after everything is dry. Join the wing halves upside down on a flat surface with the centre section blocked up  $\frac{3}{16}$  in. (8mm) as shown. Glass fibre the centre section for additional

strength, thereafter add tips and ailerons to complete the wing.

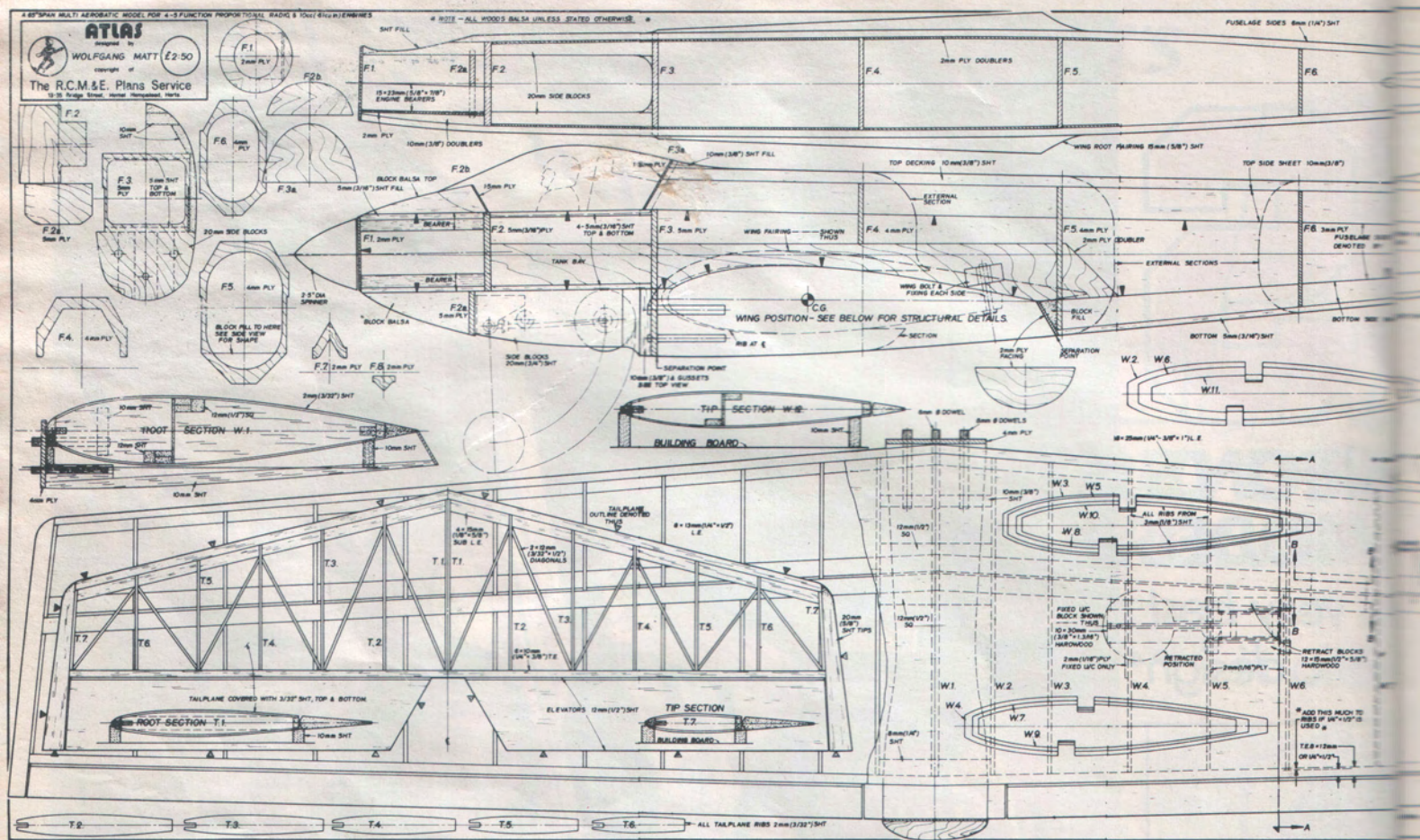
#### Tailplane

The tailplane is built much like the wing. Block up the leading edge brace and trailing edge, as shown adding the ribs and cross bracing. Don't leave out the cross bracing as this greatly stiffens the tailplane. Sheet the top - then flip the tailplane over, block up again and sheet the bottom. Trim the leading edge brace back flush with the ribs and glue on the leading edge and tips. Shape the leading edge and tips to complete the tailplane.

#### Fin and rudder

The fin is simply glued up from soft sheet, then carved to shape. Carving will be much easier and the fin less apt to warp if it is laminated by gluing together two thicknesses of  $\frac{3}{16}$  in. balsa. The same holds true for the rudder





and elevator.

### Trimming for flight

In my discussion with Wolfgang, we went into a fair amount of detail on the proper way to flight trim the Atlas. To me, it was a very interesting session. Many of the ideas presented here can, of course, be applied to other designs as well. If you follow this method, you will end up with a fine performing model.

Bear in mind that these adjustments are mostly interrelated, so you may have to go through the sequence many times to get all adjustments right. Don't rush things and it will be well worth the effort. It might be a good idea, too, to go through the sequence frequently, say every few weeks during the con-

test season, to make sure something hasn't moved out of the correct adjustment. Here is Wolfgang's step-by-step procedure.

1. During a few initial flights, set the correct control surface movement. The ailerons should be adjusted to give the right roll rate (5 sec. for three rolls) and the elevators should be adjusted to give the correct loop diameters, both inside and outside. The correct rudder throw is 35°.

2. After the control surfaces have been adjusted, pull the model vertical to make sure that engine offset is correct. If the model pulls off, heading left or right, then engine offset is not correct.

3. If the wing is free of warps, and the engine offset is correct, then the model will track

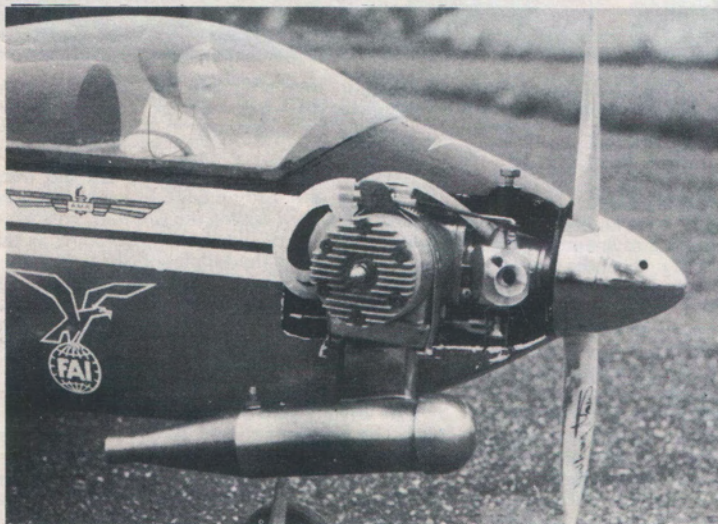
through the loops. If it doesn't, then use the wing weights to correct for left or right deviations. If this doesn't work, then discard the model! (or at least the offending major component, if you want to salvage something - ED.)

4. Check for proper centre of gravity location by making a level, high-speed run and chopping the throttle. The model should continue flying level for a few hundred feet, then the nose should drop very slightly.

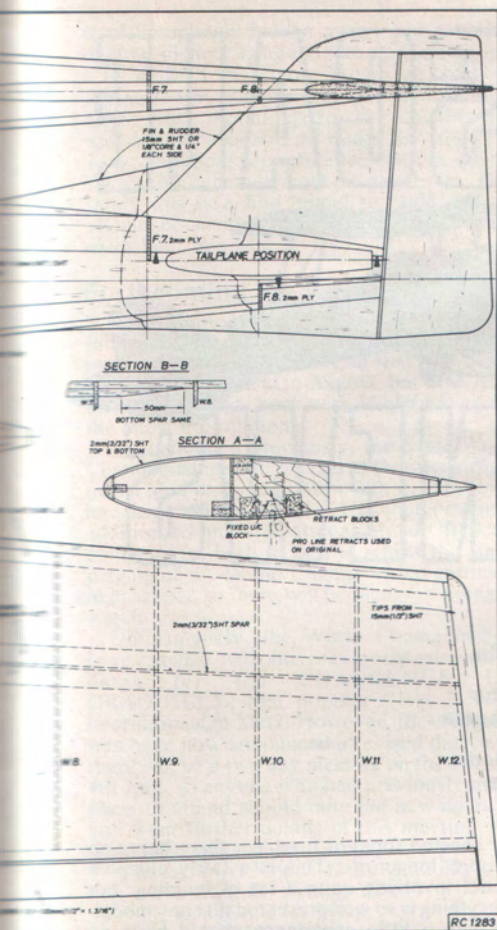
5. The rolls will be O.K. if the CG is located properly.

6. Check for correct decalage by pulling the model vertical as in a Figure M or Top Hat. Neutralise the controls, and the model should continue vertical. If the nose deviates forwards or backwards, then decalage is not correct.

Below: Atlas power pod detail. Note the mixture control, fuel tank, air vents facing into airstream and big Mini-Vox muffler. Right: the Leichtenstein contingent at 1975 World Championships. Wolfgang, on left, about to work on No. 1 model.







7. Adjust slightly more 'up' aileron travel than 'down' by bending the aileron horn forward. Experiment here to get rolls dead axial.

8. Adjust elevator differential to give slightly more 'down' elevator. This provides a measure of insurance for the Rolling Eight.

### Sidelights

I then quizzed Wolfgang about his equipment, practice habits and other items of interest and got honest, straightforward answers. If you are interested in some real titbits from the World Champ, read on.

### Engine

Wolfgang uses the very popular Webra

Below: detail of tail cone. Note separate link to each side of elevator to achieve perfect trim. Right: nose underside close-up showing the retracting undercarriage mechanism installation and actuation linkage. Note brake on nosewheel.



Full size copies of this plan, shown at 1/6th full size, are available from R.C.M.&E. Plans Service, price £2.50. Please quote Plan RC/1283.

Speed .60 to power his Atlas. He does not use muffler pressure. If you will notice in the photos, he brings his tank vents out and faces them forward into the airstream. This gives him a positive pressure in his tank that varies with airspeed. This has a slightly stabilising effect on the pace of the model. As the airspeed increases, the mixture gets a little richer, slowing the engine and, in turn, the aircraft. This works well in loops. As the nose comes up the engine leans out slightly and pulls the model through the top. Then, as the nose drops and airspeed increases, the mixture richens slightly and slows the machine down.

The fuel Wolfgang uses is a mixture containing 10% nitro, 18% castor oil and the remainder methanol. He sets his needle valve to give a steady 2-cycle run and uses a mixture control on his Webra, operated from the sixth channel of his radio, so he doesn't worry about getting a lean run.

### Prop

This is a special epoxy-fibreglass 11 in. diameter prop made by Gunther Hoppe of West Germany.

### Radio

Wolfgang uses the German Simprop contest radio. It is a two-stick radio and the World Champion uses the cradle and neck strap that are so popular in Europe, grasping both sticks between the thumb and first two fingers. His radio incorporates both dual rate aileron control and dual elevator control. He uses high rate aileron for the Figure-M, the three Rolls, the Eight-Point and the Four-Point Roll, the

Rolling Eight and the Double Immelmann. High rate elevator is used for the Rolling Eight, the Spin and landing. Wolfgang flew the same radio in the World Championships that he flew at Las Vegas, almost a year before and no maintenance was required on any of the servos during this period which included heavy practice for the World Championships. How's that for reliability?

### Landing Gear

Wolfgang uses Pro Line retracts in the Atlas driven by two retract servos. A simple DuBro spring brake is used on the nose wheel.

### Model weight

The Champ prefers a medium weight range at 3700 Kg. (8 lb 2 oz.) for his Atlas.

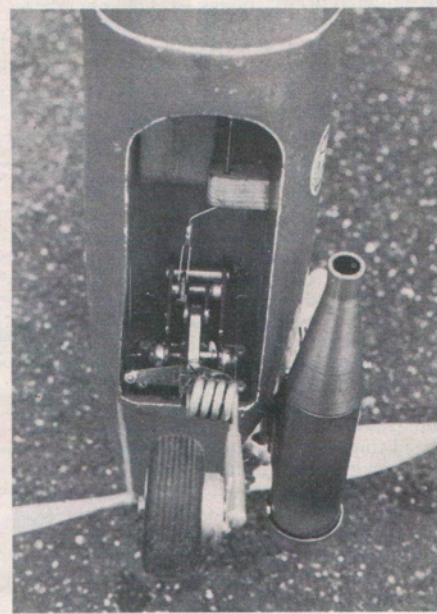
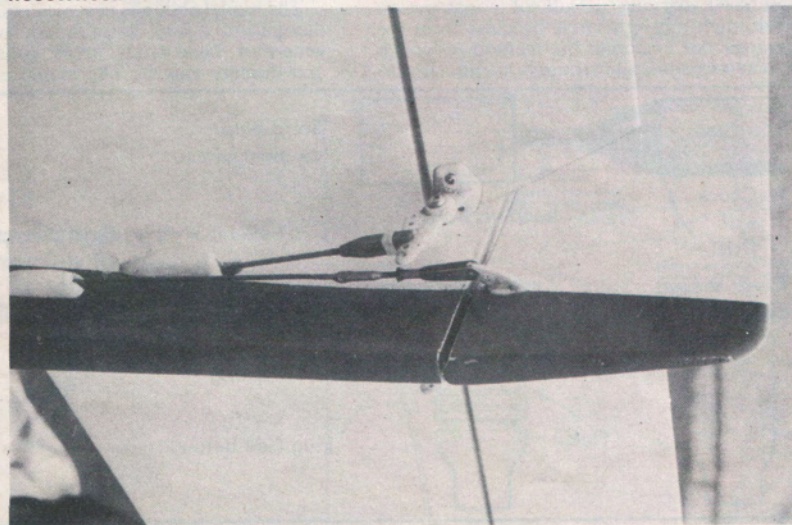
### Practice Habits

Wolfgang practises a lot and he feels that mental attitude is important both in practice and in competition. If his mental state at the practice field is such that he can't concentrate on his flying, he feels he is wasting his time, so he packs up and goes home. He generally practises only on weekends except when a contest is coming up. Then, two weeks before the contest, he practices daily for one full week putting in three flights a day. The second week he then practices only twice, but not later than the Thursday before the contest. He then refrains from flying until the contest and prepares mentally.

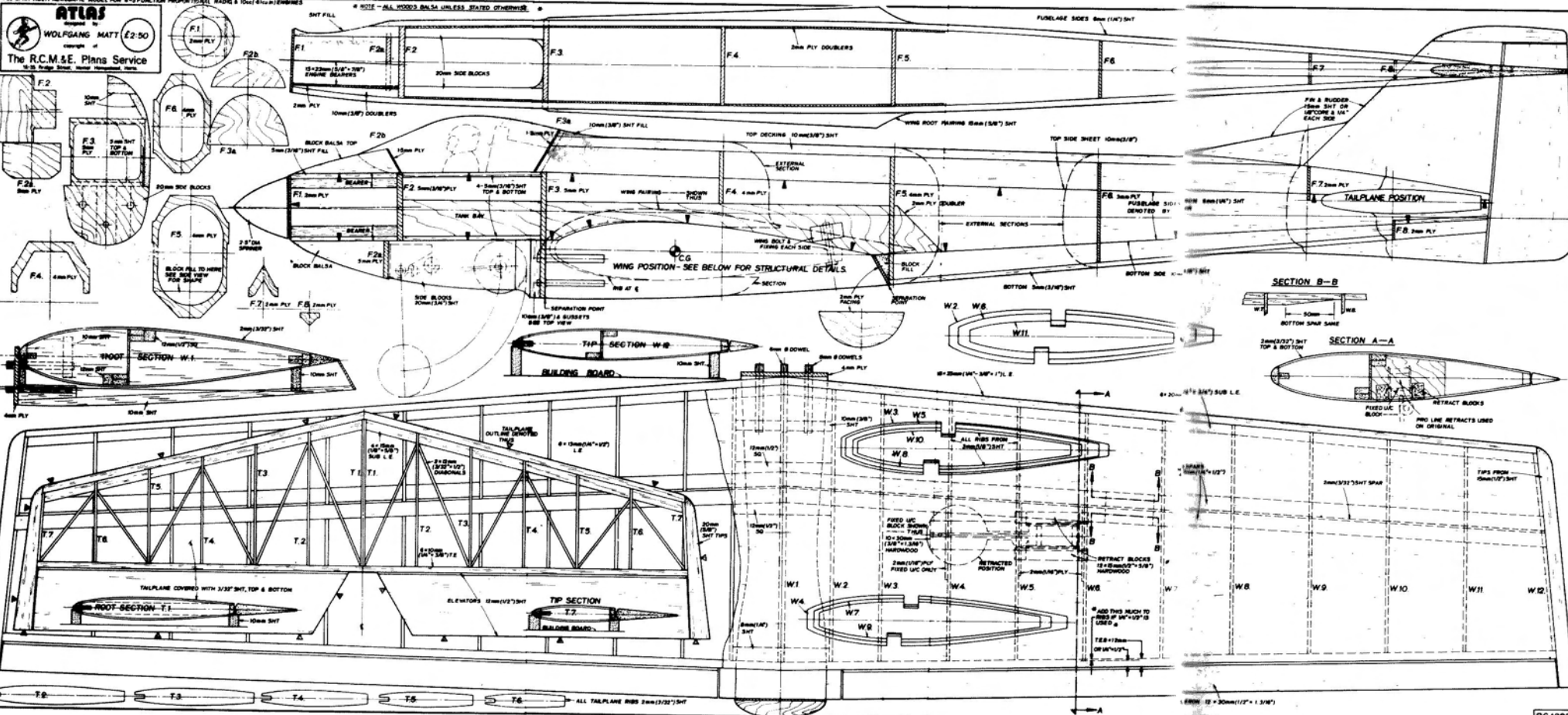
Well, there you have it - all the information you need to become World Champ. The first step is to build the Atlas. The final step is to fly it as well as Wolfgang.

All that comes in between is practice, practice, practice - so get busy.

*Editor's note:* Ron Chidgey, one of the principals in Southern R/C Products Inc., is too restrained in his presentation of the Atlas and should have noted in this article that Southern R/C is making a fibreglass kit for this fine plane which should be ready about the time that this article appears. So for those of you who don't favour the scratch-built routine, let us point you in the right direction for a fine kit.









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