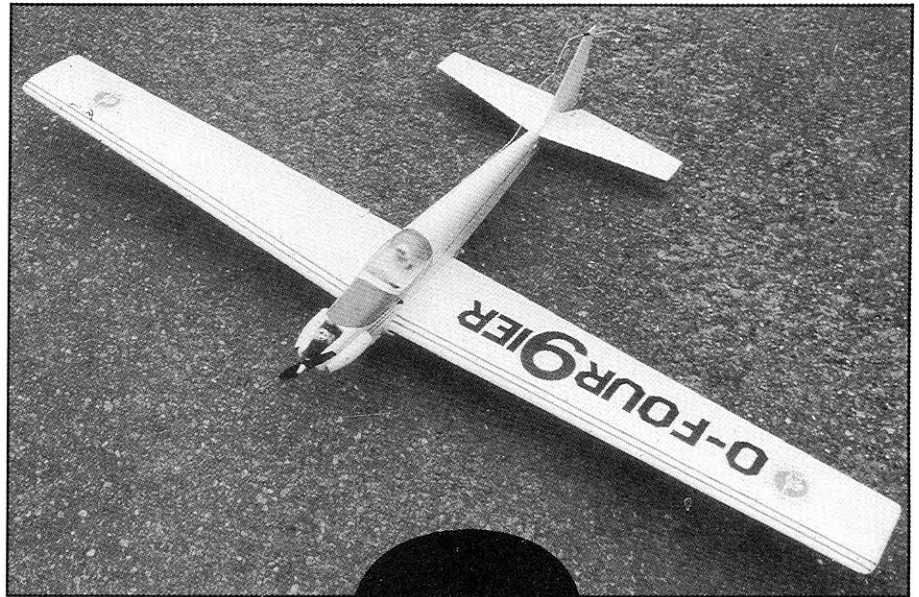


## RM Plan Feature

Your Full-Size

# Semiscale Plan

**Build Peter Miller's  
56" span Fournier  
lookalike for .049  
engines**



# O-Four 9ier

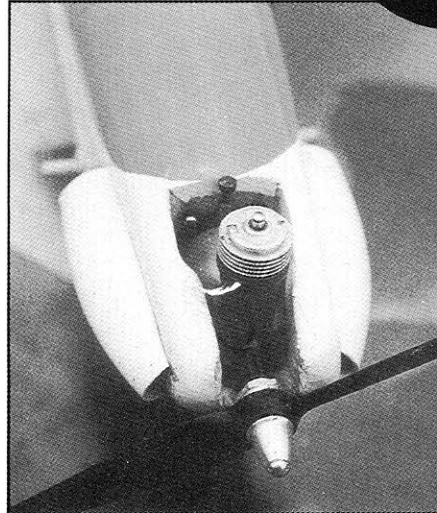
**H**ave you ever seen the aerobatic display put on by the two full-size Fournier powered gliders? The slow, graceful manoeuvres, the incredible mirror flying with the top aircraft inverted on a dead engine. The display was such a contrast to the usual power and fury that it remained in my memory.

Most modellers enjoy aerobatics but many also like to have a chance and do some gentle soaring. I know that I like this variation but quite often I take a vintage model out and then wish I had taken an aerobatic model and vice versa! I wanted to combine the two types of model in one and decided that the Fournier would be an ideal subject. With a .8cc (.049) it would be a reasonable size and yet handy for transporting and could be flown almost anywhere with a PAW 80 Classic.

When I started drawing the model up I realised that there were snags. The fuselage was quite gigantic for a model of this size and the taper on the wing was rather excessive. I slimmed the fuselage down and reduced the taper on the wing. I added strip ailerons for simplicity but I kept the moments about scale. I also increased the tailplane size a little.

The resulting model has managed to keep all the atmosphere of the Fournier while being a more practical model design. The proof of this came when I took it to test at our flying site on a private strip. By sheer coincidence there was a full-size Fournier parked outside the hangar, the model was admired by all the pilots gathered there and no one really noticed the slimming down until it was pointed out to them!

Before beginning building it is important to realise that the scale moments will result



*Cox .049 Texaco glow powers the prototype. Cowl cheeks house ballast.*

in a tail heavy model. Use very light wood for the tail assembly – you could build it up out of strip wood. Do not beef up the rear end and make sure that you can fit a full-size 500 mAh battery in the nose. This is good policy anyway in case you hook a thermal. You will probably still need some lead but more of that later.

### Flying

In common with the sensible practice being adopted by many writers these days, I am going to talk about flying before we get to the construction!

I have three servos fitted on rudder, aileron and elevator. You could use one for throttle instead of rudder or fly the model on aileron and elevator only.

With the Cox Texaco under propped with a 6 x 3.5 Master prop the model is perfectly powered. It will climb steadily to sufficient height for three and a half minutes glide at least and yet it will do loops and rolls and Cuban Eights.

Once the model is trimmed, solo hand launches are easy, the model leaves the hand in a very smooth flat climb, no panic to get the launching hand to the transmitter stick. The launch only needs a gentle push, no running, no Tessa Sanderson imitations.

The ailerons are very effective, the 1/8th movement on low rate is almost too much for gentle soaring. The rudder is very powerful, the given throw of 1in each way could be drastically reduced and I don't use it. Elevators are smooth and powerful.

For an aerobatic flight select high rates for the ailerons. Remember that you are flying on the wing, not the power. The model will not loop right after a roll but you can loop and do a roll straight after that. Loops are straight and round and easy.

Rolls are not so easy. The roll rate is slow; put the model into a shallow dive, pull the nose up to a slight climb and hit the ailerons. Down must be fed in during the inverted part of the roll but take it off again or you finish the roll in a steep dive. OK to do a loop then.

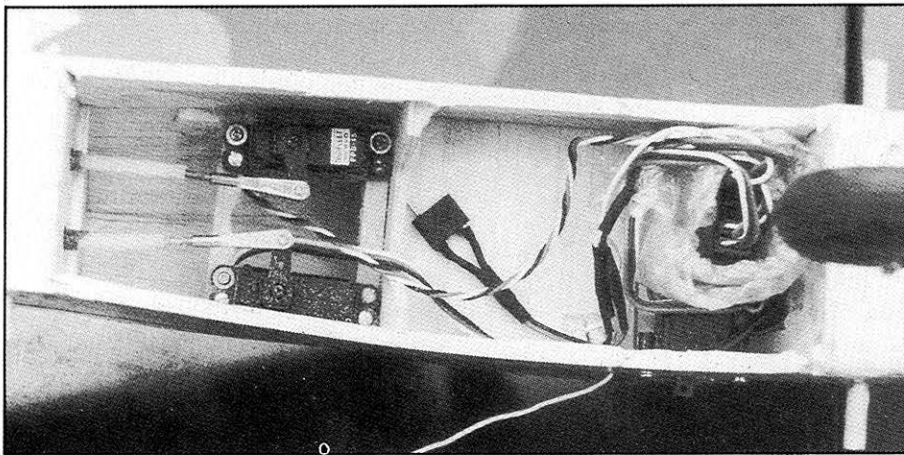
The model has a fast, flat glide which can be made to slow up with about three clicks of up trim. All controls are still powerful on the glide and for soaring low rate should be selected for the aileron. Penetration is quite good.

The one area that needs to be watched is when flying in turbulent air, wind rolling over a hedge or wood. The model can change attitude very fast. I flew over a wood some distance away in a 10mph breeze and

had a worrying few minutes as the model pitched up and down or stood on a wing tip but I got it back safely.

Once you are used to the model you will find that tight turns near the ground can be made but you will need a lot of up elevator – this tends to flatten the turn. Practice at height! Landings are always greasers, it just slides in to a non-bouncing touchdown even on short but rough grass.

The Texaco starts very easily and the tank gives quite long runs – even under propped I was getting two or three minute runs and a larger prop would improve on this. I spent an afternoon just landing, tanking up and going again, not even switching the radio off – the big battery is worth its weight.



## Fuselage

The fuselage is very simple to build. Choose firm or even hard 1/16th sheet for the sides as there are no longerons. Fit the 1/32nd ply doublers; I use Thixofix contact adhesive as it does allow some repositioning.

Glue F-2a to F-2, mount the undercarriage leg with saddles or by sewing with thread, then join the sides with this former and F-3. Do make sure that everything is square at this stage.

Join the fuselage at the rear and then fit the remaining formers. When these have set fit F-1 holding the nose together with elastic bands. Make sure that F-1 is square (you do not need any side thrust) then add triangular stock reinforcement behind F-1 and in front of F-2.

Fit the 3/16th square stringer down the spine and cover the rear top fuselage with soft 1/16th sheet and the nose with soft 3/32nd sheet. Add the tailplane platform and 3/32nd sheet treblers at the wing seat, also the cockpit floor but do not extend this right to the front of the cockpit, or you will not be able to get the battery into the hole in F-2 at a later stage.

At this point fit the snake outers for the tail controls. I use a length of sharpened tube to make the holes in the formers but go gently or you could crack them. The fuselage rear bottom sheet can now be fitted and then the tailplane and fin can be glued on. Small fairing blocks are added each side of the fin.

If one of the Cox engines with integral tank is going to be fitted, now is the time to drill the pilot holes. If another engine is to be used then the mount can be fitted now. Provision for a tank has to be made in the front bay and this may mean fitting a flat battery pack and making the bottom of the

nose into a removable hatch. Any throttle runs should be planned now.

The cowling is made from three pieces of 1/2in sheet. The engine could be mounted sidewinder but I preferred the upright mounting because the needle valve and filler would still have required a hole in the top and any throttle connections would be simpler. Also the tank could be right up in the top of the nose, leaving more room for a battery underneath.

Do not make the applecheeks at this stage. These are made and fitted last of all because that is the only place to put any needed lead. I actually cast lead applecheeks, about 1.1/2 ounces each, and then glued some cut up wheel plants over them.

The canopy can be a commercial item. I

1/8 x 1/4 L.E. to the sheet and the ribs. Add the top spar.

Glue the 1/8th sheet T.E. (trailing edge) to the rear of the ribs and when this has dried glue the top L.E. sheet down. At this stage the small hardwood blocks can be glued in to take the outriggers.

The wing can now be taken from the board and any surplus L.E. sheet trimmed back. Fit the centre section sheet and the 1/8th L.E. capstrip and the 1/4 sheet tip.

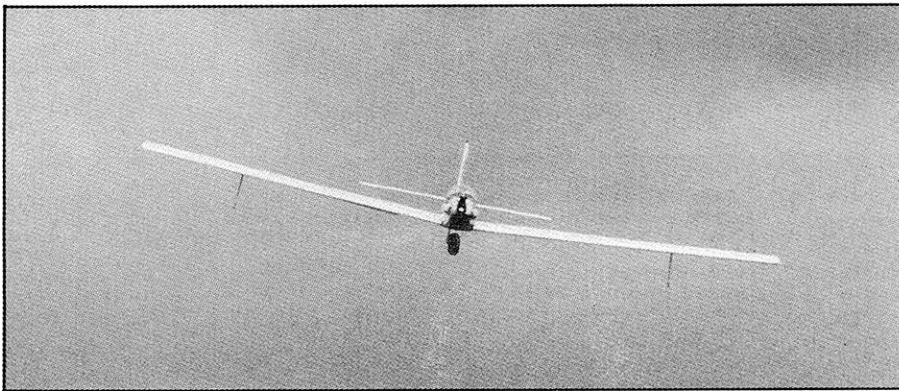
Build the second wing in the same way. Trim and sand both roots smooth and check that they fit with little or no gap. Fit the wings together accurately at the root and join with sticky tape along the bottom of the joint. Make certain that you have a perfect match. Fold the wings down and coat both root ribs with five minute epoxy and fold the wings back up until the ribs are together. Prop up at the correct dihedral angle. **MAKE CERTAIN THAT THE ROOT RIBS ARE STILL MATCHED.**

When the epoxy has set cut out the servo bay and fit a servo rail against the spar. With the covering, this joint is quite adequate if properly made.

The short lengths of T.E. can be fitted at the root. The ailerons are top hinged and so the torque rods are fitted flush with the top surface of the wing. The ailerons are 3/4 x 1/4 T.E. stock; choose medium to soft material. Chamfer the front to allow for the downward movement of the aileron. Now cut a groove in the top of the aileron to take the torque rod and cover this groove with a piece of 1/32nd ply. If the edges are chamfered it is hardly noticeable. When the aileron is fitted this arrangement will allow for the slight clearance needed at the torque rod as the aileron moves.

Check that the wings are not warped at

Prototype used Fleet micro R/C but standard size gear for aileron/elevator would be fine.



cut up a Co-op 2 litre lemonade bottle as my favourite soft drink (7-UP) bottle was not the right shape! This is cheaper than a canopy anyway. Then, when I was looking for a pilot in my scrapheap, I found a perfect canopy from some ancient wreck. The fuselage is now ready for covering.

## Wings

The wings have a modified Clark Y section and are very straightforward to build. The ribs are laid out on the plan so that they can be photocopied and then either stuck down to the wood or the lines transferred by taking a dark copy and placing it copy down on the wood and ironing it down with a hot iron. Cut the ribs a little oversize to allow for any distortion in the copying process.

The lower L.E. (leading edge) sheeting is pinned down to the plan and the 3/16th square spar is glued to it. Glue all the ribs to the spar and L.E. sheet and then glue the

*Looks convincing, doesn't she! Liberties taken with true scale outline hardly notice in flight...*

this stage; slight washout is acceptable as this will be induced at the covering stage anyway.

## Tail surfaces

Tail surfaces are cut from soft 1/8 sheet and if this is very soft it should be edged with hard 1/8th square. The elevators have plates of 1/64th ply glued to them where the joiner goes which also act as reinforcement for the horn. Similar plates are glued to the bottom of the rudder.

## Covering

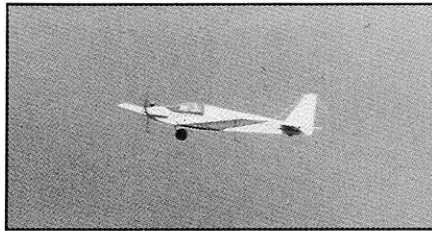
I covered the model with Solarfilm; one could use Fibafilm for the wings and Litespan for the rest of the model. I used Solartrim for the decoration and added trim lines from car trim tape which was left over

from my 'Yuppy Love' design. I put two strips along the L.E. to act as turbulator strips but I don't know if they worked because I have not flown the model without them!

It is at this stage that it is possible to induce slight washout on both wings, about 3/16th of an inch at each tip. The model was not designed to have washout but one wing had some so I added it to the other. All good scientific stuff here!

### Installation

I used Fleet micro radio and fitted rudder, elevator and aileron control; it would have been quite easy to add throttle if I had needed it. The model will fly very nicely on aileron and elevator control so a two channel set would be fine. The aileron servo goes in the usual place, the other servos fit up



behind F-3 to clear the aileron control runs.

With two channel radio the elevator servo could be fitted across the fuselage against the rear of F-3. The Rx goes against the rear of F-2 and the battery, as has been mentioned, goes in the nose bay.

With all the radio fitted and the engine installed, check the balance. It should be on the main spar. Now add lead to the nose until the model balances in the correct place. Make the applecheeks, either from balsa or

from the Chart Micro Mold items, glue the lead inside them and glue them in turn to the nose of the model.

Drill the holes for the outriggers; these are made from snake inner cables which can be of the thinner variety as they only have to support the model and need to flex on grass.

Charge the batteries and you are now ready to go flying!

### The last word

This model has all the character and performance of the full-size aircraft; it looks pretty in the air and the flying gives one the choice of quiet soaring or some more lively flying. All this from a model that is cheap to build, easy to transport, economical to operate and very pleasant and easy to fly. I know that mine is really going to rack up the hours!



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# It's a Date

## It's a date for the month of October

- Oct 3/4 **BMFA R/C Scale Team Trials (F4C)** at Church Fenton near York. Pre-entry £10 to Martin Fardell, St. Arilds Cottage, Kington, Thornbury, Bristol. BS12 1NQ. (Tel: 0454 412486).
- Oct 3/4 **Club 20 Pylon racing** at the Model Aviation Museum, Bestwood, Nottingham. Details from Mike Ward on 0602 632175.
- Oct 3/4 **Leek and Moorland Model Gliding association's Annual Two-day PSS Competition.** Details from Simon cocker, 67 Peel Street, Macklesfield, Cheshire. SK11 8BL. (Tel: 0625 613382).
- Oct 4/10 **Model Pilots' association Modelling Week** at Primrose valley, filey, Yorkshire. A superb residential holiday week of building, and flying, power and gliders. Details from MPA on 0442 66551.
- Oct 4 **Ribble Valley Model Soaring Association's 2nd National Cross-country.** Details from W. Audley, 47 Crowwood Avenue, Clifton Farm Estate, Burnley, Lancs. BB12 0JG.
- Oct 4 **British Electric Flight Association's 2nd Technical Workshop** at Manor Hall, Sandy Lane, Leamington spa, Warwickshire. Starts 10am with talks, advice and a mini-market for electric flight. Tickets £6.50 IN ADVANCE ONLY (includes lunch). Send an s.a.e. with applications to Terry Stuckey at 31 Dysart Avenue, Kingston-on-Thames, Surrey. KT2 5QZ (Tel: 081 546 1622).
- Oct 4 **Rolls Royce (Hucknall) MAC's Vintage Aerobatics Day.** Details from colin Bedson, 24 Rolleston Drive, Newthorpe, Notts. NG16 2BD (Tel: 0773 710193).
- Oct 4 **Wirral Radio Control Flying Society's Autumn Fun-fly** at Arrowe Park, Blirkenhead. Sport and scale models, proof of insurance essential. Entry £2 on the day. Details from Brian Jones on 051 336 2456.
- Oct 10/11 **Goosedale Model Aviation Museum's land and seaplanes event** at Goosedale Farm, Moor Road, Bestwood, Nottingham. Trade stands available in marquee. Details from Mike Ward on 0602 632175 or Kevin Gaunt on 0423 780726.
- Oct 11 **ASP's Model Pilots' Association Family Day and Chiltern Scale Model Club Exhibition** at Old Warden airfield, Biggleswade, Bedfordshire. A true bring-and-fly style fun fly-in for all types of model aircraft with the exception of large models. Details from MPA on 0442 66551
- Oct 11 **West Mendip soaring Association's Autumn Cross-country Comp.** Entry £2. Send an s.a.e. for details to Chris Graham, 30 Wades Road, Filton, Bristol, Avon. BS12 7EE. (Tel: 0272 684423).
- Oct 11 **Peterborough Winter Thermal Soaring Series** including Electroslot. Details from Alan Moore, 31 The Green, North Runcton, Kings Lynn. PE33 ORB. S.a.e. please.
- Oct 11 **Pylon racing at HMS Daedulus**, Lee-on-Solent. Details from David Sawers on 0428 713694.

- Oct 11 **Sussex Radio Flying Club's Open Fun-fly** to BMFA rules. Starts 2pm, odd frequencies only. Pre-entry £2 to, and details from, Tom Gaskin, 75 Orchard Avenue, Lancing, West Sussex. BN15 9EB. (Tel: 0903 753258).
- Oct 17/18 **British Waterplanes Association's End-of-season Fly-in** at Chasewater near Walsall. Details from Mick Lownds on 0822 47184.
- Oct 18 **Meon valley Soaring association's Slope Pylon meeting** at Butser Hill near Petersfield, Hants. Entries close at 10am. Details from J. Conway-Jones on 0734 340366.
- Oct 18 **BMFA Midwest Area/Malvern Soaring Association's Open Glider Fly-in** for all types of flat field gliders including scale at Upton-on-severn, Worcs. Flying starts at 10.30, entry on the field; also bring and buy sale of gliding goodies. Details from Mike Raybone, 44 Millbrook Street, Cheltenham, Glos. (Tel: 0242 236081) or Roger Refell on 0684 310258.
- Oct 18 **Pylon Racing at RAF Cottesmore.** Details from Maurice Barker on 0772 431520.
- Oct 25 **Huddell and District Model Aircraft Club's F3F Competition.** Details from Dave Beanland on 0924 280467 or Chris Rogers on 0484 515959.
- Oct 25 **Sport 40 Pylon racing event** at Glenrothes Club field. Details from Jim Rodger on 0592 53344.
- Oct 18 and Nov 8 **Pontefract and District aeromodellers (PANDAS) BARCS Open Thermal Soaring** at Pontefract Racecourse (1/2 mile from junction 32 on M62). 10am start. Details from Tony Lloyd on 0977 610594.
- Nov 15 **BARCSTEC '92** hosted by the Ivinghoe Soaring Association at the RAF Museum, Hendon, off junction 4 of the M1. 10am to 5pm, tickets cost £10 BARCS members, £12 non-members, pre-booking only. A range of talks, videos, lectures and films with the accent on the technical aspects of model soaring ranging from vintage to flying wings and with F3B, F3F and F3J design and development plus electric flight. Places are strictly limited. Tickets and further information from David A. Smith, 39 Pegasus Road, Leighton Buzzard, Beds. LU7 8NJ. Tel: 0525 384945.
- Dec 11/12 **Model Pilots' Association Airbrushing and Spray Painting Weekend Residential Course** at Knuston Hall, Northants, with guest lecturer Ian Peacock. Details from MPA on 0442 66551.
- Dec 11/12 **Model Pilots' Association Introduction to R/C Aeroplanes Weekend Residential Course** at Alston Hall, Preston with guest lecturer David Boddington. Details from MPA on 0442 66551.
- Dec 13 1993  
Jan 10  
Feb 14  
Mar 14 **Peterborough Winter Thermal Soaring Series**, including electroslot. Details from Alan Moore, 31 The Green, North Runcton, Kings Lynn. PE33 ORB. S.a.e. please.
- Jan 1-9 1993 **The 62nd International Model Engineer and Modelling Exhibition** at London's Olympia - PLEASE NOTE CHANGE OF VENUE. Bigger premises means that this annual modelling highlight will be more exciting than ever! Watch model press for further details.