

Scale Nostalgia

Dave Deadman builds a 1952 free flight scale Aeronca Sedan. Part 1

During the early 1950s, Mercury Models, under the direction of Henry J. Nicholls, produced three splendid scale aircraft, all designed by Ron Young.

In 1950 came the *Monocoupe* at 64" span for 1.5 to 2.5 c.c., then a smaller 40" *Monocoupe* for 0.5 to .75 c.c. For 1952, the *Aeronca Sedan* at 65" span appeared in the model shops. I have no idea how many Aeroncas Mercury produced, but it was very popular. I do remember how well it flew, and the deep impression it made on me at the tender age of 14 years.

There was a young man I used to fly with in the Watford area named Roy Wall. Not only did Roy build really well, but his finishes (all brushed cellulose) were superb. There's a photo of Roy in a Keil Kraft Handbook holding his 'Southerner 60', about that time. Later, he sold me his 'Southerner' and I put my ETA 29 in it. Talk about a climb! But I digress...

Roy Wall built an Aeronca with (I think) an E.D. 2.46, like the original. With his beautiful paintwork and accurate build, it flew sedately in large circles, looking very 'real' in the air. My only successful models at that time were 'sports' types. Scale seemed out-of-reach... for experts... or at least for blokes with a job and more pocket money.

Also, my building was appalling. There was always more glue and dope on me, rather than on the model.

Once a modeller...

In later years, I have built many scale mod-



Kitted by Mercury in 1952, the Aeronca Sedan at 65" span is still available from Phil Smith. With its scale areas and accurate outline, it is still a most attractive aeroplane.

els, F/F and R/C, but I confess I don't enjoy flying R/C Scale. I haven't the experience to be able to relax on the sticks and see the aeroplane in its surroundings. To me a well trimmed free-flight scale model, flying at scale speed in lazy circles, is much more realistic than the 'twitchy', over-controlled R/C model.

These days, I use R/C to keep my vintage sport models flying on the small fields available to me. This relaxed 'guided free-flight' suits me very well and gives me great pleasure. It would be great to have just one scale R/C model that could fly in the same relaxed way.

Eureka!

It came as a surprise to find that the plan

for the Aeronca Sedan is still available 50 years later. For a very reasonable price, Phil Smith (of *Veron* fame) will send you not only the original plans, but also all the patterns for the parts. All you do is 'Spray Mount' the parts onto your chosen wood, cut them out and produce your own kit. You even get a copy of the original instruction booklet!

Is it proper scale?

The outline looks fine and, according to the notes, it has scale areas and tail moment, plus scale dihedral and wing section. If you were fussy, you might criticise the nose shape or worry about the sectional shape of the dashboard, which doesn't tally with the Sedan's sales brochure.

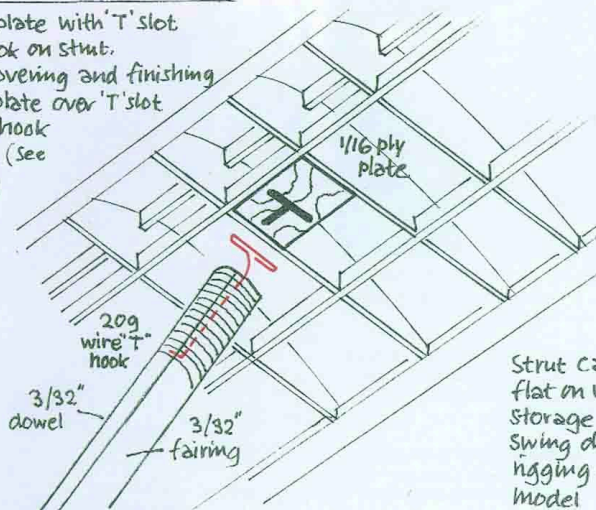


ABOVE LEFT: Many Sedans were fitted with spats which only add to the appeal. Good references are obtainable from the Web. ABOVE RIGHT: Despite her 52 years wings mean it will go in a small car.



Strut/wing fixing 1

1/16" ply plate with 'T' slot for 'T' hook on strut. After covering and finishing fit ply plate over 'T' slot to trap hook in place (see diag 2)



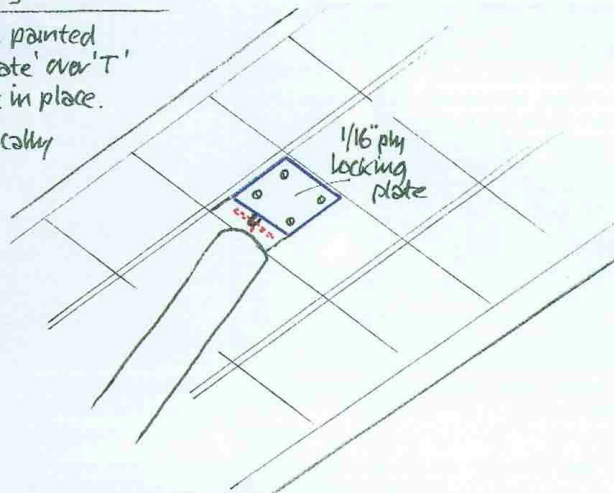
Strut can be laid flat on wing for storage and can swing down for rigging on assembled model

Strut/wing fixing 2

When covered and painted fix ply 'locking plate' over 'T' slot to trap hook in place.

Reinforce ribs locally and reinforce ply 'T' plate/rib fixing.

Shape hook so that strut can swing up to lay flat on wing for transport or storage.



The aerodynamic balances on the rudder and elevator are missing, but you could build them in. Probably it wouldn't pass muster in a modern scale top level comp., but for what I want that doesn't matter.

What engine?

The engine bay is huge, but you only need a modest 2.5 to 3.5 c.c. for even an R/C version. However, you do need a rear induction. You could use a front induction engine, but you would need a shaft extension to suit the cowl and nose. A small four-stroke would be nice, or perhaps an



the Sedan is a very handsome machine. Removable



The original used an E.D. 2.46 sidwinder, but David has fitted a Rustler Lynx inverted, equipped with an R/C throttle.

Indian Mills 2.4 with R/C throttle.

Only two motors in my small collection seemed suitable - a CS repro E.D. 3.46 Hunter, and Ian Russell's Lynx. The Hunter (great engine) was doing sterling work in a 'Super Scorpion' so the Lynx was gently run-in and the throttle tested. The throttle response is not as good as a glow motor, but it should be adequate.

The original had an E.D. 2.46 mounted sidwinder so the cylinder was flush with the side of the cowling. Personally, I hate to see a hole in the side of a scale cowl, so the Lynx was fitted inverted with the bearers below the lugs so it drops in from above. That way the engine is almost entirely hidden.

Room for R/C?

You must be joking! There's enough room for a party in there.

If you wanted to do a detailed interior, you could use small servos and hide them under four scale seats with pilots and passengers. The reference is obtainable. Mine uses standard servos for throttle/rudder/elevator, all visible (I am ashamed to say) in a bare cockpit, with access through two non-scale roof hatches.

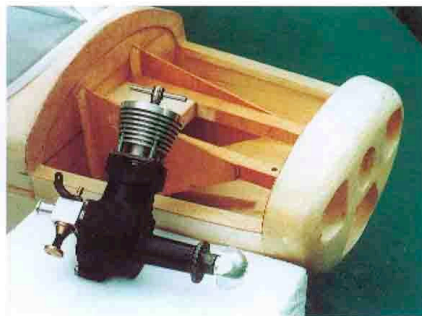
Crash-ability

In best free-flight tradition, the wings locate using dowel stubs in the wings with band hooks. Rubber bands go across the fuselage to hold the wing in place.

The wing struts also have hooks at the bottom to take bands across the fuselage. These must be strong enough to stop the wing flapping in flight. The upper ends of the struts have wire prongs in metal tubes which are sewn and glued to reinforced wing ribs. I once suffered chronic loss of control on a scale job using similar metal-to-metal fixings, so this time I have used the system shown in the sketches.

The undercarriage also has a sprung shock absorber arrangement that will work well for free-flight or R/C.

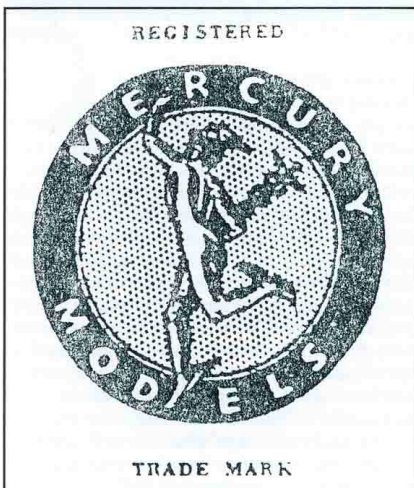
One small snag. Nowhere does it say what diameter wheels to use. I ended up with 2.5/8" fitted with spats.



LEFT: Three standard servos look lost in the vast cabin. You could do a detailed interior and hide all the gear below the floor.

ABOVE: The Rustler Lynx is a handsome vintage-style diesel. Rear induction suits the cowl best, but you could use a front induction engine and fit an extension shaft.

RIGHT: Note hooks on dowel stubs to locate on tubes in the centre section. Bands through the tubes hold wing in place. The lower strut ends are also banded. Good shock absorbing system in best free-flight tradition.



ABOVE LEFT: Older readers will remember the Mercury Models logo with a great deal of affection.

How does it build?

Simple, light and structurally sound, it all goes together very well. In fact, it's a pleasure to build following the clear instructions.

I worried a bit over the tailplane platform and a lack of stiffness in the rear fuselage so I did use sheet infills to beef it up a bit.

The fin will be glued to the tailplane and the whole unit banded on to the platform. I just hope it will be strong enough. I plan to use scale bracing wires to strengthen it further. The rudder will be worked on a closed-loop, while the elevator has a 'snake'.

Colour schemes

My own references for the Aeronca were almost nil, but David Boddington, Cedric de la Nongrade and Chris Strachan came to the rescue (thanks, folks)

with splendid schemes from their reference files, or from searches on the Web.

Next

During the next month (or so), I will finish the model, photograph it again and, I hope, report on its flying abilities.

If I am lucky it should be stable enough to fly like my relaxing 'guided free-flight' sports models. Fingers crossed.

Safe landings.

Suppliers

Phil Smith

Do contact Phil on 01202 433 431 and get yourself a copy of his catalogue illustrated with his brilliant line-drawings. All three of the models mentioned are available, plus loads more.

Ian Russell

Ian has a growing range of engines, including the Lynx and Jaguar which are ideal for the Aeronca. 0208 932 6783.

Flair Models

The CS range of repro engines is now distributed by Flair. I hope the Hunter is still available. It runs really well and throttles fine for a diesel. 01793 721 303.

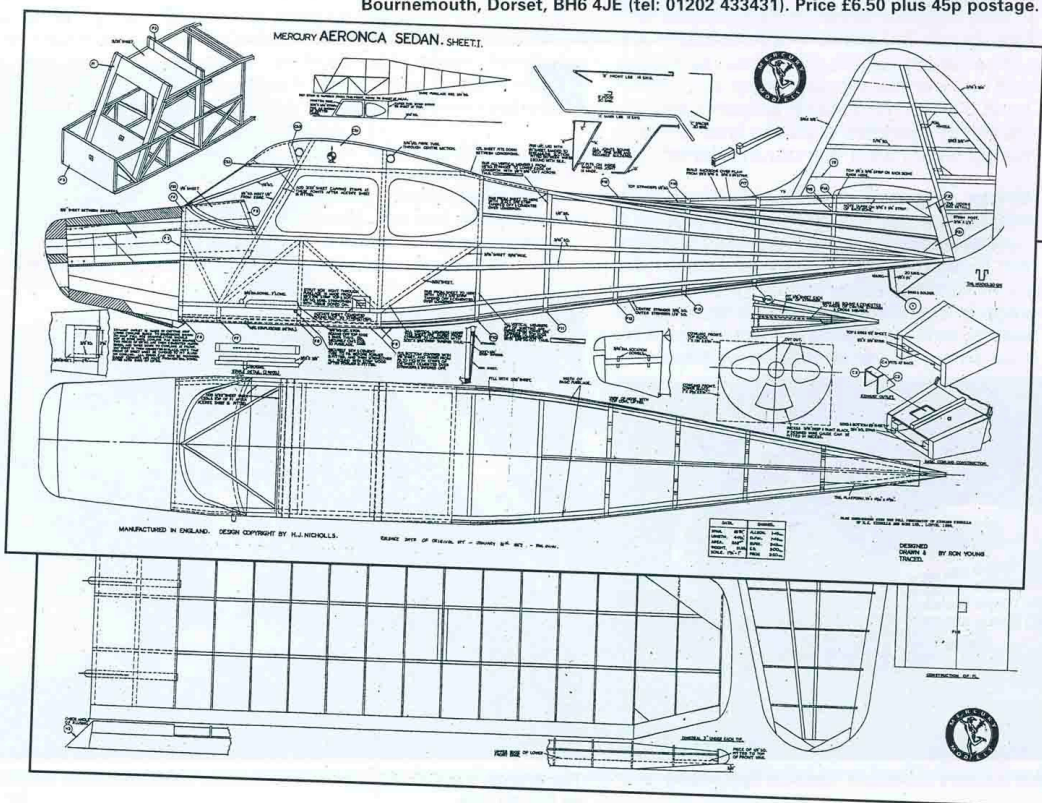
Engines Unlimited

01707 663 773 (07956 884 133 mobile). Mr. Bipin may be able to sell you a Mills 2.4 with R/C throttle. There is also a 3.4 version based on the 2.4 crankcase. This should be ideal for the Aeronca.

Next month

Covering and finishing the model, plus practical advice on lettering and painting. ■

Plans for the 65" span Mercury Aeronca Sedan are available from Phil Smith, 32 Verwood Crescent, Bournemouth, Dorset, BH6 4JE (tel: 01202 433431). Price £6.50 plus 45p postage.



Vintage scale

by Dave Deadman



Scale Nostalgia

Dave Deadman builds a 1952 Aeronca Sedan. Part 2: Finishing the Sedan and flying

When I completed the Aeronca airframe it was July 2004 and in Part 1 last month, I promised to report back on finishing and flying.

What I didn't know then was that the next few months would bring drastic changes when an inoperable lung cancer was discovered and I began a course of chemo-and radio-therapy. Now, in June 2005, my breathing capacity is quite limited and any physical effort leaves me struggling.

Mylar, tissue and dope

I wish I had learned film covering techniques, but I stuck obstinately to tissue and dope which is bad news if you have lung problems. But in May, I made a start by covering the wings and tail in Mylar. The fuselage top decking with its double curvature gave problems so I resorted to using Esaki silk for the fuselage.

The second layer was lightweight Modelspan over the Mylar and silk, which worked quite well. Thinned sanding-sealer was used to build up the finish, sanding lightly with 1000 grit between coats.

Colour

Spraying of any quantity was out because the spray vapour causes me real problems, so I decided to brush-paint using Humbrol matt enamel for the blue and cream. I have a lovely 1/2" flat sable brush which is nice to use. Straight lines were drawn on with a ruling pen, while curves were done with a set of French curves.

Lettering

In spite of 40 years as a graphic designer, I was very nervous about doing the lettering and logos. I managed to identify the typeface used by the signwriter who painted



ABOVE: With its side-by-side seating, the 65" span Aeronca is quite a chunk of aeroplane. Ready to fly it weighs 48 ounces.

TOP: A family of four could set off on holiday in an Aeronca Sedan, with quite a lot of luggage and a useful range. Not bad for the 1930s.

1491H - it's a rare member of the Futura family of types called *Futura Display* and I found an alphabet sample in an old Letraset catalogue which enabled me to draw the Aeronca logo at about 1" cap. height.

The drawing was then reduced to the size required for the cowling, and re-spaced for the lettering on the tail. These copies were then stencil-cut (see Fig.1), spray-mounted in position and given a very light spray to create a 'ghost' image which was then over-painted by hand, eliminating the stencil tags. Ghost spraying avoids problems of paint creeping under the mask and is a technique I used a lot on foam scale mod-

els.

As I gained confidence, the job grew easier. I always try to prop up the work in a comfortable position and rest the hand on something firm. Working 'in air' without support is impossible, that's why the professional signwriter has his stick with a leather ball on the end so he can rest his brush hand against it. The same technique was used for the wings - ghost sprayed with outlines drawn with a ruling pen then filled in by brush.

The whole model was given a semi-gloss finish by mixing gloss and matt Ronseal Hardglaze at 60/40%. I feel sure the full-size

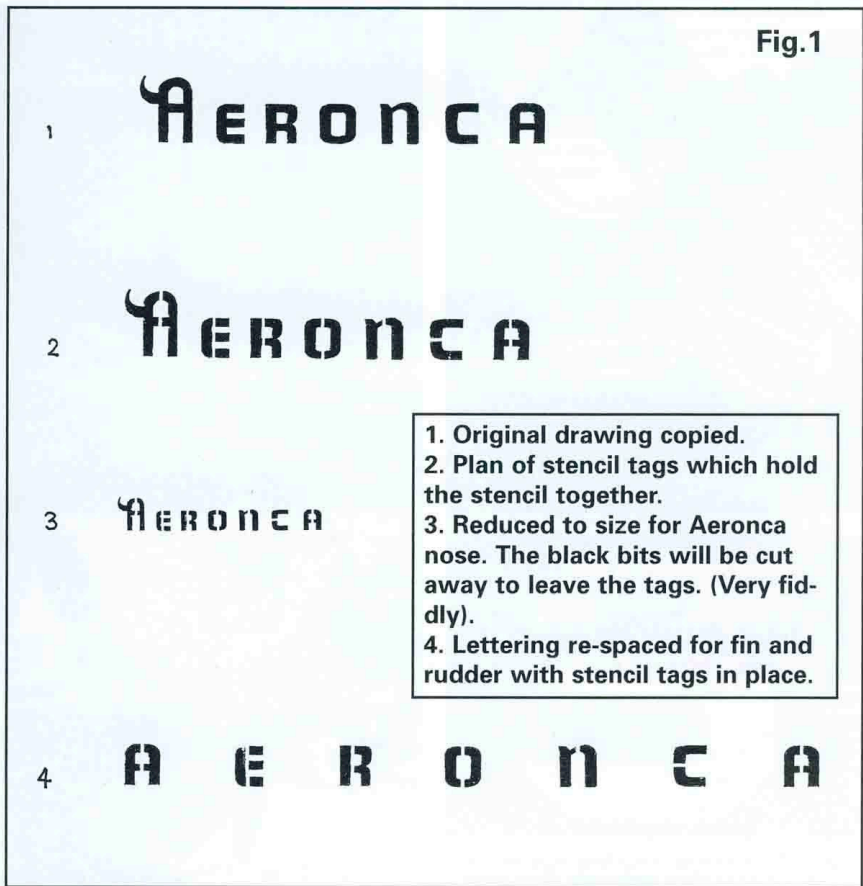
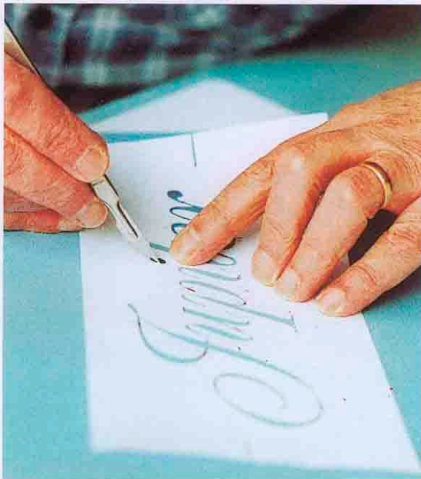


Fig.1

1 AERONCA

2 AERONCA

3 AERONCA

4 A E R O N C A

1. Original drawing copied.
2. Plan of stencil tags which hold the stencil together.
3. Reduced to size for Aeronca nose. The black bits will be cut away to leave the tags. (Very fiddly).
4. Lettering re-spaced for fin and rudder with stencil tags in place.

TOP LEFT: Different model, different logo, but this shows the lettering principle used on the Aeronca. The stencil tags hold it all together.
ABOVE LEFT: Peeling back the stencil (which can be used more than once). It only remains to fill-in the stencil tags. On the Aeronca the lettering was 'ghost' sprayed and finished by hand.

has a highly polished finish, but I am a believer in the theory of scaling-down the finish as well as the size, so I am fairly pleased with the end result.

R/C installation

The radio was fitted last year, so it only remained to connect up the closed-loop on the rudder and adjust the throws on the snakes for elevator and throttle. Access through the roof hatches (not scale) was okay and the hatches don't look out of place.

Assembly

The bands through the fuselage work well but it's fiddly. They need to be strong and doubled up to avoid wing flap which would

be embarrassing. The strut ends under the wings sit in their 'T'-slots, trapped in place permanently. When dismantled, they can fold flat under the wing out of harm's way. The arrangement is neat and practical. The tailplane, fin and rudder are banded on to the tail platform as one unit. It needs to be keyed to the platform so it can't move.

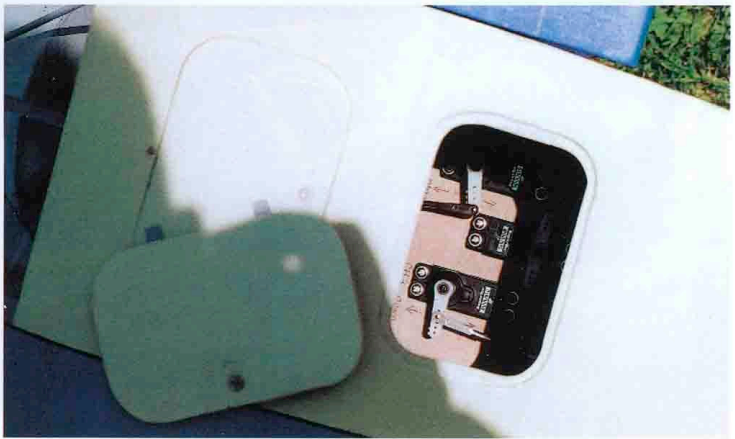
Engine runs

The Russell Lynx had already had about 20 minutes on the bench, so it was soon running in the model and turning an 11 x 4 wood prop strongly. The throttle response was not good, but just about half-power could be maintained with a fair pick-up. Perhaps more running and more experience

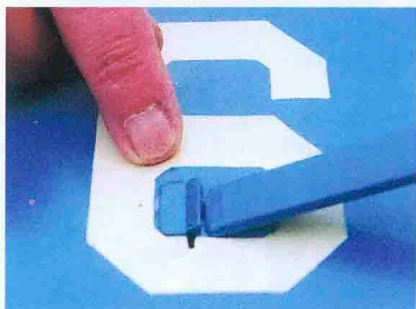
will improve the tick-over. It seems a bit of a myth that diesels don't throttle well, as my best throttler is an ancient ED Comp Special with an R/C carburettor. It will throttle right back to a lovely 'burping' tick-over and open up with confidence. To do the honours of test-flying the Sedan I had asked my old friend Richard Crossley who has test-flown several R/C models for me. It had been a windy few months here in Norfolk, but some evenings were calm, so I now had the gear charged and fingers crossed.

Summing up

I deliberately chose to make my Sedan a sport scale model with very little pretence of



ABOVE LEFT: Finished effect of stencilled markings applied as described in the text. Tail unit is banded-on, as on the original Mercury kit plan which you can still get from Phil Smith.
ABOVE RIGHT: Access to R/C gear through the non-scale roof hatches; if you finished the four-seat interior you could hide all the gear under the floor with access from below.



TOP LEFT: Dowel pegs and a long hook are part of the ground handling equipment. Wing fixing will spring back on impact - a vital feature on (what was) a free-flight model. **TOP RIGHT:** Wing struts are tucked away when dismantled. Note wooden pegs to retain the bands through the fuselage. **ABOVE:** Strut ends sit in 'T'-slots held captive by ply plates, glued and pinned. Strut can twist but can't come out of slot. This method affords less risk of damage than the original fixing and avoids metal-to-metal joint. **RIGHT:** If you chose to make a more detailed scale model there's a lot of info. on the Web, including interiors from the Sedan sales brochure.

scale detail. However, there is a lot of good reference on the Web for restored Aeronca examples, including interiors from the original sales brochures. Surface detail would consist of proper rib-tape patterns and accurate location of riveting. Access panels and landing lights could also be included.

The most obvious improvement would be a detailed dashboard, plus four seats for a family off on their holiday. There's room in that cabin to hide the R/C gear under the floor.

My thanks to Chris Strachan and Alan Callaghan who downloaded references for



Sprung undercarriage pivots on a wire in a tube across the fuselage. Wheel spats are a prominent feature on N1491H.

1491H for me. Also to David Boddington for excellent photo-references of G-AREX, the lovely red and cream Sedan resident in the UK which was the subject of last month's detail picture spread.

The crash

The first flight of the Aeronca ended in disaster. I acted as ground engineer, while Peter Smart was on hand-launch duty with Richard Crossley on the sticks.

After a range check, we again checked the control surface movements and balance point, before starting the engine, which ran well. Peter made a nice hand launch and the Sedan began to accelerate away, a little nose down, so Richard applied a bit of 'up' and the wing strut popped out of its anchor point so that the left wing suddenly assumed an extra 15 degrees of dihedral, but it was still flying well.

Then the strut bands must have broken and, like a slow motion sequence in a movie, the wings collapsed and my lovely Aeronca dived vertically to leave a perfect impression of its nose in the soft grass.

Fuselage formers F1 and F2 had collapsed and there were several broken cross braces and stringers, but the longerons were still sound. The nose and cowling were in fragments, but the engine and radio gear were undamaged.

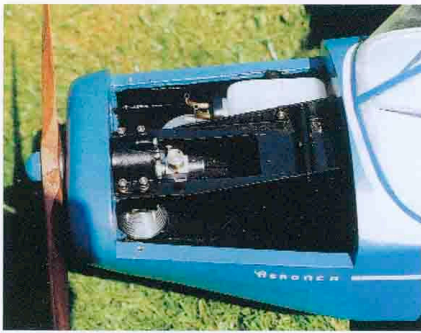
The lesson

When you've made a cock-up, I find it best to admit you've been a twit. It was a mistake to rely on the original free flight strut fixing, with bands through the fuselage. As Peter pointed out, a free flight model doesn't experience 'G' force, but when up elevator is applied on an R/C elevator, the 'G'-force is considerable - far more than rubber bands can cope with. I could have kicked myself for not realising what could happen.

The solution

What we needed, as Peter explained, was a strut fixing that would take the load - though the fuselage - onto the opposite strut and still give a bit of movement in a hard arrival.

The 'tie-bar' I came up with (see Fig.2) is epoxied into the original balsa box that took the rubber bands. Strut end fixings were also revised so that the wings can be dismantled, but the struts are locked in place by a bolt with lock nuts. The wings are still retained on stub dowels and bands though the fuselage. I don't think the Aeronca will ever be subjected to negative 'G' loads. But if I was building it again, I would use piano wire dowels in brass tubing - a much safer system for radio control operation.



FAR LEFT: The 2.5 c.c. replica Lynx diesel has plenty of power, but the throttle response is not so good. A small four-stroke with a short extension shaft would be nice.

LEFT: The full-size N1491H won an award at Oshkosh some years ago. Thanks to Chris Strachan and Alan Callaghan for the references they downloaded.



BELOW LEFT: Downloaded from the Web - this splendid in-flight shot of the full-size Aeronca Sedan upon which the model is based.

BELOW RIGHT: Another image from the Aeronca website - excellent scale detail for cabin interior and control panel.



The repairs

It's never so bad once you get it back on the bench and strip away the covering. I used rather a lot of epoxy re-building the front, but I did manage to rescue the nose block. Rather like a car that's been 'ringered', the bonnet was no longer a perfect fit, but after a lick of paint and fuel proofer, the Aeronca was ready for its second flight.

This time though, I was confident. Richard told me that before the wings folded, the model felt good to fly and he was also sure of a good outcome.

I am pleased to report that the re-built Sedan flew well on its second outing, with improved wing fixing. Test pilot Richard still wasn't happy with the short stub dowels locating the wing root, with rubber bands across the fuselage, because a knock could pull a dowel out and change the incidence.

Two strips of insulation tape so were used as a temporary fix. However, he was happy with the new nut-&-bolt strut ends.

Peter Smart gave a good launch and Richard eased in a little up elevator. This time the wings didn't flap and the 'Airnocker' climbed out smoothly. Richard report the rudder command is smooth, but that the elevator is very sensitive, so I will reduce the control throw.

Ricard also mistrusted the throttle on the Lynx diesel (he's aglow-man!) and to avoid an engine cut, kept the engine running a high throttle.

The glide is excellent for a scale model

and Richard judged the landing perfectly.

The wing root location problems will be solved by installing brass tubes in the wing and centre section, with piano wire ddi-hedral-keepers. But since I am stuck with the original stub dowels, I am fitting a tie brace through the cabin area, with a turnbuckle. The wings will then be unable to pull out, but by using a weal link in the brace, it should breal free in a crash.

Dont's let these problems put you off. The Aeronca looks great in the air and is an easy model to fly. A small four-stroke in the .26-.30 range would be perfect.

The moral...

If you do decide to make the lovely Aeronca Sedan from Phil Smith's plan and parts sheets, do revise the strut fixing and BE WARNED, the old free flight system of wing strut anchoring is a disaster waiting to happen.

Shopping

Aeronca Sedan Mercury kit plan plus all patterns for parts and full instructions:- Phil Smith, 32 Verwood Crescent, Southbourne, Bournemouth, Dorset BH6 4JE. Tel: 01202 433 431. Do get Phil's catalogue.

Russell Lynx 2.5 c.c. diesel with plain or R/C throttle:- Ian Russell, 98 Elers Road, Ealing W13 9QE. Tel: 0208 932 6783. ■



ABOVE: What every scale modeller dreads ... the gruesome aftermath of the initial test flight of Dave Deadman's Aeronca Sedan.

ABOVE & BELOW: Meanwhile, Phil Smith, who re-drew the Mercury kit plan, has been busy with a bigger, 80" span version ... well, now you're really talking!



Fig. 2

