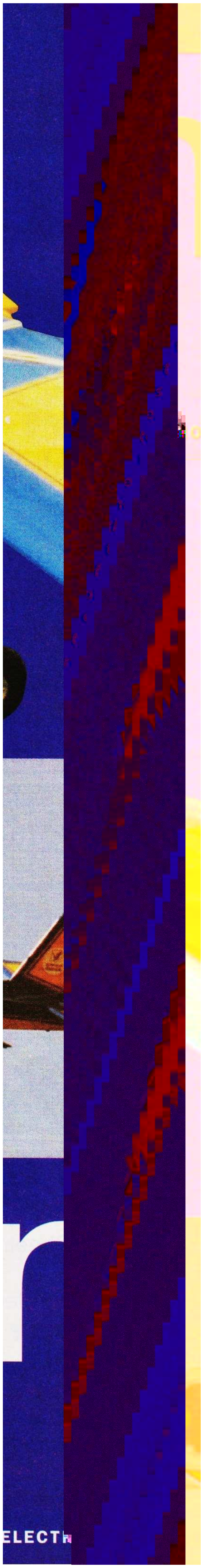
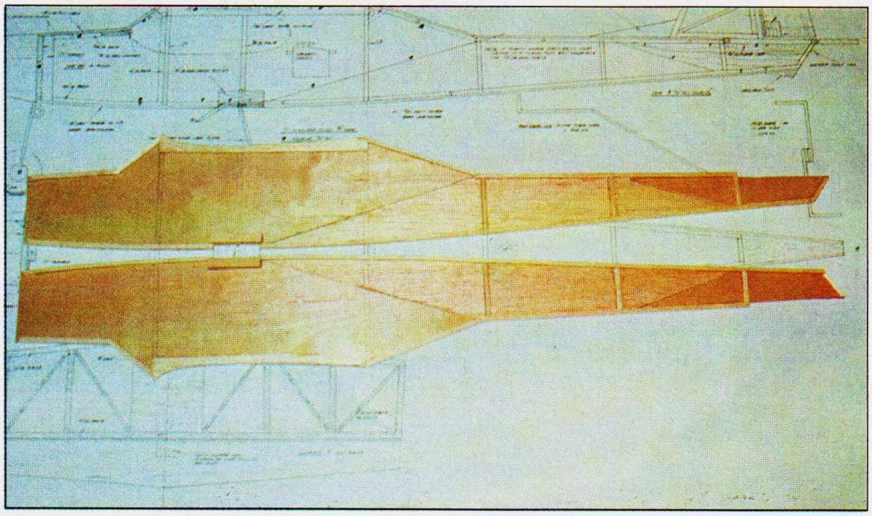
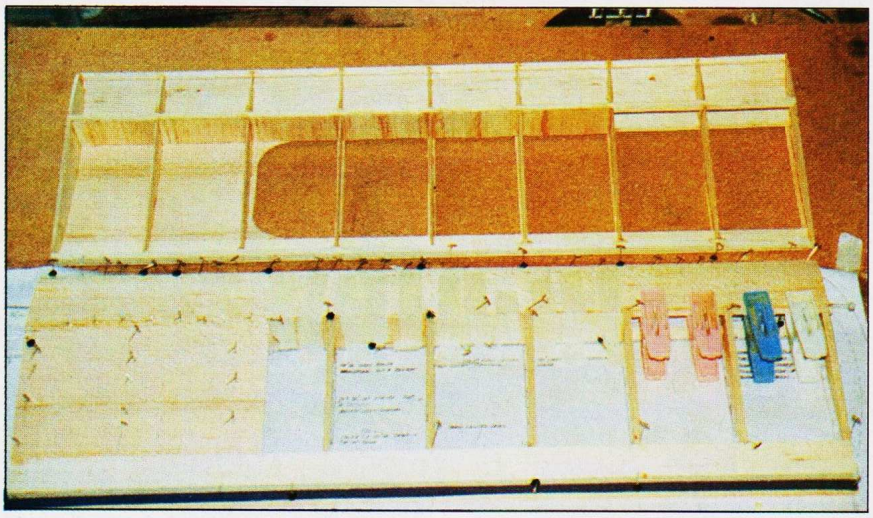




The fuselage sides clearly showing ply doublers at front and rear.



The wing under construction with the balsa pack (coloured blue) under the trailing edge.

I don't like a training model which dashes around the sky like a demented bee with its stinger on fire frightening other flyers and the trainee alike. I much prefer something a bit more gentle and sedate. To this end, I designed in plenty of drag in the form of a thickish wing section and a fuselage which is a little wider than normal for a model of this size. In order to slow it down even further, the ailerons may be drooped to the position provided by template 'A' (see plan). When you have progressed to flying solo and wish to do some aerobatics, the ailerons are repositioned to the angle provided by template 'B'.

For those building the three channel version, the ailerons are permanently glued in place using template 'A' to get the angle correct.

Horse power

My first model used an OS.30 engine of pre-Schneurle design, circa 1977, but almost unused. In order to check out the performance using a modern economy engine I later fitted an MDS.25 which has performed very well. Engines in the .20 to .30 range will suit, with a .25 being ideal for training. Using this engine the flying qualities are nice and gentle on half power and at full chat, most of the basic aerobatics are possible. Fitting a .30 engine turns the plane into a hot potato! A .25 four stroke would be great too!

Shotgun or glue-gun

The fuselage sides are cut from medium weight 3/32" sheet balsa suitably joined to obtain the required size. 1/32" ply doublers are then 'contact glued' to the front and tail end inside faces, ensuring that you make one left and one right side. Next, glue on the 3/16" sq. longerons and vertical spacers together with the servo rail chassis and the 1/2" sq. beech wood undercarriage blocks, using epoxy glue. Positions for the formers and vertical spacers may be accurately marked on each fuselage side by laying them carefully on the plan, inside face up. Using the double indicators marked on the plan (outside the fuselage outline) as guides, draw the positions on the fuselage sides.

When making the formers, mark a vertical centre line on the forward face of F2 and the rear face of F3. Using epoxy glue, fix formers F2 and F3 onto the inside of one fuselage side using a set square to keep them perpendicular. When the formers are glued in, keep the side flat on your building board and glue the other side to it. Stand the set square on the board, just touching the first fuselage side at the tailplane seat. Now align the other side so that its tailplane seat just touches the square. This will give you a nice true fuselage, as long as the formers have been made square!

Epoxy the ply undercarriage plate to the beech blocks. Using aliphatic glue, secure the bottom sheeting between F1 and F3. Draw a straight line on your building board 40" long and set the fuselage upright so that the centre lines previously marked on F1 and F3 are aligned with it. Secure the structure with whatever means you have. Pull the tail end sides together with a suitable spacer in between and set the spacer's centre line over that marked on your board. Carefully fit the 3/16" balsa spacers along the top without moving the fuselage. Leave to dry and then glue on all of the top sheet. When this has dried, remove the fuselage and glue the 3./16" balsa spacers on the underneath but do not fit the sheeting at this time. Fit former F1 and the triangular pieces behind it using epoxy glue.

Next fit the servo rails and servos. I used Sullivan Nyrods for the elevator control, the outer cover of which was securely epoxied to the exit end and secured (with scrap balsa) across the fuselage in three places. Keep the run straight. Rudder control can be as for the elevator, or as I did, by closed loop. Cables for this are from 10lb nylon covered fishing trace. Using metal crimps, secure two cables to the servo output arms, half an inch from the centre screw. Thread the cables through the Nyrod ends (previously glued in place) and cut off leaving plenty to spare. Later, when the fin and rudder are glued on, the cables are fitted to control horns each side of the rudder, half an inch from the rudder face, which will give the correct amount of rudder movement. When you are satisfied that there is no binding in either control run, glue on the bottom sheeting. Now complete the remaining fuselage structure.

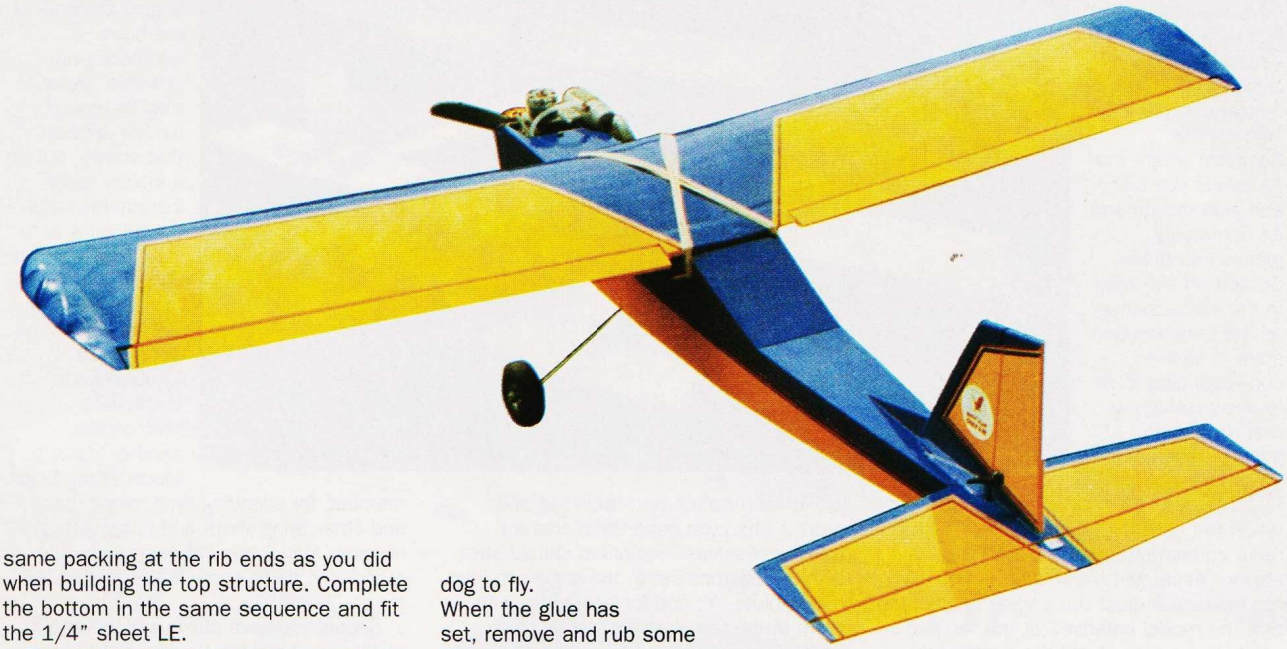
During the above sequence, when waiting for glue to dry, you could be building the fin, rudder, stabiliser and elevator, or cutting out the wing ribs.

Sticking with tradition

No foam in this wing! Start by cutting the sheeted sections slightly oversize i.e. for the top and bottom LE, centre section and false TE covering; and from the remainder cut the ribs and cap strips.

To make the ribs, cut one from 1/16 ply, push two drawing pins through it, and use it as a template to cut the others. Lay some transparent plastic over the plan and pin down the bottom mainspar, keeping it dead straight by laying it against a straight edge of some kind. Cover the complete length of some 1/4" sheet balsa packing with Sellotape and pin to the board beneath the wing ribs at the trailing edge. Glue the ribs, sloping R1 to the correct angle by using template 'C' for the aileron wing and template 'D' for the non-aileron one.

Now fit the top mainspar, false TE, trimmed as required, and the false LE. Fit the mainspar webs next, fitted with their grain vertical. Leave to set and then glue on the top LE sheet, centre section, that covering the false TE and the cap strips. Do not remove from the board until the glue has completely set. When you remove the wing, be careful not to build in a twist as you turn it over and pin it upside down onto your board. Use the



A good trainer has got to be practical in many ways and that includes being easy to transport. In every aspect Coachman fits the bill nicely.

same packing at the rib ends as you did when building the top structure. Complete the bottom in the same sequence and fit the 1/4" sheet LE.

The preferred aileron control system is for one standard servo in each wing. Using this set-up, the ailerons may be drooped to a flap position as previously described. This may be achieved by either the mixer on a computer transmitter or mechanically at the aileron servo disk. Single servo aileron control may be used by fitting one standard servo into the wing centre section and using torque rod linkages to operate the ailerons. When building the left wing, do so directly over the plan but note that ribs R1 and R2 are now placed at the opposite end.

Glue the panels together by laying one down over some plastic sheet where the join will be and epoxy the other to it. Raise the tip three inches for the aileron wing dihedral, and four and a half inches for the non-aileron wing. Make sure that the LE and TE align correctly, or a twisted wing will result and the model will be a dog to fly.

When the glue has set, remove and rub some PVA or aliphatic glue into the centre section sheet top and bottom, in a strip 4" wide on each side of the join and allow to dry. Rub in some more glue and wrap a strip of 4" surgical bandage right around the wing top and bottom and overlapping the wing join by 1". This results in a reinforced area 6" wide. Rub the glue well into the bandage to ensure complete penetration through to the wood.

Tailplane and fin

Cut the elevator and rudder from soft sheet and chamfer the LE of each but keep the TE square. The tailplane and fin are both built up from 1/4"sq. balsa. Cut all joints square and keep flat.

Covering

Use a good fuel proofer and apply two coats to the engine, tank bays and fuselage back to the trailing edge of the wing. Clearcoat is a good one here, as it improves covering 'stiction'. I use Solarfilm on my models with Prymol at the film join overlaps.

Setting up

After covering the tailplane, temporarily fix it in position with rubber bands. Fix the wing similarly. Set the tailplane square to the fuselage by measuring from the left hand corner of the elevator to a point at the centre of the fuselage at former F3. Measuring now from the right hand corner of the elevator, adjust the tailplane until both measurements are equal and mark the underside where it joins the fuselage. Now mark with corresponding marks on the fuselage so that it may be refitted in exactly the same place. Look from the TE of the tailplane to the TE of the wing and

DATAFILE

Plan specification

Name	Coachman
Designed by	Mike White
Aircraft type	Basic trainer to intermediate aerobatic trainer
Wingspan	53 inches
Wing chord	$9\frac{3}{8}$ inches
Wing area	490 sq. ins (3.4 sq. ft)
Aerofoil	NACA 2415
Dihedral at each tip	Aileron version $1\frac{1}{2}$" Non-aileron $2\frac{1}{4}\frac{8}{}$"
Fuselage length	41"
Tailplane span	20"
Tailplane area	110 sq. ins
Fin height	7"
Engine range	20-30 two-stroke 25 four-stroke
Fuel tank	6-8oz
Reqd No. of channels	Four / five
Control functions	Aileron, elevator, rudder, motor
CG from LE	$2\frac{3}{8}$" to $3\frac{3}{8}$"
Elevator throws	Rates off $\frac{3}{4}$" up and down Rates on $\frac{1}{2}$" up and down
Aileron throws	Rates off $\frac{1}{4}$" up and $\frac{1}{8}$" down Rates on $\frac{3}{16}$" up and $\frac{1}{16}$" down
Rudder throws	$\frac{1}{2}$" each way with or without ailerons
Sidethrust	1° - 2° degrees
Downthrust	2° - 3° degrees

Materials used in construction

Fuselage	Ply, balsa
Wing	Balsa
Tail surfaces	Balsa
Weight ready to fly	4 lb 3 oz (67 oz)
Wing loading	20 oz/sq. ft.