

This fun-scale Cessna is a bit of a departure from the normal for me. I usually only build large scale models but I wanted something smaller to fly during the winter months which wouldn't need assembling at the field, therefore giving me maximum flying time and minimum freezing time! This called for a one piece model of about 50in span which could be hand-launched.

I had been toying with the idea of the Cessna for several years as it is an unusual shape and no existing plans or kits are available except for the Royal kit which didn't fit my requirements or my budget. The reason why I hadn't made any positive moves towards building this model in previous winters was through lack of information. A friend had found a tiny 3-view drawing, which I had enlarged enough to take some measurements from and discovered that at 51in the model would be 1/9th scale. At the same time Flypast and Aviation News ran some articles on 02-A's which had been bought from the US government, rescued from Davis Monthan Air Force Base and restored to airworthiness. This seemed a good omen and also gave me my first colour photos, showing a faded grey and white scheme with a black anti-dazzle panel which I felt would be simple to reproduce and, more to the point, quick!

The 02-A is the military version of the Cessna Skymaster and was used by the USAF during the Vietnam war for Forward Air Control and locating downed pilots. The push-pull twin engined concept was ideal for these roles, giving the aircraft over 200mph with 1400 miles range without having any undesirable flight characteristics if one engine was 'shot out'.

So there's the background to the model and the full-size aircraft. If you fancy a scallish model which is simple to build and fly, read on.

A well used .25 powers the prototype. Another has been flown with a .40 four stroke. It's your choice!

Body talk

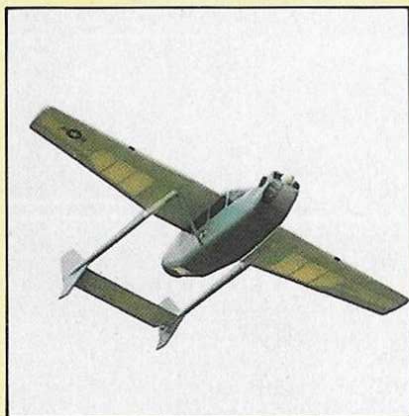
Let's start with the fuselage. Make up two sides from 1/8th sheet and glue 1mm ply doublers inside each piece using contact adhesive. Note that the front of the doubler set 6mm back from the front of

is the

Pull together

Next, pull in the rear sides and glue F4 and F5 in place. Add the angled 1/8th balsa strips to the bottom of the fuselage sides. To do this simply cut some strips oversize and chamfer so they are a good fit to the fuselage sides. Glue in place and when dry plane them flush with the bottom of the formers. Sheet the underside with 1/8th balsa laid cross-grain. Note that there is a piece of block fitted next to F5 to obtain the correct shape of the rear cowling. Plot the centre of F6 and draw a circle on to it. Glue F6 to F5 and sand to the edge of the circle. This will give the effect of a round engine nacelle when viewed from the rear.

The cowl is made as follows. Cut the cowling former from 1/2in sheet. Cut out holes for prop shaft and cooling intakes and, with the engine bolted in place to ensure correct clearance from the propeller, glue



Cessna

Simon Delaney introduces plans for a 51" twin boom scale sportster



the fuselage side to allow the 6mm ply bulkhead F1 to align against it. If you have cut everything squarely then this should automatically give zero thrust to F1. Glue the 3/16th wing doublers in place then assemble and glue F3 and F4 at right angles to one side. When dry, add the other side, checking for squareness. Once this is complete, glue F2 in place, pulling the fuselage sides in and holding in place with rubber bands or clamps until set. Reinforce this joint with 3/8th triangle strip chamfered to the correct angle. Glue in the 1/8th balsa cross piece and add triangle strengtheners as shown. Drill F1 for the engine mount and tank/throttle services and epoxy in place again using 3/8th triangle strip to strengthen the joint. Bolt the engine mount in place. Glue a scrap piece of

the 1/4 sheet sides to the cowling former and F1, cutting away one side to clear the cylinder head. I used miralite ply rolled round the top of the cowl and block underneath,

3/8th triangle strip across the back of F1 to support the front of the fuel tank and silicone the tank in place. Remember to fit the fuel pipes at this point! Plank or roll 1/8th sheet to form the decking between F1 and F2. Although this is lost under the windscreen blocking, fitted later, it does impart considerable strength to the nose area.

but you could plank with 1/8th balsa if you wish. I used an old Thunder Tiger 25 on the prototype and, using an Irvine dustbin silencer, the whole engine was enclosed bar the cylinder head and the bottom of the silencer which gave adequate cooling.

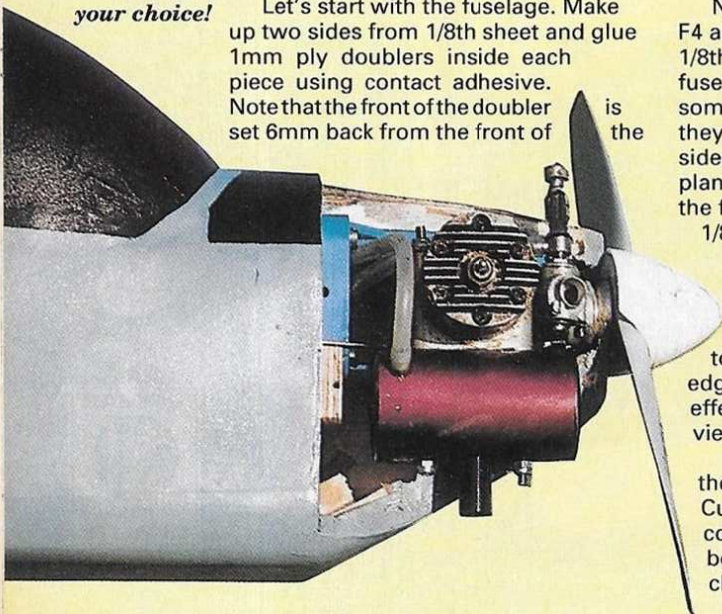
On the original model I made half the cowl removable by sawing vertically through the centre line and fitted locating tongues from 1/16th ply. This portion of the cowl was retained by a single self-tapping screw into a hardwood block glued to F1 behind the cylinder head.

At this point you may feel that you've made a large clog shoe or part of a model lifeboat, but do not despair, the best is yet to come, unless, of course, you don't like building wings!

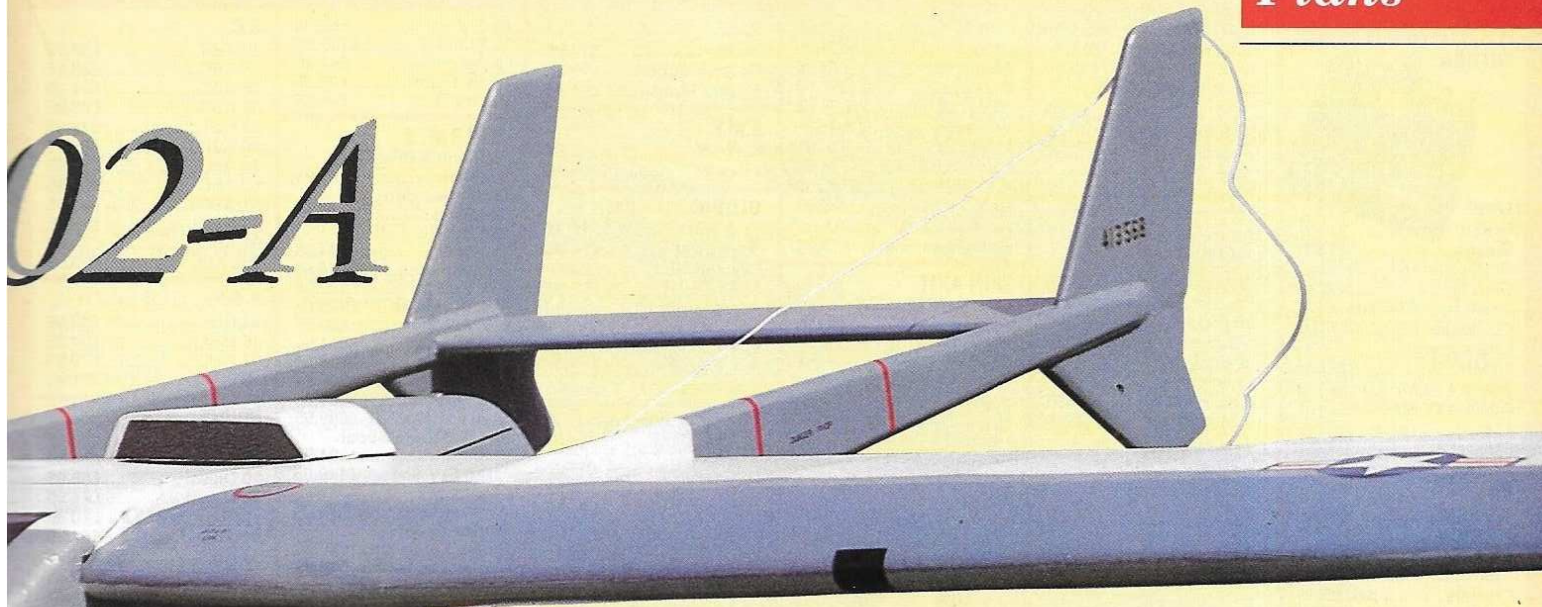
In three parts

The wing is built in three pieces, two outer panels and a centre section. The tail booms are sandwiched in between the centre section and each panel.

Start by building the centre section first. Cut eight W1 ribs from 1/8th balsa. Pin down the lower 1/4in square spar and 1/16th lower trailing edge sheeting, suitably packed up on some scrap block. Glue all eight ribs, checking their position over the plan and ensuring that they are all at 90 degrees to the building board. Next, fix



02-A

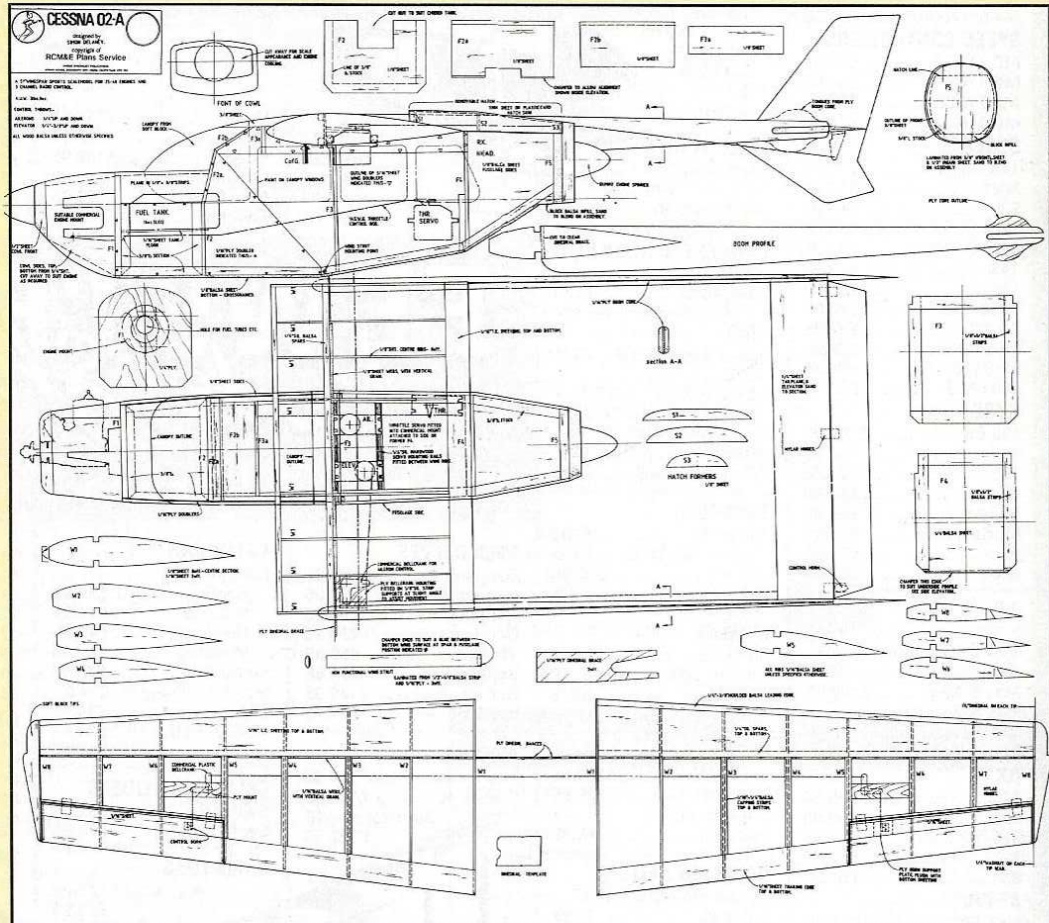


the L.E., top spar and top trailing edge sheeting in place. Glue 1/8th sheet webbing against the rear of the spars with the grain vertical.

Next, glue in the elevator bellcrank plate cut from 1/16th ply. Angle this slightly so that the rear edge is lower than the front. This helps to make the control run smoother. Use scrap 1/8th square strip balsa to support the plate top and bottom.

Outer panels

The two outer panels are built in a similar manner. Pin down the lower spar and trailing edge sheeting. This should be packed up to give the required amount of washout. I used a piece of 1/4in balsa, cut to the length of the panel, planed to a wedge shape. Cyano on all the ribs, followed by the LE, top spar and top trailing edge sheet. Glue in the aileron bellcrank plate with scrap wood to support it, again making sure it is slightly angled to give a good run to the aileron horn. Glue 1/16th balsa webbing in place and add the tip from block. Using a razor saw, carefully cut through W1 and slide in the 1/16in ply dihedral brace and glue in position - PVA is fine for this. I used bulldog clips to clamp the brace to the spars while it dried. Making a sloppy job of this could be terminal, so check that the fit is good all round the joint. Add 1/16th LE sheeting top and bottom and all that's left to do is the aileron. If you mark ribs W6, W7 and W8 when you cut them out, just cut through along the lines and through the trailing edge sheet and remove the aileron. Add the 3/32in trailing edge and LE, and sheet the rest of the aileron with 1/16th balsa, leaving a



small area for the 1/8th ply horn support. Give the wing a light sanding and build the other panel in a similar manner. Fit the aileron bellcranks and pushrods. Cut out all the tail boom parts, noting that the inboard 1/4 balsa side has a cut out to fit the tailplane. Mark the outline of W1 on the sides of the 1/16th ply boom and glue to each side of the centre section. Check that the booms are parallel by viewing from the rear and checking by eye with a straight edge placed across both booms and aligning with the top of the centre section. When the assembly is completely dry, add the inboard boom sides, cutting away the port boom to take the elevator snake. As these are

drying, test fit the tailplane again and check that its position is correct. Use clamps or bulldog clips to keep the boom parts together whilst they are setting. Note that the ply 'core' only extends as far as the wing spar to allow for the dihedral brace. Cut through the outer W1 on each side of the centre section and check the fit of the outer panels. When satisfied, glue in place, propping each panel up by 1.1/4" to give the correct amount of dihedral. I used PVA for this joint and left it to dry overnight. Next slide the tailplane on again and glue in position. Sheet in the centre section top and bottom with 1/16th balsa, leaving a hole in between the two centre ribs for access to the radio bay. Also, sheet the outer panels

up to W2. Use 1/16" x 1/4" as capping for all the other ribs, top and bottom. Now add the outer boom pieces and sand the booms to an oval section. Sand the upper and lower fins to section, cut a slot in the bottom of each part and glue onto the ply locating lugs. Sand the elevator to section, cover it and hinge to the tailplane. I used Mylar strip for all the hinges on the model, holding them in place with cyano. Then drill and pin with cocktail sticks to secure.

Hinges and hatches

Similarly, sand the ailerons to a smooth finish, cover them and hinge with Mylar. I used commercial horns fitted with 10 BA bolts on the elevator and self tappers on the ailerons. Make the wing struts from 1/8" x 1/2" balsa strip laminated to 1/16th ply and glue in place. I used 16 SWG wire cyanoed into each end to hold them in place, but it may be worth allowing them to be 'knocked off'. Make a hatch cover from plastic card or thin ply and locate with small screws. Although designed as a one piece model the original aircraft had a bolt on wing secured with a 2 BA bolt on the TE and a 1/4" dowel engaging the front of the wing, but this was only done to allow for wing incidence changes. In the event no adjustments were made, but you could make the wing removable if you wished. Make the air scoop up from former S1 to S3 and sheet with 1/8th balsa or carve from block. I made the scoop removable for easy access to the radio compartment and held it in place with self-tappers.

Combat finish

I covered the entire model in natural Solartex using Balsaloc on the curves of the fuselage to help adhesion. I then applied two coats of sanding sealer, rubbed down between coats with 1000 grade wet and dry sandpaper and some soapy water. This cuts back the finish nicely and leaves the airframe smooth and ready for spraying. The colour scheme I chose for the prototype was a Vietnam white and grey finish, although the USAF had camouflaged and all-black variants. Alternatively you could cover the model with Solarfilm and go for a civil scheme - the choice is yours. I used cellulose car spray paints as these saved time and matched my colour photographs exactly. I masked off and sprayed the front window and anti-dazzle panel black, but used fablon for the side windows which was just as effective and saved more time on masking. I used Letraset for stencilling and insignia and radio call signs were made from some transfers left over from another model. Never throw anything away - that's what I say!

I created panel lines with an HB pencil and shaded in the flaps with pencil lead rubbed on with my finger. This breaks up the wing nicely but try



Designer Simon Delaney lends scale to his handy size sport scale model. The high wing layout and chunky fuselage make hand launching an easy task.

not to go mad, because it's great fun. Blow the whole model over with Tufcote or similar and that's it, built! If you're operating from a surface that may wear the fuselage undersurface when landing, you could use glass cloth and resin to protect it.

Radio installation

It may be worth fixing the throttle servo before gluing the wing on. I used foam tape to hold the servo in place and located it against F4. Alternatively you could use a servo mount which would ease removal at a later date. A 14 SWG wire push rod was selected for the engine control. You could use a tube and cable if you wish but a wire rod is simple and quite sufficient for this purpose.

The battery and the receiver sit in between F4 and F5 to get the CG to the right place. The aileron and elevator servos are mounted on hardwood bearers in the centre section of the wing. Make sure that the servos don't touch the hatch when the arms and linkage are fitted, so measure the height of the servos accurately when gluing in the bearers. Control throws are 1/4" up and down for the ailerons, and elevator 1/4" - 3/8" up and down.

About 20% of the wing chord gives a pleasant response. Any further forward and the Cessna heads for the deck after launching. You have been warned! Mount the switch under the wing or on the rear of the engine nacelle. A dummy spinner bolted to the rear end of the fuselage adds to the twin-engine look of the model and a piece of coarse sandpaper glued into the front of the air scoop simulates a mesh grill.

On Patrol

Try to find someone experienced with hand-launching to give you your first 'throws' as I have seen models broken by over willing people who don't know that hand-launching means wings and nose level! Ask the 'launcher' to run steadily into wind and let the model fly out of his hands. This

stops people practising javelin throwing and gives the pilot an even chance of controlling the model when it is near to the ground and retrimming if necessary. The Cessna shown in the photo's was powered by a Thunder Tiger 25 engine turning a 10x6 propeller. A friend built one and used an early OS 40 four-stroke and both combinations of aircraft/engines proved to be ideal, so anything in between should be fine.

The O2-A is pleasantly aerobatic but don't forget that the rudder stick doesn't do anything. Landings are simply a case of letting the model sink slowly while holding some throttle on and flaring out at about 6 inches off the ground!

So that's it!

If you're a sport flyer and wanted to build and fly a more scale-like aircraft, but have been put off in the past this could be the one for you.



DATAFILE

Plan Specifications

Name	Cessna 02-A
Designed By	Simon Delaney
Type of Aircraft	Sport Scale
Wingspan	51in
Wing Area	350sq. ins
Aerofoil	Semi-symmetrical
Dihedral at each tip	1.1/4in
Fuselage Length	39in
Tailplane Span	13in
Tailplane Area	52sq. ins
Tailplane Section	Flat
Fin Height	8in
Engine Range25-.35 two stroke or .40 four stroke
Fuel Tank Size	4-6oz
Rec No of Channels	Three
Control Functions	Aileron, Elevator, Throttle
C.G. (from L.E.)	20-30% of chord
Elevator Throws	1/4in up & down
Aileron Throws	1/4in up & down
Sidethrust	Nil
Downthrust	Nil

Materials used in Construction

Fuselage	Balsa, Ply
Wing	Balsa
Tail Surfaces	Balsa
Weight Ready to Fly	3lbs 9ozs
Wing Loading	23ozs/sq. ft