Vic Smeed's Courtesan.

A 12" span rubber powered version.

Introduction

A variation inspired by David Deadman's CO_2 powered version which was first published in Model Flyer in 2003 and again in the Nov. `21 issue of Aero Modeller.

The main changes from Vic's & David's forerunners are

- Wing & tail plane fixed to fuselage.
- Laminated outlines substituted for sheet parts.
- LEs, TEs and main spar all slimmed down.
- Nose sheeting discarded in favour of stringers,
- No wing & tail sheeting.
- Addition of weight reducing voids where-ever possible
- Tissue covered layout paper for the fairings.
- Reduced thickness of non-load bearing sheet and strip aft of the CG.

Construction

To keep tail weight as low as possible formers F6 to F8 are made from 1/32" sheet and have weight reducing voids which are shown dashed on the plan. The easiest way to create these voids is with sharpened brass tube and they are best made before the part is cut from the sheet to prevent splitting.

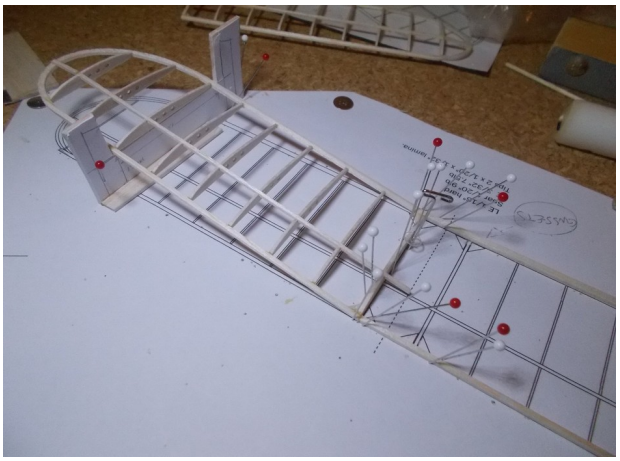
The airframe sub-assemblies can be built in any order that suits you, but you may find it convenient to create the laminated parts before you start on anything else.

Wing

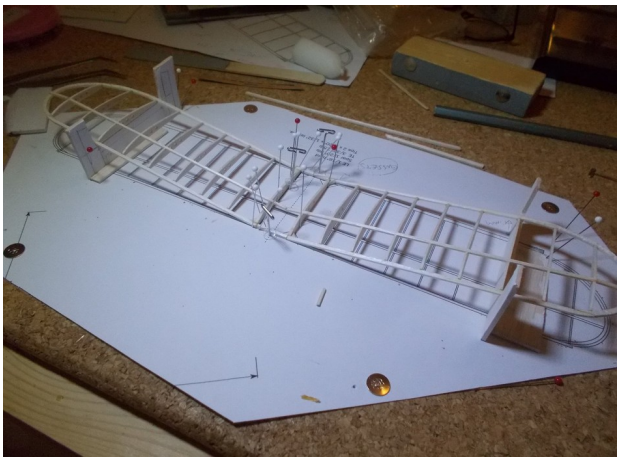
Build each half of the wing separately. Pin down the wing tip and trim to size using the cutting guides on the plan, then fit the LE & TE. Fit the ribs, aligning on the spar and sanding the LE/TE of each to fit. The root rib is canted towards the wing tip using the dihedral guide. Fit the spar, crack it – carefully, I score it with a blade first – to bring it down to the wing tip, then feather it down to about 1/32" at the tip. Smear a tiny drop of glue into the crack to reinforce it. The spar should be left projecting about half-way into the centre section (CS).

Continued over.

When both halves have been completed, pin down the LE & TE for the centre section, butt one of the halves to the CS strips and prop it so that the underside of the tip is at 7/8” (≈ 22mm), fit & glue together with the gussets as shown on the plan. Go away and have a cup of coffee, tea if you must, and a biscuit while it all sets. Fit the second half of the wing to the CS. You may need to sand the spars down a touch where they meet. When everything has set, fit the CS spar/dihedral brace against the spars. Sand the brace to a butterfly shape when all is set.



Setting the dihedral. Start...



...and finish

Fin & Stabilizer

The tail-plane is built in the same way as one of the wing halves and the fin is built as seen. If you used a template to cut the stabilizer ribs, keep it. It will come in handy for shaping the fin fairings at final assembly.

Fuselage

Fuselage construction is conventional and the only things to note are

- The lower longerons will need steaming or otherwise softening at the nose end before you try to bend them.
- The port side framework has to removed from the board and flipped over before fitting the large 1/32” sheet parts to ensure they are flush with the outside of the fuselage.

Frame up the fuselage by fitting formers F1, F3 & F4 at right angles to one side and then fitting the opposite side. When all is secure bring the stern posts together and fit the horizontal spacers. There is no upper spacer at F5 to allow clearance for the motor. It is fitted to the diagonal braces behind the cabin instead. Fit the laminated part NB to the front of F1.

Continued over.

Fit formers F2 and F5 to F8 inclusive. F2 & F5 are balanced quite precariously on the upper longerons and should be braced with stringers as quickly as is practical. Fit the aft stringers in pairs starting with those at the sides of the fuselage working up to the spine. It is very likely that the top line of one or more of the aft formers will need very gentle sanding to give a level fall of the spine stringer from the top of the cabin to F8. The side stringers will provide the necessary support for this.

After you have completed framing the fuselage, but before you fit the UC wire, is a good time to cut and test fit the cabin glazing.

Fit the UC wire to the back of F3 and sandwich it with a piece of 8 lb / cu. ft sheet. Wrap a few loops of thread around and smear the thread with a very little cyanoacrylate (CA) adhesive.

Nose Block

As the Courtesan wasn't designed for rubber power you're free to make it whatever shape most pleases you. The nose plug is made from 3 pieces of medium 1/16" sheet glued cross-grain.

For my build I bent the shaft from 20 SWG piano wire and used an Al tube projecting about 1mm from both the front & rear of the nose block to do double duty as the bush.

Covering

Go with a simple scheme & use the lightest tissue you can find, I would also recommend pre-shrinking the tissue on a frame for the wing, fin, stabilizer and for the area over the aft stringers with a final steam shrink. I used a single coat of thinned, 30% by volume, non-shrinking dope over VMC's domestic tissue.

If you're using tissue with no wet strength then I suggest that you cover the top of the wing using 5 pieces. Fit the centre section, then the main panels and finish with the wing tips. The underside of the wing can be covered with two panels. The first covering the centre section and one half, the second the other half excluding the centre section.

For the fuselage, use one piece from F5 to F8, from F5 to the rear of the cabin.

The cockpit coaming and fin fairings are made from tissue covered paper. Artists' Layout Paper at 45gsm makes a good, lightweight, substrate that is also easier to fit to curves than standard 80gsm printer paper. Daler-Rowney do A4 blocks for about £6 at 2021 prices. It's also very good for ink-jet printed roundels and the like. I fitted the coaming to mine after doping.

Final Assembly

Fit the windscreen. It will be a fiddle and you will swear at it, so wait until there are no pets, small children or spouses present before attempting this step. If you cannot find very thin, lightweight transparent material, leave it off. I found it helpful to use tiny bits of low tack masking paper to hold the screen in place before “spot welding” it with tiny dots of cyanoacrylate around the edges. Trim off any excess that projects above the top line of the cabin.

Glue the wing in place, then the tail plane and the fin observing the usual injunctions to keep everything true. It is unlikely, but you may find it necessary glue a thin strip of 7.5lb to the base of the fin and sand it back to get a good line.

Fit the tail-plane fairings.

Fit the sub-fin.

Fit the wheels.

Sit back and admire your handiwork.

Trimming & Flying

Guideline weights

These should be treated as no more than indicative, but, if you use wood of the densities shown on the plan you can reasonably expect to get similar weights.

Uncovered airframe inc. prop & shaft 5g

Covered & doped as outlined above 7.5g

Propulsion. A 14” loop of 0.06” driving a 4” Peck/VMC Pattern airscrew.

If you are flying in a small hall you may need a large trim tab on the fin and you will probably need a gurney or trim tab on the port wing to counteract torque roll.