



The Graduate

Thank you and congratulations on the purchase of your 'Graduate' kit exclusively supplied by Propguy. It has been primarily designed around the popular EME 35cc petrol engine however any 26-45cc petrol engine, equivalent glow or electric power can be used. If you elect to buy an EME engine or any associated hardware for your Graduate there is a 10% discount from Propguy. There are a number of silencers available including a super quiet silencer. Engine mounting will differ dependant on choice, please see the website for full details. www.propguy.co.uk

Overview

The 'Graduate' is a rugged easy to build and fly sports model. It has been designed to build simply and quickly needing no special skills or tools. It needs no plan to construct it, just think of it as a simple 3D jigsaw. All the important parts are here in the kit, you will need however a quantity of sheet stock we suggest 5/32" depending on how you intend to power and cover your project. You may want to give some thought to this before commencing the build.

As the 'Graduate' can be built for either electric, glow or petrol engines. Those intending to use electric power will obviously want to keep things as light as possible and use minimal sheeting on the flying surfaces and none on the fuselage.

It is envisaged majority will build and power the model with a petrol engine and the following pictures and build thread follows that theme. A word here on finishing for you to consider. The model maybe film covered, alternatively a

stronger more durable result will and can be obtained by either a fabric or resin, glass cloth paint finish without it becoming a heavy weight! More pictures of the build are on the website. www.propguy.co.uk

The Build

Adhesives, you can use cyano, aliphatic, white glue, epoxy. Cyano will speed the build process and when we say 'glue' in the instructions it refers to using cyano unless stated. Top tip: Not all cyano brands are as effective on laser cut materials, try yours first on some scrap to make sure. We sell a cyano specially formulated for laser cut material also aliphatic glue.

As with all builds familiarise yourself with the parts and dry fit them first to prevent mistakes. However if you do don't worry if you have a whoopsie we can supply replacement parts if necessary!

Building the Tail Feathers

If you are new or a novice builder you may want to start with the 'tail feathers', tail plane, elevators rudder and fin to ease you into the build. You will find all the parts marked on the laser cut ¼ sheet balsa, the parts may just need easing out and a little sanding to ensure a snug fit. Do a dry fit first and build on a good flat surface! A good tip here is use piece of cling film over your building board to protect it and so you don't glue the parts to it!

Lay all the parts out in the required format and once you are happy glue them together. Carry on and glue balsa sheet to both sides of the structures then finish by shaping a radius to the edges.

Building the Fuselage NB. BUILD A LEFT and RIGHT Hand fuselage side!

Collect together fuselage sides and doublers (six pieces in total). You will notice the press out parts contain other components within them set these aside until needed. Note: Retain safely the small pieces removed from servo cut outs in the rear section of the fuselage which are used to strengthen the servo mounting. Collect together F1B, F1C, F3, F4, F5 and the rudder servo mounting plate, dry fit

these into their respective positions, a little easing may be necessary to obtain a tight fit.

Repeat this operation on the other fuselage side.

If you intend balsa sheeting the fuselage sides you may wish to do it now as the sides can be weighted down flat.

Note: you may wish to drill F1A, F1B and F1C to suit your engine mounting before gluing these in place. A template is included in these instructions if you are using the quiet silencer to achieve the correct angle.

Now you are going to glue each fuselage side and its doubler together, and install F1B, F1C, F3, F4, F5 together with the spruce top rail and the rudder servo mounting tray in position on the first side to obtain correct alignment and clamp securely removing the formers.

The structure is pretty much self jiggling and can be assembled as a whole unit, i.e. both sides together, using white glue or aliphatic if you are confident, UC1, UC2 and UC3 can be installed at this time to square things up.

If not bond the doublers to one of the fuselage sides and then install the formers to one fuselage side using a square to check the alignment. Ensure you install F1C behind F1B which is behind F1A and that all bulkheads are square and true. When dry, again using white glue or aliphatic bond the other fuselage side in place.

Top tip: use paper clips to clamp the fuselage sides and doublers together,

When dry install the undercarriage plates UC1, UC 2 and UC3 in sandwich fashion and using white glue or aliphatic follow that by similarly installing the four side UC doublers against the fuselage doublers.

Again when dry install formers F6, F7, F8 pulling the fuselage sides together evenly and clamping together. It is helpful here to draw a straight line on your building board slightly longer than your fuselage. Mark the centerline on each bulkhead align these together so ensure you don't build a banana shaped

fuselage! The spruce longerons can also be added to form the turtle deck, note the detail where the center longeron fixes to F5 this enables the hatch catch to be located.

Cut slightly oversize the main phenolic wing tube to fit into the fuselage, this can be sanded back to make sure of a snug fit when the wing and wing tube are assembled. Repeat the exercise with the anti rotation wing tube, but DO NOT glue in position just yet! You will need to fit the wings in place as the holes are slightly larger than the tube to ensure a correct alignment. The gap can be made up by using masking tape wrapped around the tube as necessary, epoxy or 'Gorilla' type glue is useful for fixing the tubes.

Collect together F2, F2H, F3H, F4H, Dash, F5H and F5H1, these will form the top deck and removable hatch/cockpit. Cut two spruce rails to lie between F1C, F5H and F5H1, similarly cut longerons to lie between F1C, F2, F2H F4H and Dash. Dry fit all the components leaving a 1/16 gap between F2 and F2H and likewise between F5 and F5H to allow for covering and finishing. Spot glue ensuring glue does not adhere to fuselage sides . Cut between F2 and F2H to 'release' to hatch then a stronger glue joint can be made if necessary and a spruce rail can be inserted to strengthen the cockpit side rails at F5.

You can now go ahead and sheet, crosswise, the bottom of the fuselage, quadrant may be added for extra bonding area. You may like to leave the portion directly under the anti rotation tube to get better access to it when fixing it in place.

You can now begin to sheet both the turtle deck and top deck, wet the sheeting and hold in place with elastic bands to mold to shape. When dry cut and trim as necessary, you might have to repeat the process to get the desired fit before you glue it in place.

Building the Wings NB. BUILD A LEFT and RIGHT WING !

Collect together LE, S1, S2 Ail1 Ail2(two pieces) and TE, wing ribs W1 to W9. Start the assembly by installing the ribs on S1 and S2 'egg crate fashion' as shown ensuring a snug and accurate fit then add Ail1 and Ail2, the short piece fits at the wing root between W1 and W2. Then add LE and TE, the assembly will be dry fit to this stage. Ensure all ribs are down on the board and correctly positioned then using medium cyano glue the structure together, use cyano 'kicker' if to ensure there is no movement if it is necessary. Continue by cutting to length and adding the spruce spars, install the top spar first. Tip here use weight, phone directory or magazines to hold down the wing structure ensuring the rib tabs are all down on the building board. When dry install the lower spar and W0, the 5mm 'T' nut can be fixed and glued in place on the inside of W1, this will be for the wing securing bolt.

Next starting from the wing leading edge sheet the top wing halves, use cyano on the ribs and aliphatic on the balsa to balsa sheet joint as it will be easier to sand.

Sheet all the way back over the aileron trailing edge, when dry trim back to shape.

NB Don't forget to add blocks for aileron horn between W6 and W7 and for hinges at appropriate places if you are using point hinges or the like.

Cut the main phenolic tube to slightly over length to allow for sanding back for a snug fit and glue in place, a butt fit is essential to gain maximum strength. Use Epoxy or 'Gorilla' type glue for this purpose. It is recommended you block the outer ends of the tube so accidental damage to the wing rib when inserting the wing tube is prevented, you can do this with scrap ply, balsa block or a pin through the phenolic tube.

With the phenolic tube in both the fuselage and wing halves sanded assemble the wings to the fuselage using the wing mounting bolts to secure. In doing so dry fit the cut pieces of anti rotation phenolic complete with tube in their respective positions.

Anti rotation tube is slightly smaller and can be wrapped with masking tape to ensure a snug fit in the rib, make sure you use the aluminum tube between the wing halves to ensure correct alignment. Glue in place ensuring the glue doesn't creep into the wing to fuselage gap. Once dry remove the wing halves and strengthen the glue joint on anti rotation phenolic tube if required.

Now you can remove the break off tabs from the bottom of the ribs, sand any imperfection to receive the balsa sheeting. After installing the wing servo plate between W5 and W6 begin sheeting the underside of the wings starting as before at the leading edge.

When dry cut out the aileron from each wing half, these will need to be sanded to shape, the addition of 1/8 balsa 'veneer' to the wing trailing edge, aileron leading edge may be made to obtain the desired result.

To finish the wing halves laminations of 1/4 and or 1/8 strip should be added to the wing leading edge and then carved and sanded to shape. 1/4 or 1/2 can be added to the wing tips and shaped as desired.

When dry fuselage assembly is dry attach the wings and offer up the tail plane into position dry fit and check the incidence and alignment adjusting as necessary. Double check glue and fix in position. Repeat the exercise with the fin.

If you are film covering your model you may wish to cover the tail feathers first, remembering to remove the area of film at the glue joint if you do.

Use soft block or blue foam to fair in the turtle deck to fin.

CG is on the main spar (front edge of the main wing tube)