THE Vintage MODEL Co

CORSAIR

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THE Vintage MODEL Co.

CORSAIR – THE WHISTLING DEATH

In 1938 the U.S. Bureau of Aeronautics issued a specification to manufacturers for a carrier-based fighter bomber. Chance Vought successfully answered this request with a proposal for an aircraft fitted with the biggest, most powerful, air-cooled engine of the day – the hugely powerful Pratt and Whitney 18-cylinder Double Wasp. The engine required a very large diameter propeller to use the 1850 horsepower available, which gave the Vought engineers a headache as it required an equally large clearance to the ground. The simple answer of a tall undercarriage would be unacceptable due to the harsh landing loads expected for a carrier based aircraft. To overcome this problem, the design team lead by Rex Beisel came up with a 'bent' inverted gull wing design. The inboard section of the wing having a severe anhedral angle and outboard section a severe dihedral angle with the undercarriage positioned at the joint of the two. As well as being structurally sound the distinctive configuration had the advantage of minimising drag at the wing root to fuselage joint. The clean lines of the airframe and the powerful engine gave the Corsair a 400mph plus top speed and impressive rates of climb, but the long nose and consequent poor forward visibility when landing, coupled with other difficulties initially made for unsuccessful carrier trials. The U.S. Navy proceeded with the easier to handle Grumman Hellcat, turning over the Corsair to the U.S. Marines. However, the British Fleet Air Arm persisted (probably through necessity as much as any other factor) and by using different landing techniques and modifications, went on to operate the aircraft successfully from carriers. The U.S. Marines soon made use of the Corsair's speed, agility, ruggedness and range as they flew it from rough runways on small Pacific islands. It is said that the Japanese named the aircraft the 'Whistling Death' because of the deadliness of the aircraft along with the distinctive noise created by the air as it passed through the large wing root mounted oil coolers. Operating well after the Second World War, over 12,500 examples of the Corsair were produced over a 9 year period to 1953, with many serving as recently as the late seventies in some territories.

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YOUR KIT

This kit is designed for you to build a traditionally constructed, rubber powered, free flight model of a Corsair operated by VMF-216, a fighter squadron of the U.S. Marines Corps – nicknamed the 'Bulldogs'. The Bulldogs were based on the Essex Class aircraft carrier USS Wasp before taking part in the Battle of Iwo Jima in early 1945. The kit includes the materials (other than paints) to complete the suggested authentic scheme. This is a simple striking scheme, but you can decide to do your own favourite or more complicated scheme if you wish.

Construction of the model from this kit uses the traditional method of 'stick and tissue', that consists of a built up balsa wood skeleton (framework), covered with a tissue skin. The balsa frameworks are built over a plan that is printed at the exact scale of the model, which is in essence a real engineering drawing.

Power is provided by rubber strip motor that is wound up before flight. Free flight means just that – once the model is launched, it is on its own. It must follow a predetermined flight path established when the model is initially adjusted for flight or 'trimmed'. This type of traditional building technique and flying requires a degree of patience and skill, but is extremely rewarding.

The Corsair is just one of a series of kits designed and manufactured by the Vintage Model Company. Aeromodelling was very popular from the 1950s until the 1980s and following a decline and the loss of UK manufacturers such as FROG, KeilKraft and Veron, a revival is now underway. The advent of modern technology such as laser cutting of parts and the growth of the internet giving access to information on the skills and techniques required to successfully build and fly these models, means new enthusiasts are discovering the joys of aeromodelling every day.

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Typically for a small model and in the spirit of the traditional kits, profiles are simplified and adjusted from the original and a relatively large propeller is used. This is done so that the model is light and stable enough to fly on its own, is simple in construction and can work with the rubber motor. These adjustments have been done with care and sensitivity so that the shape and spirit of the original aircraft is preserved as much as possible. Also in the spirit of the traditional kits, additional items required to build the model are things that can be found in the kitchen drawer or are easily available on the high street.

KIT CONTENTS

- Four balsa sheets with precise laser cut parts and strip wood.
- PVA glue for building the wooden frames.
- One 150mm diameter plastic propeller.
- One pre-bent motor hook and shaft.
- A vacuum formed canopy.
- Three low friction plastic 'nose' bushings – one for the propeller and two for the undercarriage wheels.
- Piano wire for the main undercarriage and tail wheel.
- One motor peg (cocktail stick or toothpick).
- Rubber motor strip.
- A roll containing parts reference sheets (W), full size summary plan sheets (X), tissue to cover the model and scheme markings (Z) printed on lightweight paper.
- Scheme diagram sheet on the last page of this booklet (Y).

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OTHER THINGS THAT YOU WILL NEED

CONSUMABLES

- Glue. 'Cyano' (sometimes called 'superglue'), quick setting epoxy and a 'glue stick'.
- Cling film or waxed paper to cover your plan or a wax candle to rub over it.
- One sheet of standard printer paper (80gsm).
- Tissue sealant – if you want to fly your model outdoors (see 'Covering' for details).
- Paints (Humbrol-style enamels) if you want to give your model an authentic scheme.

TOOLS

- A 'building board' – A flat piece of wood or cork that is large enough for the largest part of the model and soft enough for pins to be pushed into.
- Some modelling pins. If these aren't available, dress making pins or drawing pins with tall heads will suffice.
- A sharp craft knife or scalpel.
- Pliers and wire cutters.
- 180 and 600 grit sandpaper and a small sanding block, or a disposable nail file with rough and smooth sides.
- A small engineers square or a plastic set square from a school geometry set.
- 30cm rule (preferably steel).
- 'Blu-Tack' or plasticine.
- A fine marker pen.
- Brushes – one thin and fine, one flat and soft 10-12mm wide.
- An old perfume bottle or similar that can deliver a fine mist of tap water.
- Some sprung wooden clothes pegs to use as clamps.

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THE PLAN, GENERAL BUILDING TECHNIQUES, TERMS, HINTS AND TIPS

The plan provides most instructions for the construction of the major components. Major components are all built over the outlines on the plan provided. *Cover your plan with cling film or waxed paper or rub it all over with a wax candle to stop the parts sticking to it.*

There are some terms used on the plan that you may not be familiar with:

- **Laminate:** This means to make a glued sandwich of various parts, often with the grain of the parts crossed to make a single thicker and stronger part. When laminating, ensure that the parts are held together or weighted down and are aligned according to the plan instructions. Make sure that you remove excess glue that squishes out, as not doing so can make the parts harder to sand and in internal corners, may leave an undesirable glue 'fillet'.
- **Cut through section:** This is simply a way of showing parts on the plan in more detail – as if you had cut through the parts on the line shown. The parts that are 'cut' are shown 'cross hatched'.
- **Bevel:** This means to angle the edges of a part, usually by sanding.

SAFETY

This kit is not a toy and as such is not suitable for children below the age of 14. Read and follow any instructions and warnings given on the various glues, adhesives and paints, etc. When flying your model, follow the guidelines in the section 'Trimming and flying your model'.

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TIPS TO MAKE A GOOD JOB OF YOUR MODEL

Read and follow the instructions and the plan carefully.

- A light model will fly much better than a heavy one, so use glues and adhesives sparingly. Work neatly and remove excess adhesive that squishes out from joints – glue weighs far more than the balsa wood! A piece of stiff 1.6mm square scrap wood with the end cut at an angle makes an ideal scraper to remove excess glue from corners or slots.
- To avoid losing the parts, remove them from the laser cut sheets only when you need them. Use the parts reference sheet to identify the required part(s). Keep what remains of the balsa sheets once the parts have been removed. This 'scrap' can be useful later to replace a broken part, or make other detailed parts of your choosing.
- Balsa wood is very delicate – a light touch is required and this is especially true when sanding. If you have not sanded balsa before, practice on the scrap edges of the balsa sheets. You will be surprised by how quickly the material is removed!
- When using glue (especially cyano), don't use it from the tube directly. Instead, drop some onto a non-porous disposable surface such as clean foil from a yoghurt pot lid. Alternatively, save pistachio nut shells – one held upright and firm on a piece of Blu-Tack or plasticine makes an ideal disposable glue container. You can then pick up precise amounts of glue on the end of a pin or piece of wire to apply to the parts. This saves overuse of the glue and the potential embarrassment of sticking yourself or other items to your model!
- **All** of the contact surfaces of the parts to be joined should be covered in glue.
- To remove the balsa parts, cut through the tabs that join them to the sheets with a sharp craft knife or scalpel – do not try to snap them from the sheets as they may split. Remove the remains of the tab with a light sanding.
- Some parts have a laser engraved letter 'T' on them – this means that the part should be orientated with the letter T to the top when it is correctly assembled.

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- If you decide to paint your model, then use paint sparingly. It is very easy to add weight with paint and your model will not fly well if it is too heavy.
- The balsa sheets are graded. Sheet 1 and 2 are hard and stiff but heavy – they are used for parts where strength is in preference to weight. Sheets 3 and 4 are weaker and softer but light and are used for parts where lightness is key, obviously at the expense of strength. There are long lengths of cut balsa (known as strip) on both the 'light soft' and 'heavy stiff' sheets, so use strip wisely and as suggested by the instructions to make things as strong and light as possible.
- Never push pins through the balsa parts or strip, (unless specifically told to do so) – it will weaken them or cause the wood to split. Use pins each side of the parts either angling them or using the head to hold the parts down.
- Never force a part to fit – check and adjust it until it fits snugly but without force.
- Pin parts together tightly but be careful not to crush or damage the wood – a tight joint is a strong one.
- Trial fit the parts before gluing and carefully adjust them if required. They are cut accurately, but small errors can occur between the parts and the printed plan. Wood is a natural material and its thickness may vary – it will contract and/or expand after the parts are laser cut.
- You can work on several parts at one time. For instance, you can make up the wheels and undercarriage at the same time as something else is setting. Just make sure you read through the instructions first and follow a logical sequence.
- If you have never bent wire parts before, then grab a few paper clips and practice on those with your pliers, before committing to bend the (expensive) piano wire in the kit. Use a fine Sharpie marker to mark the position of each bend as you go along.
- The internet contains a huge amount of information to help you build your model. Searching for terms such as 'free flight scale' and 'stick and tissue' will yield example builds and a lot of useful information to help you with your build.
- **Above all... take your time!**

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MAIN PARTS AND FRAMES BUILDING SCHEDULE

THE CENTRE SECTION

1) Identify and remove **one set of parts** from the laser cut sheets: **CS1, CS2, CS3, R1, R2, R3, R3A LC, TC and 3 off corner gussets**.
2) Cut 1.6mm square strips from the stiff sheet for the front and rear lower spars and pin them in position on the left hand centre section outline on the plan.
3) Pin down CS1 and CS2 over the outlines on the plan, check the fit at each end using the ribs R1 and R3 in their final positions as a guide.
4) Glue in position rib R2 between CS1 and CS2 and over the spars ensuring that it is upright and the ends are located in the notches.
5) Glue in place part CS3 locating the slot into the slot in Rib R2, ensure that it is upright.
6) Glue in position ribs R1 and R3 tilting them to meet the angled end faces of CS3. Allow the glue to set for a while before proceeding.
7) Glue in part R3A tilting it so its face is parallel with R3. Add a piece of stiff 1.6mm square strip for the wheel cover supports. NB these can be omitted to save weight if you are going to fly the model 'wheels up'. **NB if you are undecided at this stage then then they should be fitted as they cannot be fitted once the centre section is covered**.
8) Glue the corner gussets and parts LC and TC where shown.
9) Repeat steps 1-8 for the right hand panel.
10) Allow both assemblies to dry then lift them from the board.

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THE MAIN WING PANELS

1) Identify and remove **one set of parts** in the following quantities from the laser cut sheets: **1 off each W1-W8, R4-R8, dihedral gauge DG and special corner gussets LW and TW**.
2) On the left hand wing outline pin down the leading edge W1 trailing edge W2.
3) Pin down two pieces of stiff 1.6mm square strip that form the front (main) wing spar and the short rear spar, noting that the front spar finishes inside the notch of R8, whilst the rear spar finishes in the notch of R5.
4) Trial fit the tip pieces W3 and W4 along with the inner and outer ribs R4 and R8, once you are satisfied glue W3 and W4 together and to the leading and trailing edges respectively ensuring neat and strong butt joints.
5) Fit and glue the root rib R4, tilting it using the gauge DG as shown on the plan.
6) Fit and glue all of the remaining ribs making sure that they are upright and properly located in the lower spars, leading and trailing edges.
7) In the two 'bays' between R4 to R5 and R5 to R6 fit the parts W7 and W8 on top of the lower spar as shown on the plan.
8) Fit a stiff 1.6mm square strip as the upper spar, noting that it runs from the notch of R8 and extends out from R4 as shown on the plan.
9) Glue W5 in position, along with special corner gussets LW and TW.
10) Carefully bevel the edges of W6 to fit snugly against R8, and glue in position.
11) Add a piece of stiff 1.6mm square strip for the wheel cover supports. NB these can be omitted to save weight if you are going to fly the model 'wheels up'. **NB if you are undecided at this stage then then it should be fitted as they cannot be fitted once the wing is covered**.
12) Repeat for the right hand wing panel. Leave both panels to set before removing them from the building board.

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COMPLETING THE WINGS

1) Pin the wing centre sections back over the profile on the plan. Ensure they are nice and flat and that they are accurately positioned.
2) Take the left hand wing panel and apply glue to the end face of R4 and the mating face of the top spar extension and glue to the face of R3 on the left hand centre section. Ensure it is correctly aligned to both the centre section and the profile on the plan. Prop up the wing tip 85mm using a heavy sturdy object such as an upside down small shot glass. The two pieces can be clamped together using a sprung clothes peg or gentle modellers clamp. Just make sure that the wood is not crushed as it is clamped.
3) Repeat step 2 for the right hand centre section and wing panel. Leave the assemblies to set before removing them from the building board.
4) Round off the leading edge of the wing assemblies and taper the trailing edge as shown on the plan. Carefully give the structures a light sanding to smooth the joints, remove lumps and bumps and the burnt edges of the laser parts.

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THE TAIL PLANE (STABILIZER)

1) Identify and remove **all** of the parts on the laser cut sheets: **1 off T1, T4 and T7 and 2 off T2, T3, T5 and T6**.
2) From the light 1.6mm square strip, cut all of the ribs using the plan to get the right length, set these aside.
3) Pin down the tail plane central spar T1.
4) Pin down T4 and work round in each direction from it trial fitting T3 and T2 each side. When you are satisfied, glue the parts in position making sure that you have nice neat butt joints.
5) Pin down T7 and work round in each direction from it trial fitting T5 and T6 each side, once you are satisfied they are a good fit, glue into position. Allow this outline to set.
6) Once the outline is set, glue all of the ribs in place adjusting the length if necessary.
7) Leave to set then remove from the board and give both sides as well as the outside edges a light sand. Be careful so as not make the structure too thin or cause unevenness in the surface by over sanding.

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THE FIN AND RUDDER

1) Identify and remove all of the parts on the laser cut sheets: FR1-FR6.
2) From the light 1.6mm square strip cut all of the ribs using the plan to get the right length, set these aside.
3) Pin down the fin and rudder central spar FR1 and glue FR4 in position.
4) Lay out the parts starting at FR2 and work round in each direction, making any small adjustments as required. When you are satisfied, glue all the parts in position making sure that you have nice neat butt joints. Allow this outline to set.
5) Once the outline is set glue all of the ribs in place adjusting the length if necessary.
6) Leave to set then remove from the board and give both sides as well as the outside edges a light sand. Be careful not to make the structure too thin or cause unevenness in the surface by over sanding.

THE FUSELAGE

This is built by building one half over the plan on top of a central keel using half formers which, along with 1.6mm square strip 'stringers', provide the fuselage shape. It is then lifted from the plan before the other half formers and stringers are added to complete it.

Preparing the fuselage parts

NB: In all of the following steps of this section ensure any excess glue is removed from the slots and locations in the parts as they are laminated – otherwise parts added later may not fit.

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1) Identify and remove parts in the following quantities from the laser cut sheets: **2 off F2, F3, F4, F7, F10, F11, WS1 and WS2**.

2) Make two **opposite hand** (i.e. one left hand and one right hand) laminations from parts F2 and F3. NB apply the glue to the face of F3 that is opposite to the 'T' markings so they can be referred to later on in the assembly. Pin both laminations to the board to keep them flat and aligned ensuring that the rectangular cut out in each part lines up perfectly.

3) Make two opposite hand laminations of parts F10 and F11, aligning the profiles.

4) Make two opposite hand laminations of parts WS1 and WS2, aligning the profiles

5) Referring to the plan pin down 2 off each of F4 and F7 with the etched rectangle marks uppermost so they are set as opposite hands, then cut and glue in position the small pieces of 1.6mm square strip in position over the etched marks. Work accurately as these parts help position the wings later on in the build.

6) Leave the parts to dry thoroughly and remove from the board before proceeding.

To build the left hand fuselage side:

1) Identify and remove parts in the following quantities from the laser cut sheets: **1 off each: F5, F6 ,F8, F9, K1 and K2. Note the part K1 is quite delicate and large so carefully cut it from the sheet and handle it with care**.

2) Identify the left hand set of parts **F2/F3, F10/F11, WS1/WS2, F4 and F7** as previously laminated and assembled.

3) Carefully pin down part K1 over the profile on the plan, aligning it carefully to the profile and the slot positions. Avoid placing pins where they will get in the way of other pieces to be added later on.

4) Glue in position the F2/F3 lamination, making sure that the 'T' is at the top. You must make sure that it is accurately located and that it is perfectly at right angles to the board using your square. Glue the F10 and F11 lamination at the rear matching the profile. Allow them to dry before proceeding.

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5) Trial fit the formers F4 to F9 in the relevant notch in the side keel K2, referring to the positions of the notches on the plan – these should be a snug, but not overly tight fit. Also check their fit in the notches of main keel K1. Score and 'crack' K2 upwards at the right of the F9 notch.

6) Apply a stripe of glue on K1 adjacent each notch (but not in the notch) for the formers F4 to F9, then position each one of the formers in the notches. Then without hesitation, apply glue to the notches and ends of the side keel K2 and fit it carefully to the formers kinking upwards to locate into the notch in F10/F11. Be careful not to crush the formers. Ensure that the front end of K2 is properly located in the F2/F3 notch and check again that F2/F3 has remained upright. Use extra pins if required to make sure that everything stays flat. Leave the glue to set for a while.

7) Fit the WS1/WS2 lamination between F4 and F7 and into the slots in F5 and F6. This forms the seat for the wing later.

8) Add stringers in the notches from 1.6mm square strip. Use stiff strip for the three stringers fully illustrated on the plan, the three lower front stringers that run from the nose to F4 and WS1/WS2 and the uppermost stringer that runs from the nose to F6. For the stringers that finish towards the rear, refer to the diagram on the plan to check at what position to finish them.

9) Fit all remaining stringers which are made from the light strip, again referring to the diagram on the plan to check where they finish towards the rear.

10) Allow everything to dry for as long as possible, then remove it from the board. Carefully cut out the four temporary crosspieces from the main keel K1.

To build the right hand fuselage side:

1) Identify and remove parts in the following quantities from the laser cut sheets: **1 off each: F1, F5, F6, F8, F9, K1 and K2 plus the right hand set of parts F2/F3, F10/F11, WS1/WS2, F4 and F7** as previously laminated and assembled.

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2) Glue in position the F2/F3 lamination, making sure that the 'T' is at the top, then add former F1 cross-grained aligning the square hole. Pin the assembly nose down on to the board to ensure all is flat square and true. Allow this to dry before proceeding.

3) Glue the F10 and F11 lamination at the rear matching the profile.

4) Now follow previous steps 5–9 for this side, checking at each stage of adding a stringer that the fuselage is staying straight and true.

Completing the fuselage construction:

1) Remove parts in the following quantities from the laser cut Sheets: **2 off F12, and 2 off F13**.

2) Carefully cut out the sections of the keel in the cockpit position between F6 and F7, and at the tail end as indicated on the plan.

3) Starting with the left hand side, glue F12 only at F7 and the stringer 'A' position leaving the front edge to stick out at this point. Repeat for the right hand side and allow the glue to set.

4) On each side carefully bend and glue the front edge to F6 in steps to conform to the F6 profile.

5) Trial fit F13 on each side bevelling the edges to meet the stringers top and bottom to ensure a snug and flush fit to the outer profile.

6) Set the fuselage aside and complete the nose block.

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THE NOSE BLOCK

1) Remove parts in the following quantities from the laser cut sheets: **1 off each NB1-NB4, EC1-EC3 and 3 off NP1**. It is not strictly necessary to fit the engine graphic at this stage but it is less fiddly now rather than later.

2) Laminate the parts NP1-NP3, aligning the central hole, make sure that the 'T' on each part is in the same orientation and that the edges are all flush. Allow this nose plug assembly to dry. Once dry, trial fit it to the square hole in the fuselage nose, adjusting it to have an easy fit. Cyano adhesive can be run around the hole and the edges of the part to harden the wood. DO NOT glue this plug to the fuselage!

3) Glue the nose plug to the nose block, ensuring that it lines up with the cross markings on NB4 and the holes remain in line. Make sure that any glue that squishes out between the parts is removed, otherwise it will prevent the parts from sitting together properly. Allow the completed nose block to dry.

4) Glue a plastic nose bush in to the hole in the nose block using cyano adhesive. **DON'T ALLOW THE ADHESIVE TO GO INSIDE THE BUSH**.

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FINISHING THE FUSELAGE

1) Fit the nose block, **BUT DO NOT GLUE IT IN PLACE!** Then sand it to match the fuselage and to the profile as shown on the plan. If you want to paint the nose block it should be coated with full strength dope and sanded to a smooth finish beforehand.
2) Carefully sand the outer wing seat parts (WS2) each side to match the profile of the formers each end and the stringers at the top and bottom.
3) Sand the tail end parts F10/F11 to the profile shown on the plan.
4) Sand the remainder of the fuselage all over to remove the burnt edges of the parts. Be careful not to over sand and ruin the profile of the parts especially around the cockpit area.
5) Offer up the wings to their final positions and make any minor adjustments to the slots and locations to make sure the wing root ribs meet the wing seats fully. Set the fuselage, nose block and wings aside.

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THE WHEELS , UNDERCARRIAGE AND SPINNER

1) Using wire cutters, pliers and cotton thread, make up the undercarriage legs and tail wheel from the wire provided. **Make sure that you make two legs and they are opposite hands**. The cotton thread binding should be strengthened using cyano. Note that where wire parts are joined the cotton thread can be exchanged for wrapping with fine wire and then soldering.
2) Identify and remove parts in the following quantities from the laser cut sheets: **2 off each WH1-WH7 NOTE: PARTS WH5 ARE VERY DELICATE SO TAKE EXTRA CARE!**
3) Sand the internal diameter of the WH4 and WH6 parts to remove the 'tags' and burnt edges using a piece of sandpaper wrapped round a pencil or similar. Similarly remove the tags from external diameter of parts WH5 and WH7.
4) Laminate the parts cross grained as shown on the plan to make 2 wheels, make sure all of the parts stay concentric. Once they are set, round the edges off as shown on the plan. If you want to paint the wheels they should be coated with full strength dope and sanded to a smooth finish beforehand.
5) Fit a plastic nose bush to each wheel using cyano adhesive. **DON'T ALLOW THE ADHESIVE TO GO INSIDE THE BUSH**.
6) Identify and remove parts in the following quantities from the laser cut sheets: **1 off LG1L, LG1R, LG2L and LG2R**.
7) In parts LG1 and LG2 (both hands) make a groove following the line etched into the parts. This is best achieved using the left over piece of wire from the undercarriage legs or failing that, an empty ball point pen drawn along to simply 'dent' the wood.

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8) Follow the instructions on the plan to make up the two main undercarriage leg assemblies – be very careful to make sure that you make a left hand and right hand assembly using the 'L' and 'R' versions of LG1 and LG2. If you want to paint the leg assemblies, they should be sealed and sanded to a smooth finish beforehand. Leave the wheels off the axles at this stage.

9) Remove **TW1** from the laser cut sheet and glue to the centre of the tail wheel wire with cyano. Allow it to dry then sand the wood flush to the wire.

REMAINING PARTS FOR USE IN THE ASSEMBLY OF THE MODEL

1) After all of the previous building steps have been completed, there should be **2 off** of the following parts left on the laser cut sheets: **OC1**, **OC2**, **LG3**, **LG4 and LG5**. Remove them from the sheets and set them aside to be added once the model is covered.

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COVERING

The tissue in the kit is used to provide a 'skin' over the balsa wood framework. The basic idea is that the tissue is attached to the framework and then sprayed with water and then left to dry. As the tissue dries, it shrinks and tightens. For flying indoors this can be left 'as is', however, sealing the tissue is advisable if you intend to fly your model outside, as it makes the tissue more durable and stops it going 'saggy' if it is damp or humid. Traditionally, cellulose dope was used for sealing the tissue (thus the process is often called 'doping'). Cellulose dope is pretty smelly and is now frowned upon for shipping by post making it hard to obtain unless you have an old fashioned model shop in your locality. Two alternatives are available:

Clear lacquer This is available at many DIY stores in spray cans. The model can be given a single coat of it once it is built, but before the paper decals are applied. If you use this method then make sure that you only apply a light coat. It is very easy to get carried away with it and add a lot of weight!

Eze Dope This is a modern replacement for cellulose dope, and being water based it is fine to be shipped by post. This is thinned (30% Eze-Dope to 70% water) and then brushed on the tissue after it has been shrunk. If you choose to use the Eze-Dope, then you should shrink the tissue with a 5% solution of it (rather than plain water) and pin the model parts down each time you apply a coat, as you do when you shrink them following the instructions overleaf:

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THE FIN, RUDDER AND TAIL PLANE

1) For the covering you will need a glue stick, PVA, fine brush, scissors, an old perfume bottle or fine mist sprayer and a sharp knife. It is also worthwhile to get a sponge and a dry cloth so that you can keep your fingers clean and dry as you work. Thin the PVA around 50% with water (err on the strong side if unsure) in an old jar lid or similar.

2) Cut out some spacers (about a dozen or so) about 20mm long and 5mm wide from the edges of the left over sheet and apply one layer of sticky tape to one surface. These spacers are used when shrinking the tissue – the sticky tape simply prevents the spacers sticking to the parts.

3) Starting with the fin and rudder, cut out two pieces of tissue that are about 10mm bigger than the outline of the part. Lightly apply the glue stick only to the face of the parts of the structure that form the outer profile, keep the covering smooth and avoid it gathering in blobs on the surface and in corners. With the tissue flat on the work surface, put the glued side down onto it. Turn the tissue covered side towards you and gently tug and tease the tissue until there are no wrinkles and the tissue is nice and smooth. You do not have to make the tissue tight, the water shrinking will do that later. Give the glue stick a few minutes to do its job.

4) Once the glue has set a little, cut the tissue carefully leaving an edge about 1mm wider than the part all the way around, apart from where it fits to the fuselage. Here you should cut it flush to the structure.

5) Working in stretches of a couple of inches at a time, apply the thinned PVA to the tissue edge that is sticking out and carefully roll the tissue up so that it sticks to the edge of the part. Rub all-round the edge with a dampened finger to ensure that the edge is fully stuck down and nice and smooth. Do not get the PVA on the tissue any other place other than the edges or the tissue will not shrink properly later.

6) Repeat for the other side, once again overlapping the tissue at the edges. Let the glue dry for a few hours or preferably overnight.

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7) Spray the part with a fine mist of water on both sides, then use the spacers that you 'sticky taped' to hold the edge of the part off the board. Use pins set at an angle to hold it flat until it dries. Holding the part down in this way helps prevent warps. Note that the tissue is very delicate when it is wet, so handle the part at the edges and with care so that you don't damage it.

8) The method for the tail plane is the same.

THE WINGS

1) Cover the underside of each of the wings with two pieces of tissue, one for the main wing panel and one for the centre section, overlapping the joints at the R3/R4 position. Cover each wing panel first and the centre section last. As with the fin/rudder and tail plane, use a glue stick to attach the tissue at the outlines only, then seal the edges and joints with 50/50 thinned PVA to ensure that it is well attached. At tissue to tissue joints, brush the thinned PVA through the top later tissue, and gently rub the joint with a damp finger to ensure a good joint.

2) Cover the top of the wings in a similar manner, but with three pieces of tissue. This time the wing panels themselves are covered with two pieces, one that runs from the R3/R4 position to R8, then from R8 to the wing tip. The centre section is covered with one piece that runs from the R3/R4 to the root rib.

3) Allow the glue to go off for a few hours or preferably overnight and then shrink the tissue on each panel (top and bottom) one at a time doing the wing panels first, then the centre section. Pin or weight down the outline of each panel with spacers underneath as you did for the fin, rudder and tail plane. Note that you should add 'washout' (twist) to the wings at this point by putting a 1mm spacer (approximately the thickness of a credit card) under the trailing edge of at the R8 position.

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THE FUSELAGE

1) The curvy shape of the Corsair fuselage means that it should be covered by several separate pieces to avoid wrinkles and get a smooth finish. Work methodically through the steps to ensure all areas are covered correctly. Glue them in place to the stringers with a glue stick, then using PVA through the overlapped joints. The following is a suggested order for the strips *on each side at the front*:

   a) Two pieces for the nose area between F1 and F4, from the main keel at the top round to the side keel and then from the side keel to the main keel at the bottom.

   b) A piece between F4 to F7 that covers the two stringers from stringer 'A' downwards.

   c) A piece between F4 to F7 that covers the two stringers below those in b) *and* the wing seat.

   d) A piece between F4 to F7 that covers the two stringers below those in c) and the bottom of the main keel.

   e) Working upwards from stringer 'A' a piece between F4 to F6 that covers the two stringers to the top of the keel.

2) Repeat for the other side at the front.

3) Once both sides are complete at the front, start to cover the rear each side:

   a) A piece that runs from F7 to the rear that covers the two stringers from the stringer below the cockpit (stringer 'A') downwards.

   b) Three pieces that run from the bottom stringer in a) to the main keel, each running between a set of formers i.e. F7 to F8, F8 to F9 and F9 to F10/11.

   c) Working upwards from stringer 'A' two pieces that run between F7 and F9, covering two stringers each to the top of the main keel.

   d) A piece from stringer 'A' to the top of the main keel between F9 and F10/11.

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4) Repeat for the other side at the rear, then finally cover the bare balsa pieces around the cockpit area (F12).

5) Allow the glue to go off for a few hours or preferably overnight, then shrink the tissue. You need not constrain the fuselage in any way, the tissue shrinkage should be equal on both sides and no warps should occur.

6) Trace the pattern for the cowl onto standard printer paper (80gsm) following the solid lines.

7) Using a glue stick, glue it to an area of tissue sheet that is larger than the part. Once the glue has dried, cut it from the tissue sheet leaving extra at the edges as indicated by the dotted lines on the plan. Slit the part along the lines as indicated on the plan to make the cooling 'gills'.

8) Fit the cowl to the fuselage using a glue stick. Use the tissue overlap at the bottom keel to make a good almost invisible joint. Dampen the long tissue flap on the front edge and then use thinned PVA to smooth and glue it over the nose.

9) Using a similar method to the cowl, cut out two tail wheel/arresting hook covers. Glue them to the tissue the opposite faces down to make **opposite hand** parts. Wrap the parts around a pencil or similar to give them a slight curve as shown on the plan and set them aside until the final assembly.

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FINAL ASSEMBLY

1) If you want to draw on the control surfaces, do so now using a fine marker or strips of black paper referring to the chain-dashed lines on the plan.
2) If you want to cover or paint bare wooded parts such as the wheels, undercarriage legs etc. do so now. This is much easier when the parts are not fitted to the model.
3) Cut the tissue away around the aerofoil shaped profile in the wing seats and glue the wings in position. Apply glue to all of the contact surfaces and ensure that the wing locates properly. Referring to the diagram on the plan, check the wings are in the correct position by resting the assembly across the R3/R4 joints, ensuring that the fuselage is set upright and checking the height of the wing tips each side.
4) Slit the tissue between the two stringers that seat the tail plane and glue it in position making sure it is square and true.
5) Glue the fin and rudder in place, ensuring it is properly located on the fuselage and at right angles to the tail plane.
6) Fit oil cooler fairing parts OC1 to the leading edges of the wing each side, then bevel and fit parts OC2 onto the bottom surface of the wings butting them up to OC1. Allow to dry and round of the edge as shown on the plan and cover the bare balsa of OC1 with some tissue.
7) Cut out and cover two oil cooler fairings in the same manner as those in earlier steps, leaving extra tissue in the areas indicated. **Ensure that you make one left hand and one right hand part**.
8) Cover the oil cooler fairings with the paper parts using a glue stick. Use the tissue flaps and thinned PVA to secure it to the wing, OC1 and the fuselage side.
9) If you are going to fly your model 'wheels up' you can omit steps 10 to 15.

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10) Fit the wheels to the axles. Note that the 'spoked' side of the wheels face outwards. The wheels can be retained by simply bending up the wire, or using the insulation from some thin electrical flex held with a blob of glue. NB make sure that the glue does not enter the wheel centre bushing and the wheel can rotate freely.

11) Carefully slit the tissue between R3 and R3A and fit the undercarriage legs with quick setting epoxy, angling them correctly.

12) Fit parts LG3 to the front face of the undercarriage legs where shown on the plan.

13) Bevel the edges of the landing gear covers LG4 and LG5 and fit them to the underside of the wings where the supporting strips were added when the wings were built.

14) Noting the correct location of the tail wheel, make a pin hole in the tissue and glue in the tail wheel wire using epoxy.

15) Fit the two tail wheel/arresting hook covers at the rear of the fuselage at the position shown. Use PVA glue on the tissue flaps to secure them.

16) Markings are provided on lightweight paper; they should be cut out, and glued in position with a glue stick using the colour scheme diagram (Y) at the back of this booklet.

17) Fit the motor peg made from the cocktail stick/ toothpick provided, cutting it to length and leaving about 5mm sticking out each side. Use the scrap ends dipped in cyano and rolled round the peg hole to harden it, trying the stick for a good 'squeaky' fit each time you add more cyano. **BE CAREFUL! – Wait for the cyano to dry at each stage before trial fitting the stick to avoid it being permanently bonded!**

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TRIMMING AND FLYING YOUR MODEL

When flying your model, choose a large area free from any obstructions. Do not fly it towards people or property.

To fly successfully, your model must be correctly trimmed. Trimming is a normal procedure for any aircraft, but for a free flight model it is especially significant as once the model is released, you have no control over it. Trimming takes some time and skill and the basics are outlined here. More detailed information and help are available from the many experienced free flight modellers who have websites dedicated to the subject or post information on numerous on-line forums.

The first step involves fitting the motor and checking the balance. Short flight tests should then be carried out during which the behaviour of the model can be observed. Following initial flight tests, the number of winds on the motor and thus the duration of the flights can be slowly increased.

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TO MAKE UP AND FIT THE MOTOR

The motor consists of the rubber strip provided. This strip is more refined than that used in rubber bands and is very stretchy, allowing it to hold lots of energy. A single loop should have enough power for the model if it is built lightly as per the instructions. Contrary to popular belief, the rubber motor is not designed to hold in the nose plug, and motors that are much longer than the distance from the propeller hook to the rear peg are used by experienced modellers. This requires a geared winder to 'stretch wind' the rubber motor. If this is your first model and you do not have a stretch winder, tie a knot in the rubber to make a loop that is roughly the distance between the peg and the hole in the nose. Wetting the rubber makes it easier to tie a knot, however, do not pull the knot too tight otherwise it can tear. Once knotted, apply a tiny drop of cyano to the end 'ears' of the knot, taking care to avoid putting cyano on the actual working part of the rubber. To make your rubber motor more efficient it can be lubricated with castor oil or spray silicone trim polish that can be bought from motor factors.

Put the rubber loop down into the nose of the model, lower it down to the peg position and trap the loop with the peg, then connect the other end to the motor hook, and fit the nose plug.

TO BALANCE THE MODEL

Referring to the arrow on the plan labelled 'balance', hold the model with your fingertips under the centre section at that position. It is likely that the model will want to tip backwards. If it does, add Blu-Tack or plasticine to the nose of the model, adjusting the amount until the model balances at the correct position with the tail plane approximately level.

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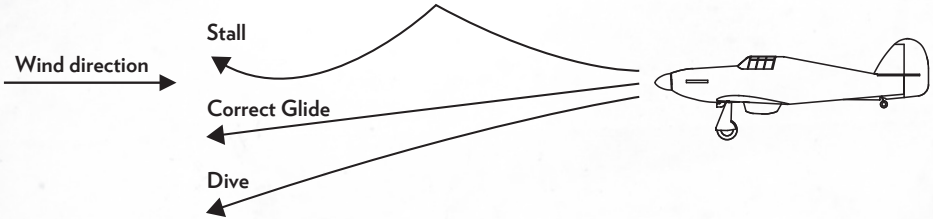
TEST GLIDES

Choose a calm, dry day if you are trimming your model outdoors. This is a small model and slight gusts and disturbances will make it hard to judge how your model is behaving. It is useful to find a field with nice long grass to act as a gentle landing spot during these early flights.

Gently throw your model towards an imaginary point on the floor about 7-8 metres in front of you into any wind. If the model nose rises then falls then there is insufficient nose weight. If the model heads nose first downwards, then there is too much nose weight. Carry on test gliding and adjusting the nose weight until the glide is smooth, and the model lands about halfway towards the imaginary point.



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POWERED FLIGHTS

Wind up the motor with approximately 50 turns (wind clockwise looking at the front of the model) and launch it into the direction of the wind (if present). This should achieve a gentle powered glide. Aim for a gentle left turn by adding a tab made from clear acetate (the clear film that you might find on a chocolate box 'window') to the trailing edge of the rudder. Adjust it towards the left to make the plane turn left and to the right if the left turn is too sharp. If the left wing 'dips' and the model spirals in, then add an acetate tab to the lower left hand wing and bend it down a little. Gradually increase the turns on the motor in steps of 50 turns up to approximately 250 for the short simple loop. At each step make adjustments to the tabs to control the flight pattern. If you struggle to get your model to fly well, then check for warps in the flying surfaces of the model. These can be removed by twisting them over a bowl of steaming water.

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THANK YOU FOR CHOOSING A VINTAGE MODEL COMPANY KIT

We hope that you have enjoyed building and flying your model.

Be sure to collect and build the whole range, available from many high street gift shops or direct from our website **www.vintagemodelcompany.com** where you will also find a wide range of modelling accessories and tips.

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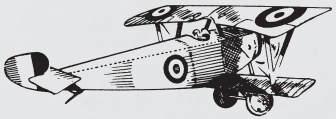

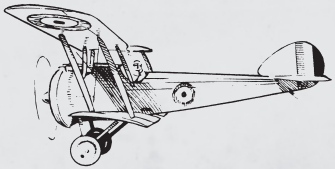

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FLIGHT LOG

Keep a log of your flight durations here

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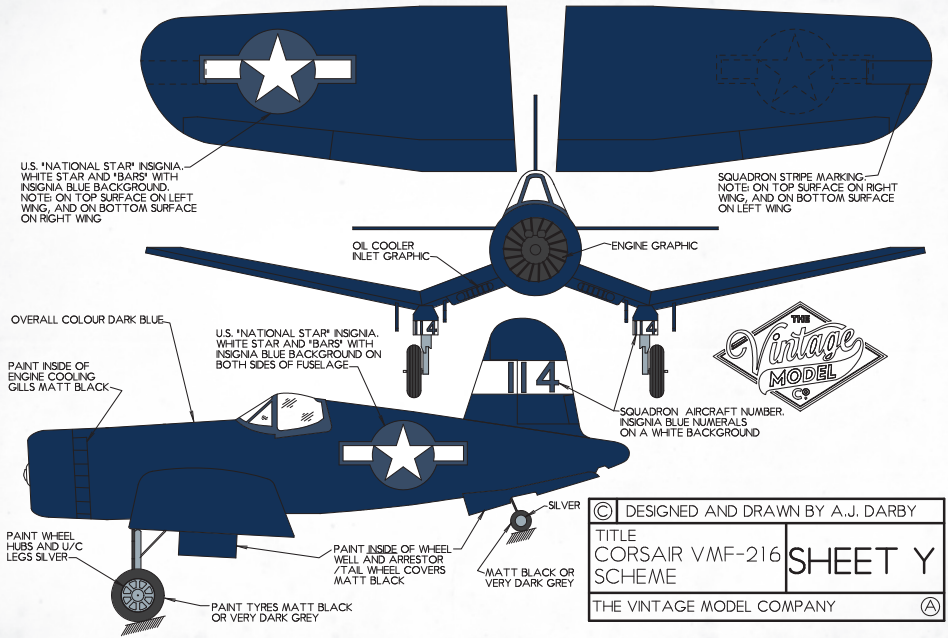

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