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# **Macchi MC.200 *Saetta***

Italy's Workhorse Fighter of WWII

Manual Version 1.0 – March 2007

Scale: 1/12
Wingspan: 34.7 in
Area: 172 sq in
Weight: 17 – 20 oz
Power: BM 2408-21



Kit 8007

## Materials

### This kit contains the following materials:

- This construction manual
- Plan sheet
- Decal sheet
- Laser-cut wood pack
- Vacuum-formed plastic canopy, headrest fairing, and cylinder fairings

### To complete this kit, you will need the following additional materials:

- 3/32" Aluminum tubing, 8"
- 1/16" Music wire, 20"
- 1/16" x 4" x 18" Balsa sheet for wing and fuselage skin, 6 each
- 3/8" x 3/4" Balsa for wing leading edge
- 1/8" x 4" Hardwood dowel
- 1/64" or 1/32" Ply and foam blocks for fillets
- Wing mounting bolt
- Hinges (ailerons, elevator)
- Miscellaneous servo mounting materials and pushrods
- Covering materials and paint
- Glue
- 1/8" Diameter Super Magnets, 2 pairs
- BM 2408-21 Brushless motor

**NOTE: We recommend that you read this entire manual before beginning construction.**

## Construction

### Wing Skins

- Each wing bottom skin consists of two laser-cut pieces: forward and aft. Gently clean up the mating edges of the pieces with 220-grit paper on a sanding block.
- Lay the pieces of a wing skin on a flat board or table, with the outer surface up. Run a length of masking tape along the join lines. Turn the assembled skin over, bend the joints open, and run a bead of aliphatic resin or wood glue down the joints.
- Lay the assembled skin back down on the board – masking tape side down. Run a damp paper towel over the joints to remove excess glue. Place a sheet of wax paper over the assembled skin. Then weight it down with another board, books or what have you. Keep the weight on the skin until it is completely dry.
- When the skin is dry, remove the masking tape. Lay the skin on a flat board with the outer surface up, and sand it smooth with 120-grit paper on a long sanding block. Be sure to keep your sanding motion at a 45-degree angle to the joints and wood grain. Clean the skin with a tack rag.  
**Note** – it should not be necessary to sand the inner surfaces of the wing skin. Just be sure to remove any excess glue.

- Follow the same steps to assemble wing top skins, using 1/16" x 4" x 36" balsa sheets.
- Lay a bottom skin on a top skin. Trace the shape of the bottom skin onto the top skin, adding a 1/4" margin at the trailing edge. Cut out the top skin.

### **Wing Panels**

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- Pin a lower wing skin to your building board. Pin behind the spar position only. The lower skins are the ones with the rib and spar positions etched into them.
- Glue the ribs and main spar to the bottom sheet. Note that the spar is notched at the dihedral angle for root rib W1. To maintain an accurate Clark Y airfoil, moisten the leading edge of the sheeting and pack it up so that it follows the curve on the bottoms of the ribs.
- Glue the 3/8" x 3/4" leading edge strip in place against the front of the wing skin. Note that the leading edge strip sits on your building board, not on the wing skin.
- Glue the aileron spar to the bottom sheet and ribs.
- Glue the aileron leading edge to the bottom sheet, about 1/32" aft of the aileron spar. DO NOT glue the aileron leading edge to the aileron spar.
- Make aileron ribs from scrap 1/16 balsa and glue them to the rear of the aileron leading edge and the bottom sheet.
- Cut eight aileron 1/2" long aileron crank bearings from 3/32" aluminum tube.
- Make an aileron crank from 1/16" music wire and four of the aluminum tube crank bearings.
- Trim a slot in the aileron leading edge for the aileron crank. Glue the aileron crank bearings in place where they pass through ribs W2, W3, W4 and W5. Install scraps of balsa to support the innermost bearings.
- Using scrap balsa, make a bearing block for the aileron crank. Glue it in place, but DO NOT glue the music wire crank to the bottom skin or to the bearing block.
- Glue scrap 1/16" or 1/8" balsa reinforcements to the outside rear portion of rib W1. Using a sharp #11 blade, cut a slot in root rib W1 for the wing bolt, but don't cut the reinforcements. The center of the slot should be about 5/8" forward of the trailing edge. Notch the bottom skin so that you can find the bolt hole later.
- Glue scrap 1/16" or 1/8" balsa reinforcements to the outside front portion of rib W1 where it is notched for the locating dowel.
- Using a long sanding block and fine grit sandpaper, sand the assembled wing panel to prepare it for the top skin. Sand the airfoil angle into the trailing edge, so that the trailing edge is about 1/32" thick.
- Place the laser-cut 1/8 balsa washout jigs under the trailing edge of the wing, and under the tip rib. This will build in about 2 degrees of washout.
- Cut a hole in the top wing skin for the aileron crank.
- Apply a thin bead of Pro-Bond or aliphatic resin to the tops of the ribs and spars and along the top of the leading and trailing edges. Lay the top skin in place and pin it firmly to the ribs and spars. Let the wing assembly dry.

- Laminate two WT pieces to make a wing tip block. Glue the wing tip block to the wing.
- Carve and sand the leading edge to shape.
- Notch the leading edge for the 1/8" dowel.
- Sand the wing panel to its final shape.
- Repeat these steps with the opposite wing panel.

### Wing Panel Joint

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- Prepare the root rib faces for joining, by sanding them flat with a long sanding block.
- Join the panels using 15-minute epoxy between the root ribs. Use masking tape to hold the bottom skins flush. With one wing tip flat on the building surface, elevate the other wing tip to the required total dihedral.
- Reinforce the wing joint by wrapping it with 1/2" wide nylon or glass cloth. Saturate the wrap with CA or epoxy.
- Use a 1/8" drill bit to clear the wing bolt hole and the dowel hole in the leading edge.
- Use a sharp blade to cut the ailerons free from the wings. Use a sanding block to finish the aileron leading edges and the aileron slots in the wing.
- Cover the wing as desired. (See "Finishing Your Model")
- Hinge the ailerons.
- Trim the wing trailing edge as shown on the plans.
- Cover the wing as desired.
- Install the 1/8" dowel in the leading edge. The dowel should project about 1/4" forward of the wing.

### Fuselage

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- Place a sheet of wax paper on your building board. Pin the fuselage crutch to your building board.
- Laminate the upper half of former F3 from two pieces - 1/16" ply and 1/16" balsa - with the ply piece forward.
- Glue the upper formers F3 through F10 to the crutch. (Note that there is no upper former F7.) Make sure the formers are fully seated on the crutch tab, and that they are perpendicular to the crutch.
- Glue cockpit floor CF in place between formers F6 and F8.
- Glue a 1/8" square balsa upper keel in the notches from F4 to F10.
- Glue the two F3-F4 SPACERS in place between F3 and F4.
- Using 1/16" balsa, plank the upper fuselage between F4 and F10. Note that the crutch provides a ledge for attaching the sheet.
- Remove the upper fuselage from the building board.
- Laminate the lower half of former F3 from two pieces - 1/16" ply and 1/16" balsa - with the ply piece forward.
- Laminate the lower half of former F4 from two pieces - 1/16" ply and 1/16" balsa - with the ply piece to the rear.
- Glue the lower halves of formers F3 through F11 to the crutch, making sure that they are seated in their notches and perpendicular to the crutch. (Note that there are no lower halves of formers F6 and F8.)

- Glue a 1/8" square balsa stringer in the notches from F3 to F4. Glue another 1/8" square balsa stringer in the notches from F7 to F8
- Dampen the wing saddles and glue them to formers F4, F5 and F7.
- If desired, add a battery tray to suit your battery.
- Laminate the two 1/16" ply WING MOUNTS. Then fit the WING MOUNT assembly into the slots in the wing saddles. Trim the WING MOUNT assembly flush with the wing saddles, and glue it in place.
- Plank the fuselage bottom with 1/16" balsa sheet from F3 to F11.
- Using the wing saddle as a guide, trim out the wing opening in the lower fuselage.
- Fit the wing in place on the fuselage. Drill through the wing into the WING MOUNT assembly. Tap the mounting bolt hole in the WING MOUNT assembly.
- Glue a 1/16" balsa shim to the top side of the crutch immediately behind former F10. This shim will set the horizontal stabilizer incidence.
- Sand the nose of the fuselage to shape.
- Glue two Super Magnets into the pre-cut holes in former F3.
- Set the motor mount assembly aside.
- The cowl is made up of two plywood formers (F1 and F2) held in position by eight 2-3/4" long stringers of 1/8" square balsa, and sheeted with 1/16" balsa. A plywood jig is provided to hold the formers in place while you add the 1/8" square sticks and sheet the cowl.
- Carefully remove the formers F1 and F2 from the 1/16" ply sheet. DO NOT REMOVE the inner portions of the formers.
- Glue Super Magnets into the pre-cut holes in F2. Be sure to orient the magnets so that they match with the magnets in F3. Use scrap balsa on the front side of F2 to provide a glue surface.
- Remove the two COWL JIG parts from the 1/16" ply sheet.
- Assemble and glue the two COWL JIG parts so that they make a cross shape when viewed from the end.
- Glue formers F1 and F2 to the COWL JIG.
- Glue eight 2-3/4" long sticks of 1/8" square balsa between the notches in F1 and F2.
- Cover the cowl with 1/16" balsa sheet.
- Carefully cut the COWL JIG and the center parts of F1 and F2 out of the assembled cowl.
- Glue the two cowl rings to former F1. Orient the cowl rings so that the grain of one ring is perpendicular to the grain of the other.
- Sand the cowl rings to shape.

### **Motor Mount and Cowl**

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- Assemble the motor mount from four parts of 1/16" ply: two SIDE parts, one BOTTOM part, and one MM part. Note that two MM parts are provided; one is pre-drilled for the BM2408-21 motor.

- After covering the cowl, glue the fourteen cylinder head fairings in place. A template to help you position the fairings can be downloaded from [www.warbirdkits.com](http://www.warbirdkits.com).
- Add an air scoop made from scrap wood between the two bottom cylinder head fairings.

### **Empennage**

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- Join the two ELEVATOR parts together with a 1/16" music wire joiner.
- Glue the RUDDER to the VERTICAL STABILIZER. (Optional – hinge the rudder to the fin for rudder control.)
- Cover the STABILIZERS, ELEVATORS and RUDDER as desired. Omit covering from the portions of the stabilizers that will be covered by the tail blocks.
- Hinge the ELEVATOR parts to the HORIZONTAL STABILIZER.
- Glue the vertical stabilizer into the slots in the horizontal stabilizer.
- Glue the assembled stabilizers into the slots in the crutch and F10.
- Glue the upper half of former F11 in place.
- Plank the fuselage between F10 and F11.
- Glue the tail blocks TB together. Then tack glue them to F11.
- Carve and sand the TB assembly to final shape. Remove it from the fuselage. Hollow it out to reduce weight, then glue it back in place.

### **Fillets**

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- Fit a foam or scrap balsa filler to the bottom of the wing forward of former F7.
- Place a piece of wax paper or plastic wrap over the center section of the wing and bolt the wing to the fuselage.
- Cut fillet bases from 1/64" or 1/32" ply and glue them to the fuselage
- Cut and install 1/16" balsa fillet formers from scrap materials. Add foam blocks and sand the fillets to shape.

### **Detailing**

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- Cut off the forward end of the head rest fairing along the mold lines. Then glue this cutoff inside the fairing, perpendicular to the base of the fairing.
- Trim the headrest fairing to fit the fuselage, and glue in place.
- Trim the windshield to fit. Glue it in place after painting the fuselage.
- Add a pair of 3/32" aluminum tube machine guns to the fuselage. Drill holes for the machine guns about 2-1/8" behind the forward end of the fuselage (F3) and about 3/4" off the fuselage centerline.

## **Finishing Your Model**

- We suggest covering the fuselage with 1/2-ounce glass cloth and finishing resin for maximum strength.

- The wing can be covered with your choice of coverings. We prefer Doculam or other lightweight paintable film.
- Paint and decorate the model as desired.
- Seal the entire model with a light coat of Krylon clear spray.
- Paint the canopy and glue it in place.
- Epoxy the motor mount assembly into the slots in F3.

### Decals

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**CAUTION: You must seal the decals before immersing them in water!**

The decals included in this kit are printed with on premium inkjet water-slide decal paper. Follow the steps below to achieve a great looking set of markings on your model.

- Seal the decals with several thin coats of Krylon Crystal Clear™ spray varnish. Make sure you thoroughly cover the ink.
- Make sure the surface where the decal is to be applied is smooth and glossy. Matte surfaces will permit tiny air bubbles to be trapped between the surface and the decal, thus spoiling the decal.
- Cut out and trim all the markings that you plan to apply in this session.
- Apply some warm, soapy water to the model where the decal is to be positioned. (Use dish soap for this.)
- Dip the decal in a bowl of water for about 30 to 40 seconds. Using your fingers, gently try to slide the decal off the backing paper. As soon as the decal slides, slide it off

the backing paper and onto the model in the desired position. Use a soft absorbent cloth to gently blot excess water from the decal. Allow the decal to dry.

- Spray a coat of Krylon Crystal Clear varnish over the decal.

### Flying Setup

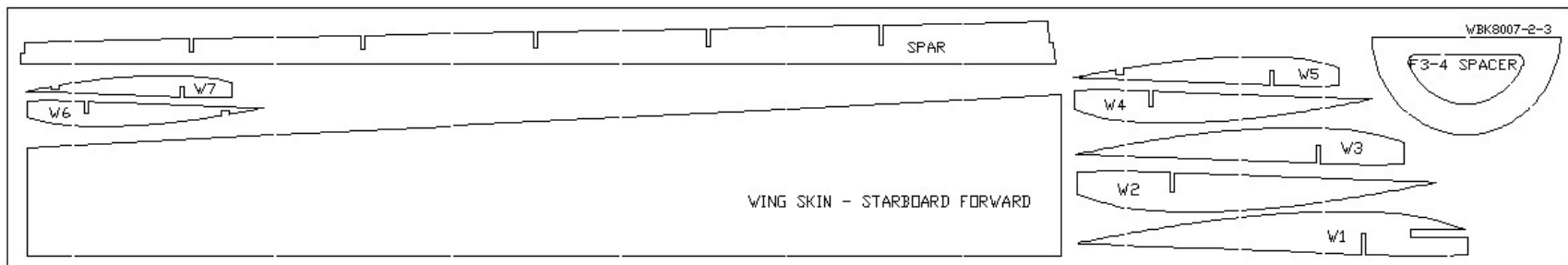
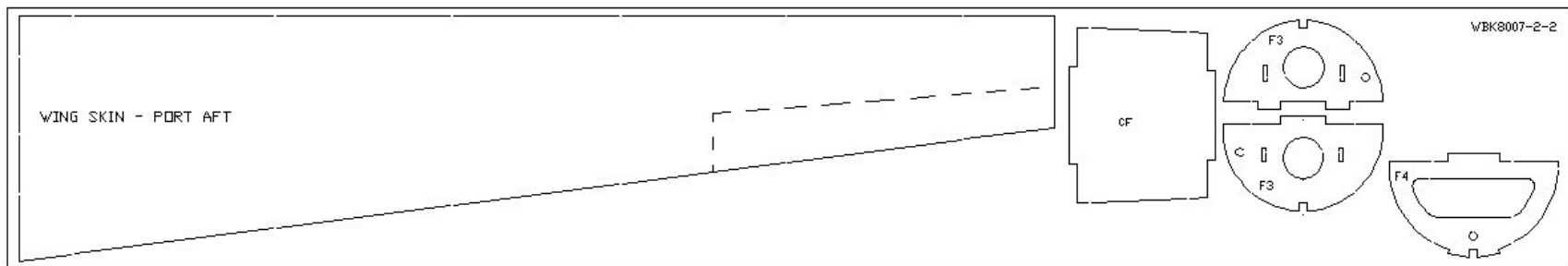
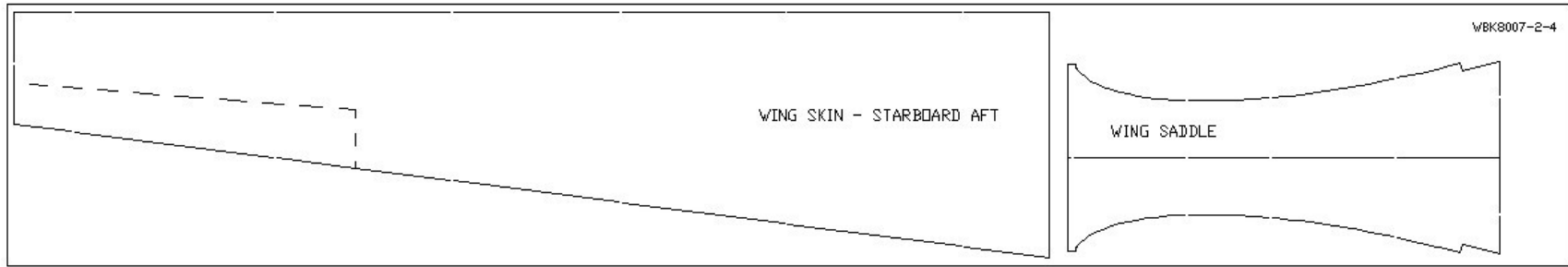
- Keep the model as light as possible for best performance.
- Your Macchi C.200 model should balance at 1-5/8" behind the leading edge at the center chord. This is approximately 25% of the mean aerodynamic chord. For the first few flights, you may want to move the balance point forward 1/8" to 1/4" until you're comfortable with your model.
- Set the control throws to:  
Elevator: 1/2" up – 1/2" down  
Ailerons: 3/8" up – 1/4" down

### Need Help?

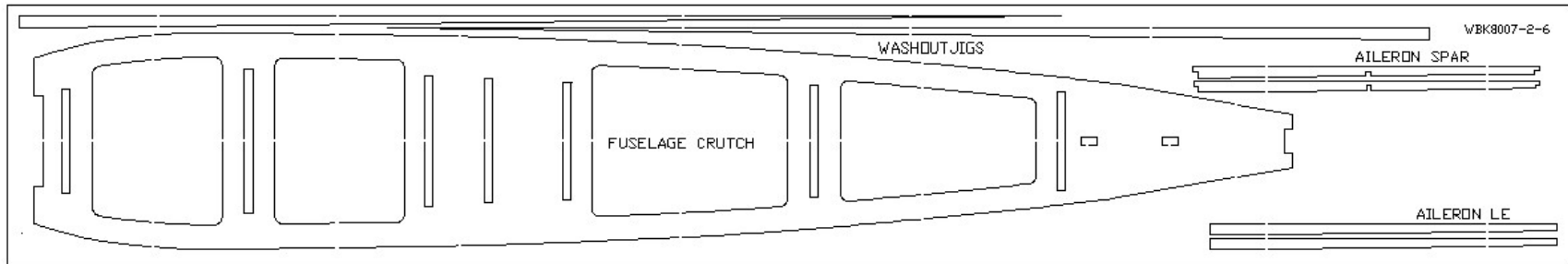
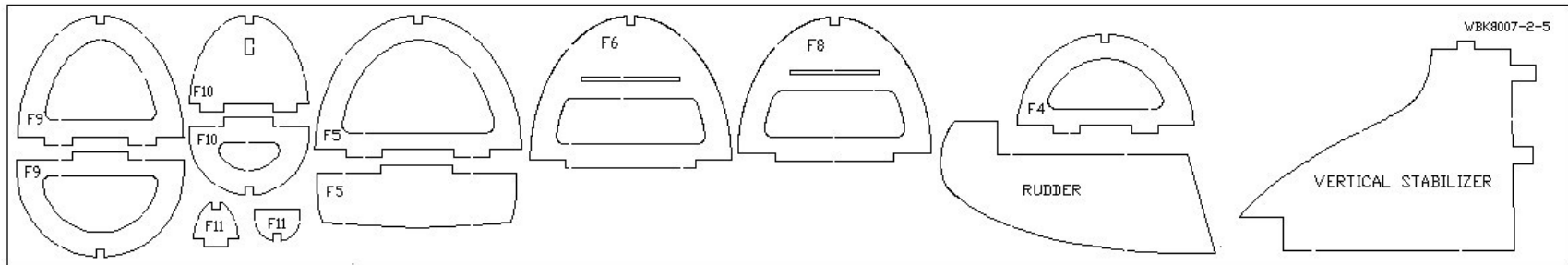
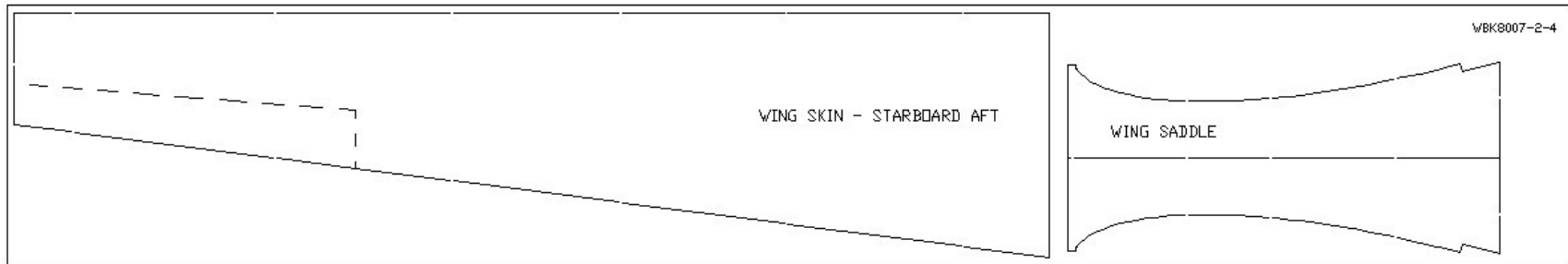
If you have questions or need help with assembly of the kit, drop an email to [tom@warbirdkits.com](mailto:tom@warbirdkits.com).

**A special thanks to Vicki and Charlie at Manzano Laser Works for selecting and laser-cutting the balsa in this kit!**

## Parts Identification Guide



# Assembly Manual for Macchi C.200



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