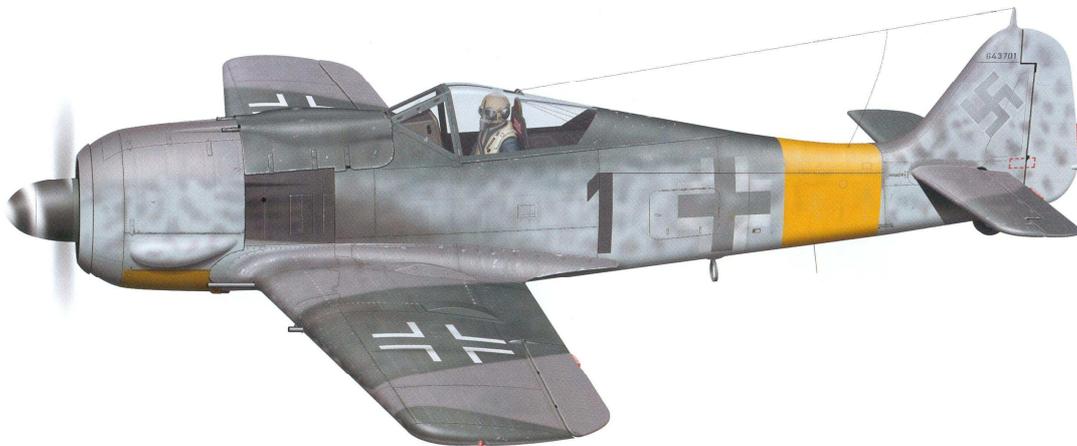




Dan Deingo



# ***102" FOCKE WULF 190 A*** **BUILD INSTRUCTIONS**



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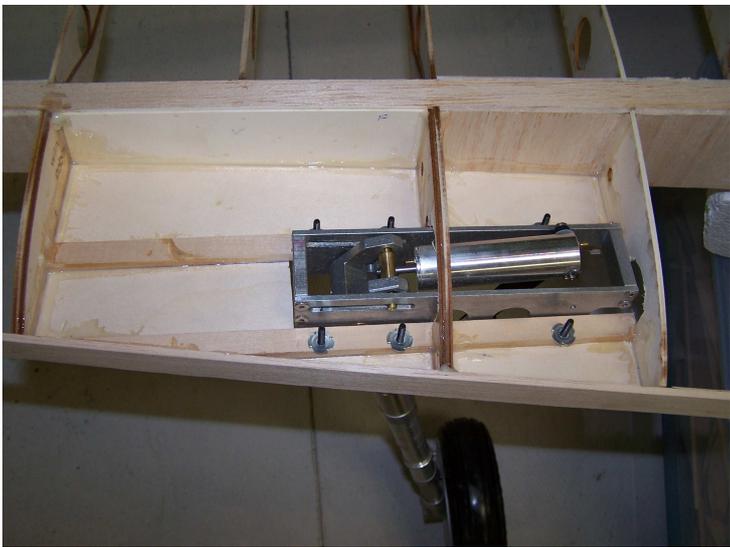
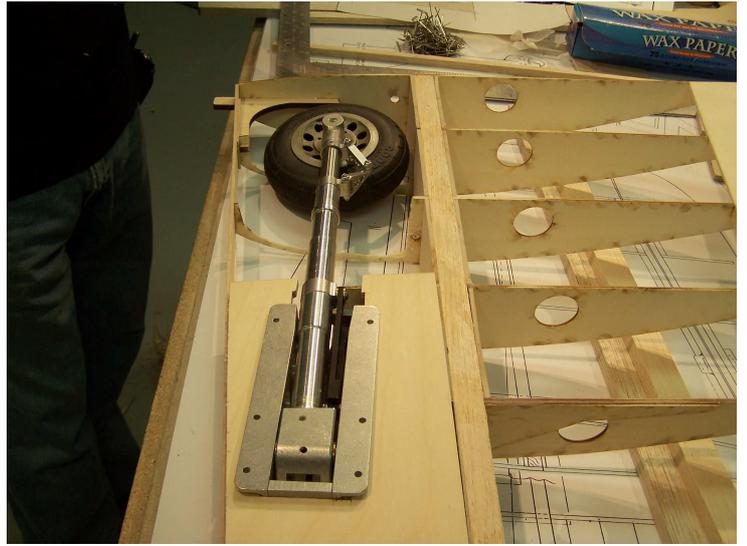
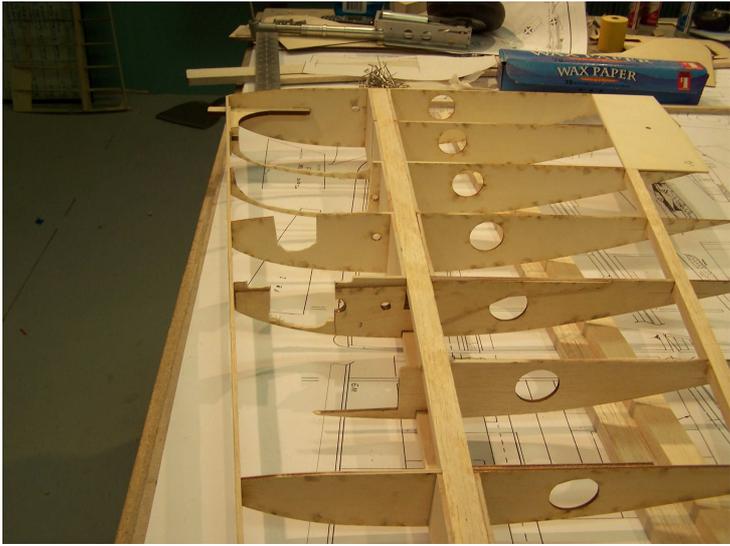
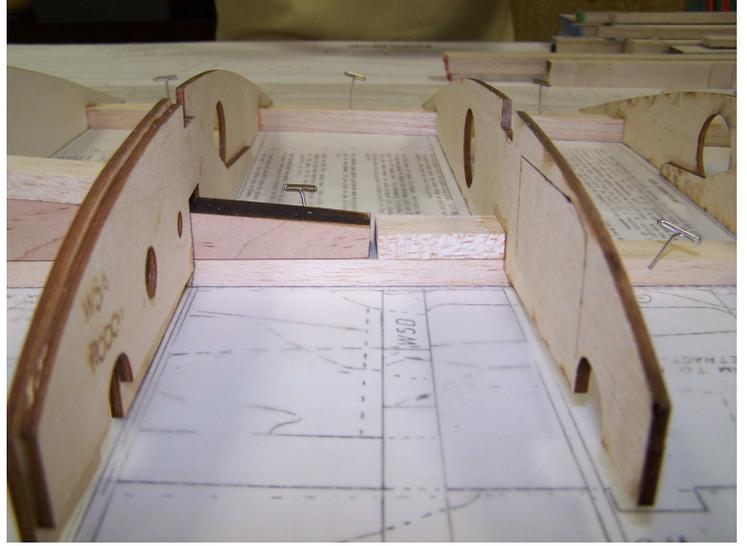
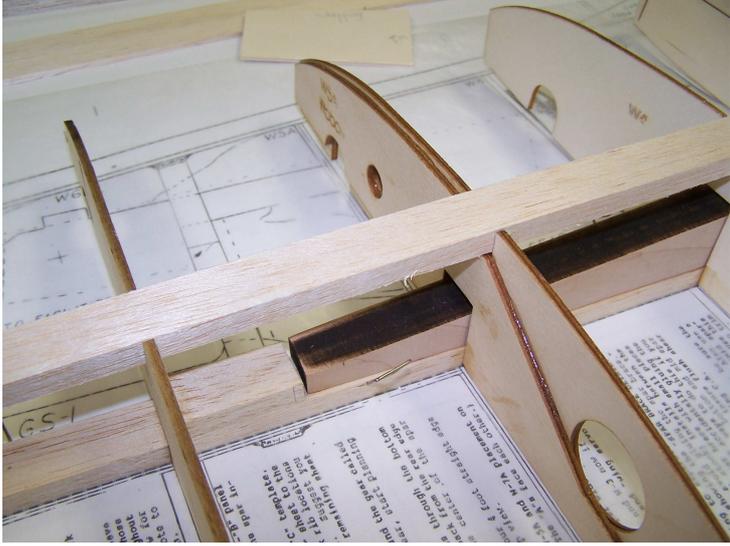
## **Meister Scale FW 190 A & D9 Sierra Retract Modification Instructions**

Written update 1/01/08 by: John Monaghan for Meister Scale Models.

This is a very simple process to do all the parts that are set to help you achieve a more scale aircraft and have a more reliable landing gear. Utilizing your standard set of plans, all you have to do is swap out the parts. The parts are what make the change of the location of the gear due to the longer length of the struts in the Sierra Retracts as opposed to the original designed retract installation. The process is as follows:

You change out ribs W2, W3, W4, W5, W5A, W6, W7A and the gear plate. The new gear plate is extended from W7A to W4 utilizing a bigger surface for the larger retract mount frame. In doing this process, you no longer use the hardwood  $\frac{1}{2}$ " x  $\frac{1}{2}$ " rails that go from leading edge to the main spar. You will use a  $\frac{1}{4}$ " x  $\frac{1}{2}$ " piece of hardwood for blind nuts on the top side of the gear plate. You will no longer use the  $\frac{1}{8}$ " balsa sub leading edge. This will be replaced with  $\frac{1}{8}$ " aircraft ply recommended from wing rib W1 to W8. You need to use  $\frac{1}{8}$ " plywood sheer webs on the leading edge side of the main spar from W1 through W7A. The correct gear plate angle is set in the doublers and the ribs. When installing the retract to the gear plate, you will need to use button head style machine screws and the best for this is 8/32. You may need to shim the retract on the plate towards the tip and this will help the retract in the closed position so that the wheel will sit deeper in the wheel well. Don't worry if the wheel sits down a little in the closed position. Due to moving the gear in one rib space, the wheel is now in the belly pan section of the wing closest to the root rib so you will have plenty of clearance. As for the forward angle in the gear down position, this has been set in the parts so the angle should be correct. On the prototype both Sierra's 6" wheel and the Glennis 5-1/2" scale wheels were tried. The Glennis 5-1/2" wheel fit the best out of the two and is more scale, but the choice is yours. After all is installed, you will need to use some  $\frac{1}{8}$ " Balsa to fill in the bottom of the ribs on W5 and W6. In order for the sheeting to be outlined around the retracts, it might also be helpful to add some Balsa in between the same ribs. On the prototype wing, the balsa was notched so that it sat on top of the retract mounting flange, but it is your choice to do so in case you would ever need to remove the gear. You will need to lengthen the upper part of the gear door for the installation of the gear door. This is done by taking the standard size gear door that may come as a cut part in your kit, and measure in at the top  $1\frac{1}{4}$ " and cut and splice a piece of ply to lengthen the door to the proper fit.

**We hope that this will help you in achieving a simple and less stressful installation.**



## **FUSE INSTRUCTIONS**

1. Build the B-1 (see templates).
2. Install 1/2" triangle stock to B-1. Use a straight edge to insure a straight line. Lay aside.

## **FUSE SIDES**

1. Be sure the FS-1A and 1B are cut accurately. Double-check the notches in the FS-1A (Important)
2. Assemble the FS-1A and 1B using a four foot straight edge along the bottom of the parts.
3. Next, install the FS-2A and FS-2B to the assembly, noting the assembly marks.
4. When finished, sand the assembly and decide which surface you want in face outward. Mark it outside.
5. The second side is built on top of the first using wax paper to avoid gluing together. It's VERY important that both sides are identical. (Even if they are not perfect.)
6. Mark the second side outside and now install the 1/32 ply doublers (over all splices) on the inside of each side.

## **B-1 TO SIDES**

The tabs on the B-1 and the notches in the sides must be in the called for positions – double check now. Pin one side to the B-1. Be sure the B-1 and side are touching a flat surface & glue. Check that the bottom edge of the side is flush with the bottom of B-1. Proceed with the other side.

## **INSTALLING THE BULKHEAD TO B-1**

1. Using the angle support (A S) install the F-4 bulkhead and the F-8 bulkhead.
2. Loosely install F5, 6 & 7. Eyeball from the rear to determine if they are in alignment with F4 and F8. Adjust the bottom edges to help their alignment. Note: Do NOT glue yet.

3. Install the F8A between the F7 and F8. If F7 looks to be inline between F8 and F4 then tack glue it in place.
4. Repeat with the F7A and F6 bulkhead. When satisfied with the alignment glue all parts. Note: Did you install the controls yet????
5. Locate the cockpit deck and temporarily install stop of F4, 5 & 6. Glue the F-5 bulkhead to the sides and remove the cockpit deck.
6. Install 4 stringers in the bulkheads F4 through F8. Note: The top stringers go 4" or so past F7 to F8. Glue the top stringers to the bulkheads only. Hope your control system is in place.

### **INSTALL NOSE ASSEMBLY TO FUSE SIDES**

1. With the fuse on its side, lay the nose assembly in place. Tack glue the area at F1 and F3 being sure the tabs are in place.
2. Roll over and repeat tack gluing.
3. Set upright and check assembly for alignment. Finish gluing. Note: The jig does not meet with F4 on purpose.
4. Select very stiff stringers for all nose section needs. Install now. Note: All stringers are 48" long and may need to be spliced where needed.
5. Note: All fuse planking extends past the F1 firewall at least 1/4". Check and make sure all stringers and planking are cut flush to F1.
6. The remaining planks can be installed now. We suggest you use soft balsa blocks between F6 and F8. Install these blocks (do NOT glue) and shape, remove, hollow out then reinstall and glue back in. Install wing saddle doublers now.
7. When you are ready to install the wing, a notch for the wing tongue is provided in F1. This notch will have to be trimmed to allow the wing to seat properly. The optional wing fillet is installed at this time. See detail A and instructions for wing extension fillet.
8. After the wing installation is complete, install the WTD to front of F1 and down against the wing tongue. (Do NOT install tail feathers until wing is installed.)
9. Install the tail wheel now.
10. After the fuse is planked, and the sheeting and stringers are cut flush to F1, you can now make the cowl plug. Place fuse on the plans. SH1, nose down and trace

outline of F1 and sheeting. Cut cowl mounting plate out on inside of the line being careful to sand off 1/32" or so to fit the plate in the cowl. To trim cowl, find a flat surface. Place nose down and every inch or so, measure up 11-1/2" and mark. Use tape as a guide to saw excess glass from rear of the cowl. Install cowl plate and glass joint to seal. You will need to remove some wood as you make clearance holes for exhaust.

### **DETAIL C**

1. Make temp 3-5" x 3-5".
2. Position temp on the fuse not position of crutch notch in sheeting.
3. Trace and cut out skin. You will be cutting through one stringer.
4. Remove material from F1 as shown on F1 template.
5. Install new piece of 1/64" or 1/32" ply in cutout area. Sand flush in F1.
6. Glue two pieces of 1/2" x 3/4" x 3-5" balsa. Top and bottom as shown.
7. Sand flush to the fuse.
8. Sand angle as shown in Det C
9. After this is completed on both sides, mount cowl. Mark area on the cowl plate with pencil and remove to allow air flow.

### **ENGINE**

The prototype was designed around a quadra 65 for the following reasons:

1. Has rear exhaust;
2. Has good factory muffler;
3. Fits inside the conveniently;
4. Is 4 cubic inches of power; and
5. Runs super and quiet.

Now, you have a wide variety of engines in today's market. We suggest a Zenoah G-62, Zenoah GT-80 for ease and reliability. For more performance use a 5.8, 100cc engine.

## **REMOVAL ASSEMBLY AND INSTALLATION OF WHITE PLASTIC PARTS**

1. A small pair of tin snips is an excellent choice for accurate and easy cutting along the separation lines. A razor saw is good for straight cuts.
2. Remove the wing gun ammo covers and match to starboard and port wings. (See plans.) Some versions of the A5 through A8 FW 190 use the heavy fuse gun breach covers in front of the canopy. Check which version you are building before installing. Same is true for the canopy! We carry the standard “flat” and “blown” versions. Check your three view and or color scheme for correct canopy. Note: Be careful cutting out canopy. Go slow as they might crack sometimes. Use ZAP Epoxy, ZAP-A-DAP-A-GOO, PFM or similar gluing adhesive to affix the canopy to the frame. For a sliding canopy see instructions attached.
3. When ready to install the plastic parts to the fuse and wing, tape the parts in place. Use thick CA to glue in place. DO NOT use kicker as it will attack the plastic, ruin the bond and just make a mess! IT’S UGLY!!!

## **SPINNER ASSEMBLY INSTRUCTIONS**

Note: It is important that the backplate skirt matches even with the spinner skirt.

1. Using a #10 or 12 x 1-1/4” wood screw, secure backplate the to your workbench (skirt down).
2. Cut your prop blade exits in the spinner.
3. There should be four to six holes for 4-40 x 1/4” bolts spaced between the cutouts to secure the spinner to the backplate. Place these holes 3/8” up from spinner skirt bottom. Tap 4-40 threads through the spinner and backplate.
4. Use Loctite when installing the 4-40 screws or call to purchase a set of our clinch and screws.

## **VERTICAL FIN**

1. Note: Use the stab illustration to guide you through the fin assembly. Make sure that F-7 and F-10 are exactly square (90°) to the F-2 side and end view.
2. Center the F-2 to an 18” line drawn on your work surface. Glue the F-2H to F-2 (see side view on Sheet 1 of blueprints). Pin F-2 securely to surface.
3. Glue the F-90° part to F-2 1/8” from top end and on center.

4. Glue the hinge blocks in place (see side view).
5. Install ribs F-7 and F-10 to the F-2. Use a 90° brace at F-10 to insure 90°. Check this from two directions as shown on stab illustration. Pin in place before gluing.
6. It is important that the part F-1A remains straight during installation to the front of the ribs. Suggest you tack glue a piece of 1/8" x 1" x 10" balsa on edge to the F-1A before installing.
7. Pin F-1A to F-7 and F-10. Lay assembly on side view of fin. It should match. Adjust if needed. (Sand front of F-7 and F-10 to match F-1A before gluing.) Install F-8 and F-9.
8. The fin 1/8" sheeting outline is provided to insure proper fit of fin to the fuselage. The bottom edge of the sheet install to the F-2 exactly 9-13/16" from the top end of F-2. Put this mark on F-2 both side edges.
9. The rudder assembly is simple and shown on your side view sheet 1.

### **WING INSTRUCTIONS**

You may elect to cap strip or totally sheet the wing. You must decide now. The prototype model had a cap strip bottom and a sheeted top wing. Weight is not a consideration. Ease of building is.

1. Make up the 4 "A"- "B" sheet panels, pick the best sides and mark "out" on them. Remember, you need two top and two bottoms.
2. Repeat above for the 4 "C" sheet panels. Note: You should have a 4-foot straight edge to use in trimming the bows from those sheets that are not straight. Most patterns supplied throughout these plans are either 2-7/8" wide or 3-7/8" wide to allow for trimming. Be sure to keep the sheets straight. Write a note to yourself and pin it in a prominent place to help remind you.
3. Lay wax paper onto the right wing plan. Pin the part "A"- "B" panel in place being sure the rear edge is center to where the spar installs. See note on left wing plan.
4. Pin the Part "C" panel in place. See note on Part "C" template. If you are going to sheet the bottom, add one 3" or 4" sheet to the part "A"- "B" panel now. Pin assembly in place. Mark rib locations onto the rear sheet to aide proper rib placement. Suggest you obtain some tracing paper to make patterns for the remaining sheet panels.

5. The retract gear parts patterns are designed around the gear called out on the plans. If you plan to use another gear, start planning now.
6. Make up the four spars now. Put guide pins through the bottom sheet (if you are sheeting the bottom) 3/8" back from the rear edge of the part "A"- "B" which locates on the center of the spar location. Go slow.
7. When installing the spars, be sure to use your 4-foot straight edge to insure the spar is straight in the top view.
8. Check your W-5 and W-7 ribs for proper W-5A and W-7A placement on W-5 and W-7. See these ribs on plans. (The "A"s face each other.)
9. Check all notches in your ribs for proper width and depth.
10. Install the bottom sheet between W-1 and W-3 now if cap striping the bottom. Install all cap strips and "wing servo template." (Mark rib location on bottom sheet.)
11. Install ribs W-2 through W-13. Fit the 1/8" x 1" ply servo rails and glue in place.
12. Decide now if you want the wing to separate for transport and storage. See front view drawing showing the "SPAR BRACE DETAIL." If you want separation, be sure to avoid gluing the spar brace. Note: The "mid spar" (from 3/8" x 3/4" stock) installs between the ribs and is held in place over the spar brace with small pieces of balsa. This method helps protect from accidentally gluing the "spar brace" to the ribs. There are other ways to do this if you think about it. Important Note: The top, bottom, and mid spar material all must be the same exact width to insure flush shear web contact when gluing in place with gap filling C.A.
13. When tack gluing the "mid spar" pieces to the ribs, be sure the "spar brace" is centered to the center of the wing. Also use a square against the bottom spar when positioning the "mid spar" parts. These parts must be exactly above the bottom spar. Use this method when installing the top spar also. You might have to trim a few of the top rib notches.
14. The W-1 must be kept flat (or straight) during installation at the angle shown on the "spar brace." Tack glue a straight piece of 1/8" scrap balsa on edge to this rib.
15. Make an angle brace to insure the proper W-1 angle when in place. See lines on "Spar Brace."
16. The top and bottom spars butt against W-1. Use your straight edge against the top spar when installing. Again, use your square to insure the top spar locates exactly above the lower spars.

17. Install shear webs now, W-1 through W-5 and W-7 through W-13 to both sides of spars. The remaining shear webs are a special shape and of 1/8" plywood.
18. Use your 48" straight edge to check for high spots at the front of the ribs before installing the L.E.-7.
19. Make up the L.E.-2s (two pieces if you like). Install. Angle sand top and bottom edge of the L.E.-2 to conform to the rib angle. When the wing sheet is glued down it will fit flush with the L.E.-2.
20. Install the aileron header Ail-1 right on the aileron cut line in Part "C." Use pins as a guide.
21. Put a piece of 1/32" ply (spacer) next to Ail-1 when installing Ail-2 part. Install aileron rib. Note: The full size F.W. had fabric-covered ailerons. See four views supplied for details if you want scale ailerons.
22. Install the top Part "C" now.
23. Install all retract parts and the retracts now. See Retract Instructions.
24. Finish gluing the bottom A. B. sheet.
25. Install top sheet from center of spar back to Part "C." Use your tracing paper to get the shapes of the tapered sheets. This is optional. You may elect to cap strip top and bottom as shown on plan. Weight is not a consideration. Install the top "A"- "B" panel, the L.E.-1 and the tip. A razor plane is a very handy tool at this point.

### **WING EXTENSION FILLET**

Note: Before installing Fus/Wing fillet, follow these steps to create more volume for our standard or scale diameter main wheel. See Detail A on Sheet 1 for isometric view.

1. Locate rear of top spar and mark with pencil.
2. Install sheeted wings to fuselage. Bolt down.
3. Install cowl.
4. Install WT-1 temp to wing and fuselage. Line up rear with pencil line.
5. Mark temp line on cowl and remove part of hinge line on cowl to clear WT-1.

6. Reinstall WT-1 to wing and glue to wing. Make sure it is pressed tight to fuselage, especially top edge. Bottom edge may be trimmed flush to bottom wing sheeting or used as a guide to thicken bottom forward portion of wing.
7. Install triangular block to wing leading edge. You may want to make larger and sand down to size rather than add filler.
8. Use strips of balsa (1/8-1/4-1/2 thick x 4" long x varying heights) to fill area shown. You can also use foam (green) etc., which will not be attacked by resin.
9. Sand and blend to wing.
10. Remove wings.
11. Glass entire wing (1 oz.).
12. Glass reworked area with two more layers of glass cloth.
13. Install gear with wheel and note interference.
14. Hog-out balsa/foam so wheel is sealed and locked and door is flush to bottom of wing.
15. For those of you crazy enough to try this, nice going. This is what scratch building and using our heads is all about. This extra modification adds a lot of "looks" to this plane.

### **RETRACT INSTRUCTIONS**

The wing is designed around the Robart Number 145 Retract Head and Robart Strut Number 155 "Straight Oleo Strut." The F. W. Strut is 77 degrees to the bottom of the wing when down. The axle is 94 degrees to the strut. Strut length is 14" from axle to strut end. Note: The following is done before bottom sheet is glued to the 1/8" leading edge and before top sheet is installed. We also carry CJM and Sierra Precision Retracts. If using Sierra Precision retracts you will have to move the retract inward one rib location for the gear to fit properly. You also will need to make a new mounting plate as all retracts have different upper frames.

1. The part G.S.-1 installs against the bottom of the W-5A and W-7A ribs creating the retract angle. Do this now.
2. To install the retract head, clearance for the inboard mounting flange must be made by removing 3/8" of the bottom wing sheet where the mounting flange touches this sheet when attempting the head installation. See note on plans.

3. Install the W-5B and W-7B. It will be necessary to trim to angle the notch in W-5B for retract clearance when installing. Note: Remember that the top sheet might interfere with your retract when installing. Pin a piece of scrap across ribs W-5 and W-6. Try installing retract head. If a problem exists, trim the areas needed.
4. Use 6-32 blind nuts and bolts to mount the retracts.
5. When satisfied with the installation, finish gluing the bottom sheet to the 1/8" L.E.-2.
6. Install top sheet, L.E.-2 and tip now.

### **STRUT DOORS**

In full scale there is an upper and lower door. The lower door is attached to the strut part that moves up and down and the upper door attaches to the main strut.

### **SUGGESTED COVERING AND PAINTING SYSTEMS**

1. Clear Monokote with automotive primer (lacquer base) and any lacquer base colors. This is the lightest system available.
2. Super Coverite and lacquer colors.
3. Fiberglass Cloth and Polyester Resin on the fuselage and Clear Monokote or Super Coverite on the flying parts. Again using lacquer paints. Note: We assume you will be using a gas engine.
4. Meister Scale has a full range of Warbird paints available. They are interior latex laser color matched to paint chips. This is the preferred paint system using fiberglass and polyester resin. See accessory sheet for price and availability or call for details.

### **CONTROL THROW SET UP**

1. Ailerons 1" up and 1" down.
2. Elevators 1" up and 1" down.
3. Rudder 2" each way.

4. Throttle must be set to a low idle to allow the model to fly slowly enough to land.  
Note: The above can be changed to individual taste after initial flight.

### **FLYING**

The 190 has the same “Fun Scale” characteristics as its predecessors. Slow take off and landing capabilities so do not use much throttle on first take offs, if you want realism.

The 190 is very acrobatic if set up for it, so help yourself.

### **GENERAL TIPS**

1. Because most balsa sheet wood has a bow shape from nature, it is necessary to straighten at least one edge before applying the fuselage F.S. templates.
2. It is very important that the FS-1A, FS-1B and FS-2B be cut accurately, including the notch in FS-2B. Be sure the alignment mark is placed properly on the FS-2B. Double check the 1/8” x 1/2” notch locations in the FS-1As.
3. When cutting out the bulkheads, check the notches for proper depth, etc. now. Saves a lot of fuss when installing the stringers.
4. The best control system to use is the DuBro “Laser Rod” System. They do not change length with the weather. We have used this system in all of our designs and assure you it is the best. If you prefer hidden controls for “scale,” have at it.
5. We provided some of the necessities for a scale cockpit interior, which are optional items. The hood and headrest are easy to make and add a lot of appearance.
6. We also stock a complete cockpit kit and pilot, decals and custom markings. See our accessory sheet.

Note: The fuselage templates do not always match the side view shown on Sheet 1

# MEISTER SCRATCH BUILD FW 190A

## WOOD LIST

### FUSELAGE Balsa

20-	1/8" X 3" X 36"	FS -2A, 3A, 3B, 2B, 3D AND OTHER PARTS
6-	1/8" X 4" X 36"	FS-1A, FS-2B, FS-1C AND BOTTOM SHEET
16-	1/4" X 3/8" X 36"	STRINGERS
2-	1/2" X 1/2" X 36"	TRIANGLE FOR B-1
3-	1/2" X 3" X 36"	B-1
2-	1" X 2" X 36"	SHAPE BLOCKS BETWEEN F7-F8

### FUSELAGE PLYWOOD

1 -	1/32" x 6" x 36"	WING FILLET
2 -	1/8" x 12" x 48"	
1 -	1/4" x 12" x 24"	
1 -	1/2" x 1" x 9"	WING BOLT PLATE BASS OR PINE

### WING Balsa

12 -	1/8" x 1/2" x 36"	Med	Cap Strips ( <b>exclude if sheeting wing</b> )
10 -	1/8" x 3" x 36"	Med	Sheeting
20 -	1/8" x 4" x 48"	Med	Sheeting Parts "A," "B" and "C"
4 -	1/4" x 1" x 36"		AL-1 and AL-2
2 -	3/8" x 3/8" x 36"	Med	Outboard Spars
4 -	3/8" x 3/4" x 36"	Hard	Inboard Spars
1 -	1/2" x 1" x 36"		L.E.-1
2 -	1/2" x 1-1/2" x 36"		L.E.-1
2 -	2" x 4" x 12"		Wing & Aileron Tip Block

### STAB

8 -	1/8" x 3" x 36"	Balsa	Sheeting & 1/8 all parts
1-	3/8" x 3/4" x 36"	Balsa	L.E. Horizontal stab
2-	3/8" x 1" x 36	Balsa	Elevator header and rudder header R-2
1-	1" x 3" x 36	Balsa	S-3, E-4, R-3 and R-4
1-	1" x 3" x 12	Balsa	F-1
1-	1-1/2" x 3" x 36	Balsa	F-3