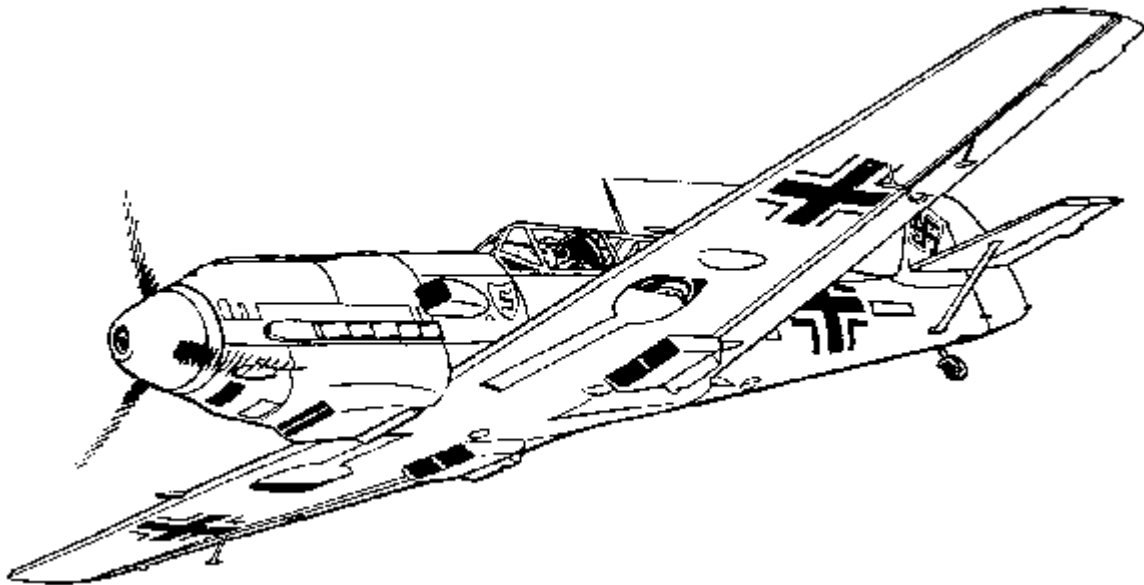




102" WING SPAN MESSERSCHMITT BF-109



THIS IS A VERY EASY PLANE TO BUILD

BEFORE YOU START

The fuselage self jiggling system used an easy accurate assembly. But, attention to detail when cutting the parts from the patterns is very important.

SUGGESTION FOR PARTS ACCURACY

1. Cut the patterns to within 1/4" of the outside lines.
2. Attach to the selected wood with scotch tape.
3. Use a #11 blade to punch through the patterns. Every few inches, place scotch tape over the cut area. When done, you still have the patterns to verify your finished parts. If you acquire a desk style scotch tape dispenser it will be a great asset now and in the future.
4. Alternate methods are used of carbon paper over the wood, or "SEE TEMP" to make separate patterns while preserving the originals.
5. After cutting out the bulkheads, make a 1/4" x 3/8" x 1" piece of balsa to be used as a depth gauge. Check all notches in the bulkheads for proper depth. (Same for wing rib notches.)

NOSE ASSEMBLY

Note: It is important that F2C (Platform) remain flat during the installation of the various parts to it. Therefore, you will need two 2" high, 2" wide and 10" long to set the F-26 onto during assembly.

1. Install the F-2 firewall 90° to the F-2C. Be sure it is centered. Use a piece of scrap to hold at 90° (did you draw engine center lines on F-2?)
2. Slide the F-23 part into place and glue to F-2C first, then to back of F-2. Be sure F-2 is 90° to F-2C.
3. Install F-1's and F-3 next, using braces against the F-1's to insure 90° relation to F-2C.
4. Install F-1A's.

5. Install the F-T.
6. Install 1/4" x 3/8" stringers to bottom of assembly.
7. Set the B-1 assembly on a reasonably flat surface. Use a level to assure this. Check fuselage sides by looking at the assembly from the side. The top edges of the FS-2 and FS-2A sides should appear to be parallel with each other. If not, figure out "what went wrong."
8. The bottom of bulkhead F-5 must be 90° to its vertical centerline. Correct as needed. Important: When satisfied, install the angle brace F-6A to the center back of F-6. Install to B-1. (You might need to sand the sides of F-6 for ease of installation.)
9. Square up the bottom edges of F-7 through F-10 as above.
10. Glue F-10A to front of F-10. Put into position. Note: It is very important that F-10 be installed perfectly 90° to B-1 as seen from the rear. Locate the F-10 alignment tool.
11. Slide the tool as far forward as possible onto the fuse and hold it up against the B-1 so that it is flush. This creates the center for the top of F-10 to locate to. When F-10 is aligned, glue in place. This tool is used later on so hold on to it.
12. Loosely install the F-7, 8 & 9, along with the F-11. Check straightness of F-11. Adjust where necessary. Glue all now.

B-1 ASSEMBLY

1. Join the FS-2 and FS-2A, using a straight edge along the top edges of these parts.
2. When ready to make up the next side, assemble it right on top of the first side, thus assuring both sides are exactly the same. Very important. (Use wax paper under glue area.)
3. Check to see if both sides are "exactly" the same.
4. Glue the FS-3 to bottom of F-2 – F-2A assembly. Use a straight edge at the bottom of FS-2A when sliding the FS-3 into position. Check wing saddle to be sure it matches. Again, lay the next side onto completed one and install FS-3.
5. Install the 1" triangle to B-1. Use a square block against B-1 to insure the triangle piece is flush to B-1.

6. With B-1 on a flat surface, install one side to B-1 using pins. Be sure side is down against bench. When satisfied, put two pins straight into the side and into the triangle. One near the front and one 1" in front of the fin post hole. These will serve as locator holes when you reassemble the side with slow C.A. Leave the pins in the side. Apply slow C.A. to triangle, then put the pins back into the original holes and press the side into place. Add many more pins. Check its position. Install the other side, being sure that the B-1 tab fits the notch in the fuse side correctly.

NOSE ASSEMBLY AND B-1 ASSEMBLY JOINING

Note 1: If you are confident enough to join the nose to the B-1 assembly without help, skip to next section. Be sure it is straight.

Note 2: The following is for the purpose of building a straight fuselage without a jig.

1. Draw on to your workbench a straight line 72" long about 8" in from the edge.
2. Mark a centerline on the bottom of F-3 and F-6.
3. Locate your F-10 alignment tool and glue it to your workbench at one end of the 72" line. This tool will keep the F-10 over the 72" line when the nose is installed.
4. Slide the B-1 assembly into the window of the F-10 tool and place the F-6 center mark onto the 72" line. Use scraps of balsa against each side (and glued to your bench) to insure the B-1 assembly stays put.
5. Place the nose assembly into position, holding it with clamps, rubber bands, etc.
6. Two bricks are handy to hold the sides against the F-3 and to hold F-3 over the centerline.
7. The tabs on F-3 will hold it to the holes into the sides but you might want to block up the F-1's to the proper level.
8. When satisfied spot glue the sides against the F-1 tabs and F-3 tabs. Install F-4 and F-5.
9. Eyeball the top of the entire assembly for straightness. Adjust the nose as necessary. Add stringers from F-1A to F-5 and to the top of nose. Note: If you run the stringer in one piece past F-6, the cockpit deck will not fit properly nor will the fuse sides have the proper shape in the cockpit area if flat. Note: Where stringers make a sharp change in direction, cut through and relieve the stress for proper fit.

10. The lower stringer should join into and terminate at 1" triangle wood.
11. In order to properly locate the FS-1A part to the fuselage side, measure along the lower side stringers 29-1/16" from the front of F-1's.
12. Install the FS-1A's with front edge on the 19-1/16" marks.
13. With the fuselage still lined up over 72" line install the cockpit deck to the top of the stringers. Sand edges flush with the stringers.
14. Your fuselage is now ridged and may be removed.
15. Before gluing anything to F-1's, check to see if it is parallel to the F-2 firewall. If not, your spinner will not fit correctly. Adjust with braces until the balance of parts are installed.
16. Install four 1/4" x 3/8" stringers between F-1's and F-1A's. The two upper most will butt against F-1's (no notches). Install the four wing saddle doublers now.
17. When installing the four wing saddle doublers, be prepared to pull the sides in against the F-4 and F-5. Use triangle stock to help hold the sides in when gluing to the F-4 and 5.
18. Install your engine and all controls now (includes scale tail wheel).
19. Install rest of planks at your leisure.

ENGINE

The prototype used the Quadra Q42. We recommend a Zenoah G-62 for good performance and you can locate one for a reasonable price. We also have used a Quadra 75 or similar for better performance.

Note: The plastic extension on the Q42 carb has to be trimmed to clear fuse side.

Note: A simply way to prime the engine is to install a 1/8" dia. tube through the fuse centered on the carb inlet. With 1/4" of the protruding outside, it is a simple matter to prime with a syringe.

Note: Make your test flights without the cowl to insure adequate cooling. After engine is broken-in experiment with the cowl-cooling situation.

REMOVAL, ASSEMBLY AND INSTALLING THE 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. The air scoop halves can be taped together for gluing. Use thick C.A. on the inside. Use kicker to speed setting. Note: The front ring has an arrow that must match the arrow on the main body.
3. When ready to install the several plastic parts to the fuselage, tape the parts in place. Use thick C.A. to glue. **DO NOT** use kicker as it will attack the plastic. **BELIEVE!**
4. A small fillet of Bondo filler putty around the air scoop and chin cowl will create a nice appearance as well as increased attachment of the parts. Note: Because the chin cowl will touch when fuse is set down, consider reinforcing it.

SPINNER/ASSEMBLY INSTRUCTIONS

Note: It is important that the back plate skirt matches evenly with the spinner skirt.

1. Using a #10 or 12 x 1-1/4" wood screw secure the back plate to your workbench (skirt down).
2. Cut your prop blade exits in the spinner.
3. There should be four holes for 6 x 32 bolts spaced between the cutouts to secure the spinner to the back plate. Place these holes 3/8" up from spinner skirt bottom.
4. Place spinner over back plate. Does it go all the way down against the workbench?
5. Holding the spinner firmly against the workbench drill through the back plate.
6. Access to the 6-32 lock nuts us made with engine cowl removed. Eight 6-32 x 1/4" bolts and eight 6-32 aircraft type lock nuts required.

CANOPY

1. When canopy has been fitted and exactly in place on the fuselage, install some pins next to the front windshield, along the bottom of the sides and at the rear to facilitate exact location when gluing the canopy down. Note: Recommend 5-minute epoxy or R/C 56 glues. DO NOT USE C.A.

WING INSTRUCTIONS

Note: This wing design has a flat bottom, thus no need for jigs, etc. However, you will need a flat surface to build your wing. If you don't have a suitable surface, try this. If you acquired the 1/8" Luan Mahogany 4' x 8' wall panel recommended, cut a 24" x 48" piece from the flat area of the leftovers (grain should be lengthwise). With the sheet on the uneven work area, check high low spots with a 36" straight edge. You can shim the low spots under the board with a variety of items, including newspapers. Use a level to insure no twist exists.

1. After all ribs have been cut out, do yourself a favor. Check all spar notches for exact depth and width NOW! Make up the "spar brace" now. It should be just under 3/4" wide.
2. Make up your "A," "B," "C" and "D" 1/8" balsa sheet parts. Pick the good sides and mark "faces out" remembering you have to add doublers at the splices. A template is provided for the tip and aileron outline.
3. Cut the ailerons from the Part "C." (Do not remove.)
4. Secure the aileron to Part "C" using scotch tape. The tape should be applied to the side that will face the outside. Note: When the wing is completed, remove tape and the aileron will come free.
5. Build the right wing first. (Instructions are on the left wing plans between the ribs.)
6. Lay the bottom parts A, B and C-D in place. Locate the W S-T (Wing Servo Template) and the 1/8" x 1" x 4-1/8" servo rails. Install along with all bottom sheets between W-1 and W-3 and all the cap strips.
7. Make up the 1/4" x 3/4" x 36" top and bottom spars to splice with the 1/4" x 3/8" x 15" outboard spars. Join.
8. Place the bottom spar onto the bottom sheet as shown on plans. Note: Be sure the center of the 3/4" wide spar locates to the rear edge of Part "B." (See Plan Note.)

9. Install ribs W-1 and W-3 through W-12. W-1 is angled to match line on “Spar Brace.”
10. The square cutouts in the W-2 and W-3 ribs are exclusive to our “FUN TRACKS” gear. Should you have another gear in mind, now is the time to engineer the geometry. We recommend CJM retracts for this aircraft.
11. Install the W-1A W-2 and the 1/2” x 1/2” x 5” maple beams. Use epoxy to secure.
12. Install top spar. Use your straight edge along top of spar. Install the 1/8” balsa (vertical grain) webbing in the rear side from W-1 through W-6.
13. Install the 1/8” balsa L.C. to front of ribs (precut to 5/8” x 44-1/8” x 1-1/8”). Check for a bow in this piece. Correct as needed.
14. If you plan to have the wing separate, do not glue the spar brace in place. Study the drawing showing the “Spar Brace” (from front view) in the wing. Note: The “mid spar” (trim 1/4” x 3/4” stock) is installed between the ribs and are held in place over the spar brace with small pieces of balsa. Glue in place now. 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. REMOVE “SPAR BRACE” NOW.
15. Install the webbing to the front of spars from W-1 through W-12. REMOVE THE SPAR BRACE FIRST!
16. Install all top sheet parts now. Suggest slow C.A. Don’t forget to sand angle on top and bottom edge of the 1/8” L.E. before gluing the sheets to it.
17. Install the 1/2” balsa L.E. You can pre-cut this as before – measure your needs.
18. Install the aileron part AIL-1 right on the aileron cut line.
19. Install the AIL-2. Use a 1/16” shim between the AIL-1 and AIL-2 (for hinge clearance).
20. Install aileron ribs.
21. Install top sheet Part “C”-“D”. Use white glue or slow C.A.
22. Use tip shape template to trim front top sheet. Install two layers of 1/8” balsa under top sheet to strengthen tip and give it fullness. See plans.
23. Install wing to fuse now.

24. Tail assembly is now installed to fuse. Square up the wing from rear view. Be sure front fin post is flush with bottom of B-1 hole and rear post is down on to B-1. When satisfied, glue in place.

GENERAL NOTES

You may entirely sheet your wing for purposes of realism without concern for weight.

The wing separation feature shown is of great benefit for transport and storing. The use of engines with less than 6 cu in. is recommended when using this feature in conjunction with high-speed violent stunts.

Economy can be increased with the use of 1/8" Luan Mahogany which is found at lumber yards in the form of regular smooth 4' x 8' sheets, 36" x 80" door skins or regular cheap grooved wall paneling. You can make all bulkheads and ribs with this material and not appreciably increase the weight of the model.

TAIL FEATHERS

1. Build the horizontal stab first, being sure you do not install the S-5 yet.
2. Install the "tail brace" with five-minute epoxy. Be sure it is at 90° to the stab. See side view of vertical fin.
3. Hinge the elevators now. Suggest you use DuBro #257 1/4 Scale hinges, as they have removable cotter pins. Be sure you install pins through the hinges.
4. Install the two elevator control horns. Suggest DuBro #105. Use #2 sheet metal screw to mount.
5. Build the vertical fin and rudder, leaving the F-3 and F-6 parts to one side.

Note: Tape a piece of paper to these two parts to remind you not to install until told to do so.

Note: You may elect to build F-2 and F-4 from 3" wide stock.

6. Be sure the cutout for the "tail brace" in the F-2 & 3 parts is accurate, as this angle creates the proper stab incidence.
7. Install the stab to the fin. Use five-minute epoxy on the "tail brace" and pin the two S-3's to the F-1 until epoxy sets.

8. The S-5, F-6 and F-3 can now be installed.
9. The fin stab assembly is fitted to the fuselage only when the wing is installed which allows visual alignment of the stab to the wing.
10. The F-4 fits into the 1” square hole in the “B-1” and flush to the bottom. F-3 sits against the top of the “B-1.” Use slow epoxy when installing.

COVERING AND PAINTING

Because of the many unusual paint schemes you can choose from available documentation sources, colored iron on films are not the best choice. Listed are suggested covering – paint systems.

1. Clear Monokote with automotive primer (lacquer base) and any lacquer base colors. This is the lightest system possible.
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 assure you will be using a gas engine.

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 flights.

FLYING

Double check your CG!!! The 109 has the same “Fun Scale” characteristics as its predecessors. Very slow take off and landing capabilities so do not use much throttle on first take offs, if you want realism.

The 109 is very acrobatic if set up for it, so help yourself.

FUSE (BALSA)

2 -	1/8" x 3" x 36"	FS-3, 4A, F-8, F-9, FT, F-11, WSD Cockpit Deck
7 -	1/8" x 4" x 36"	F1-A, B & C, FS-2A, B, F-6, F-7
8 -	1/4" x 3/8" x 36"	Stringers
1 -	1/4" x 3" x 36"	B-1
1 -	1/4" x 4" x 36"	B-1
1 -	3/4" x 3" x 36"	Joins the Top of F-11
2 -	3/4" x 3/4" x 36"	Triangle

FUSE (HARDWOOD)

2 -	1/8" x 12" x 48"	Luan Mahogany from Door Skins or Wall Panel F-1, F-1A, F-1C, F-2, F-2A, F-2B, F-2C, F-2D, F-3, F-4, F-5, & F-9.
1 -	1/4" x 12" x 12"	Aircraft Ply F-2

WING (BALSA)

20 -	1/8" x 1/2" x 36"	Cap Strips
10 -	1/8" x 3" x 36"	Med. Sheet Ribs
5 -	1/8" x 3" x 48"	Part B Leading Edge
8 -	1/8" x 4" x 36"	Part C Webb
5 -	1/8" x 4" x 48"	Part A & D

A/C PLYWOOD

2 -	1/32" x 6" x 12"	Strut Doors
2 -	1/4" x 4" x 5"	To Tongue Plate

HARDWOOD

2 -	1/2" x 1/2" x 12"	Maple Gear Blocks
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VERTICAL FIN WOOD

1 -	7/16" x 2-1/8" x 10"	R-3
1 -	7/16" x 3/4" x 26"	R-4
1 -	1" x 1" x 36"	F-1, F-2, F-3

1 -	1" x 1" x 18"	F-4, F-5, F-6
1 -	1/8" x 3" x 36"	R-1, R-2
1 -	1/8" x 1" x 5"	Ribs
1 -	1/8" x 7/16" x 24"	Ribs
1 -	1" x 3" x 3"	F-5

STAB WOOD

1 -	3/8" x 5/8" x 30"	E-1
2 -	3/4" x 3/4" x 36"	S-1, S-2, S-3
1 -	3/4" x 3" x 12"	S-4, E-2
1 -	3/4" x 1" x 9"	S-5
1 -	1/8" x 3" x 36"	E-3
1 -	1/8" x 3/4" x 36"	Ribs
1 -	1/4" x 4" x 8"	Ply Tail Brace