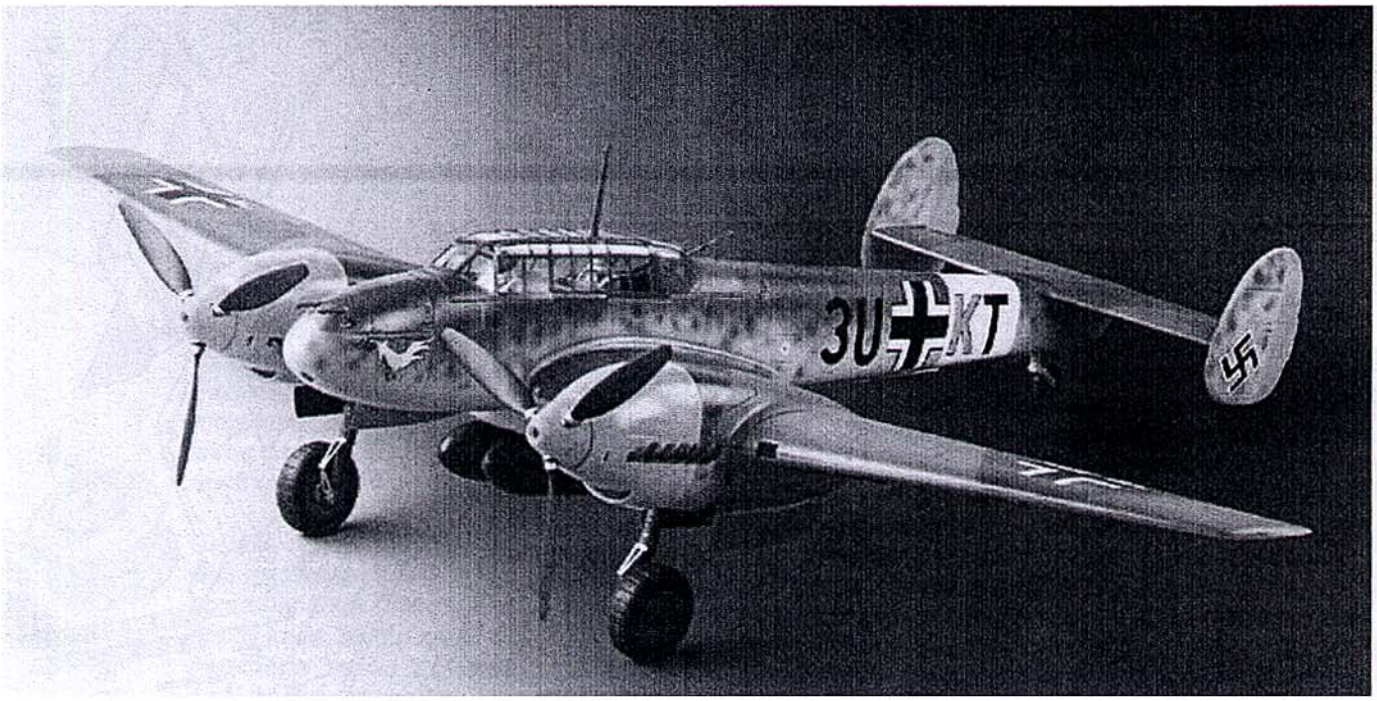
Messerschmitt Bf 110 C

Radio Controled Electric Scale Kit of the Famous German WWII fighter

Owner`s Instructions Manual



Technical Data		
Wingspan	mm	**1135**
Length	mm	**845**
Weight	g	**640-690**
Wing area	dm^2	**20**
Wing loading	g/dm^2	**32 - 34**
Control elements	Elevator, Ailerons, Motor	
Power Specs. / Requirements		
Motor	SPEED 300 / 6V	
Propeller	3-bl. FSK 236/200	
Gearbox	GRIEBL 7,7:1	
Battery pack	2x1500 mAh Li-Pol	
ESC	min.18 A constant	

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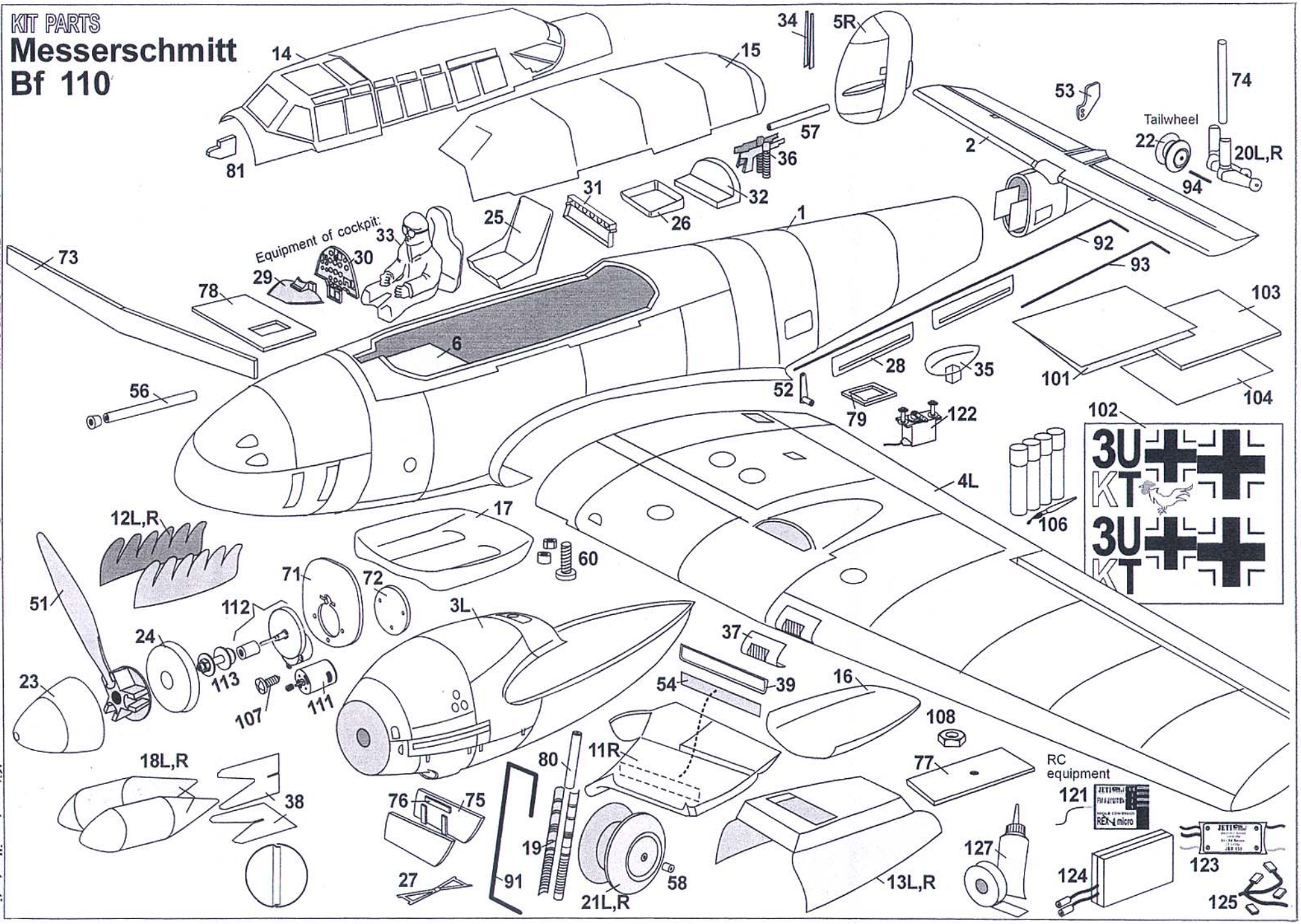
KIT PARTS

Messerschmitt Bf 110



KIT PARTS

Messerschmitt Bf 110 – RC

#	Title	Qty.
List of foam parts		
1	Fuselage	1
2	Rear of fuselage with horizontal stabilizer	1
3	Motor nacelle L, R	1+1
4	Wing with ailerons L, R	1+1
5	Vertical stabilizer L, R	1+1
6	Cockpit floor	1
List of PSH foil parts		
11	Lower wing air intake L, R	1+1
12	Exhausts L, R	2+2
13	Undercarriage doors L, R	1+1
14	Canopy frame	1
15	Canopy	1
16	Lower reinforcement of motor nacelle	2
17	Bomb or drop tank rack	1
18	Bomb halve L, R	2+2
19	Undercarriage leg inside / outside	2+2
20	Tailwheel L, R	1+1
21	Undercarriage wheel halve outside / inside	2+2
22	Tailwheel leg halve	1+1
23	Colorful propeller spinner	2
24	Spinner back plate	2
25	Pilot seat	1
26	Air gunner seat	1
27	Torque link	2
28	Bottom fuselage antenna	2
29	Instrument panel cover	1
30	Pilot instrument panel	1
31	Gunner instrument panel	1
32	Rear of cockpit inside	1
33	Pilot figure	2+2
34	Antenna L, R	1+1
35	Circular holder of antenna	1
36	Rear machinegun L, R	1+1
37	Air intake	1
38	Bomb fins (4)	set
39	Intake grill	2
List of plastic parts, pipes		
51	3-blade propeller FSK (propeller hub + 3 blades)	2
52	Aileron control horn	2
53	Elevator control horn	1
54	Air intake net (maquette of honneycombes) (1)	1
56	Front ringers of fuselage Tr 2/1 (1)	2
57	Machinegun barrel Tr 2/1 (1)	2
58	Tubbing for wheel retainers Tr 3/1.5 (1)	2
60	Plastic screw M4x20 with nut and bushing for wing gripping (3)	1
List of wood parts		
71	Firewall Pw 3	2
72	Reducted firewall for brushless motor	2
73	Center wing support spar B 4	1
74	Tailwheel leg filler B 4	1
75	Undercarriage wire leg support blocks Pw 3	4
76	Undercar. leg support, parts A, B, C S 2x5 (1)	2 set
77	Plate for wing nut Pw 3	1
78	Servo and receiver tray Pw 3	1
79	Ailerons sero frame Pw 3	1
80	Undercar. leg filler B 5x8 , 200 length (1)	2
81	Canopy latch Pw 3	2
List of steel wire parts		
91	Undercarriage leg Oc 1,8 diameter	2
92	Elevator pushrod Oc 0,8 (1)	1
93	Ailerons pushrod Oc 0,8 (1)	2
94	Tailwheel axle Oc 1	1
Other parts		
101	Instruction manual	1
102	Decal Sheets	set
103	Extra PP material for testing	1
104	Extra PSH material for testing	1
106	Set of 4 pc. Colors for a repairs	set
107	Screws for motor PAN HEAD 2,2x8 mounting	6
108	Nut M4 (3)	

Optional equipment *(Not included in kit)*

Propulsion 300 line

111	Motor SPEED 300 / 6V	2
112	Gearbox GRIEBL 7.7:1 + 5/6 diameter inset + + 10-tooth pinion + LOCTITE glue	2 set
113	Propeller adapter MPJ 3 diameter / M5	2

#	Title	Qty.
Optional equipment *(Not included in kit)*		
RC equipment		
121	3 channel (or 5channel) receiver (5)	1
122	Servos HS-50, 55 or C141 (5)	2-5
123	18 amp minimum ESC	1
124	Battery pack 2 x 1500 mAh Li-Pol	1
125	Leads, connectors, switch	set
127	Glue, tape, etc.	set

Material specification:

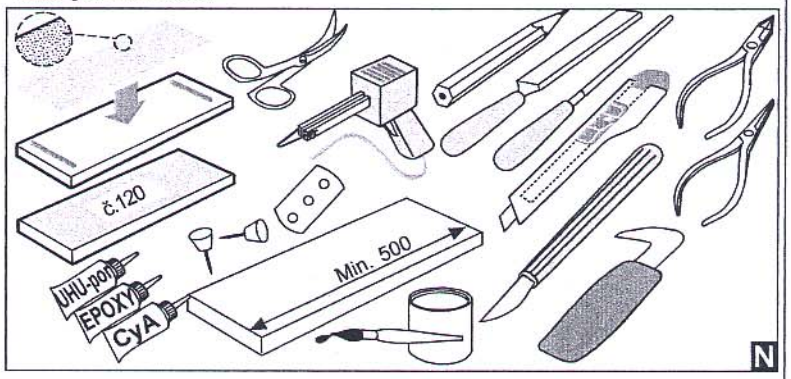
B=balsa wood	Oc=steel
PP=foam material	S=spruce wood
Pw=plywood	Tr=tube
PSH=Polystyrene hard foil	set=collection

All measurments are in metric system (mm).

Explanation of notations:

(1) Provided as one piece, cut to size as necessary.
(2) 3 channel receiver as minimum.
(3) Parts for the variant with demountable gripping of wing.
(4) Make from PSH plate.
(5) Glued inside of fuselage.

Tools you will need:



Sharp Utility knife · Pair of scissors · Small flat and round files · A pair of plyers · Emery paper #120 and #240 · Epoxy (5 min.), Fast drying glue, UHU-por glue · Soldering iron · Pencil · Small set of non-corrosive paints for coloring the pilot`s figures and occasional touch up repairs.

Applying Decals:

Cut out the decal about 0.5 - 1.0 mm from the edge of the marking and soak it in water (40 degrees Celsius = 100 F) for about 15 seconds or until the decal begins to slide off the backing paper. Now remove the decal from the water and slide the decal from the backing paper to the surface of the model. Carefully position the decal as desired. Using your fingers, slowly and carefully press out the air bubbles. Once the decal is in place and any air bubbles removed, use a cotton swab or tissue to dab anddry the decal to finish.

Although all of our kits are thoroughly inspected prior to leaving our factory, it is possible there may be some missing parts or parts which have been damaged during shipping.

If you do find any parts which are missing or have been damaged in this kit, please contact the dealer from which you purchased the kit or you can contact us directly.

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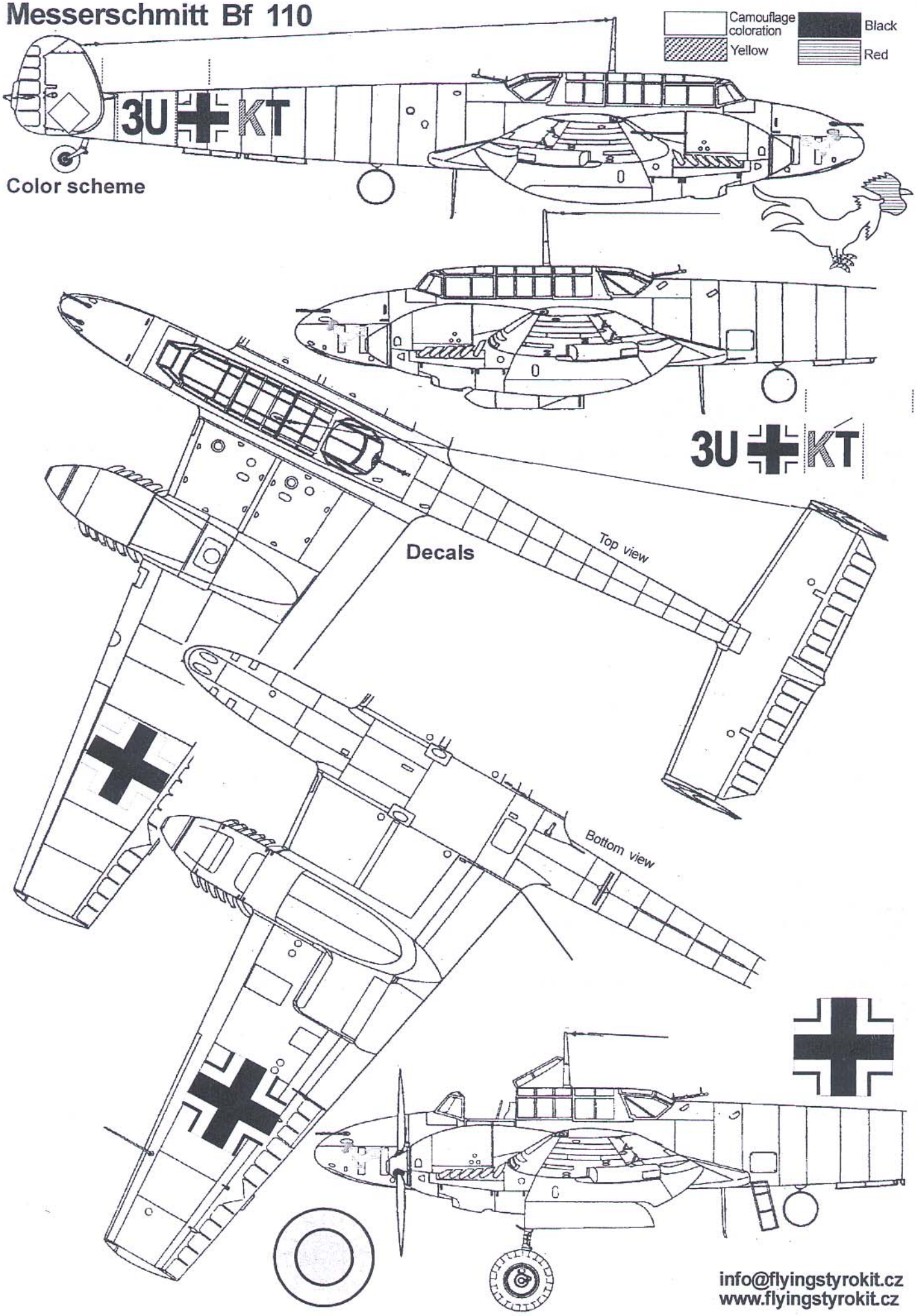

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Building Instructions
"Bf-110"
Flying Styro Kit

You have purchased one of the most accurate Flying Scale Models of Germany's Bf-110 "Zerstorer" (Destroyer). The Bf-110 was designed as a "Heavy Fighter", a concept that proven to be a flawed one. While the Bf-110 was not a great success as a daylight fighter it became a valuable aircraft for the Luftwaffe as a night fighter and bomber destroyer.

While a great deal of work has been done for you, there is still a lot for the modeler to complete. You have quite a few options to consider and the final level of detail is left up to you. The main parts are molded of a new foam that has a tougher shell than previous Flying Styro models. Parts still require careful handling during the construction phase. A clean construction area and some soft padding will go a long way toward keeping your model unblemished. The model can be built as a display model, a flying model or both. The removable scale landing gear can be omitted for a flying only model, but they are great looking on the model when it is "In the hanger". Please look over all of the instructions prior to starting, take your time and enjoy the challenge. The vacuformed styrene parts must be cut out before assembly. This can be done with a combination of a sharp hobby knife, scissors and small cuticle scissors.

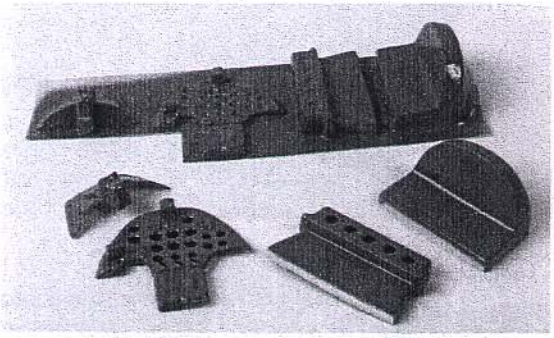
What you need to complete the kit:

2-PM221234 AXI Motors
2-PM22002 Radial Mount Kits
2-Jeti JESAP08 Brushless Controllers
2 Packs MJ21011 1.8mm Gold Connectors
1-TP21003 3 Cell LiPoly Pack
2-Micro Servos (Hitec 55's)
Micro Receiver
Hobby Knife with spare blades
Needle nose pliers
5 Minute epoxy
Emory board or thin sanding stick
Diagonal cutters
Soft pencil

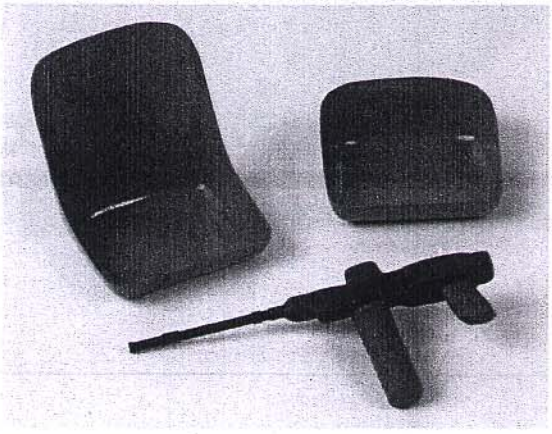
Items not essential but highly recommended:

Dubro mini E/Z connectors (DUB845)
Dubro mini E/Z links (DUB849)
Foam safe medium CA and accelerator
Canopy Glue
Dremel tool and accessories
Small drills
Needle files
Masking tape
Liquid Styrene glue
Uhu Por foam glue

1. Pre-cutting the various vacuformed detail parts will save you a lot of time when it comes to assembling your model. This should be done with a new sharp Exacto blade, sharp scissors and small cuticle scissors. Good lighting is essential for an accurate job. First trim the part from the large sheet with the scissors.



2. The photo shows the instrument panel parts before and after trimming. The indentations that represent the instruments are painted by dripping some black paint into them with a toothpick.

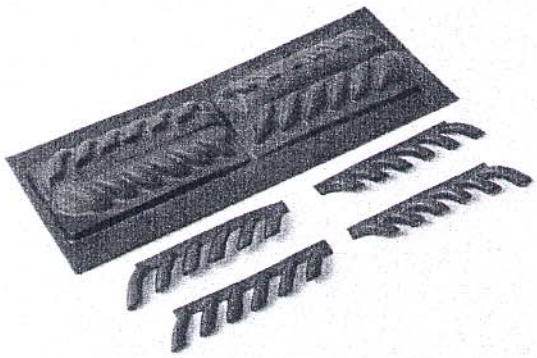


3. Some parts can be cut out completely with scissors. Others will need to be cut with the sharp knife.

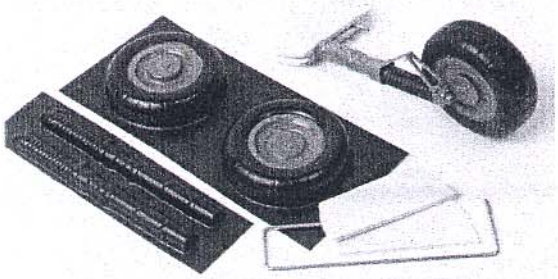
4. On parts that mate together, like the machine gun in the photo, the mating surfaces can be sanded flat on a piece of fine sandpaper that is mounted face up on your workbench.

5. Photo shows the exhaust stacks before and after trimming. These are a good example of a detailed part that requires trimming with a sharp knife.

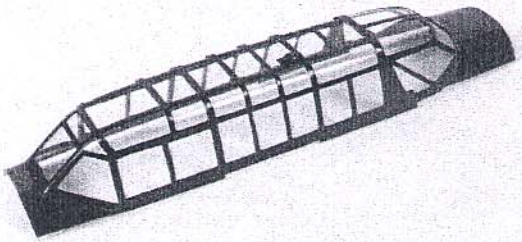
6. After cutting out the exhaust stacks, the backside can be filled with a combination of epoxy and microballons. This will give the exhaust a full three-dimensional look.



7. Photo shows the parts required to assemble one of the main gear units along with the final assembled part.



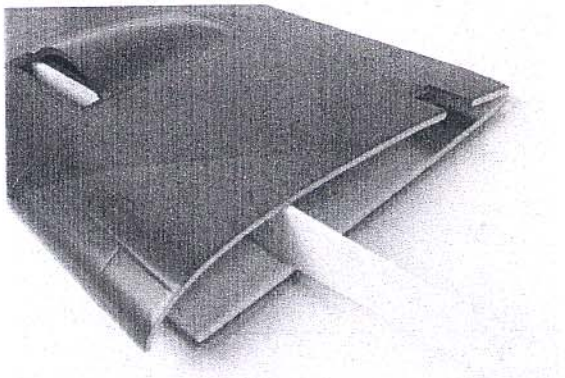
8. One of the more complex parts to cut out is the canopy. The technique that I have found to be the easiest is to carefully score around the edge of each window area from the inside of the part. The inside has a sharper demarcation line. After scoring around the glazing several times, gently bend the part to pop the window area out. Take your time with this and you will be rewarded with a highly detailed attractive part. The cut edges of the canopy frame can be touched up with the paint supplied with the kit.

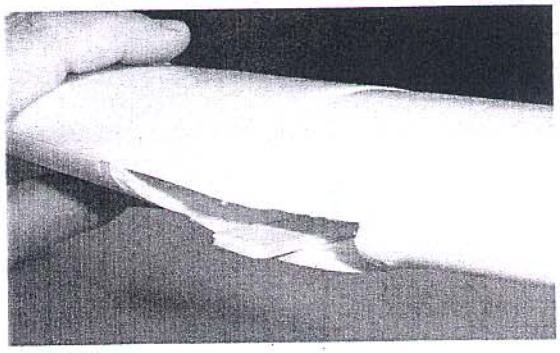


9. Begin with the assembly of the main wings. Test fit the balsa spar joiner into the wing halves. Some sanding of the top and bottom of the joiner may be necessary for a perfect fit. When satisfied with the fit, epoxy the joiner in one wing panel, in front of the main spar, let the epoxy set.

10. Test fit the two wing panels together adjust the fit if necessary. When satisfied, apply a thin bead of epoxy to the wing joint and a coat of epoxy to the spar joiner. Slide the parts together and align. Maintain the parts alignment as the epoxy sets. Wipe any epoxy from the joints prior to it setting.

11. After the wings are joined, locate the balsa wing retainer. Epoxy this to the inside center bottom of the wing (See photo). This is to maintain alignment of the wing to the fuselage.

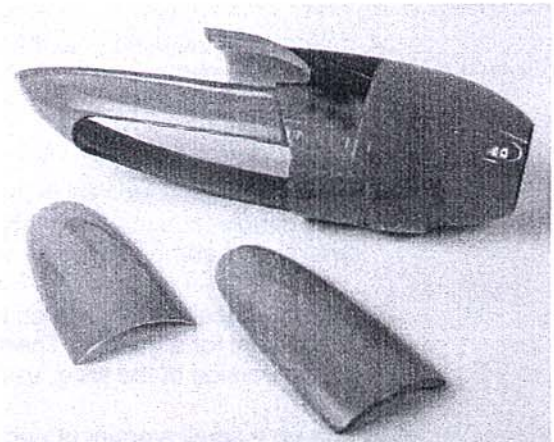




12. Locate the motor nacelles. Carefully cut the gear doors free with a new sharp blade. Photo shows the nacelle with the gear doors cut out and also shows the vacuformed gear door abrasion cover.

13. NOTE: If you are going to make a flying model only and do not wish to have the static gear option, skip this step and simply glue the abrasion cover onto the nacelle.

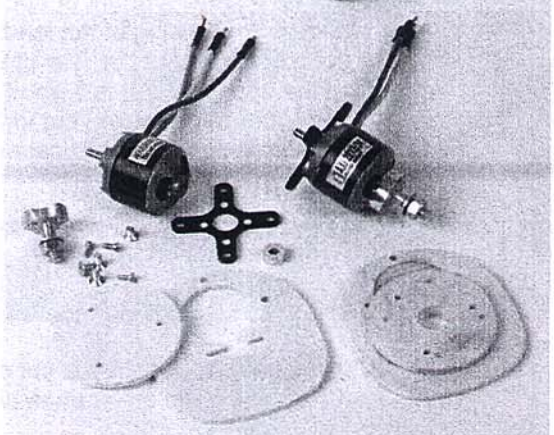
14. When using the AXI motor, the hole in the black plastic front cover of the nacelle will need to be enlarged. Mark and cut it out to a diameter of approx. 1" (25mm)



15. Locate the wooden motor mount parts. If you are powering your model with the 7.7:1 geared Speed 300 motors, you will only need the 2 wooden parts that are pre-cut for this

16. If you are using a brushless motor system you will need the additional 2 wooden disks. NOTE: The 2 disks are pre-drilled for the PJS motor mount.

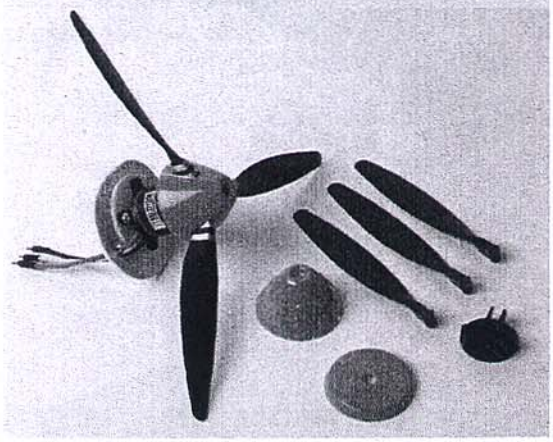
17. Shown in the photo are the motor and mount parts both disassembled and assembled. NOTE: When using the AXI motors, a hole will need to be drilled in the center of the wooden disk.



18. Screw the motors to the mounts. Locate the spinners, backplate and props. Trim the spinners.

19. The hole in the prop is too large for the prop shaft adapter on the AXI motor. Shim the shaft with a short length of heat shrink tubing. If that is not available, you can wrap the shaft with a couple of turns of tape.

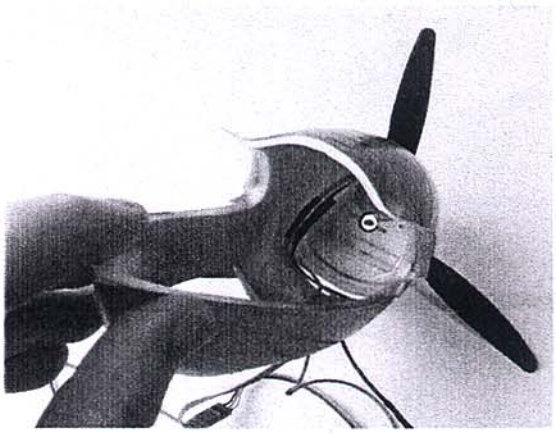
20. Do not glue the spinner to the backplate at this time. When gluing the motor mount into the nacelles you will install the prop and spinner to check the alignment and spacing of the motor.



21. Pre-wire the speed control to the motor, check for correct rotation. NOTE: For right hand rotation with an AXI motor with radial mount and a Jeti brushless controller, connect one wire with the same color and two wires of different colors.

22. Dry fit the motor and mount into the nacelle, sand the edges if necessary. Reinstall the prop, backplate and spinner and check that the spinner is centered on the front of the nacelle and that there is a 1/16" (1.5mm) gap between the back of the spinner and the face of the nacelle.

23. When satisfied with the fit, epoxy in place by applying glue to the edges of the mount from the inside of the nacelle. Hold in correct position till the glue has set.

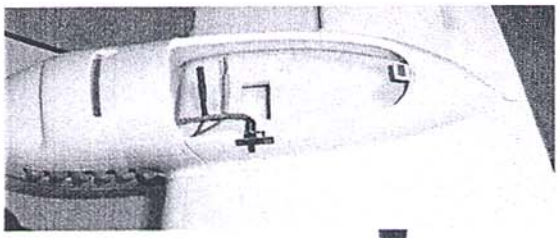


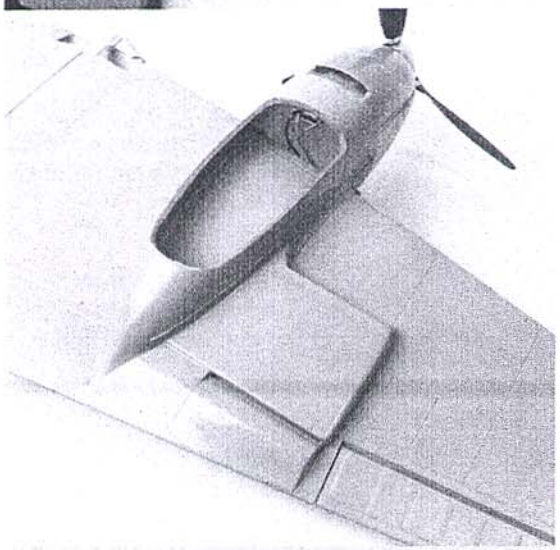
24. Solder wire extensions to the power wires on the speed controls. Feed these wires to the center of the wing and extend them out of the hole in the upper surface that you have cut there.

25. Mount the speed control to the bottom of the nacelle with double-sided tape. In this location the speed control will receive some cooling air when in operation.

26. Slip the nacelle into place on the wing and adjust as necessary for a good fit. There is a centerline marked on the underside of the wing, use this as a guide.

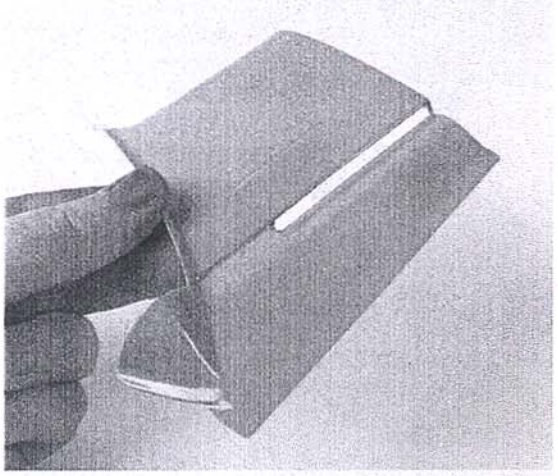
27. Mix up a small amount of epoxy and tack glue the nacelle to the wing at the leading edge on each side of the nacelle and at the rear of the nacelle. Hold in place till the epoxy sets. It is a good idea to replace the foam gear door part that you cut free earlier to maintain alignment during this process.



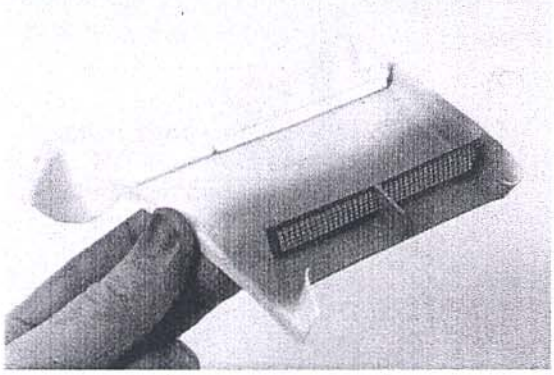


28. If you haven't done it yet, cut out the radiators. Locate the black plastic grill frames and cut them out as well.

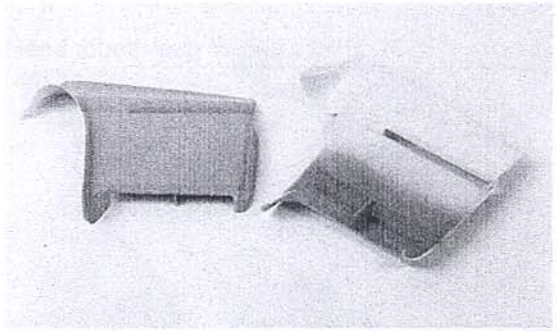
29. Photo shows the rear of the radiator with the air exit opened up.



30. Photo shows the location of the interior grill. Make sure that the frame that holds the grill does not extend below the radiator. Paint the interior of the radiator with some of the touch up paint.

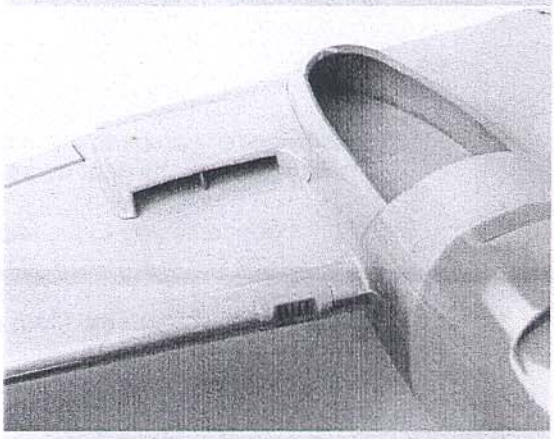


31. Photo shows the radiator's ready to be installed on the underside of the wings.



32. Test fit the radiators to the underside of the wings. Some gentle bending of the radiator flange where it meets the nacelle may be necessary for a smooth fit.

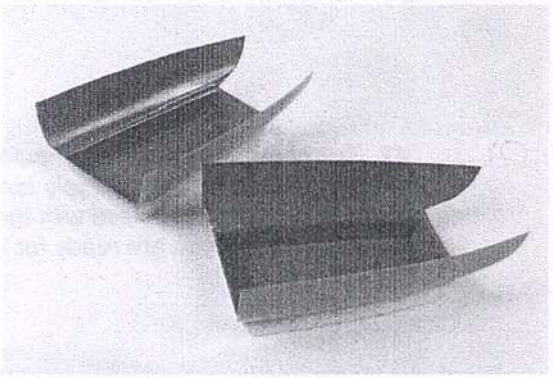
33. When satisfied with the fit, glue in place with Uhu Por. Apply the glue to the edges of the radiator part and put the radiator in place. This is to transfer some of the glue from the radiator to the wing and nacelle. Allow the glue to set for about 10 minutes then reassemble the parts. When used in this manner, Uhu Por is a strong contact glue.



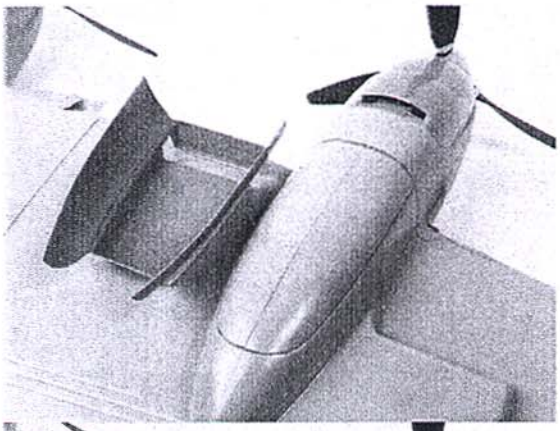
34. Locate the wooden parts that make up the landing gear retainers. Cut the hardwood strips into three pieces for each gear (see the drawing) then using the wire gear as a guide, glue the wooden parts to one side of the plywood. The wire should be a snug fit between the hardwood strips. After the epoxy has set, then epoxy the remaining plywood side to the first, make sure that you keep the epoxy from squeezing into the pocket where the wire gear will go.

35. When gluing the plastic gear legs over the wire gear, some spacers can be made out of wood scraps to help with the alignment of these parts. (see photo)

36. Locate and cut out gear doors. Do not cut the doors free from the center part that extends into the nacelle. (see photo)



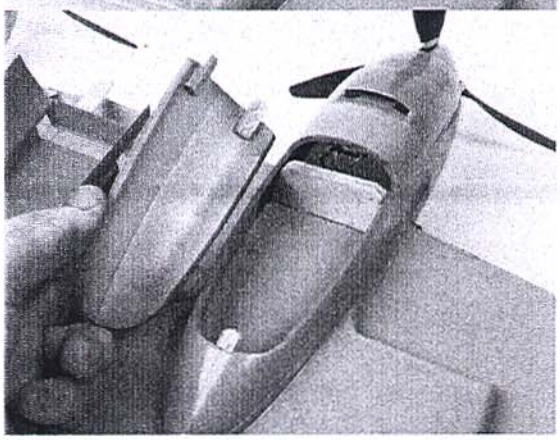
37. Photo shows gear doors beside engine nacelle.



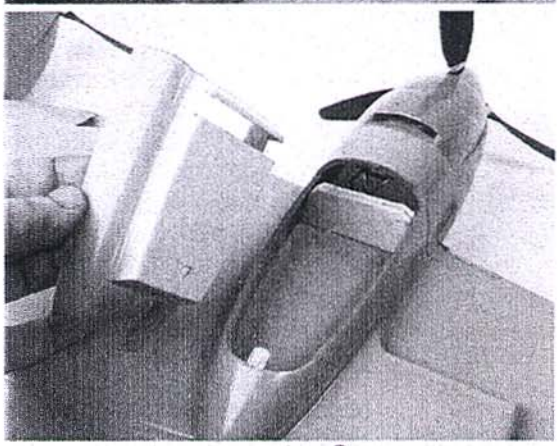
38. Add wooden scraps to the front edge of the foam part that represents the gear doors in the closed position.

39. Add a wooden scrap to the rear of the nacelle opening. Drill a hole in the rear scrap to accept a small magnet, glue magnet into this part. Glue a small washer to the bottom of the rear of the foam part.

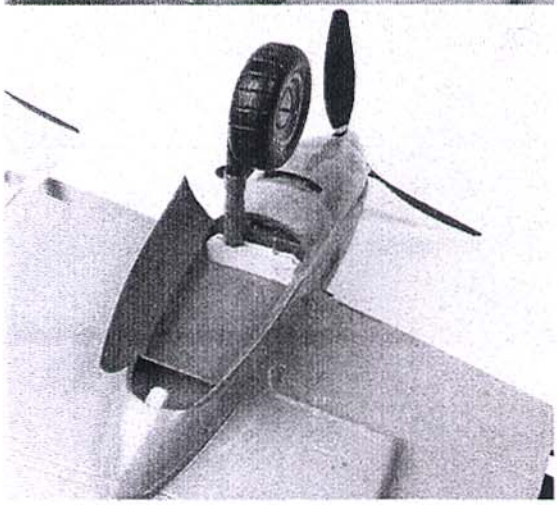
40. Locate the gear retainer plywood parts and trial fit them in the nacelle. Look at the scale drawings to see the location and angle of the gear legs. When satisfied with the fit, glue them in place with epoxy.



41. Trim a slot in the open gear door assembly to allow it to fit over the wooden gear retainer. (see photo)



42. The complete assembly should look like this when complete. For flying, simply remove the gear and open gear doors and replace with the doors in the closed position and you are ready for flight.



43. Locate the plywood servo retainer and using it as a template, mark the wing for the aileron servo. (see photo)

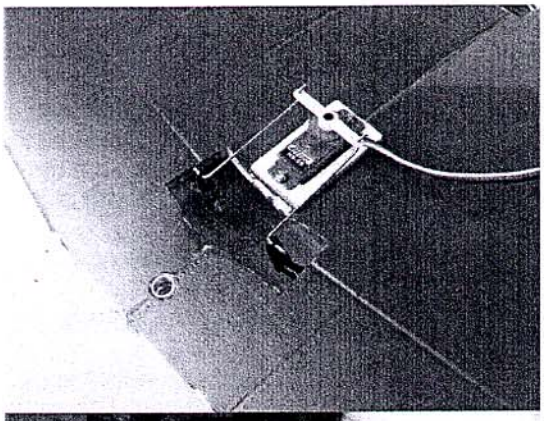
44. Cut hole in upper foam surface of wing for aileron servo and glue the ply retainer in place. Screw servo into retainer.

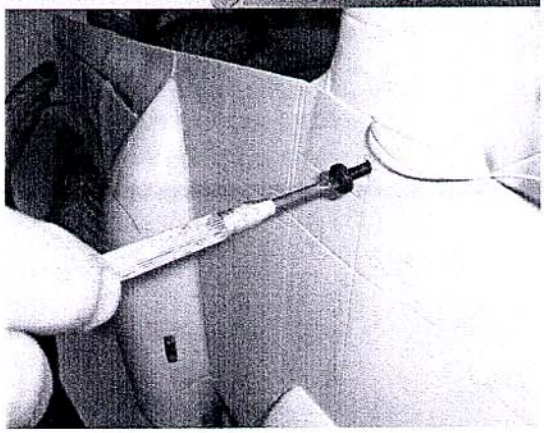
45. Sand the ends of the aileron torque rods to remove any paint overspray and to roughen them up for good glue adhesion. Make up the wire pushrods from some of the wire provided. It should look like the photo on the right.

46. Epoxy the plastic control horns in place on the torque rods. Make sure that the ailerons are in the neutral position, allow to set completely.

47. Place wing on fuselage and locate the position of the wing retaining blind nut from inside the fuselage. Remove the wing from the fuselage and make a hole large enough to install plastic tube thru wing. This tube is to prevent the wing attachment screw from crushing the wing. Epoxy tube in place.

48. Screw wing in position with nylon screw

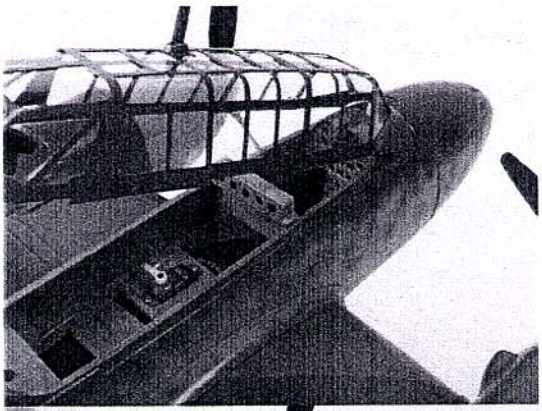




49. Locate the plywood elevator servo retainer plate. Adjust the hole to fit your servo and screw servo into plate.

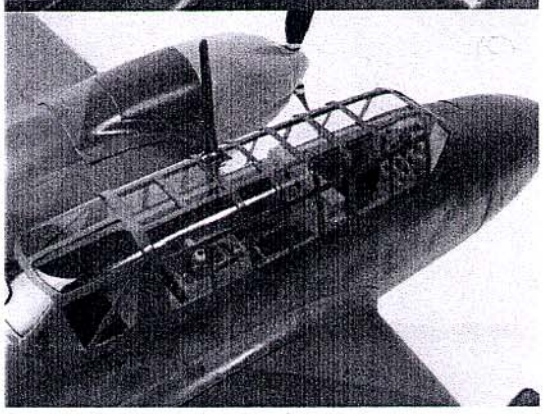
50. Fit this assembly into the fuselage and line it up with the pre-installed elevator pushrod sleeve. Epoxy the assembly in place.

51. The hole in the top surface of the main wing will need to be located so that the elevator servo penetrates into the wing when installed.



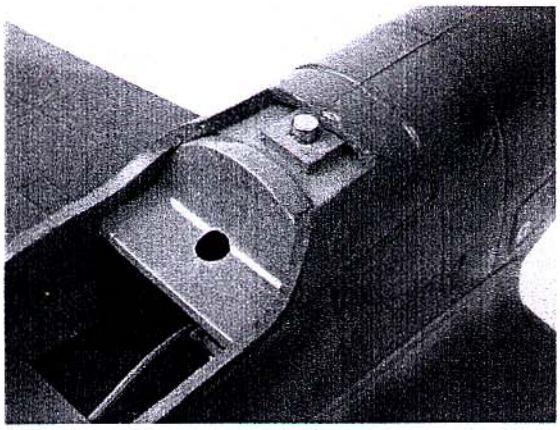
52. Roughen up the underside of the front of the canopy then glue the plywood canopy retainers to the canopy with Uhu Por, using the contact cement method described earlier.

53. The scale antenna that you assembled earlier can be added to the canopy at this time. Open a hole in the antenna base on the canopy. Trial fit the antenna mast, when satisfied with the fit, remove the mast and fill the hole in the antenna base with epoxy, replace the antenna and align.



54. Trim and install the plastic cockpit interior parts.

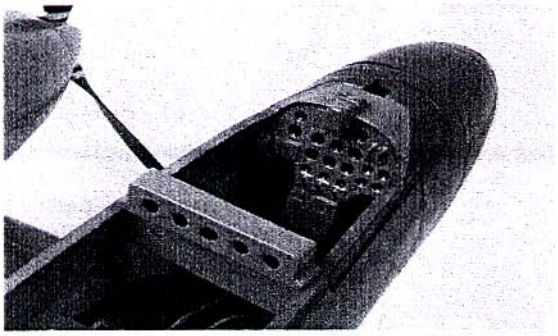
55. Trim the rear cockpit section of the fuselage like the photo to the right. The shelf that is located behind the plastic part is made from the pre-painted Depron sheet provided. Trim to fit and glue in place with Uhu Por.



56. Glue a small magnet to the shelf as shown. Glue a washer to the underside of the canopy in the spot that is directly above the magnet.

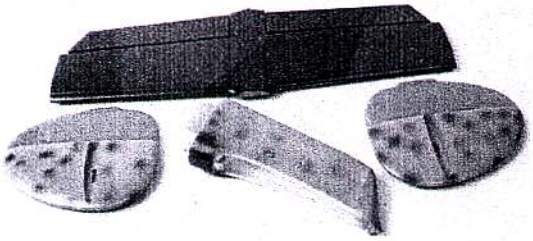
57. NOTE: The hole in the plastic part is to receive the base of the machine gun. The machine gun is glued to the canopy.

58. Install the instrument panels as shown in the photo. The seats and pilot and gunner figures can be installed also.



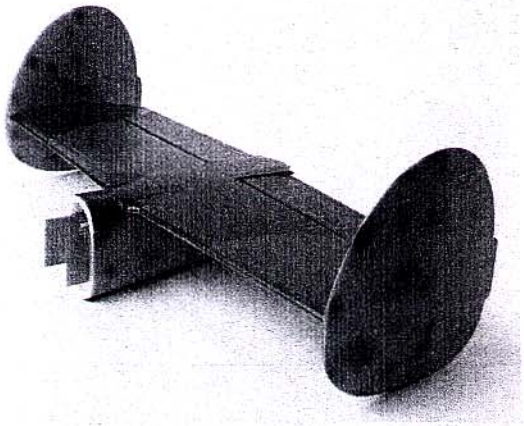
59. Locate the tail parts shown in the photo.

60. Epoxy the control horn into the elevator at the pre-marked position.



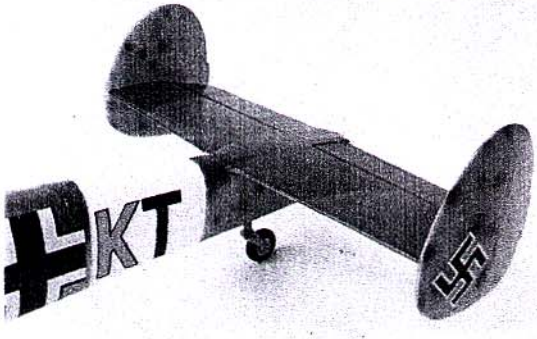
61. Carefully fit and glue the tail unit parts together.

62. Before attaching the tail unit to the fuselage, thread a length of pushrod wire thru the pushrod housing. Attach the rear end of the wire to the elevator horn with an L-bend. Retain the wire with a small length of pushrod housing glued to the end of the L-bend.



63. Before attaching the tail unit to the fuselage, install the tail wheel assembly. The location for this is marked on the underside of the tail.

64. Thread the pushrod wire into the pushrod housing that is located in the main fuselage. Glue the tail section to the main fuselage. Carefully maintain the alignment so that the tailplane remains aligned with the wings when viewed from the rear.

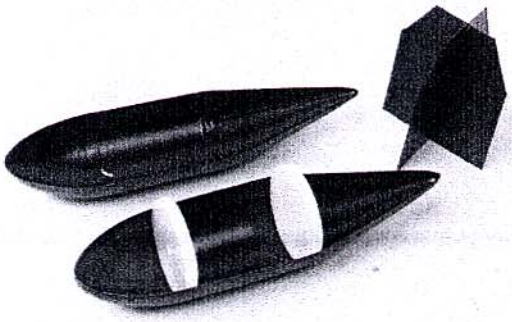


65. Locate the vacuformed bomb parts and cut them out.

66. The tail fins are cut from the black plastic sheet provided.

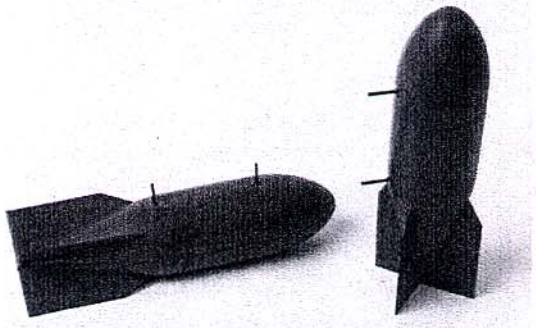
67. Cut 4 Depron disks of approx. 7/8" (21 mm) dia. To fit into the bombs. These disks aid in assembling the bombs and in retaining them on the bomb rack later.

68. Photo shows the assembly of the bombs.



69. Locate the Depron disks at the positions shown. Glue the halves together with styrene glue.

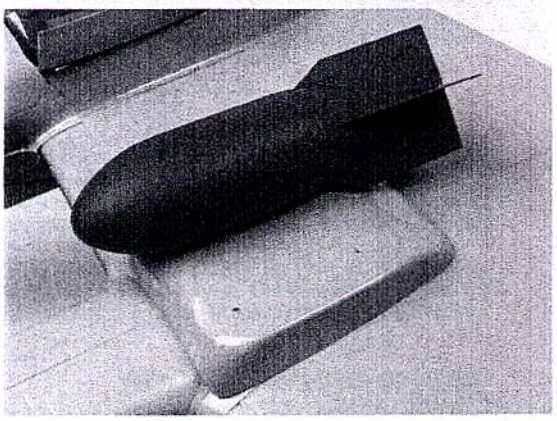
70. Cut the slots in the rear of the bombs for the fins, slide them in place and glue.



71. At the position on the bombs that corresponds to the location of the foam disks, drill two small holes. These should be on the side of the bomb that does not have a seam and should be centered between the fins. (see photo)

72. Glue in pins made of bamboo or CF rod, leave about 3/8" exposed.

73. Locate the wooden tab and glue it in place in the leading edge of the main wing. Make sure that it remains aligned with the pocket located in the fuselage.



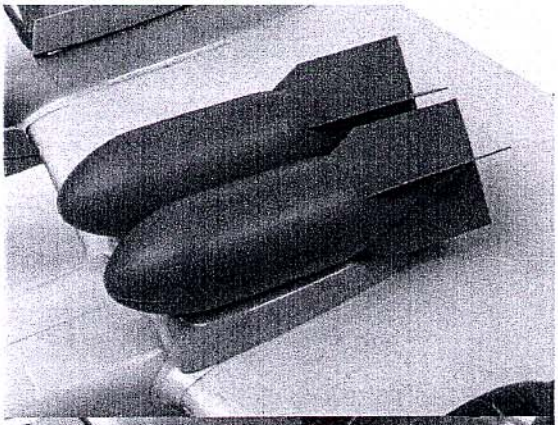
74. Add the blind nut to the rear wing mount and drill a hole in the wing that lines up with this mount. Add a tube thru the hole in the wing that will keep the wing mounting screw from crushing the wing.

75. Locate bomb rack and with the wing installed on the fuselage, fit the rack to the bottom of the wing.

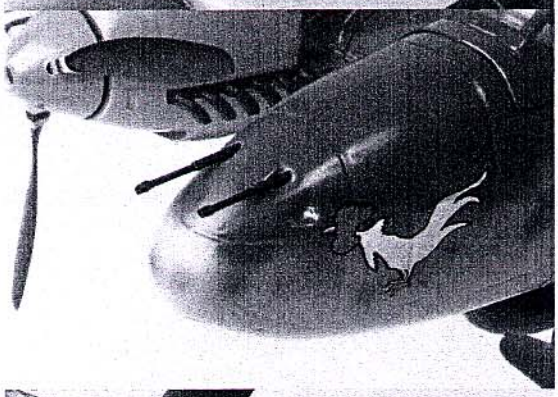
76. Glue rack in place on the bottom of wing. DO NOT glue the front section of the bomb rack to the fuselage or it will be impossible to remove the wing.

77. Drill holes in the bomb rack that correspond with the pins on the bombs. Slide the bombs on the rack.

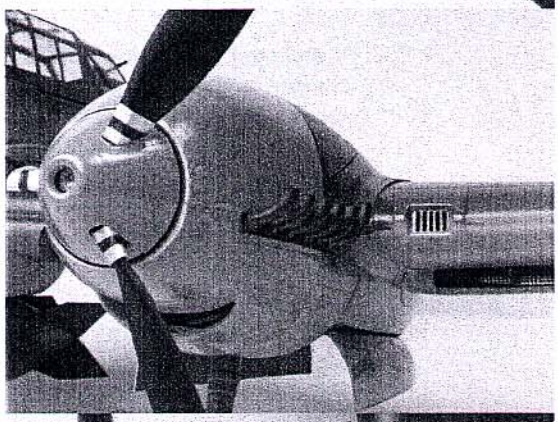
78. Do not glue them in place they will be removed for flight.



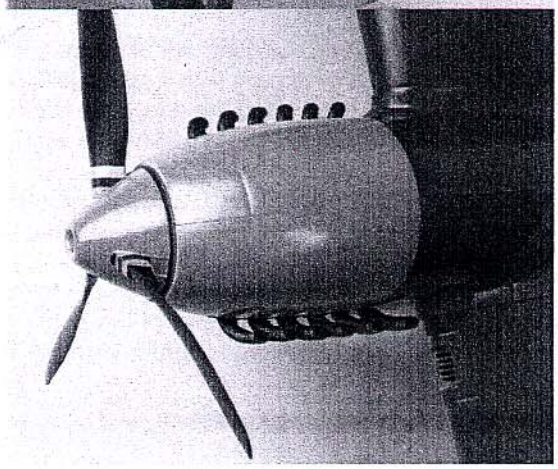
79. Prepare the detail parts. The cannon are built from some of the pushrod tubes supplied in the kit. Look at the 3 view drawing for length and position.



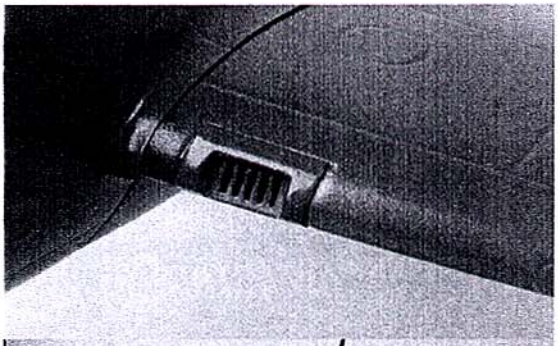
80. Glue the finished exhaust stacks to the side of the engine nacelles. The exhaust pipes on the outboard side of the nacelle point up and on the inboard side point down. Glue in place with Uhu Por using the contact cement method.



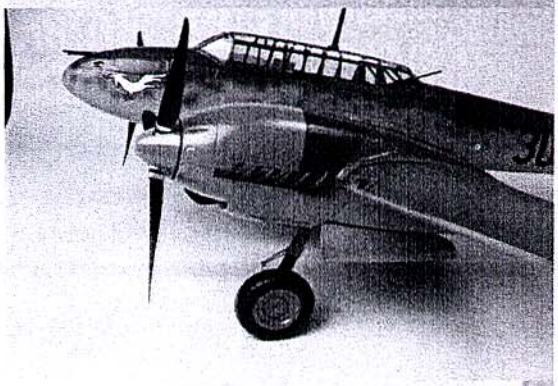
81. Photo shows the orientation of the exhaust stacks.



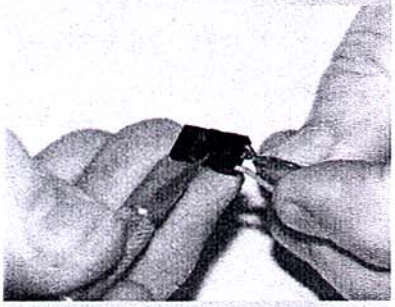
82. Photo of installation of wing air inlet. Cut notch in marked location on main wing and glue in trimmed styrene part.



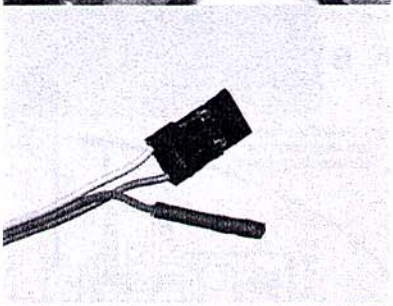
83. Photo of general layout of detail parts.



84. In an earlier step you soldered extension wires to the red and black power wires on the speed controls and threaded them down the wing and into the fuselage. Install the battery connections by soldering the 2 red wires into one connection and the 2 black ones into another.

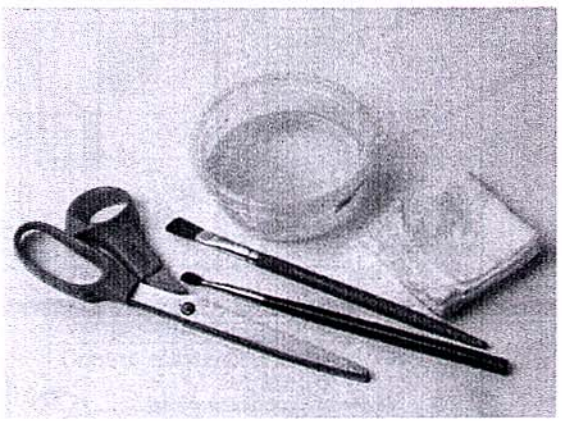


85. Disable one of the 2 BEC's. Do this by removing the red wire and its pin from the receiver plug on the speed control and insulating the end. Using the point of a hobby knife, lift the small tab on the side of the receiver plug. Slide the pin out. Using a piece of heatshrink, insulate the exposed pin. Do not remove the pin, it can be reinstalled at a future time if any adjustments to the timing or brake functions are required.



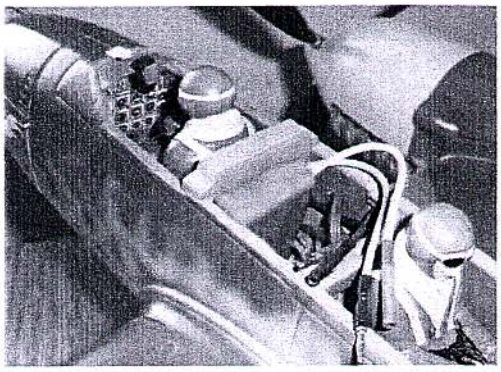
NOTE: Make sure that you have set the brake to OFF and the timing to HARD, and the cut off voltage to HIGH, and the battery type to Lithium, BEFORE you disable the BEC.

86. Tools that you will need to install the waterslide decals on your model. Sharp scissors, artist brushes (square tip), Gluto glue, damp pad of paper towel.



87. Cut the decals from the sheet into their individual parts. Soak the decal in water for about 5 seconds. Remove and let stand for a couple of minutes, till is slides freely on the backing paper. While you are waiting for the decal to loosen, apply a small amount of the Gluto glue to the area that is to receive the decal. This greatly aids in positioning the decal and it improves the adhesion of the decal when dry. Refer to the box photo for the decal locations.

88. When complete, install the batteries into main fuselage and balance the model. The CG is located at 2-1/2" to 3-1/16" (65 to 80 mm) back from the leading edge of the wing at the root.



89. Aileron movement should be about (12 mm) in each direction. Elevator movement should be about (6 mm) in each direction. These are good amounts for testing and can be adjusted to you flying style over time.

90. Flying: With the controls in neutral, the model should be launched with the throttle between 1/2 and 3/4 power. Climb to a comfortable altitude and trim as required.

91. Landings are best with reduced throttle. DO NOT shut the motors off completely, the 2 props create a great deal of drag when freewheeling and can slow the model too abruptly. By reducing the throttle slowly and bringing the model close to the ground, you can bring the plane to a very slow speed and land softly.