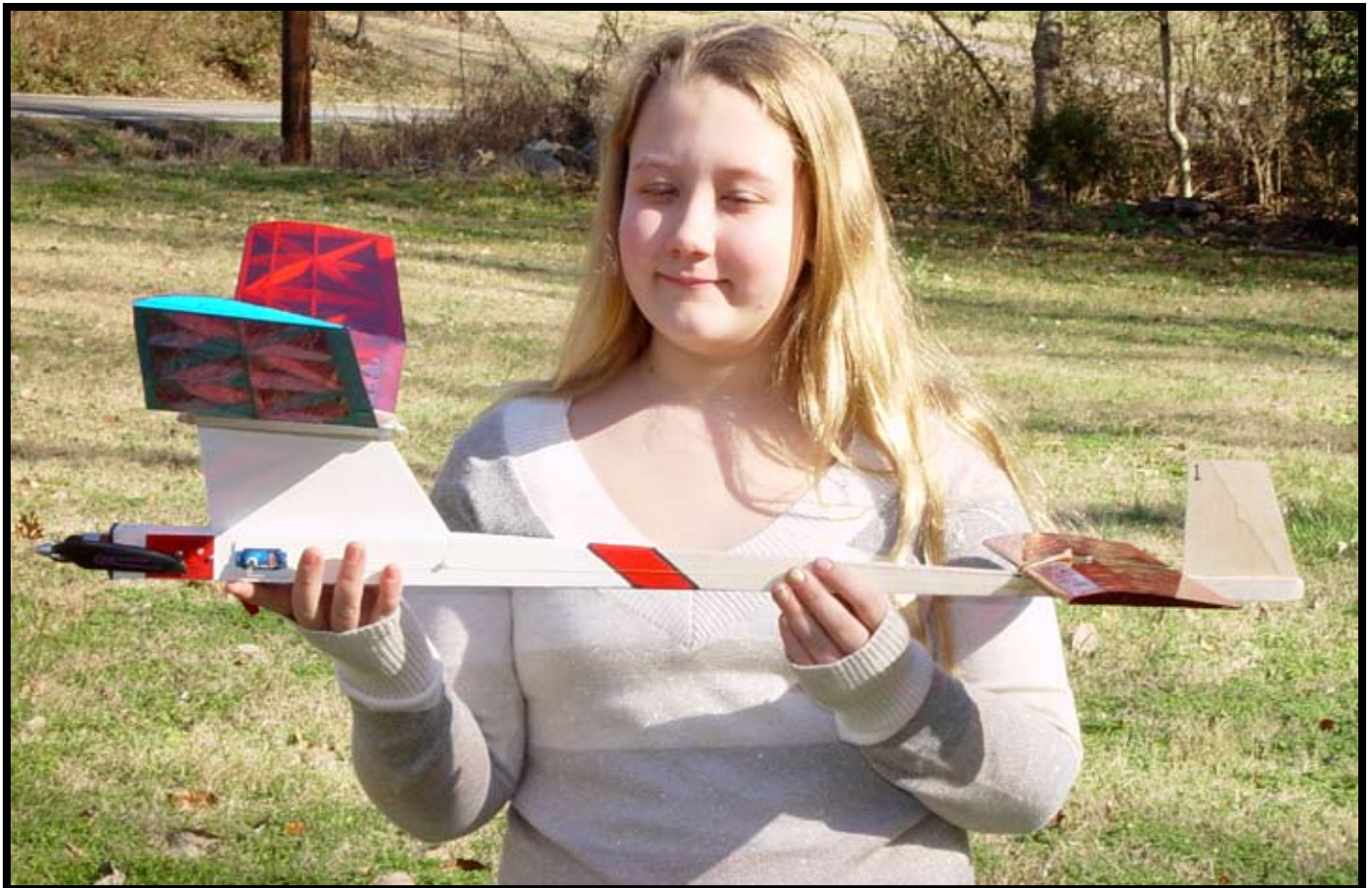


Top Notch Products

MUTT

Assembly Manual



Top Notch Products Co.
PO Box 1051
Goodlettsville, TN 37072
www.topnotchkits.com

TNPC 3439

MADE IN THE USA

Terminology used in this manual.

With the precision of laser cut parts and notch and tab construction, the assembly and gluing sequence becomes very important. If components are glued in place too soon, they will not allow enough movement to install other components. When instructed to install a part, do only that. You will be instructed to glue it when it is no longer required to be moveable.

Test Fit:

Test fit and install but do not glue.

Install and glue:

Permanently install the part.

Locate and prepare:

Find the parts requested, you can locate them faster using the parts locator pages at the back of this manual. The parts locator will direct you to the correct sheet number as well as describe the part for easier identification. Most of the parts are supplied still in the sheet. These sheets are called the carrier sheet and the parts are held in the carrier sheet by small breaks in the cutting line. These are called retainer breaks and in most cases the parts can be extricated by simply flexing the carrier sheet and the retainer breaks will release the parts. In harder materials it may be necessary to use your hobby knife to sever the retainer breaks to remove the parts. After removing the parts, a small nub may remain where the retainer break was, this must be removed with a light swipe of sandpaper so it will not interfere with the parts fit.

Adhesives:

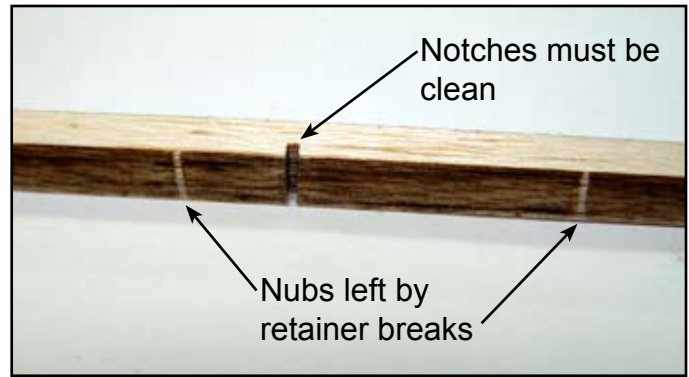
There are four primary types of adhesives recommended for constructing your model. They are Cyano-Acrylate (referred to as CA) in all viscosities, Aliphatic Resin Glue (carpenters glue), Polyurethane glue referred to as PU and Epoxy. CA is the primary adhesive to use however there are times when it is not the best choice.

They are:

1. When you need more time to carefully position a part than a fast setting adhesive will allow.
2. When attaching plastic such as a windshield (Use Pacer formula 560 here).
3. When gluing laser cut aircraft grade plywood's. The microwave set adhesives used in aircraft grade plywood does not ablate well under a laser beam. As a result it burns the wood fibers near by leaving a charred edge. Fast setting CA adhesives do not allow time for the adhesive to penetrate this layer of char and bond to the wood fiber underneath. Use a slower setting adhesive such as Aliphatic Resin for maximum strength use Epoxy on aircraft grade ply parts. Lite Ply's do not use this type of adhesive and do not suffer from this problem.

To apply thin CA we recommend the Dave Brown pipets available from Hobby Lobby. Be sure to stretch the end (pull it with a pair of pliers) to a thin applicator tip, as they are not supplied in this configuration.

Before we begin, a few words about laser cut parts. Most of your parts are supplied in numbered sheets. The sheets the parts are in are called carrier sheets. You will notice that every so often the the cut line is interrupted leaving a small gap of material connecting the part to the carrier sheet. These are called retainer breaks. In most cases just flexing the carrier sheet will release the part however in some cases you will need to sever the retainer break with a hobby knife. The retainer break may leave a small bump or nub on the parts. This should be removed with a light swipe with fine sandpaper. It is very important to insure all notches are completely clear of material as this will adversely affect the precision of the fit. See the photo at the right for clarification.



Fuselage Assembly

The fuselage is built over the top view plans. Cut or fold the plans and place them on the building board with the top and side view of the fuselage visible.

- 1 Place a piece of waxed paper over the plans to protect them.
- 2 Locate the fuselage bottom (FB) and open all the former slots. With a lite pass of fine sandpaper, remove any nubs from the sides left by the retainer breaks. Leave the hatch area in place for now.
- 3 Lay FB over the plans and align it carefully with the plans. Pin it securely in place.
- 4 The firewall is supplied in two sections of 1/16" ply, FW-A and FW-B. These must be glued together. Use the 1/8" dowel through the hole in both parts to help align them and glue them together.
- 5 Carefully remove the hatch area knock out.
- 6 Locate and prepare the hatch frame (HF).
- 7 Carefully align the hatch frame over the hatch opening in FB. You should have an even 1/16" of space on each side of the hatch frame. Glue it in this position

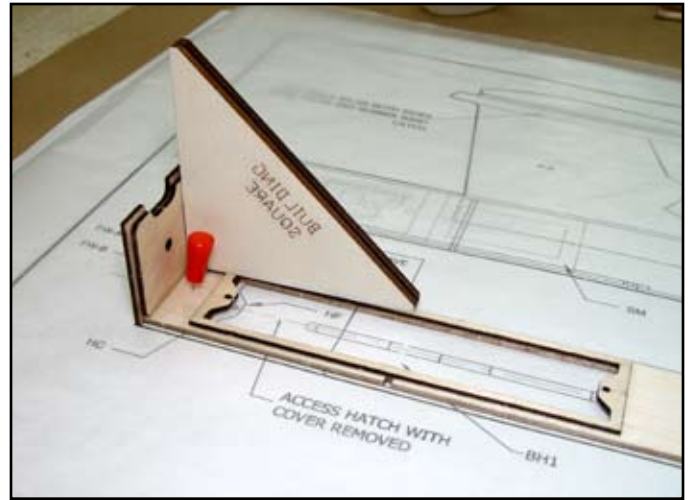


LEFT: To insure a straight fuselage, the fuselage bottom is aligned with and pinned to the plans.

BELOW: The firewall sections are glued together using a 1/8" dowel to assist in the alignment of the parts.



- 8. Glue the firewall assembly to FB, use the square to insure it is at 90° to FB. FW-A should be at the front and FW-B should face aft and the side of the firewall assembly with the notch in it should be down, this is where the motor wires will enter the fuselage so installations may vary and you may want it at the top.

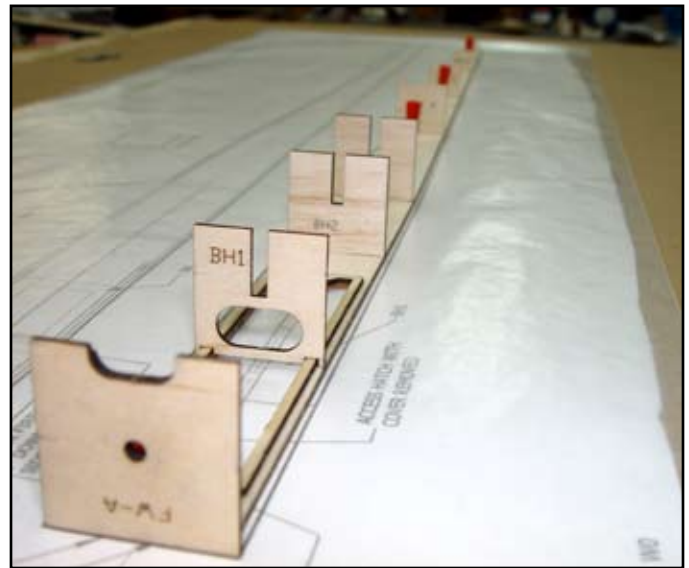


ABOVE” The hatch frame has been installed and now the firewall is being glued to the fuselage bottom.

- 9 Install and glue all formers, BH-1 through BH-7. Use the square to keep them all at 90° to FB.

BELOW: The firewall and all formers have been installed and the structure is ready to install the fuselage sides.

- 10 Locate and prepare the fuselage sides (FS). Remove any retainer nubs with a lite sanding.
- 11 Install and glue both sides at the same time. Start gluing at the firewall and work your way back. Check frequently that the fuselage is lined up with the plans to insure it is straight.
- 12 Cut two pieces of ¼” triangle stock and glue them between the firewall and the sides for additional strength.



BELOW: The stabilizer platform is installed onto BH-6 and the fuselage top.

- 13 Locate and prepare the stabilizer platform (SP). Glue it to the fuselage assembly. Note that BH-6 will engaged the slot in SP.



- 14 Remove the pins and remove the fuselage assembly from the plans.
- 15 The fuselage top is supplied in two sections. Locate and pair both sections. Test fit the forward section; it should butt the aft side of the firewall in front and butt the stabilizer at the aft end. When satisfied with the fit, glue it to the fuselage assembly.
- 16 Install and glue the remaining section of fuselage top aft of the stabilizer plate.
- 17 Install and glue the tail plug (TP).
- 18 The wing saddle (WS) is supplied in two sections. Locate, prepare and assemble the wing saddle.
- 19 The pylon is supplied in two sections. Locate, prepare and assemble the pylon.
- 20 Place the wing saddle on the bench and glue the pylon to it. Use the square to insure it is perfectly square. Use a 1/16" shim under the square to level it with the wing saddle.
- 21 Glue a piece of 1/4" triangle stock to each side of the pylon at the wing saddle. This will strengthen the pylon and provide the rubber hook for the wing at the front and back of the saddle.
- 22 Install and glue the pylon assembly into the fuselage. Insure that the pylon assembly is bottomed in the slots in BH-1, BH-2 and BH-3.
- 23 The vertical fin (VF) is supplied in two sections. Locate, prepare and assemble VF.
- 24 Glue VF to the fuselage in the slots provided. Use the building square to insure it is square to the fuselage. See the photo for details.
- 25 24. Locate and prepare the hatch cover (HC). Note the not all of the lightening holes in HC are scrap. The two split holes will be use for wing alignment and the one with the hole in it becomes a washer to be used on the DT line. Save these parts for later use.
- 26 Secure HC to the fuselage with two #2x3/16" self-tapping screws.

BELOW: The pylon has been assembled and is now being attached to the wing saddle. Note that the square is used to insure the saddle is perfectly square to the pylon. A 1/16" scrap balsa shim is used to level the square.



BELOW: The vertical fin assembly is being installed. The fuselage is held perfectly flat on the building board by the shot bag on the left. The square is elevated above the fuselage with a wood block and the square insures it is perfectly vertical.

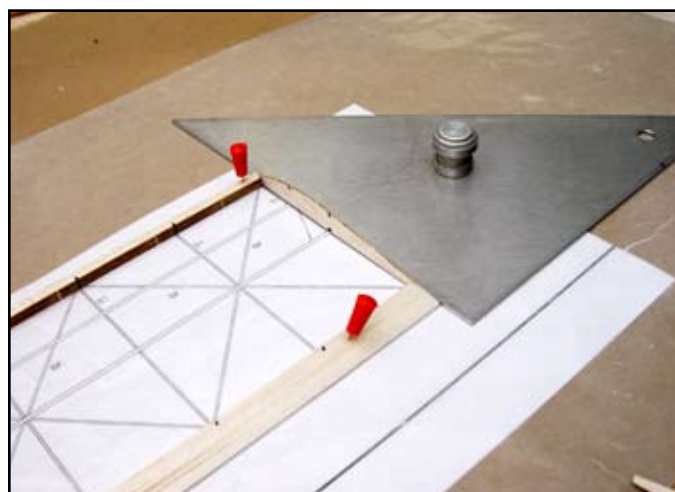


This concludes the basic assembly of the fuselage. Use a lightweight filler to create a small fillet at the pylon and vertical fin for additional strength. The type of finish used is up to builders preference.

STABILIZER ASSEMBLY

Place the stabilizer plans on the building board and cover them with waxed paper to protect them.

- 1 Locate and prepare the stabilizer trailing (STE). Carefully align it with the plans and pin securely in place.
- 2 Locate and prepare the stabilizer leading edge (SLE)
- 3 Locate and prepare all ten of the S1 stabilizer ribs.
- 4 Use one of the S1 ribs to locate the exact position of the leading edge. Align a straight edge along the outside rib (Not the stabilizer tip ST) to insure the rib is square, then pin the leading edge at that end. Repeat this procedure at the opposite end to position the leading edge. When satisfied with the fit, Glue both tip ribs in place.
- 5 Locate one of the 1/16" square basswood sticks and slide it through the notch at the bottom of the ribs.
- 6 Install the two center S1 ribs. Use a piece of scrap 1/16" material as a temporary spacer at the front of the ribs and glue them in place.
- 7 Install and glue the six remaining S1 ribs.
- 8 Install and glue the top 1/16" basswood spar. NOTE: we will need to install all the geodetic ribs before we can install the leading edge basswood stringer. Install only the top spar stringer at this time.
- 9 Locate, install and glue all sixteen sections of the geodetic ribs. Wipe the leading and trailing edges of the ribs against a piece of medium sandpaper to for a small chamfer. This will add significantly to the strength of the joint.
- 10 Install and glue the remaining 1/16" basswood stick

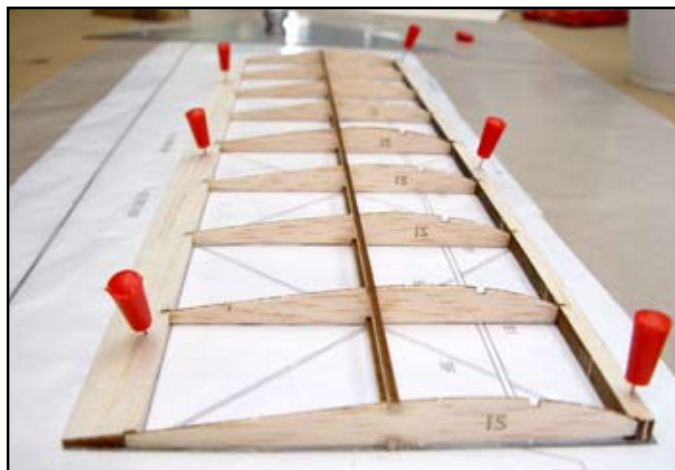


ABOVE: A straight edge is used to insure the outboard rib is aligned with the plans and vertical.



ABOVE: Use a scrap piece of 1/16" stock when installing the two center ribs to insure proper spacing for the stabilizer hook which will be installed after covering.

BELOW: Assembly proceeding with the top and bottom spars in place. Next we will install the geodetic or angles ribs.



- 11 Install and glue the stabilizer tips (ST).
- 12 Installation of the ply stabilizer hook (SH) is best installed after the stabilizer has been covered.

This concludes the stabilizer assembly

Wing Assembly

The wing is composed of four panels, two inner and two outer panels. We will begin with the inner right panel. Construction is exactly the same for the inner left panel. Place the right wing plan on the bench and cover it with waxed paper to protect it. The spar consists of a 1/16" balsa sheer web with notches for each rib and it is capped on top and bottom with a 1/16" square basswood strip.

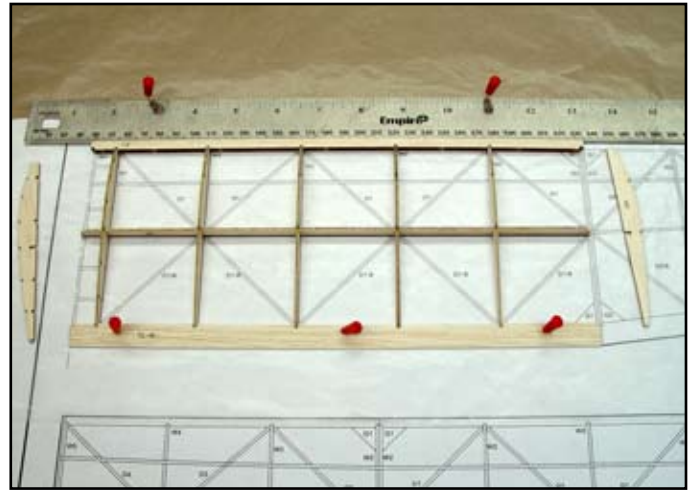
Inboard panel

- 1 Locate the inboard panel trailing edge and pin it in place, carefully lining it up with the plans.
- 2 Locate and prepare one of the inboard spar sheer webs (SP). Place a straight edge on the bench and secure it with pins. Place SP up against the straight edge with the notches facing the straight edge. Glue a 1/16" square basswood strip to the edge of SP. Make sure it is kept perfectly straight when gluing as that will be its final shape. Trim the basswood strip at both ends to match the sheer web.
- 3 Note that in the sheer web, there are five slots. The end with two slots close together is the root end. Place a W1 rib into the first slot at the root end. Place a W2 rib in all remaining slots.
- 4 Place the trailing edge of each rib in the appropriate slot in the trailing edge.
- 5 Place the leading edge onto the front of the ribs, check that the ribs are aligned with the plans and then and then pin the leading edge into position.
- 6 Glue each rib to the trailing edge. Make sure each rib and the trailing edge are flat on the building board and each rib is bottomed in the slot when applying glue.



ABOVE: A 1/16" square basswood spar has been laminated to the bottom of the sheer webs in preparation for assembling the wing inboard section.

- 7 Repeat this process at the leading edge.
- 8 Glue each rib to the spar.
- 9 Glue on the root (W1) rib. Note that this rib will lean in by design. The dihedral is cut into the spar end. Make sure the rib is against the spar.
- 10 Glue on the break end rib (W2). Note that this rib will also lean inward for the same reason. Make sure it follows the angle of the spar.
- 11 Locate, install and glue the geodetic ribs. Sand a small chamfer on both ends to increase glue land and get a snug fit.
- 12 Install and glue a 1/16" square basswood stick in the slots provided between the spar and the leading edge. Install and glue the corner gussets (G1).



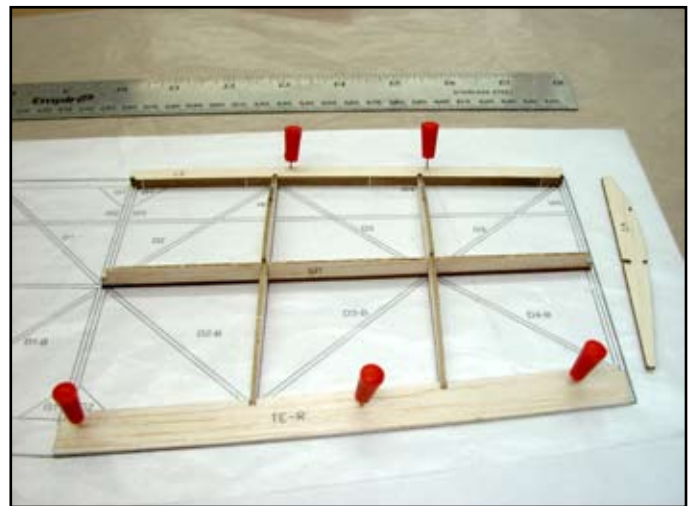
ABOVE: The right inboard wing panel assembly underway. Make sure all parts are bottomed in there respective slots and are flat on the building board.

- 13 Remove the assembly from the plans and plane and sand the leading edge to contour.

This completes the basic assembly of the right inboard wing panel. The short segments of 1/16" square basswood at the root will be installed after the wing halves have been joined. Repeat steps 1 through 13 to assemble the remaining left inboard panel.

Outboard panel assembly

- 14 Locate and prepare one of the outboard sheer webs (SP). Use the same method as you did on the inboard spar to glue a 1/16" basswood stick to the bottom of the sheer web.
- 15 Align the trailing edge with the plans and pin it in place.
- 16 Install ribs W3 and W4 min there appropriate notch on the sheer web. Place the trailing edge of each rib into the notch provided in the trailing edge (TE) R or L.
- 17 Place the leading edge onto the ribs and when the ribs are aligned with the plan, pin the leading edge in place.



ABOVE: The right outboard wing panel assembly underway.

- 18 Install and glue the inboard rib (W2) and the tip rib (W5).
- 19 Install and glue the top 1/16" square basswood to the top of the sheer web. Trim this flush with both ribs. Install and glue the corner gussets (G2).
- 20 Install and glue on the wing top (WT).
- 21 Remove the assembly from the plans and plane and sand the leading edge to contour.
- 22 Sand the inboard end perfectly flat. Use the dihedral gauge to check the angle.
- 23 Glue the outboard panel to the inboard panel. The outboard tip should be 2" above the building board for the correct dihedral.



ABOVE: When joining the inboard and outboard wing panels, sand both adjoining ribs flat and check the dihedral. If necessary, sand the ribs lightly to achieve a good fit without any gap. Use this same procedure at the root.

Repeat steps 14 through 23 for the left outboard panel.

Glue the two wing halves together in the same manner, observing the dihedral recommended on the plans. Install the short sections of 1/16" square basswood at the root section.

Part #	Qty.	Sheet #	Size	Material
BH-1	1	1	1/16" X 3.5" X 7"	AC PLY
BH-2	1	7	1/8" X 4" X 10"	BALSA
BH-3	1	7	1/8" X 4" X 10"	BALSA
BH-4	1	3	1/16" X 3" X 36"	CONTEST BALSA
BH-5	1	3	1/16" X 3" X 36"	CONTEST BALSA
BH-6	1	3	1/16" X 3" X 36"	CONTEST BALSA
BH-7	1	3	1/16" X 3" X 36"	CONTEST BALSA
D1	18	2	1/16" X 3" X 36"	CONTEST BALSA
D1-B	4	2	1/16" X 3" X 36"	CONTEST BALSA
D1-B	8	3	1/16" X 3" X 36"	CONTEST BALSA
D2	2	3	1/16" X 3" X 36"	CONTEST BALSA
D2-B	2	2	1/16" X 3" X 36"	CONTEST BALSA
D3	2	3	1/16" X 3" X 36"	CONTEST BALSA
D3-B	2	2	1/16" X 3" X 36"	CONTEST BALSA
D4	2	2	1/16" X 3" X 36"	CONTEST BALSA
D4-B	2	2	1/16" X 3" X 36"	CONTEST BALSA
FB	1	5	1/16" X 3" X 36"	CONTEST BALSA
FS	2	4	1/16" X 3" X 36"	CONTEST BALSA
FT	1	5	1/16" X 3" X 36"	CONTEST BALSA
FW-A	1	1	1/16" X 3.5" X 7"	AC PLY
FW-B	1	1	1/16" X 3.5" X 7"	AC PLY
G1	6	3	1/16" X 3" X 36"	CONTEST BALSA
G2	2	3	1/16" X 3" X 36"	CONTEST BALSA
HC	1	1	1/16" X 3.5" X 7"	AC PLY
HF	1	1	1/16" X 3.5" X 7"	AC PLY
LE	4	8	3/16" S 1.5" X 18"	BALSA
P-A	1	7	1/8" X 4" X 10"	BALSA
P-B	1	7	1/8" X 4" X 10"	BALSA
S1	10	6	1/32" X 4" X 11"	BALSA
SF	8	6	1/32" X 4" X 11"	BALSA
SH	1	1	1/16" X 3.5" X 7"	AC PLY
SLE	1	8	3/16" S 1.5" X 18"	BALSA
SM	1	1	1/16" X 3.5" X 7"	AC PLY
SP	1	1	1/16" X 3.5" X 7"	AC PLY
SP	2	3	1/16" X 3" X 36"	CONTEST BALSA
ST	2	6	1/32" X 4" X 11"	BALSA

Part #	Qty.	Sheet #	Size	Material
TM	1	1	1/16" X 3.5" X 7"	AC PLY
TP	1	8	3/16" S 1.5" X 18"	BALSA
VF	2	3	1/16" X 3" X 36"	CONTEST BALSA
W1	4	2	1/16" X 3" X 36"	CONTEST BALSA
W2	14	2	1/16" X 3" X 36"	CONTEST BALSA
W3	2	2	1/16" X 3" X 36"	CONTEST BALSA
W4	2	2	1/16" X 3" X 36"	CONTEST BALSA
W5	2	2	1/16" X 3" X 36"	CONTEST BALSA
WS	2	3	1/16" X 3" X 36"	CONTEST BALSA
WT	2	2	1/16" X 3" X 36"	CONTEST BALSA

POWER OPTIONS

POWER (recommendations):

- Motor: 1806N 2500 kva, sources: Texas Timers, Hobby King
- ESC(controller), 10 amp, sources: HobbyPartz(Exceed), Hobby King(Red Brick)
- Timer, sources: Texas Timer, Starlink-Flitech, Peck-Polymers
- Battery: 300-350 mah 30-65C 2 cell, sources: Hobby King, Banana Hobbies, RC Lipos
 - * recommend Turnigy Nanotech, Hyperion, Genisus, or Thunder Power
- Servo if desired: Hitech HS55 or equivalent
- Prop: GWS 7 x 3.5

FLIGHT SET UP

- Set motor up with 1 degree down and left thrust.
- 1/8" wash-in on right inner wing panel, all other wing services flat.
- Set stab with about 1/32" shim on right side of stab platform for right had glide.
- Set rudder tab with 1/64" right turn for initial pwr. Trials, adjust as required.
- Flight pattern should be right pwr. And right glide.

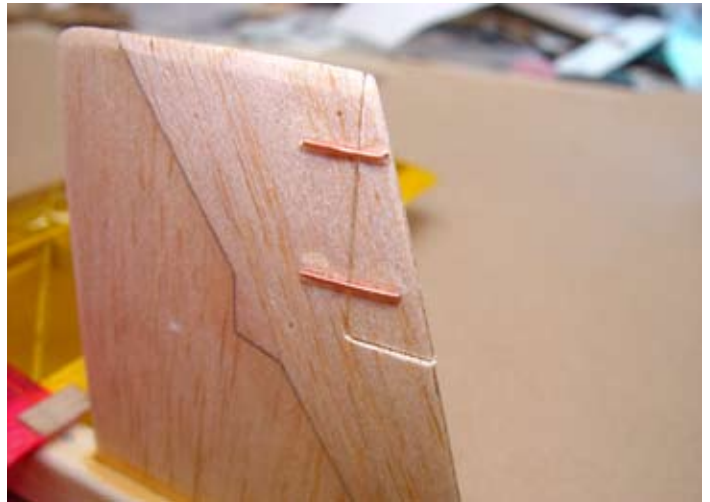
Below: Two examples of motor, timer and DT servo installation. Locate these components to aid in obtaining the correct CG location.



BELOW: Typical DT installation, note the ply exit wire guide washer.



BELOW: Two light gauge pieces of mailable copper wire formed like a staple make an excellent trim tab attach system.



RIGHT: The battery pigtail exits the battery to connect to the external LiPo battery.



Top Notch Products Co.

PO Box 1051

Goodlettsville, TN 37072

Phone 615-866-4327

www.topnotchkits.com