PCM
MODELS

DV8R

Construction and Flight Manual

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Introduction

The ***DV8R*** is ***PCM*** Model's follow up to our popular AV8R sport trainer jet but is a completely new model designed from the ground up to be a superior all around performance jet, hence the name (Deviator). Rather than simply "blow up" its smaller cousin we decided to create a model than has looks *and* performance usually found in far more expensive jets but in a package that fits a wide range of modeler's skills. With its large size, light wing loading and generous landing gear stance, the ***DV8R*** has an incredible flight envelope that will prove favorable to nearly any jet pilot. We are so impressed with ***DV8R***'s flight prowess, it's smoothness and it's extreme stability at all speeds that we think you'll agree that it will be one of the best flying models you have ever flown.

Patrick McCurry

Experience Level

Building the PCM DV8R requires only basic experience with typical balsa and plywood construction to complete the model. In addition you will be introduced to some new techniques implemented to yield a composite foam/balsa and plywood main wing. However, the need and understanding for proper *craftsmanship* is of utmost importance to realize the total process from opening the box to getting the model into the air. This is simply the nature of turbine modeling. If you have some experience with *building* and *flying* models of this type you will have no problem with the construction of this model. If this is your first turbine model, don't be afraid to seek help. As the builder of this model it is up to YOU to see to it that this model is properly constructed and operated. PCM also recommends that you read through this manual completely and understand it before beginning the construction of your model as we have implemented some new techniques and methods for building a model of this type.

Options

The DV8R kit as shipped to you is a complete kit. In addition to the kit there are items you will need to obtain to finish your model. Options such as landing gear, brakes, fuel tanks, servo mounts and more can be purchased directly from PCM. In many of the instructions and photos that follow some of these items are mentioned or referred to during the construction process. Please feel free to contact us for more information concerning these items.

What Is Needed To Start

As we mentioned earlier, it is expected that the builder of this model posses at least most of the skills necessary to construct a model of this type. With these skills comes knowledge of modeling tools that may be needed for a given procedure. For this reason we will not give a piece by piece count of every tool used during the construction of this model, rather from time to time we will mention the method and tools used to achieve a desired result on the factory prototypes. Our first model was built using very basic modeling tools, on an average size banquet table.

About Adhesives

The prototypes were built using a variety of adhesives throughout the process. Predominantly speaking, a good CA such as the Pacer ZAP line is a must. CA is used in all wood-to-wood areas. Additional strength is gained at times from using epoxy resin to bond wood formers within the fuselage. Also, industrial strength glues will provide

tremendous strength and can be used in some areas. The wings and tail surface cores are EPS foam. Standard CA glues CANNOT be used in contact with this foam, as this type of glue will destroy the foam. Pacer's PT 25 Odorless CA and epoxy resins were used with excellent results on foam in the prototypes. The instructions will include glue types used during crucial phases. PCM carries all of the adhesives you may need to build your model.

Hardware Selection

Along with the construction of the ***DV8R***, you the modeler, will need to select, acquire and install, an engine and its associated hardware as well as the onboard radio gear, etc. We will make suggestions based upon our experience with the ***DV8R*** as well as the experience gained with other models. The final selection, installation and operation of this equipment is left entirely up to you and your experience.

Engine selection - Please *READ*!

The factory ***DV8R*** is flying with a JetCat P80, which is a perfect match for this model. There are many other manufacturers of engines that are in the 17 – 28 pound thrust range. The design of the model is based on the weight and thrust of the 17 - 28 pound turbines and will be greatly disrupted if a larger engine is fitted. For this reason we have no recommendation for the larger engines and strongly insist that they not be used.

Parts Lists

(BOLD FONT DENOTES LASERCUT PARTS)

Main Fuselage Construction

1] **FF1 X 2** (1/8th Plywood)
2] **FF2 X 2** (1/8th Plywood)
3] **FF3 X 2** (1/8th Plywood)
4] **FF4 X 2** (1/8th Plywood)
5] **FF5 X 2** (1/8th Plywood)
6] **FF6 X 2** (1/8th Plywood)
7] **FF7 X 1** (1/8th Plywood)
8] **FF8 X 4** (1/4 Balsa)
9] **FD1 X 4** (1/4 Balsa)
10] **FD2 X 4** (1/4 Balsa)
11] **WP A X 1**(1/8th Plywood)
12] **WP B X 1**(1/8th Plywood)
13] **BH1 X 1** (1/8th Plywood)
14] **BH2 X 1** (1/8th Plywood)
15] **BH2A X 1** (1/8th Plywood)
16] **BH3 X 1** (1/8th Plywood)
17] **BH3A X 1** (1/8th Plywood)
18] **BH4 X 1** (1/8th Plywood)
20] **BH6 X 1** (1/8th Plywood)
20] **BH7 X 1** (1/8th Plywood)
21] **BH8 X 2** (1/8th Plywood)
22] **HF1 X 2** (1/8th Plywood)
23] **HF2 X 2** (1/8th Plywood)
24] **HF3 X 6** (1/8th Plywood)
25] **HF4 X 1** (1/8th Plywood)
26] ½ x 3/8 x 4 Maple Motor Mount x 2
27] ½ x ½ x 36 Balsa Triangle Stock x 10
28] 1/8 x 1 x 8-1/2 Ply Strip x 1
29] ¼ x ½ x 36 Spruce x 1
30] 1/8 x 2 x 6 Ply Strip x 2
31] 1 x 1 x 36 Balsa Triangle Stock x 1
32] 6-32 T-Nuts x 4
33] 6-32 Flat Washers x 4
34] 6-32 x 3/8 SHCS Bolt x 4
35] 2-56 steel clevises x 4
36] 2-56 Eyebolts x 4

37] 36” Kevlar Steering Cable x 1
38] ¼ x ½ x 36 Spruce x 1
39] Fiberglass Canopy Hatch

Main Wing Construction

1] CNC Foam cores x 2 (Left and Right)
2] **MAIN SPAR x 1** (1/8th Plywood)
3] **MAIN SPAR DOUBLER X 1** (1/8th Plywood)
4] **FRONT SPAR x 1**(1/8th Plywood)
5] **REAR SPAR X 2** (1/8th Plywood)
6] **RS DOUBLER X 2** (1/8th Plywood)
7] **WR5 X 2** (1/8th Plywood)
8] **WR4 X 2** (1/8th Plywood)
9] **WR3 X 2** (1/8th Plywood)
10] **WR2 X 2** (1/8th Plywood)
11] **WR1 X 2** (1/8th Plywood)
12] **GPLATE X 2** (1/4 Plywood)
13] **WR1A X 2** (1/4 Balsa)
14] **GP1 X 2** (1/4 Balsa)
15] **GP2 X 2** (1/4 Balsa)
16] Balsa Wing Tips x 2
17] 3/8 x 3 x 48 Balsa Sheet x 1
18] ¼ x 3 x 36 Balsa Sheet x 2
19] 1/8 x 4 x 48 Balsa Sheet x 16
20] 1/8 x 4 x 36 Balsa Sheet x 4
21] ½ x 1-1/2 Birch Dowels x 2
22] ¼ - 20 x 2 Aluminum Wing Bolts with Washers x 2
23] Flat Nylon Hinges x 18
24] ¼ x 3/4 x 1-1/4 Ply Hinge Plates
25] Chrome Steel Control Horn With Bushing x 4
26] 2-56 x ½ Button Head Screws x 8
27] 4-40 Solder Clevises x 4
28] 4-40 Steel Clevises x 4
29] 4-40 Threaded Rod x 4
30] 6-32 x 3/8 SHCS Bolts x 8
31] 6-32 T-Nuts x 8
32] 6-32 Flat Washers x 8

Vertical Fins and Stabilizers Assembly

1] Foam Stabilizer Cores x 2
2] Vertical Fin Foam Cores x 2
3] **TF1 X 2** (1/8TH Plywood)
4] **SF1 X 2** (1/8th Balsa)
5] **VF1 X 2** (1/8th Balsa)
6] Balsa Stabilizer Tips x 2
7] Balsa Fin Tips x 2
8] 1/16th x 4 x 36 Balsa Sheet x 10
9] ¼ x 2 x 36 Balsa Sheet x 3
10] ¼ x 1 Birch Dowels x 4
11] Nylon Flat Hinges x 16
12] Carbon Control Horns x 2
13] Chrome Steel Control Horn With Bushing x 2
14] 2-56 x ½ Button Head Screws x 4
15] ¼ x ¾ x 1-1/4 Ply Hinge Plates
16] 4-40 Steel Control Rods x 4
17] 4-40 Solder Clevises x 4
18] 4-40 Steel Clevises x 4

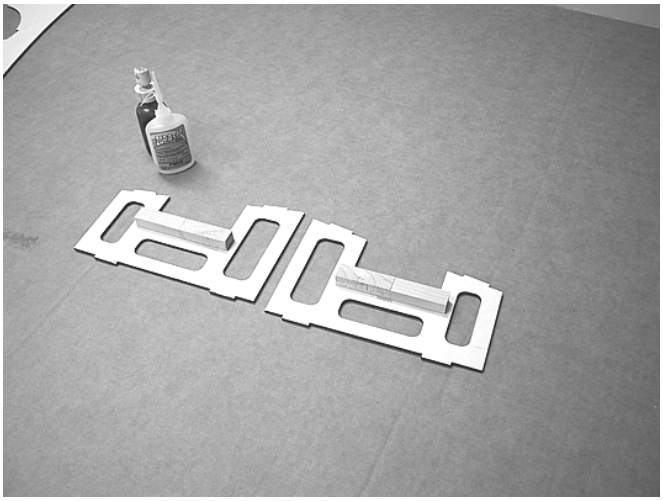
Rear Fuselage Construction (Booms)

To arrive at the DV8R's uniquely shaped fuselage, we have devised a method that allows you to build the fuselage in three separate sections and then these are brought together for final assembly much like a full scale aircraft is built. IMPORTANT: It is very strongly recommended that you closely follow the instructions as we present them here in order to construct the model correctly. We have spent much time devising these methods and they are PROVEN to work!

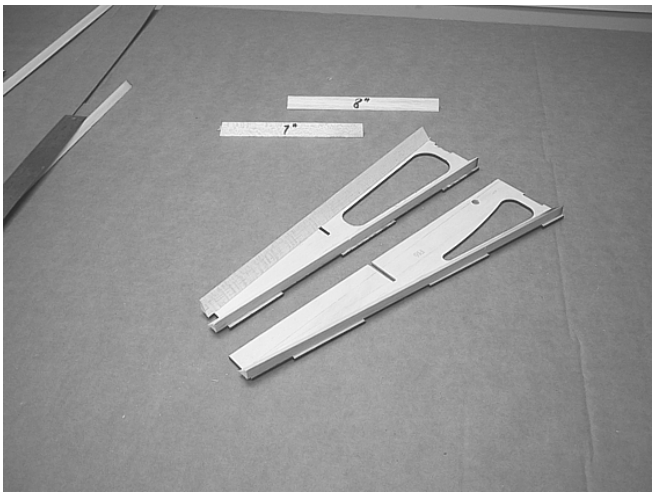
You are going to build two separate sections for the rear of the fuselage and then you will construct the front section of the model as a single unit. It goes without saying that the parts provided can be assembled as either a left or right so it is all to easy to forget that you need to reverse your construction techniques to build the model properly so we will conclude with the following.

VERY IMPORTANT: BE SURE OF THE ORIENTATION OF ALL PARTS **BEFORE** FINAL GLUING ☺

We begin by constructing one tail boom section; in the photos you will see both booms being constructed so you may begin with either side but it would be best to finish one then go back and build the other.

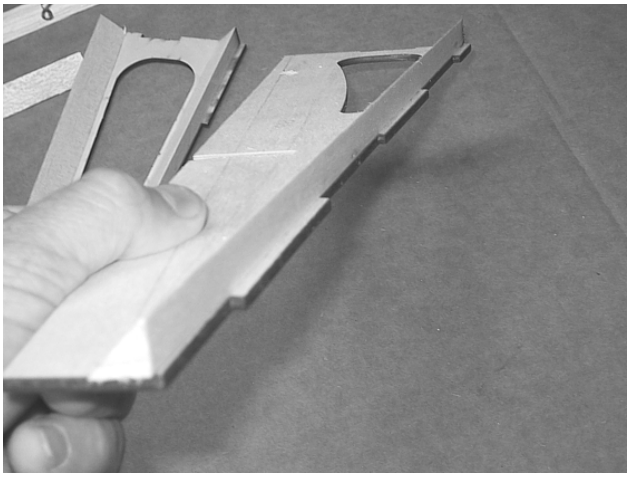


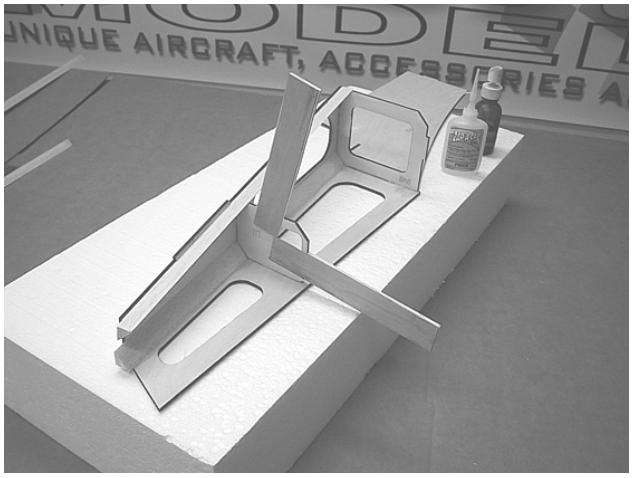
- Locate the two motor mounts (**MM**) and two ½ x 3/8 x 4 Hardwood Blocks and epoxy or CA them securely to the sides of the motor mounts flush with the opening as shown.
- Remember to make a left and right.
- Locate formers FF 5 and FF 6 and a length of the ½ x ½ x 36 balsa triangle stock
- Study the following photos to get an idea as to how the balsa triangle stock is oriented onto the formers to allow them to index with the other pieces that will be used in the next steps.



- Use CA to glue the balsa triangle to the formers as shown and leave overhang at the rear. This will be sanded flush later.
- Cut a seven-inch and an eight-inch section of ½ balsa tri stock. These pieces will be placed forward and aft of the stabilizer spar at the joint at the bottom of former FF6.

- Locate formers FF3, BH8 and TF1. Trial fit these parts together as shown below. Make sure that all of the parts fit together squarely and tight.

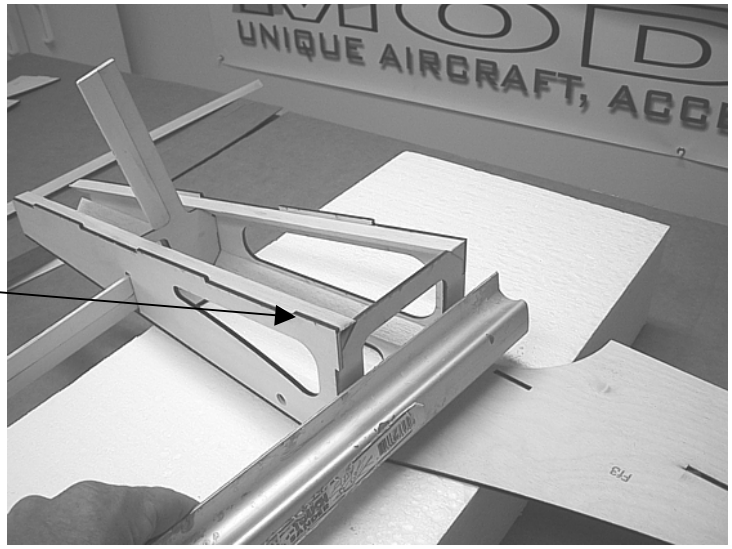




- Once satisfied with the fit, add the former FF6 and once again ensure that the fit is correct and the boom structure is square.

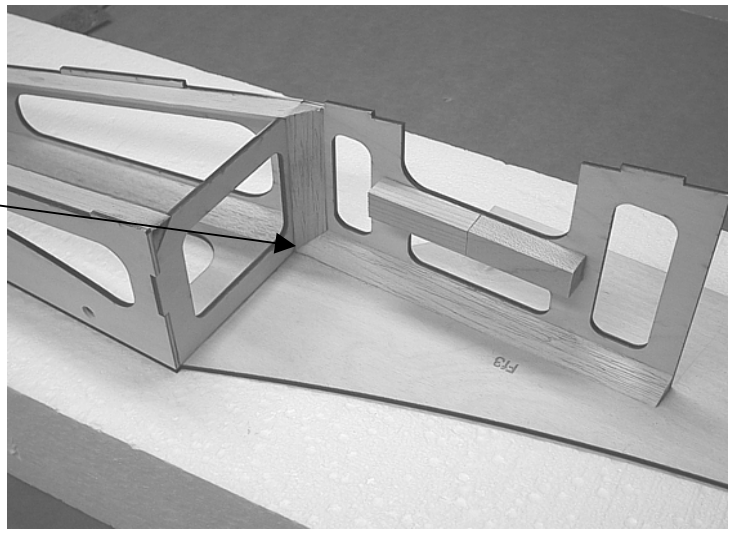
- Now you can use a sanding block to square up the edges of the balsa triangle at the front of former BH8 as shown at Right.

- Locate the motor mount assembly that corresponds to the boom you are building. (The hardwood piece is located away from the center of the model as shown in photos).



- Using ½ balsa triangle, add pieces to the rear and base of the motor mount as shown.

- Ensure that you are working on a flat surface to maintain the squareness of the boom.



- Locate former FF4 and trial fit onto the boom assembly as shown, when satisfied with the fit you can final glue the former onto the assembly which will complete one of the booms.

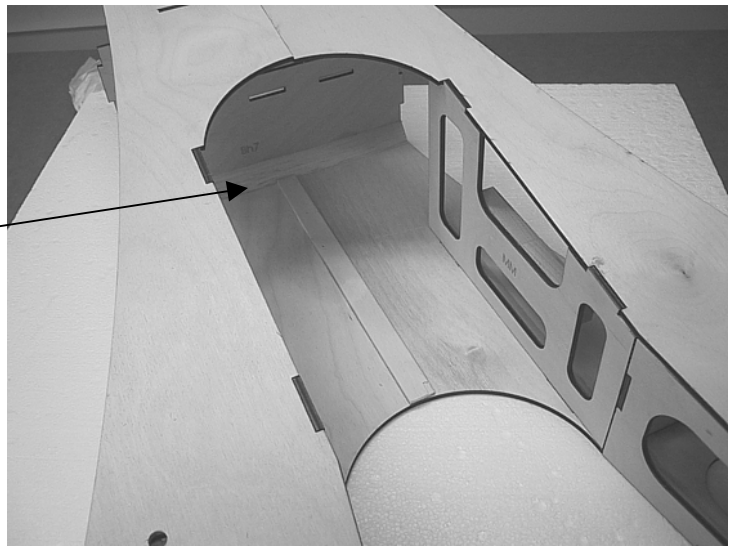
- Repeat all of the above steps and build the other boom. Don't forget that you must build an OPPOSITE boom!

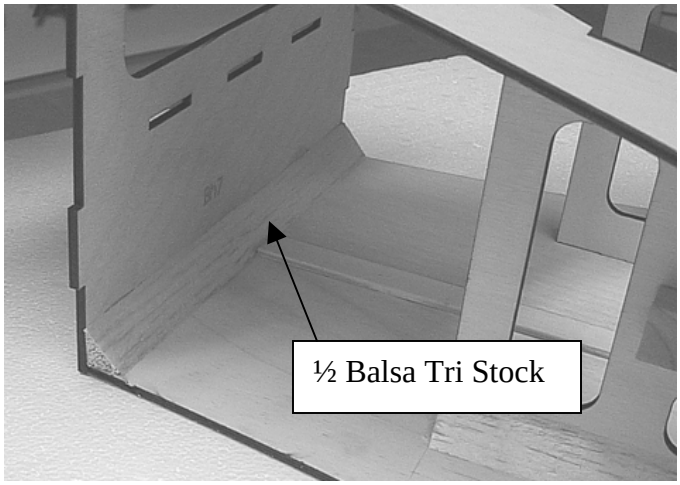
JOINING THE TWO BOOM HALVES

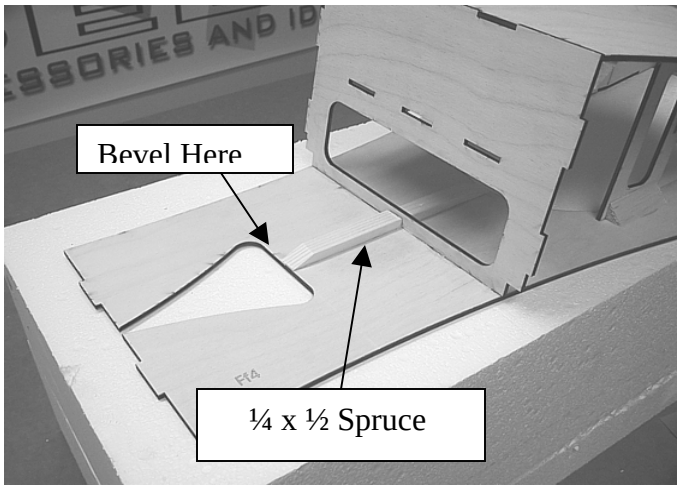
- You will need to place the two halves on an elevated surface to allow the Stabilizer spars to hang off the side. This will allow the two halves to sit flat for joining.

- Locate former BH7 and fit to the structure as shown. At the bottom you will add a piece of ½ balsa triangle and then install the 1/8 x 1 x 8 and 5/8 ply strip joining the two halves at the bottom.

- Place the assembly upside down and cut two ½ x ¼ x 4 pieces of spruce to join the top sections as shown. You may want to bevel the edge behind the intake as shown in the following photos.



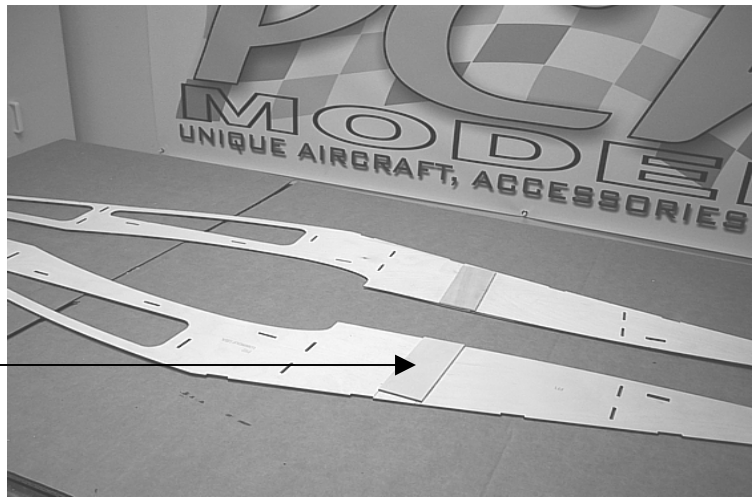




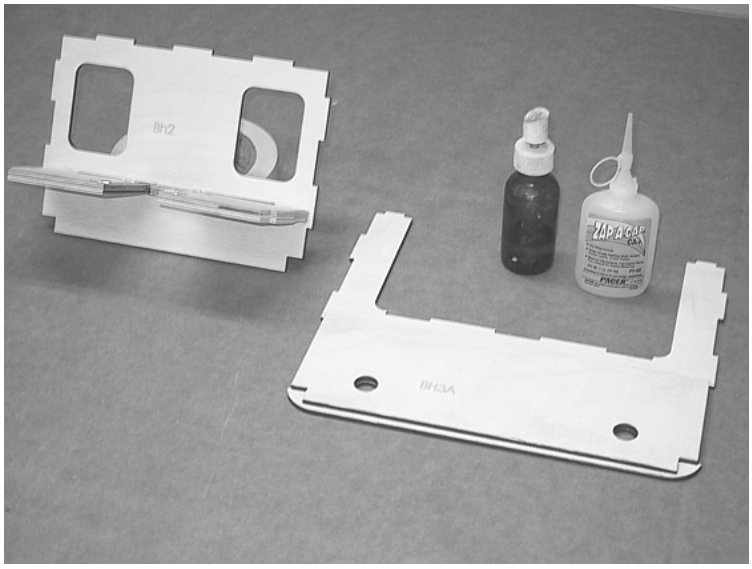
Check to make sure that all joints are securely glued and that the boom structure is straight and square. Some of the interior areas around the motor mount will be visible on the completed model. If you wish to paint or finish this area, now would be a good time. This concludes this portion of the assembly at this time.

MAIN FUSELAGE CONSTRUCTION

- Locate formers FF1 and FF2 and two 1/8 x 2 x 6 pieces of plywood; these are the main fuselage formers.
- Join the formers together with the plywood pieces on a flat surface and make sure you have a left and right.



- Locate formers BH3, BH3A and BH2, BH2A. Using epoxy or CA laminate formers BH3 and BH3A aligning the ½ holes. Glue BH2A into position on BH2 as shown.
- Press four 6-32 t-nuts into the holes in BH2A from the top and glue into position.
- Locate former BH6 and trial fit into the slots in the center of the BH3 assembly. IMPORTANT: Make sure the doubler (BH3A) is on the opposite side of the joint between the two main formers. As shown in the photo.
- Glue a piece of ½ balsa triangle stock in place between BH3 and BH6 on the *other* side of the joint shown here.

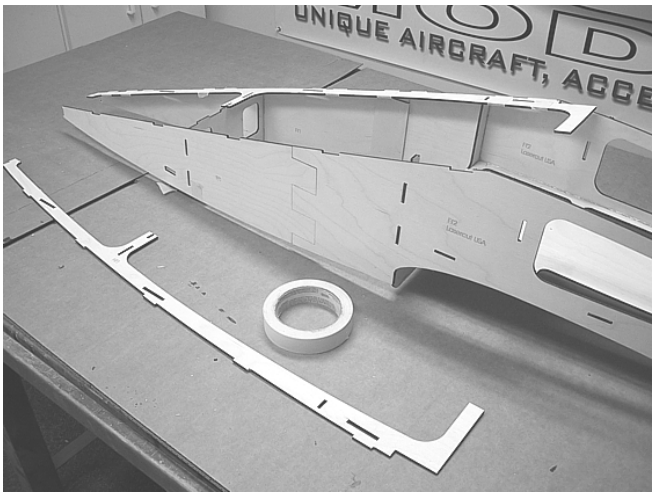


(NOTE) In the following steps we will be dry assembling the front fuselage section. This section is made almost entirely from birch plywood, which is very strong, but it is also very stiff. Some of the steps require that you bend the plywood to form some of the more complex shapes of the DV8R. We use 1-inch masking tape to good effect during the construction of this section. Before beginning, cut several lengths of tape and have them ready so that when you bend the pieces into position you can quickly secure the assembly with the tape and some light glue tacking. This entire portion of the fuselage construction is done *almost* entirely without the use of glue. It is best if you dry fit everything to see how it all goes together first and use glue only when you are sure everything is correct. When properly built, there are no gaps between these formers and this is what you should strive for.

- Place the BH6 assembly into position on one of the fuselage sides. Use masking tape to hold in position. Strive to get a good fit at all joints.
- Now add the other fuselage side to the assembly, again striving to keep everything tight and square. You may use some tack glue joints to help. DO NOT glue the Fuselage sides to the rear of BH6.

- Place the BH2 assembly into position in the nose and using masking tape and bring the fuselage sides into position.
- As these former assemblies are placed into position the fuselage should be square and straight
- At this point, place the entire fuselage on a flat surface and continue by locating former BH1 and place into position at the extreme front of the model.

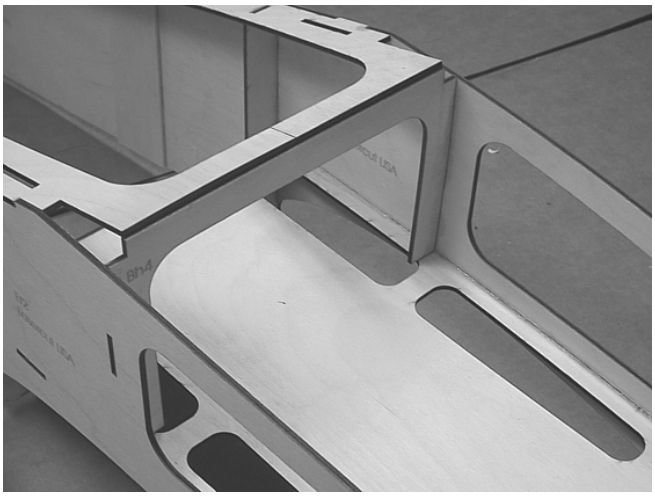
- The fuselage sections should arrive at the nose equally.



- Locate the two HF1 formers and secure onto the top section using masking tape as before.

- Insert former BH4 into position on top of BH6 and just behind the HF1 formers as shown (Below Right).

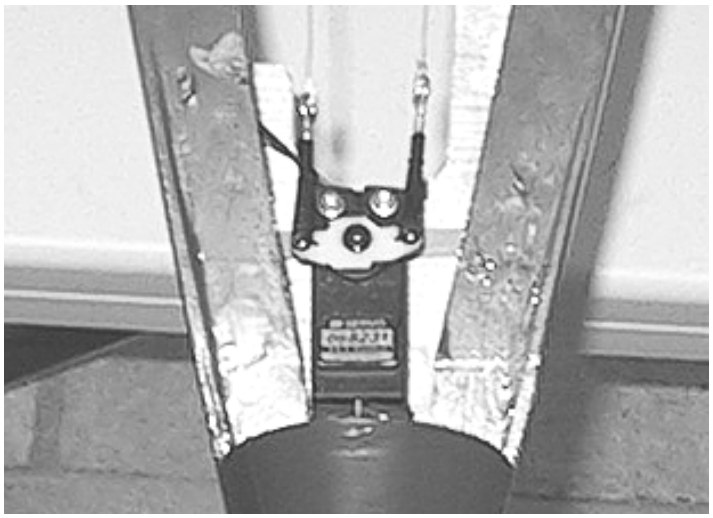
- While you may go ahead at this time and securely glue most of the joints it is VERY IMPORTANT that the fuselage sides only be tack glued to the former BH6 towards the rear of this assembly. In a later step when the rear section (booms) are fitted to the front section you will need to spread the sides apart just slightly to bring the fuselage sections together. You may use clamps at this time to temporarily hold the fuselage sides tight to BH6.



- From the 1” x 1” x 36” balsa Triangle stock, cut four three inch sections and glue them above and below the forward gear mount as shown.

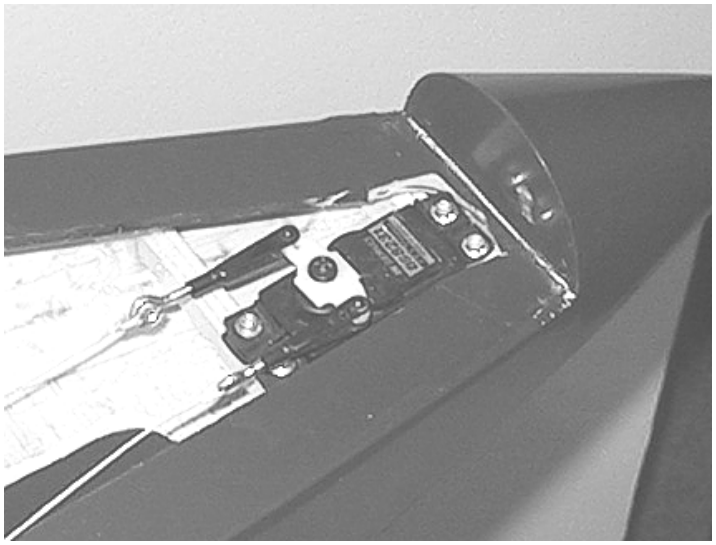
NOTE: At this time you may want to go ahead and bolt the nose gear unit into place but it is not necessary. You can set up the nose steering servo without the nose gear in place.

- Cut sections of ¼ x ½ Spruce from the supplied stock to mount the nose steering servo as shown in the accompanying photos.



- The servo needs to be on the centerline of the model when viewed from above and nearly flush with the cockpit level when viewed from the side. Also keep in mind that a standard size servo may be just touching the bottom of the fuselage for proper clearance.

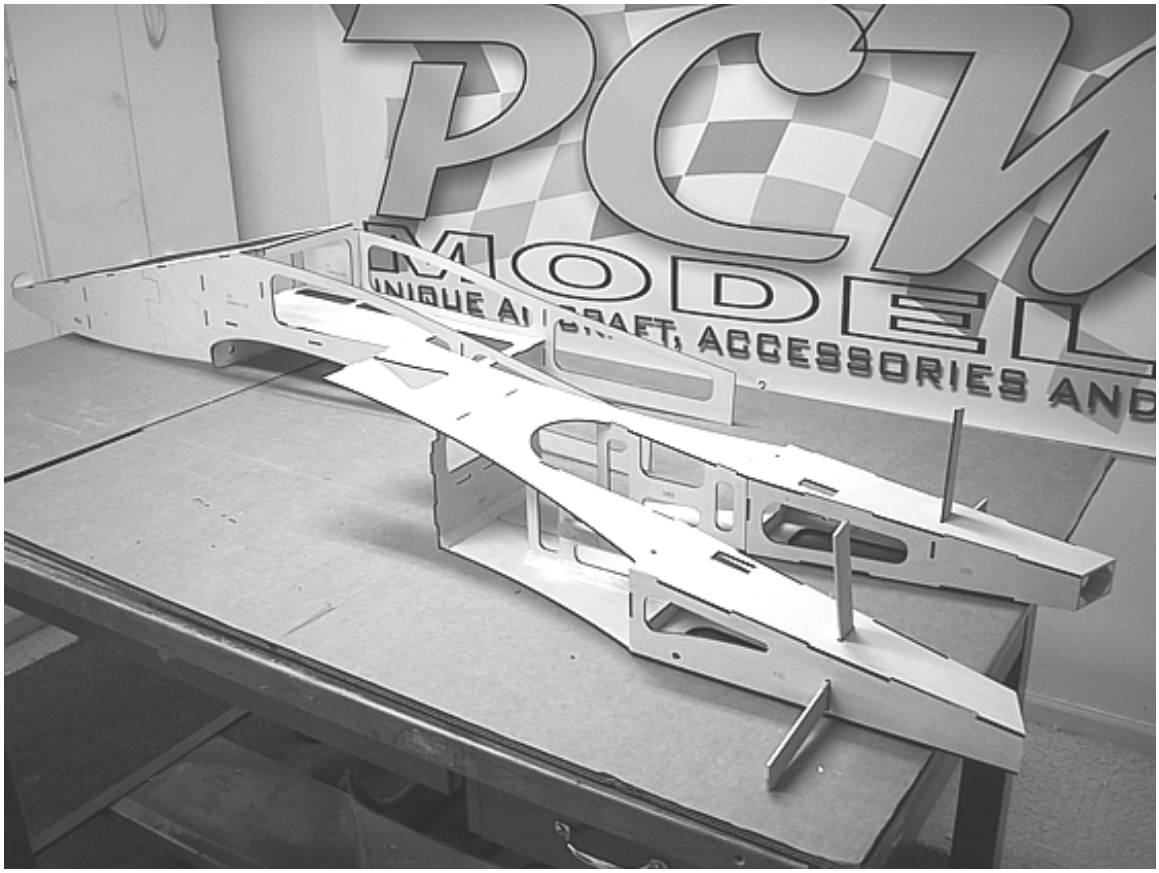
- The nose gear steering is activated via pull-pull set up. Locate the materials to make up the control lines and proceed as follows.



NOTE: When setting up your steering, first screw the four 2-56 eyelet screws into the 2-56 clevises about a 1/16th of an inch only. Connect the clevises to the servo arm and steering arm at the top of the strut. Holding the strut and servo straight, use the supplied steering cable and make up the two pull-pull lines.

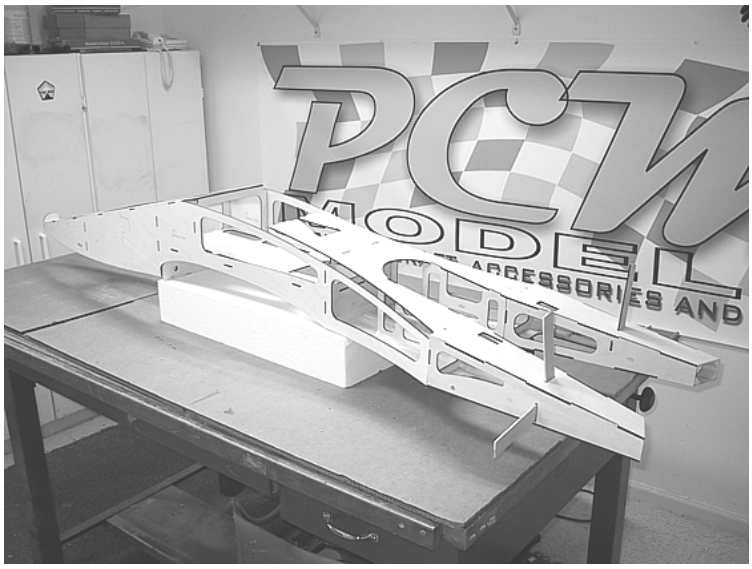
TIP: Remember that these lines will stretch a little when first used and you will need to read adjust the connections. This is why you do not want to screw the clevises all the way onto the eyelet screws when first setting up this control run. Also keep in mind that when the model is rolling the nose gear strut will be pressed backwards against its stop, tightening these lines somewhat. When the model is at rest, there will be a little play or “slop” in the lines so adjust accordingly. You can install the servo either before or after sheeting the bottom of the fuselage. If you run out of available threads for adjustment, you may tie a knot in the Kevlar thus shortening it to allow for fine-tuning. Use thin CA on all knots to ensure they will not come loose.

Joining the two fuselage sections

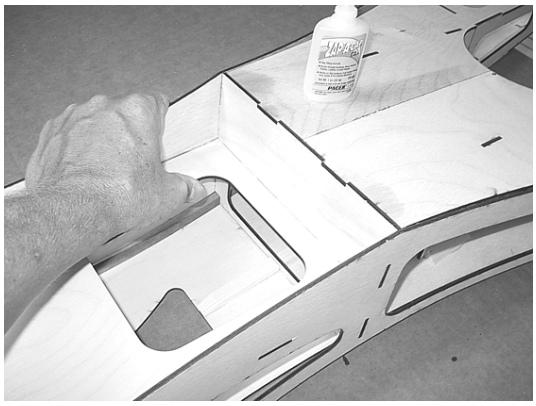


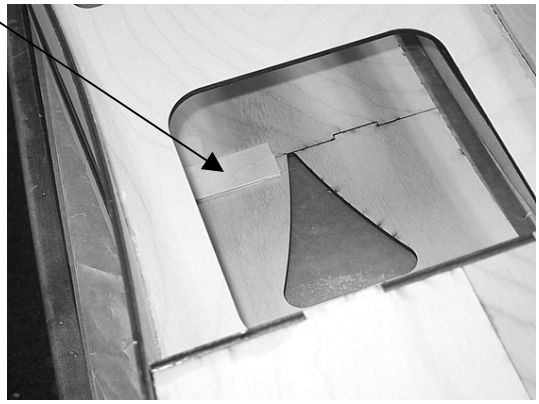
As you can see, the joining of the two sections is very straightforward. The bend in the back of the fuselage will require the use of masking tape as before to hold everything tightly in place while checking for squareness and fit.

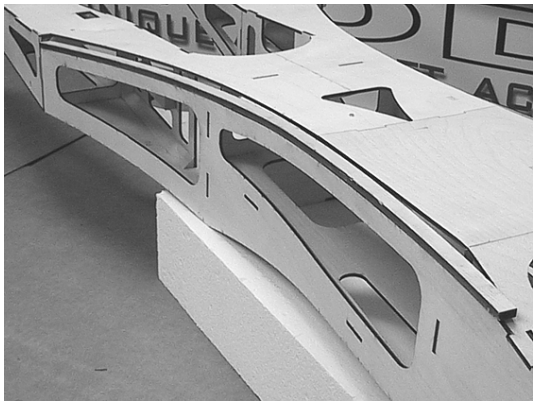
- The keys to the fit of the two sections are the tabs on the former BH7 and the corresponding slots and tabs on the fuselage sides and BH6.
- Carefully align the two sections and ensure that the fit of all joints are tight and proper.
- Use a medium CA to begin tacking all joints working a little at a time until you have a good fit.



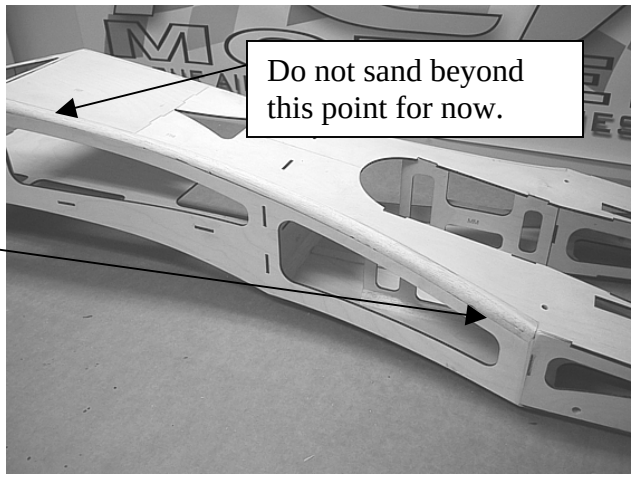
- Continue gluing the structure at all joints.
- The fuselage sides at the rear of the model, on the bottom, are butted up against the curved sides of Formers FF3.
- The sides of the fuselage at the top will have an approximately ½ Square inch gap.
- Former FF7 is placed on the top edge of the boom section and is glued in place and then reinforced with scrap pieces of ply as shown at right.
- The front of former FF7 will but up against the back of formers HF1 (hatch formers).
- Glue one of the balsa FF8 pieces into place in the ½ opening between the fuselage sides and the top of the fuselage as shown.
- Repeat for both sides, and then laminate a second FF 8 into position on top of the first completely filling the void.
- From the inside of the fuselage you can go back and reinforce these joints with thick ca or epoxy if you prefer to get a very strong joint between the two fuselage plywood formers.
- Repeat for both sides.







- First sand the balsa formers flush with the sides and top of the fuselage and then you may round these formers off to give a smooth and flowing shape.



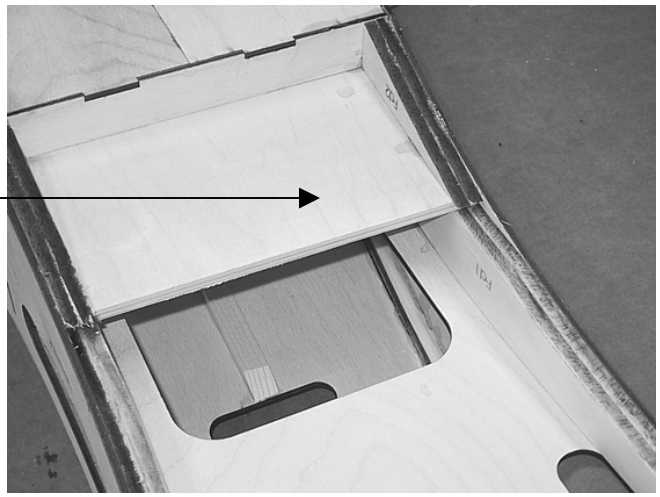
NOTE: At the rear where the balsa formers blend into the square ply wood section you will want to shape the balsa such that it blends from a square edge at the rear into a more round shape just inches away. Leave the edges at the front of the balsa formers alone for now. After the hatch is installed, you can then sand the balsa formers to blend to the canopy hatch for a better and more flowing shape.

- Where the balsa formers extend *across* the hatch area, use a sanding block to sand the balsa flush with the hatch surface.

- Glue the ¼ balsa formers FD1 into place on the inside of the fuselage one at a time to laminate to the flowing shape of the fuselage.

- Install the ¼ Plywood former WHP into position on top of the balsa formers.

- Glue the ¼ balsa formers FD2 on top of the Wing Hold down Plate (WHP).

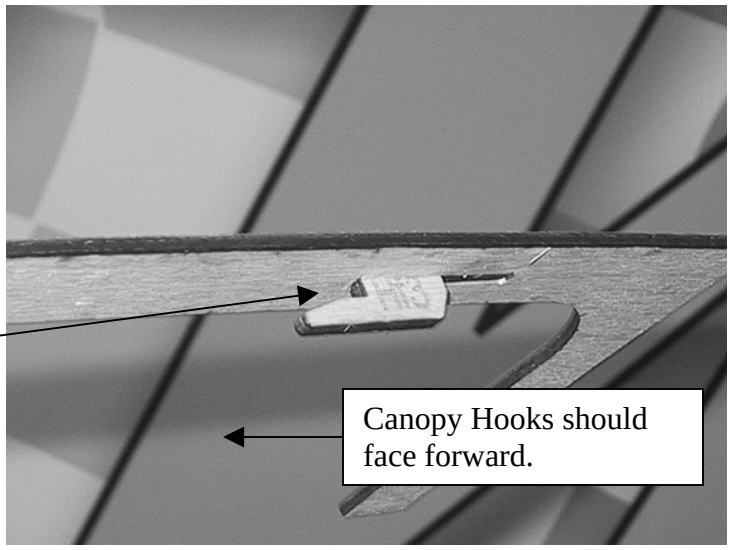


At this point the fuselage should be a complete unit. If all of the joints are securely glued and fitted, the model will have become very stiff. Go back over your work and make sure it is so. Reinforce any joints that may need it.

Installing the Canopy Hatch

The hatch, when completed, slides into place by utilizing six hook like fixtures on the bottom of the canopy structure. Familiarize your self with the shape and location of these fixtures to get a good idea as to the orientation of all parts involved.

- Begin by locating the six HF6 formers and the two HF2 formers.
- Use a piece of scrap ply of the same thickness as the fuselage sides as a gage to place one of the HF6 formers into a slot in former HF2. You will want HF6 to be glued into position such that the gage is a tight fit between the gap of the HF6 and HF2. Use thin or medium CA to glue the pieces together.
- Repeat for the other five HF6s and make sure of the orientation, they should all point forward.

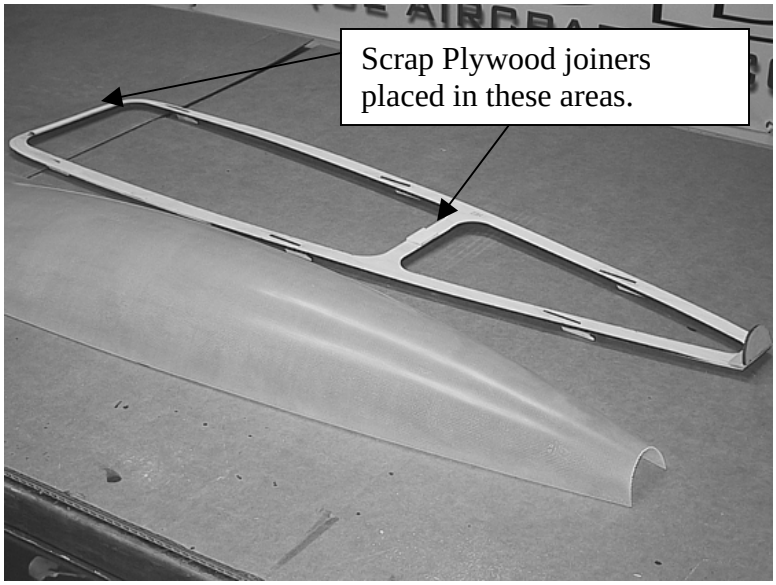


- Once completed you will have two separate sections of the hatch, each with three hooks for securing the hatch to the body of the model. Try placing each of the sections into position and the sliding it forward. It should slide forward 5/8ths of an inch and be fairly tight the first time or two that you try.
- When you slide both sections into position they should line up equally at the ends and just touch at the three positions across the model. This is what you are aiming for. If one section is too tight, try to find the suspect hook that is holding back and *slightly* file some material off of the *top* of the hook.
- When both sections meet the above criteria, you may now place the fiberglass canopy hatch over the structure and take note of any areas where the ply structure needs to be sanded to allow for a good fit.

- Use scrap plywood to make two joiners to span the rear gaps of the two sections. Slide the sections into place on the model and make sure of the fit as before. Now glue the two joiners in place onto the sections but make sure not to glue the hatch formers to the model.

- With the hatch formers still all the way forward and secured, glue former HF4 on top of the formers at the front and flat against the front former BH1. Continue to trial fit the fiberglass canopy hatch onto the framework making sure of a good fit by slightly sanding or adjusting where necessary.

- When satisfied with the overall fit, remove the completed Canopy hatch former and set aside.



- Using a one-inch wide masking tape, apply a strip all the way around the open hatch area. What we are aiming to do here is to provide a surface that will act as a barrier between the hatch canopy hatch former and the top of the model in all areas where the fiberglass canopy meets the wooden fuselage including the front rear and side. This is to keep from gluing the hatch to the model in the following steps.

- With the tape in place, wipe a thin film of light machine oil, Vaseline or similar product onto the surface of the tape to act as a parting agent that the epoxy in the next step will not stick to. This is to allow for easy removal of the canopy hatch when cured.

- You may need to cut away the masking tape if it has covered any of the six slots in the hatch area to allow the hatch formers to engage properly.

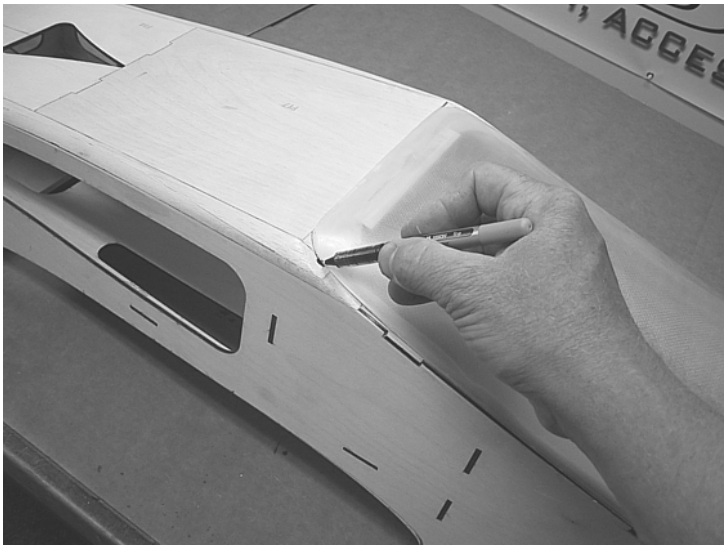
- Place the wooden hatch former into position on the model on top of the tape and once again trial fit the canopy onto the framework to ensure that you still have a good fit.

- Looking at the canopy try to get an idea as to where the fiberglass comes into contact with the wooden framework beneath it.

- When you are sure all is correct, mix a batch of thirty-minute epoxy sufficient to cover all areas of contact between the hatch and the framework. Adding some milled fiber or micro balloons will make the mixture less likely to run and will aid in giving greater contact between the two pieces.

- Apply the epoxy to the fiberglass in the correct areas and then place into position on top of the framework. Use masking tape where necessary to aid in properly holding everything in position.

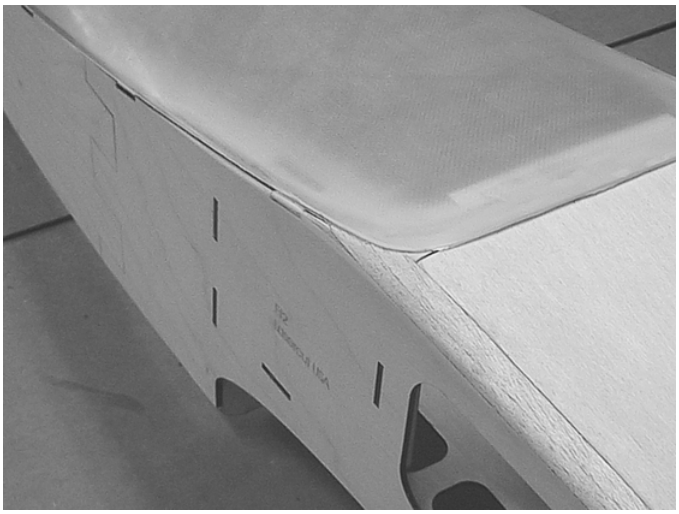
- When the epoxy cures, remove the tape and use an Exacto knife if necessary to gently slide between the canopy and the fuselage around the circumference to allow the canopy to slide back.



- Remove the canopy hatch. Pull all of the tape off of the opening and touch up both surfaces if necessary.

- Place the canopy back into position and use a pen to draw the shape of the canopy onto the frame work to indicate where any sanding may be necessary.

- Remove the canopy hatch from the model and using a sanding block, begin to sand the balsa formers at the rear of the hatch area to shape as well as any areas along the other edges of the canopy using the lines you placed as a guide.



- Once you have everything roughed in, install the canopy hatch and complete the sanding of the upper fuselage/ canopy hatch area.

- This completes the fuselage construction until after the main wing is mounted.

- If you choose to, you may fill and sand the entire fuselage to your liking except for the underneath portion of the fuselage from the wing forward.

Main Wing Construction

The main wing is built as a one-piece unit. It is a true composite of wood and foam construction that yields and incredibly strong wing for both flight and landing gear installation. You will not need the gear for construction but you should have it in hand before sheeting. PCM has worked with Robart to produce a matched set of landing gear for this model. All of the steps and instructions are for this gear. If you choose to substitute the gear, it will be up to you to insure fit, operation and feasibility of your chosen gear. WE HIGHLY RECOMMEND USING OUR GEAR.

The entire wing assembly can be put together and held in position without gluing by using masking tape. It would not be a bad idea to do so now to see how everything fits together if you are unsure of how this all works.

- Locate the bag that contains all of the wing hardware and laser cut parts as well as the two main wing foam cores. Take a minute to familiarize your self with all of the components.

- You will notice that the wing has slots, troughs, pockets and cutouts pre cut for you. When properly built you will not need to cut or alter the foam wings in any way.

- Begin by laminating the two rear spars together and then add the rear spar doubler to that. Ensure that you get the centers correct, draw a centerline if necessary. Use CA or epoxy but make sure of a good fit and ample adhesive.

- You will need to use a piece of 1/8 balsa or light ply to place outboard of the rear spar doubler that makes the rear spar 3/8 thick all the way to the end. Sand flush with the top and bottom of the spar assembly.

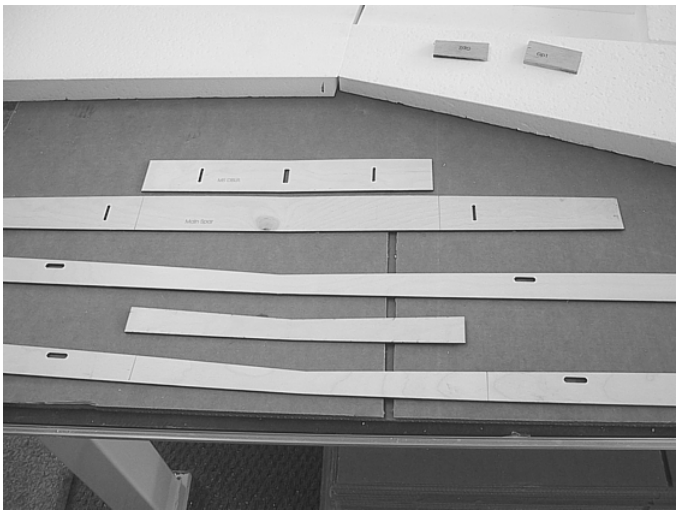
- Laminate the main spar doubler onto the main spar in the same fashion and ensure that it is centered properly.

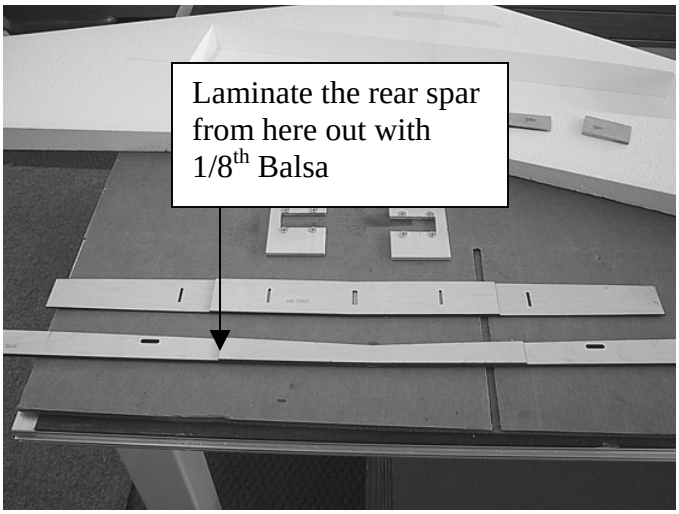
- Locate eight 6-32 t-nuts and press into position in the formers named GPLATE. Use epoxy or thick CA on the back of the nut to keep from working loose.

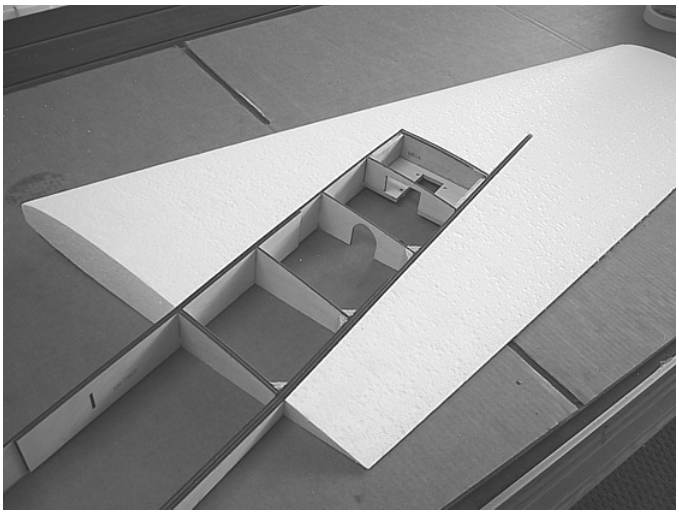
- Epoxy the main spar into position at the front of the gear well of a foam wing core. Make sure it is centered on the face of the foam top and bottom as well as left and right by aligning the center of the ¼ x 1-inch slot with the root edge of the core. The doubler of course faces the interior of the wing.

- Epoxy the rear spar assembly into position in a similar fashion, top and bottom and left and right using a centerline that lines up with the root edge of the core.

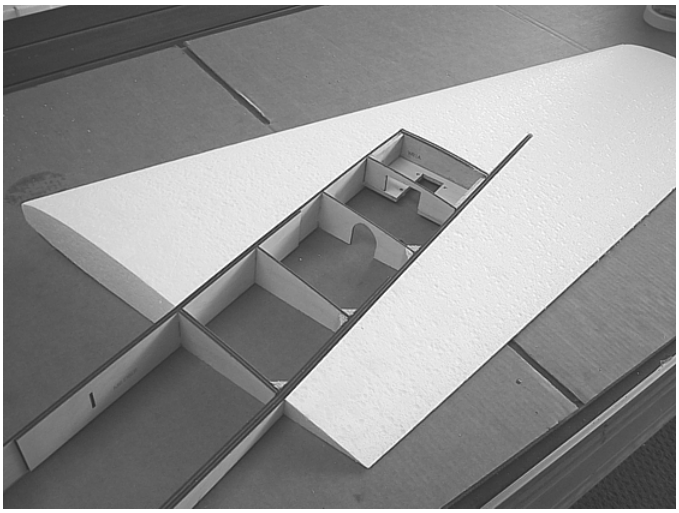
- Laminate two the WR5s and glue into position between the Main and Rear Spars as well as formers WR4 and WR3.



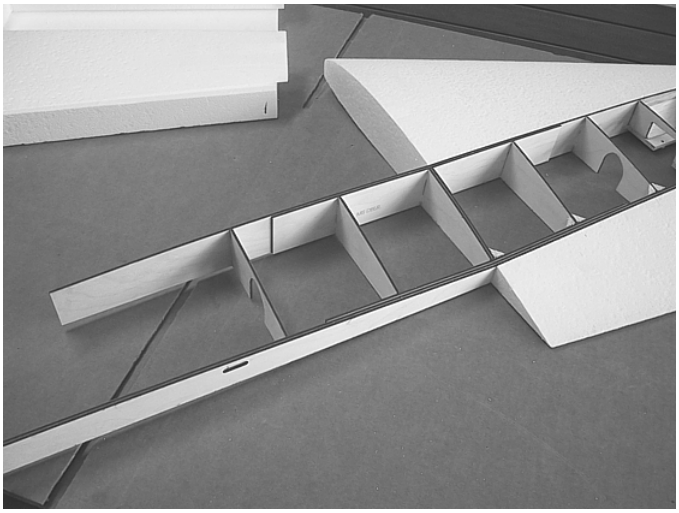




- Tack glue the rear of the formers to the Rear Spar ensuring alignment top and bottom, then reinforce with ½ balsa triangle stock as shown. (NOTE: This photo is of a prototype wing, it does not have the machined slots and pockets, as does your kit).



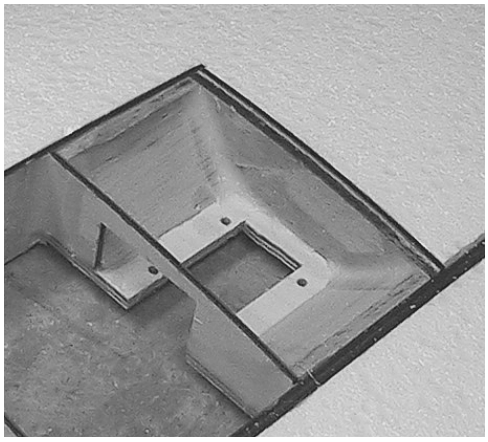
- Glue the ¼ balsa former WR1 into position against the side of the foam between the two spars.
- Glue ¼ balsa formers WR1A, GP1 and GP2 into their respective positions carefully noting orientation.



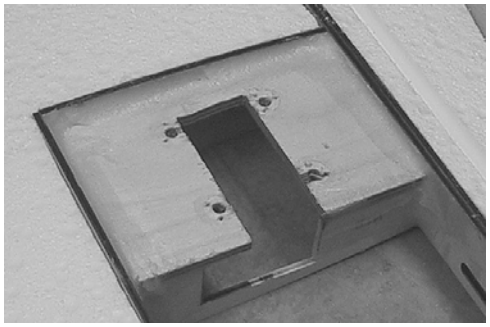
- Glue the ¼ Plywood Gear Plate into position from underneath the outer spar assembly.
- Glue WR2 into position on the Gear Plate between the spars.
- On the spar assembly opposite the current wing, add formers WR 4 and WR3 as before. The spar should be in perfect alignment when completed.
- Trial fit the other wing panel into position on the spar assembly. The spars should line up front and rear but you will note a slight gap at the bottom of the two foam wing panels due to the slight dihedral. Using a block to sand the lose foam wing for a good fit to the other wing panel.

- Using thirty-minute epoxy, add the lone wing panel onto the spar assembly and other wing. Use masking tape to hold in position if necessary and allow to cure.
- Add all of the formers as with the other wing.

- From the length of 1 x 1 balsa triangle stock, cut pieces to fit over the gear plate as shown to further reinforce this area.



- Once the triangle is in, mix up a batch of milled fiber and epoxy and thoroughly apply the mixture to the top and bottom of all joints within the gear bay area. To further reinforce the area fiberglass cloth should be applied to these areas as well.



- The main landing gear can be installed temporarily at this time to check for fit and alignment.

Making The Wing Skins

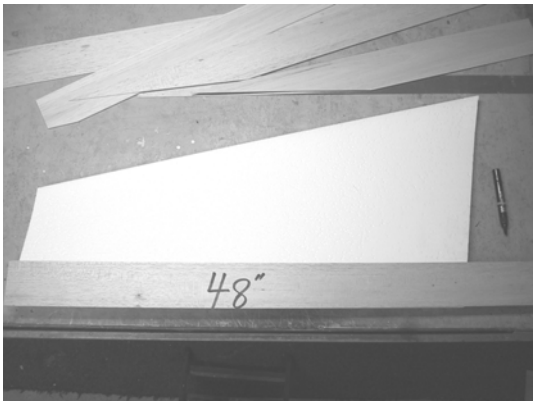
If this is your first foam wing, you have probably seen how simple the construction is going so far. But if you have always wondered about getting the skins onto the wing and the sequence that works best, rest assured it is very simple and very quick. We are going to make up four separate wings skins tailored to fit into position on the wing and *then* they will be added one at a time to arrive at the finished wig. Whether this is your first foam wing or not we strongly recommend following the steps as presented here.

Adhesives

Typical CA glues attack the foam included in this kit. However a *Foam* CA such as Pacer Technology (ZAP) PT 25 is perfect for adhering small pieces to the foam such as leading and trailing edges of balsa. For the application of the skins to the wing cores we only use epoxy as it has been found to be one of the best methods still available today. If you have a better or more preferred method of applying balsa skins to a foam wing we say go for it but just check a small area of the foam first to be sure. For joining the individual sheet wood, we use a thin CA. Using a flat surface, we place the sheets onto wax paper and wick the CA into the joint. This method is strong and fast and has worked great.

- Included in your kit are sixteen (16) sheets of 1/8 x 4 x 48 balsa and four (4) sheets of 1/8 x 4 x 36 balsa.

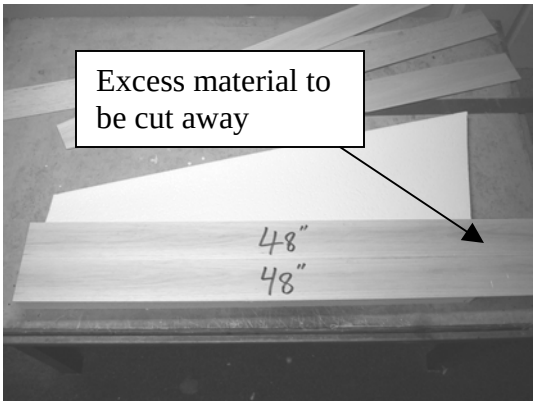
- Take a look at the following photos to get an idea as to the layout of the individual pieces to arrive at a complete skin. Note that the grain at the front of the wing is parallel with that edge of the wing as is the trailing edge balsa parallel with the back of the foam.



- Use one of the cradles that the wings were packed in to lay a single sheet of the 48-inch stock out, aligning one edge at the tip with the remainder hanging over the root. Note that you will want to extend the balsa about 5/8ths of an inch off the back of the cradle as shown.

- Now place a second 48 inch sheet in front of the first making sure there is just sufficient overhang at the tip with the rest hanging of the root.

- Make a mark at the root edge on the two sheets and cut away the excess leaving about a ¼ inch or so hanging over the root. The left over pieces will be used on the fuselage later.

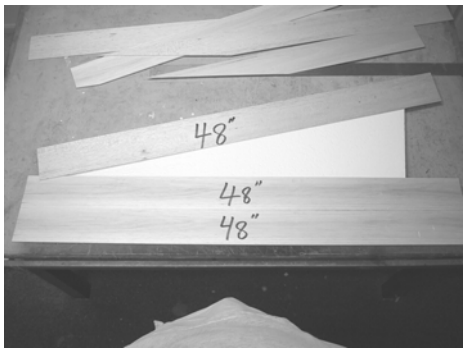


- Now use these two pieces, as templates to make three just like each piece for the other three skins and put the duplicates aside for now.

- These two pieces can now be joined together as a single piece. We use CA to join sheet wood but if you have a preferred method that will be fine.

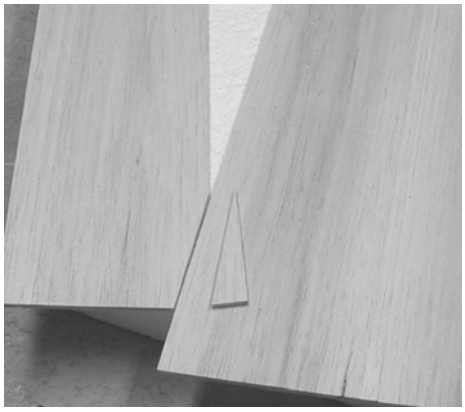
- When this assembly is ready, place it back into position as before remembering to leave 5/8ths hanging over the rear of the cradle.

- Place another 48-inch sheet onto the cradle, this time aligned with the front of the cradle as shown. Be sure to leave a little over hang (3/8ths) on the front just as you did with the rear.



- Make a line on the front sheet right where the back sheet assembly crosses underneath. Cut the sheet on this line and then put back into position on the cradle. Don't worry about making a perfect fit just yet.

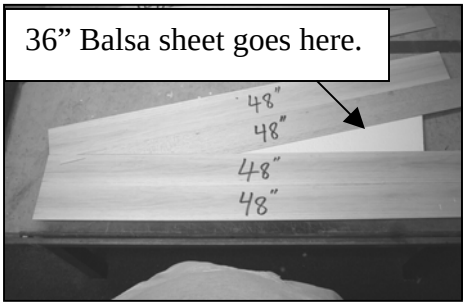
- Take another sheet of 48-inch piece and place behind the front sheet as shown. Again make a line where the separation will be and cut the balsa to fit.



- Now you will have two sheets aligned with the front and two aligned with the rear of the cradle.

- Take a sheet of the 36 x 4 x 1/8th inch sheet balsa and perform the same step as above, keeping the grain parallel with the front sheeting.

- Make a mark at the root end of these three sheets allowing approximately a ¼ inch over hang as before and then cut the ends off. (NOTE: These pictures do not show the ends cut off but you should do so in order to get the lengths correct now)



- Use these three pieces as templates to make three more of each of them as before and place the copies aside for now

- Join the three front sheets and use a long sanding block to make the bottom edge of this assembly straight so that it will have a good fit when joined with the bottom assembly.

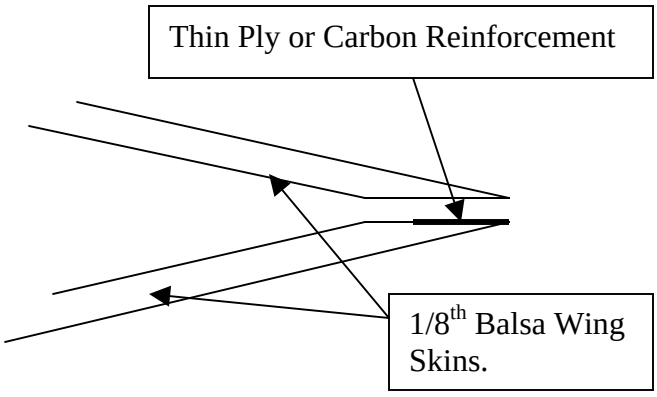
- Join the two assemblies together and use scrap to fill the little void in between them.

- This completes the making of one wing skin.
- Using the copies made earlier, make up the other three sheets in the same manner.
- To complete the skins and get them ready for application to the wing, you may now sand the wing skins as a single unit to eliminate any seems and make the skin perfectly flat.

Overview of Application

The main wing cores are designed so that the skins should extend past the foam T.E. (Trailing Edge) approximately ½ inch. To arrive at a sharp trailing edge, we have found that beveling the *inside* T.E. of each balsa skin approximately ½ inch and then applying the skins so this bevel extends past the foam yields great results. In this manner the trailing edge is finished upon sheeting. Beveling the two skins also allows us to install a thin piece of material such as 1/64th ply or even a strip of Carbon Fiber to further reinforce the trailing edge. To do this correctly you must first Bevel the TE of the wing skin as mentioned. Then place the skin into position on the cradle that the foam comes to you in. Next the core is placed on top of the skin. Then the TE of the foam is aligned parallel to the TE of the skin but a ½ inch inboard. Holding this position, you now need to make a mark at the front and rear of the balsa skin at the center of the two wings' joint. Remove the skin and, using a straight edge cut a straight line between the two marks. Now the skin is ready for application.

Beveling the Skins

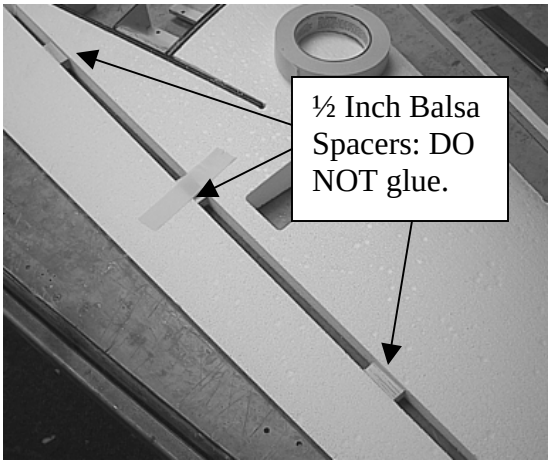


On the inside of the skin, draw a line parallel to the TE ½ inch towards the front. Place the skin on a flat surface and use a straight sanding block to taper or bevel the balsa from a full 1/8th of an inch at the line to nearly nothing at the extreme TE. Then, on the bottom skin only, you can if you desire, add a 3/8th or ½ inch strip of 1/64th ply or even a thin Carbon Fiber laminate onto the beveled edge. When the top skin is applied the bevel on that skin will meet with the bevel on the lower skin yielding a trailing edge that needs little or no sanding.

- The skins will be applied, one at a time and the <u>bottoms are applied first</u>. Make up one skin as talked about above.

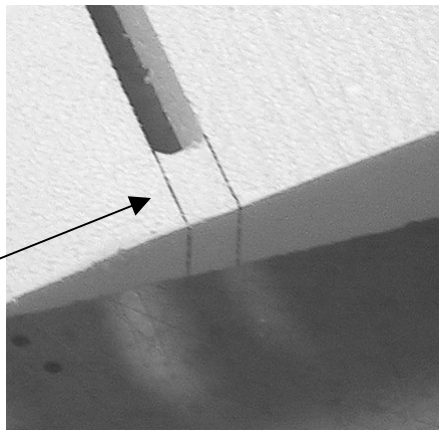
- You will need a large flat surface on which to work. You will also need some weight with which to hold everything in place while the skins set. Masking tape will also come in handy.

- We have cut a ½ inch slot through the wing at the location of the flap and aileron separation line. After skinning this will make the job of building the ailerons and flaps a cinch. But during sheeting you must ensure that the slot is properly maintained at exactly ½ inch.



- Cut some scrap pieces of quarter inch balsa material to temporarily fill into the slot at a few locations along the length of the slot. They should not be glued in but rather just placed into the slot freely. Now use tape to secure the slot from pulling away from the temporary fill.

- You will notice we supplied you with a servo passage that extends from the servo cutout to the gear bay. It would be a good idea to lay a piece of string or a servo extension in there now before the bottom skin goes on



- On the tip of the wing, draw lines with an ink pen for the ½ inch cutout all the way out to the tip, top and bottom. Now connect the lines on the tip so that when the sheeting is on you will have a reference line to cut away the flight surfaces.

- Use a sanding block with 80 – 100 grit paper and *lightly* sand the surface of the foam core in preparation for the skins. You needn't sand the foam "glass smooth" but rather "Clean up" the surface with a quick once over.

- We sheet the wings with thirty-minute epoxy. Mix up enough to cover the surface of the foam. We are going to spread the epoxy on the foam so that it is were the balsa contacts the foam and not in open spaces (such as the servo extension shaft) which is what may happen if you spread the epoxy on the wooden skin itself.

- Place the skin into the bottom cradle of the wing you are working on, and then place the foam wing onto the skin in the approximate position. We want the extreme tip of the skin to be exactly three inches from the center of the ½ inch cutout in the wing. This should be close to ½ an inch. Make the rest of the trailing edge parallel.

- Place the top cradle onto the wing and line up the cradles with respect to the core while maintaining the relative position of the skin to the core.

- When all is set, weight the entire structure down firmly and evenly. We use a large flat board to place onto the cradle and then use plenty of weight across the entire board to distribute the weight evenly. Don't be afraid to put weight on there – we use up to 75 pounds for a wing of this size!

- After cure, remove the weight and square up the overhanging balsa at the tip and leading edge with a sanding block. Cut away the bottom sheeting to expose the gear bay. It will be covered by the supplied ABS.

- You can now remove the ½ inch spacers and the tape.

- Repeat the above steps for the <u>bottom of the other wing.</u>

- When finished with both bottoms, the top skins are completed in a similar manner, but do not apply any epoxy to the beveled portion of the trailing edges, they will be glued together after all four skins are applied.

- Before final sanding you will need to join the trailing edges of the wing. We use medium CA in between the beveled edges and a long straight edge to press them together until cured.

- When all skins are applied sand the surface and edges of the entire wing.

Making the Ailerons and Flaps

Overview of Construction

Simply put, you are going to cut away the sheeting over the ½ inch cutout in the wing, then fill in the space between with ¼ inch TE and ¼ LE (leading edge) on the front of each aileron and flap. First the whole back piece that forms the flight surfaces of the wing will be cut away in one piece. Then the back of the wing will be "cleaned up" and a ¼ piece of balsa installed. Next you will install a solid piece of ¼ balsa stock onto the front of the cut away piece and the whole unit sanded. Then the aileron and flap will be separated and finally, each flight surface will be hinged and fittings for servo control and horns added.

- Use the marks at the tip made in an earlier sequence as a guide at the tip for marking the edges of the ½ inch cutout. Make a mark on the top and bottom skin in the *center* of these two marks.

- Measure down the trailing edge of the wing from the tip 35.5 inches and make a mark. Then measure this mark from the center of the wing and make another mark the same distance from the center but 5.25 inches up on the wing.

- Now connect these two marks in a vertical line. This will be the separation line for the flap root and should be parallel with the center of the wing.

- Measure up on this line 5 and ¼ inches and make a mark Now connect this mark with the one you made at the tip, this will be in the center of the ½ cutout.

- Repeat top and bottom for both wings.

- Cut through the balsa sheet with an Exacto knife along the entire length of these separation lines, thereby removing the aileron and flap as a single unit. DO NOT cut them apart yet.

- Now you can see the foam underneath at the TE of the wing and LE of the flap and aileron assembly.

- Using the foam as a guide, carefully cut away all of the balsa and make flush with the foam. Be careful not to sand into the foam and disturb the alignment of the flight surfaces.

- Using the ¼ x 3 x 36 balsa stock cut tapered pieces to fit to the TE of the wing and LE of the aileron and flap piece, but still do not cut apart the aileron and flap as yet.

- Use Pacer's Zap PT-25 or your preferred method to secure balsa to foam in the following steps.

- Glue the ¼ inch tapered sheet balsa pieces into place on the wing TE and Aileron/flap LE and sand flush and smooth with the surface of the wing sheeting and at the ends.

- Place the aileron/flap assembly into position in the wing cutout and ensure it goes back just as it was cut away, if you followed the instructions, this will happen automatically.

- You may need to "clean up" the root edge of the flap where it meets the wing and remove approximately 1/8 of an inch of material from the wing AND from the Flap to allow for the following step.

- Use scrap 1/16th balsa sheet to cover the foam at the flap root and the open portion of the corresponding flap pocket. Sand flush with surface.

- Hold the Flap/Aileron back into position on the wing with a scrap piece of 1/8th balsa as a spacer between the Flap/Aileron and wing. Now sand the tip of the Aileron/Flap flush with the tip of the wing.

- Remove approximately 1/8th of an inch of material from the Flap/Aileron Tip and install scrap 1/16 balsa as before.

- Now when you hold the Flap/Aileron in position on the wing you should have a 1/8th inch gap next to the flap root and the same at the tip when the balsa wing tip is held in place.

- When the above is so, measure down the LE of the Flap/Aileron from the tip 16 inches. Make a mark perpendicular to the leading edge. This is the cut line.

- Cut apart the Aileron and flap then square up the ends and add some scrap 1/16th balsa to finish the control surfaces. Make sure that you are satisfied with the fit of these surfaces before hinging them.

Flight Surface Hinging and Control

Overview

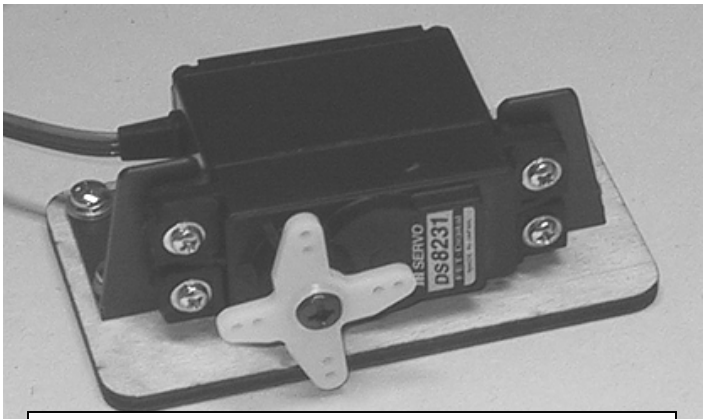
The Hinges supplied in this kit are known to work great with this type of model. When properly installed they will serve you well. Before final gluing they need to be flexed a few times and it is a good idea to scuff them with 80 grit sand paper for better adhesion. The location of the hinges on the surface is determined first by the number of hinges and the length of the surface and especially where the control horn is placed.

We have found that by first determining the location and orientation of the servo, then planning for the exact location for the control horn and its ¼ ply base, we can better plan for the best location of the hinges. Once the location of the Horn base plate is installed a hinge is placed on one side or the other as near as possible for maximum stiffness. From there, the following horns can be placed in an even fashion.

NOTE: These steps are very important in cases such as the installation of the Flap and elevator control runs. Both of these surfaces will need to have either reversed servos OR (this is what we do) orient both servos the same direction such as both horns facing right. When you place the servos in such a manner, the location and placement of the control horn and thereby the Horn Base Plate will be in different locations relative to the control surface they operate. Simply put: Plan the servo location and orientation **first**, then the control horn, then the hinges. We have supplied 4 hinges per surface with the exception of the flap, which receives 5.

Servo Mounting

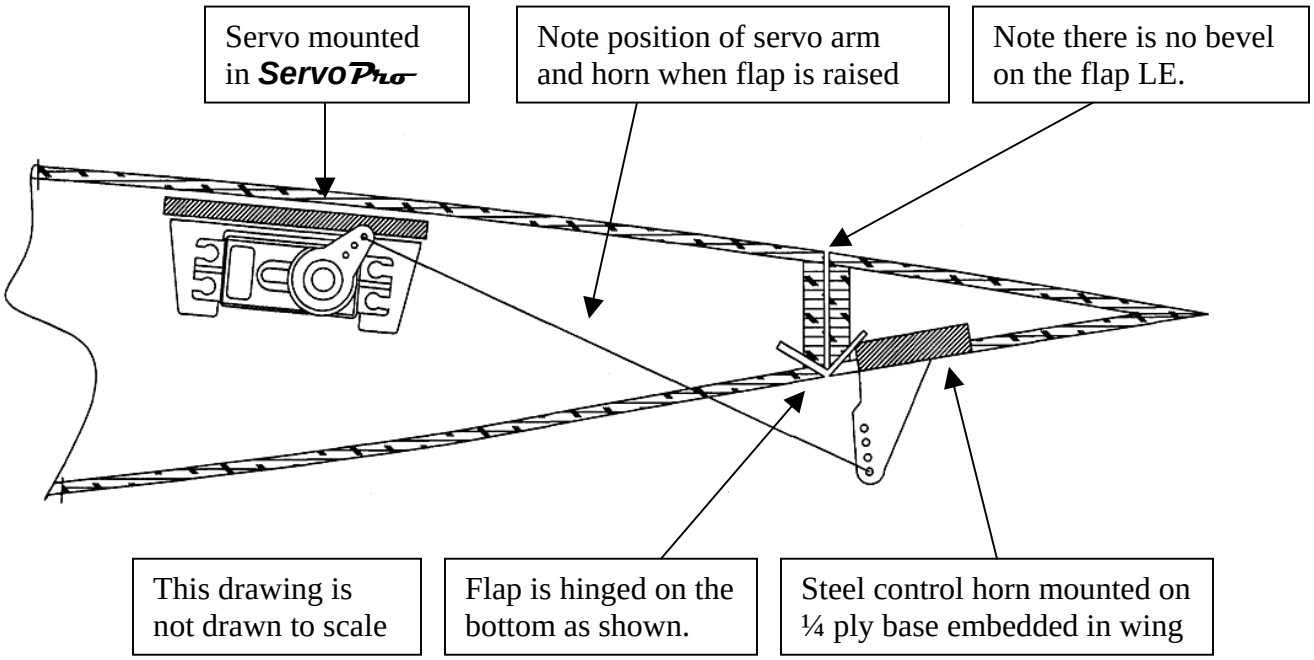
You will need to have six (6) servo mounts for the DV8R that will allow the servos for the Ailerons (2), Flaps (2) and Elevators (2) to lie flat within their structures. The ServoPro was designed specifically to fill this need and is strongly recommended. Contact PCM for more details. If you have another method that works for you that will be fine.



PCM ServoPro servo mounting system

- The two Flap servos are located within the gear bays. The 4-40 pushrod runs underneath the gear leg (when retracted) and passes through the balsa sheeting and out to the horn located in the top of the flap. The Flap is Bottom hinged.

Flap Detail Diagram



- The servo is located between WR3 and WR2just in front of the retract air cylinder. The horn is oriented towards the top sheeting as shown in order that the pushrod has a straight shot to the control horn. It is important that you make sure your geometry of the pushrod is correct. A flap, unlike an aileron or elevator is not at neutral travel in the center rather it is at the end of its travel in one direction (raised) and then passes through the mid way point on its way to full deployment. Ideally, the geometry of the servo arm, pushrod and control horn should be at right angles when the flap is at half travel. Note relative position of the control horn clevis pivot point and hinge point location.

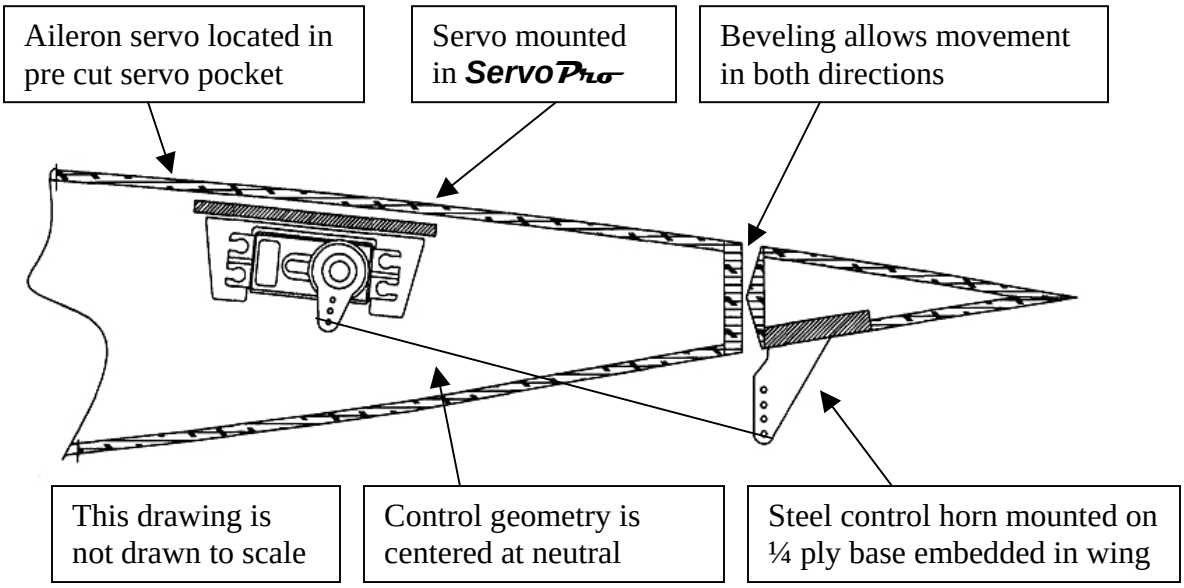
- When the location of the control horn is determined, Imbed a ¼ x ¾ x 1-1/4 Plywood Control horn base flush with the sheeting. First cut away the balsa skin then remove enough foam underneath for the base to sit level. Use 5-minute epoxy

- The control horn is mounted to the base with the supplied button head screws.

- Make the pushrod from the supplied 4-40 materials, the solder clevis goes towards the servo end after cutting the rod to length and the adjustable clevis attaches to the control horn. Solder the clevis to the pushrod using a quality silver solder.

- Repeat the installation of the servo, control horn, 4-40 pushrod and clevises for the other flap.

Aileron Detail Diagram



- The aileron servo is mounted similar to the flap servo and is located in its own servo pocket, make sure you can run the extension into the wheel and gear bay.

- Imbed the base for the control horn at the appropriate point, add the control horn and setup the 4-40 pushrod.

Finishing And Mounting Wing

- Using the supplied 3/8 x 3 x 48 balsa sheet cut two pieces to fit to the LE of the wing and glue in place and sand to shape. Sand the LE's flush with the front of the wing.

- Epoxy the balsa wing tips onto the wing and shape to satisfaction.

- Epoxy the front spar into position on the front of the wing

- Place the fuselage upside down on a flat surface or in a cradle and trial fit the wing into the wing saddle. You may have to sand the wing saddles for a good fit.

- When a good fit is achieved, make sure the wing is setting square and true to the fuselage. Measure from the wingtips to a fixed point on the fuselage to ensure that the wing is setting correctly.

- When the wing is setting right, hold it securely and drill through the ½ inch holes in the BH3 assembly and into the wings front spar. A depth of 1 inch is sufficient.

- Install the ½ inch Birch Dowels into the holes in the front spar and place the wing back onto the model. You may need to adjust the holes in the BH3 assembly, take your time and get a good fit.

- With the wing in position, square it with the fuselage again. Locate WPA and WPB; these are the wing hold down plates. They are glued onto the fuselage and wing so the visible line is a perfect fit and ensures that the wing will not move rearward under high speed or loads. Glue them into their respective locations.

- Tap and drill for the ¼ - 20 wing bolts at a position as far to the front and side of the ¼ ply hold down plate within the fuselage as is possible.

Final Fuselage Construction

The bottom of the forward fuselage can now be sheeted. Unlike the wing, which will use removable covers over the gear bay, the bottom of the nose is sheeted piece by piece and the cut out for the nose gear is made progressively into the sheeting. However if you wish to make a similar removable cover, we say go for it.

- Locate remaining ½ x 36 Balsa Triangle stock. Begin by placing one piece at a time into the square opening and gluing along the edge where it meet the fuselage side.

- Repeat for both sides then laminate a second piece of the triangle stock onto the first to arrive at a square edge to the fuselage side.

- Using a long sanding block placed across the width of the fuselage, sand the two edges flat and flush with the tops of the former BH2 and the step in the former BH3.

- Using the sheeting leftover from the wings begin gluing planks ***across*** the fuselage so that the grain is perpendicular to the line of flight.

- Continue one strip at a time until you get to the location of the nose gear.
- You will need to have the gear in place at this time.
- Raise the gear leg out of the fuselage and note where it contacts the wood and begin to cut away the necessary balsa to make the opening.
- Continue to add a piece of balsa and make the opening one at a time until you have completely covered the bottom of the fuselage.
- Use the ¼ x 1/8 x 36 Spruce to make reinforcement on the bottom sheeting from the inside, both behind BH3 and in front of BH2 next to the gear opening for added strength.
- Sand the edges of the sheeting flush with the fuselage sides.
- Add the balsa nose block to the fuselage and sand the entire front of the fuselage to shape.
- Go over the entire model and fill any voids and sand to satisfaction.

Stabilizers and Vertical Fins

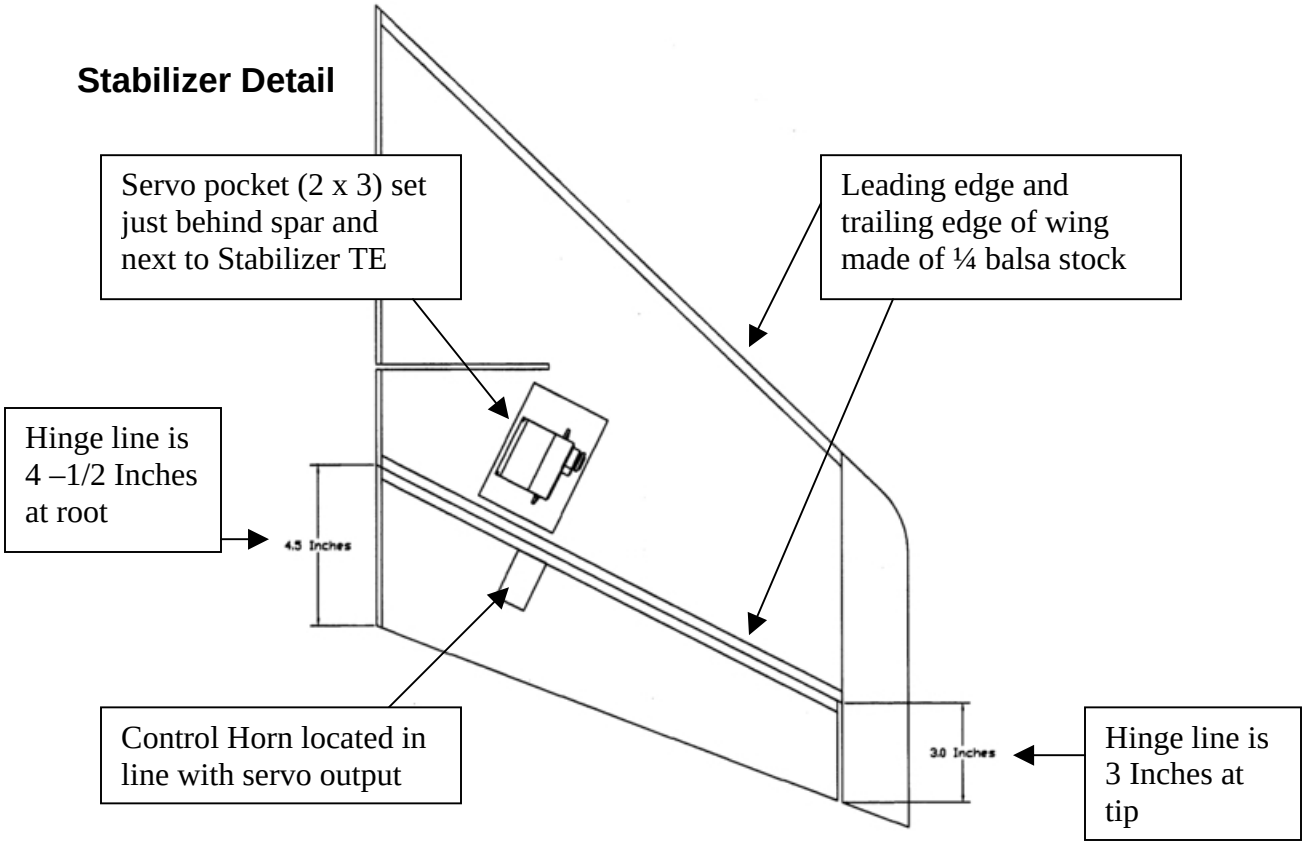
The Stabilizers and Vertical Fins are constructed and finished in an almost identical manner as the main wing. Since you now see the process we will just stick to the details and you can use similar methods and materials as before.

- Use the supplied sheets of $1/16^{th}$ x 4 x 36 balsa to make up the individual skins for the stabilizers and Vertical Fins. Just as with the wing use the cradle to lay out your skins and keep in mind that you will need about ½ inch extra at the rear. Also the sheeting is parallel at the front and rear of the core, just as before.
- Apply the skins and square up all edges.
- Trial fit each individual surface into position on a respective spar. You will notice that there needs to be an angle sanded into the root for a good fit, do so now.

Just as with the wings, you will cut away ½ inch of material within the individual flight surfaces, then build back with ¼ front and rear.

We will give you the measurements for the hinge line then you will add ¼ front and rear and make marks top and bottom the cut away the control surface and finish the edges to the lines you have drawn.

Stabilizer Detail

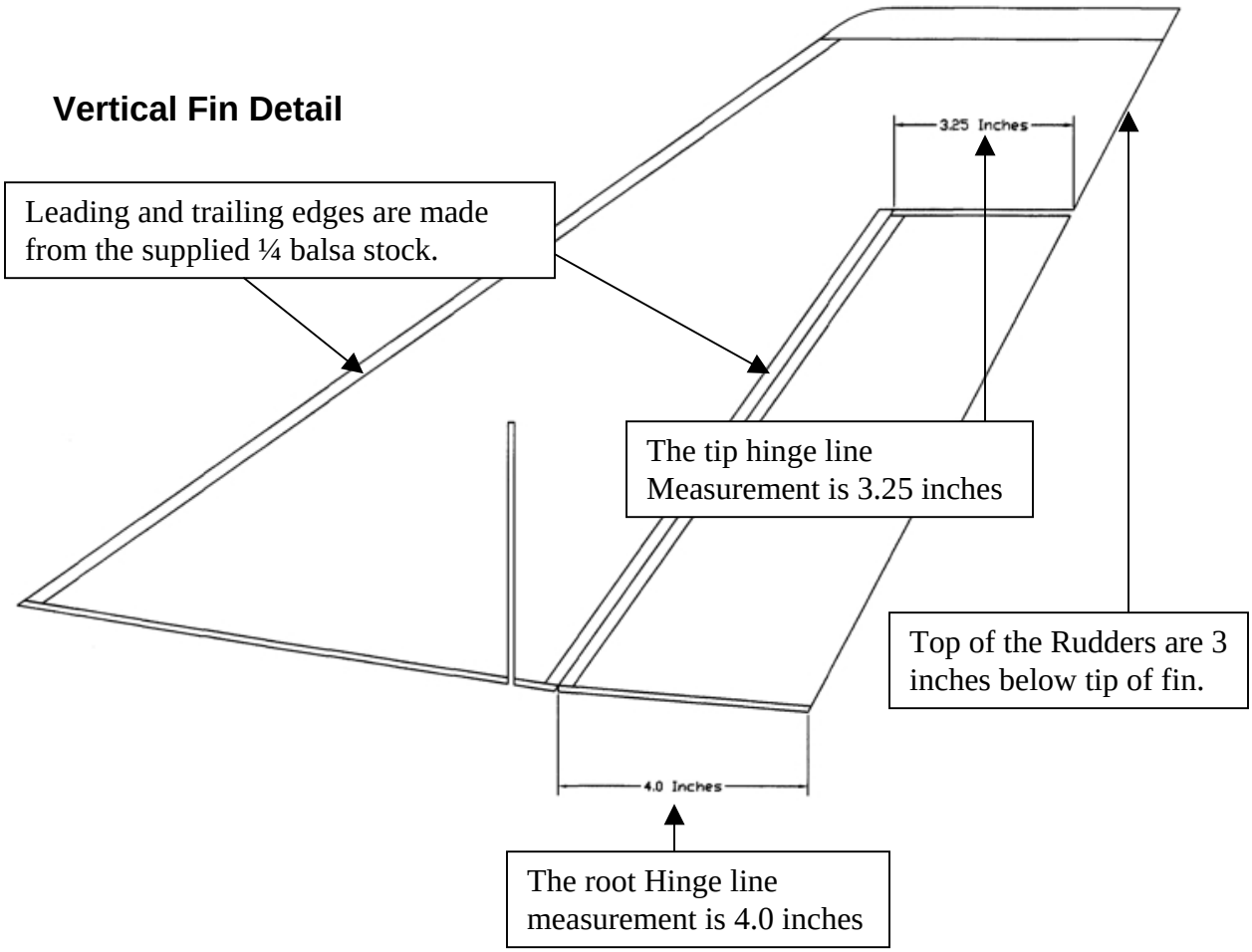


- Cut away the elevators using the above diagram. Use the supplied ¼ x 2 x 36 balsa sheet to make up all the leading and trailing edges. Sand to suit as you did with the wing.
- Add the balsa stabilizer tip and sand and shape to suit.
- Install servo, control horn and base and use supplied 4-40 materials for control runs. The servo lead is to pass through the hole in SF1 and into the fuselage.
- Hinge the stabilizer with the four supplied flat nylon hinges and ensure you have clearance against fuselage for freedom of movement.
- When the fit of all is as you like it, install SF1 onto the stabilizer and sand flush with sheeting surface.
- The ¼ birch dowel is epoxied into the hole in SF1 and should extend into the foam approximately ¾ of an inch.

- When finished, the stabilizer is ready for final sanding and covering and can be mounted last to aid in easing the covering.

- Complete both Stabilizers.

Vertical Fin Detail



- Cut away rudders and install all ¼ balsa stock and sand to shape.

- Add balsa vertical fin tip and sand entire fin to shape.

- Install hinges, and make sure of clearance at top of rudder and at base of fuselage. You will need to angle the base of the rudders as shown in illustrations and photos for clearance of movement. Ensure that the rudders have a minimum of 1 and ½ inches of throw on your model.

- Add VF1 to base of fin and sand to shape.

- Install 1-inch birch dowels as you did with the stabilizer.

- Servo is mounted in cutouts located in top forward section of booms.

- The rudders use a sleeker horn that is epoxied into a slot made at the base of the rudders. (See Photos for details).

- Make up control rods and clevises as before.

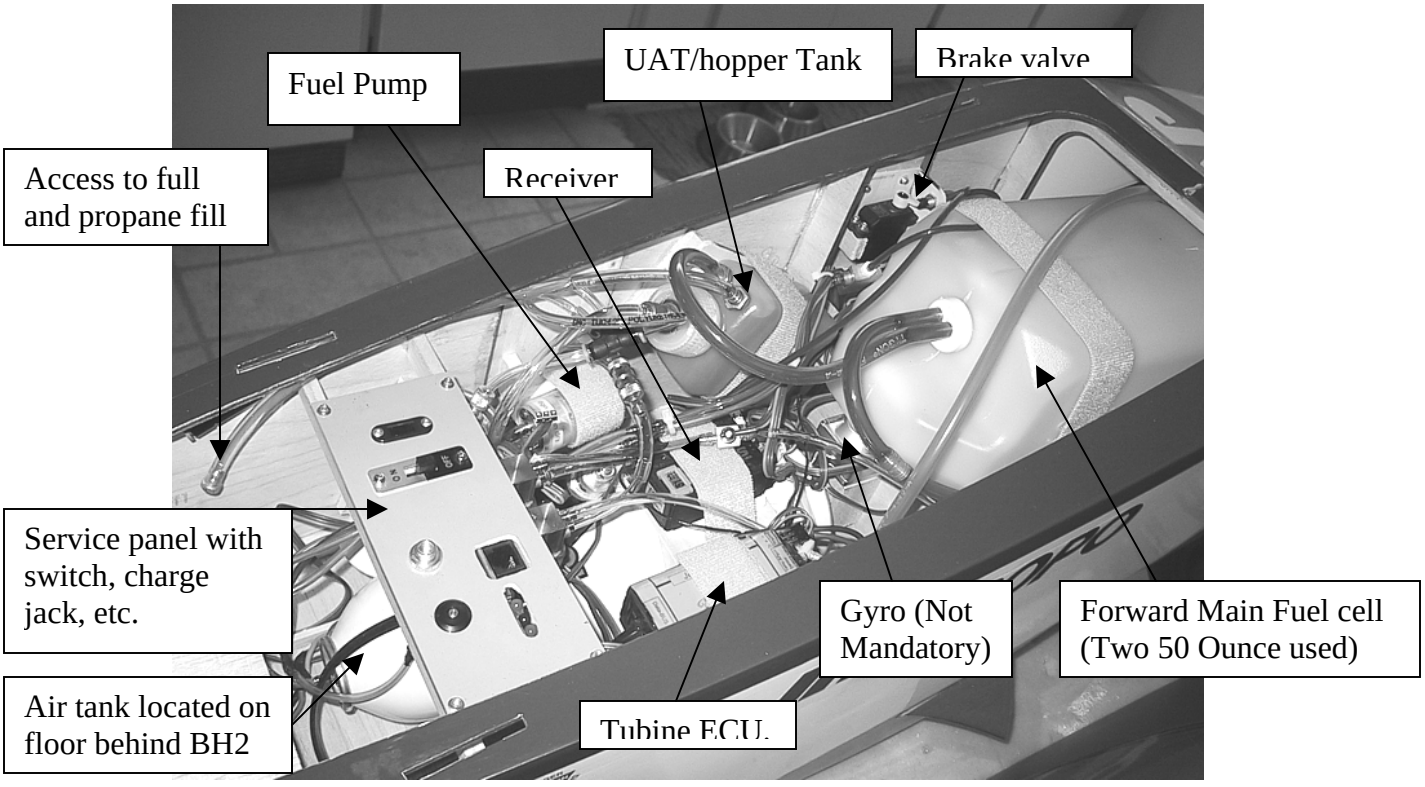
- When satisfied with fit and finish you can final sand in preparation for covering. The fins can be mounted after covering.

Final DV8R Construction

At this point the wood construction of your model should be complete. It would be a good time now to go through and make a trial run of installing all of you on board equipment such as radio, fuel tanks, engine and related accessories, air system and so on to get an idea as to where everything goes.

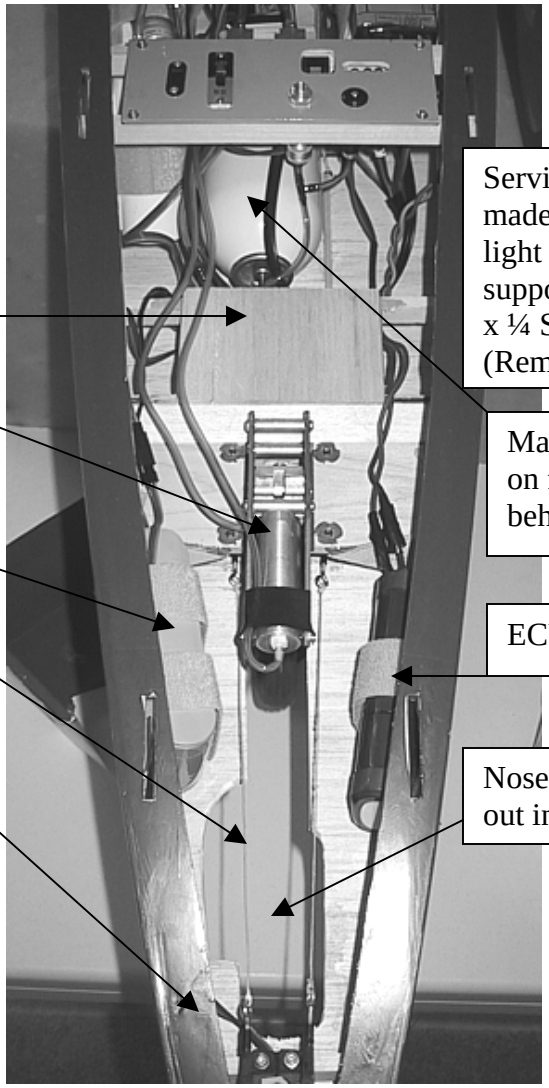
We have supplied some extra materials that will allow you to make up simple fixtures to hold items such as receiver, batteries fuel pump and so on. We have found one of the fastest and easiest ways of securing gear into a jet is through the use of hook and loop material more commonly referred to as "Velcro". The use of this material also serves as a convenient method of removing and component that needs replacement or service. Typically we will make up a simple mount that has a sufficient amount of Velcro to hold the intended item, Then the mount is either glued or screwed into place within the model depending on which method is preferred. Rather than a distinct description of each item (which will differ from user to user) we have included some photos here for your inspection.

REAR HATCH AREA



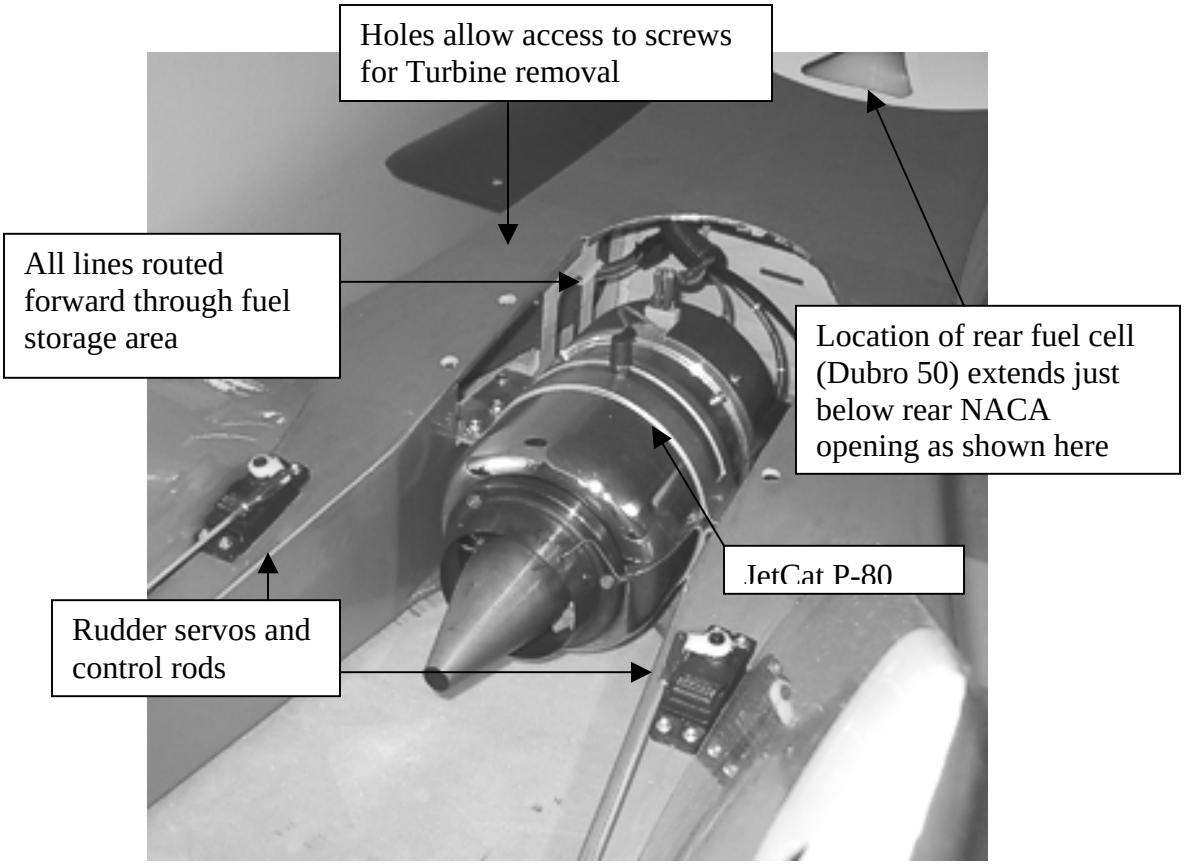
Forward Hatch Area

Picture at right showing typical configuration and arrangement of gear. (NOTE the factory prototype shown here was built as normal and then modified to hold a full-length pilot figure. You will see that the upper portion of BH2 has be removed to facilitate this installation and is NOT part of the kit)



Turbine Installation

The factory Prototype uses a JetCat P-80 (18 Pounds Thrust) located as shown. The engine is mounted such that it is just above the 1/8th plywood joiner that ties the two boom halves together. All turbine lines and pluming as well as the servo leads for the tail are routed beside the motor mounts and up through the fuel tank area to the rear forward hatch. No extensions were necessary for the turbine to be installed. For a complete list of servos and extension materials see the "FAST FACTS" sheet supplied with this instruction booklet.



When all gear is installed the model can be finished in your preferred method of film covering. NOTE: the DV8R was not meant to be covered by fiberglass. Even though the wings and tail surfaces will readily accept this type of finish, the fuselage has several “Lightening holes” which will prevent fiber glassing in those areas.

The Fiberglass canopy is made from the highest quality epoxy resins and will readily accept a wide variety of paint and finishing methods. Paint to suit. The covers for the gear well are standard ABS plastic and can also be painted with a variety of paints, if unsure paint a scrap of the plastic made from the cutout.

Setup and Flying DV8R

PCM Highly recommends that the radio gear you install in the model be of the highest quality possible. Even though this model is meant as an inexpensive medium to high performance jet, it is still capable of loads that will make inferior radio and flight equipment fail.

Overview of Control Setup

By Patrick McCurry

With years of flying jets and heavy scale models I have found that there are methods and connections that I will utilize with just about any model to get the most performance and control I can. While you may have methods of your own we think you should take a look at a few that may new to you and determine if it might be something you want to try.

GYRO

While the DV8R certainly does NOT need a gyro I install one because of the slight benefits it affords me in a variety of conditions- simply put in choppy wind conditions a gyro will smooth out the flight of ANY model when properly installed. I like the ability to “tune” any of my models flight given the surround current conditions. Also I would mention that I ALWAYS and ONLY use a gyro that affords me the ability to adjust gain and turn completely off if necessary. This of course will occupy an available channel of the radio.

STEERING

Regardless of the model I fly I always separate the rudder operation from the steering. This gives me many benefits. First I can fine-tune the steering of the model at ANY time without disrupting the rudder trim for flight. Second, I can now slave the steering to the rudder stick and dial in precisely the amount of through I want for a variety of situations. For instance I can limit the sensitivity of the steering while marinating total authority to the rudders, which is an ideal setup for nearly any model. And lastly I can now control the model on the ground with authority regardless of the inherent ground handling traits of a given model.

Example: I can, using the steering knob on my JR 10X, taxi my model at slow speed with incredible accuracy and a lot of "turns on a dime" throw to a position on the runway for take off. Then I can center the steering knob and release it and take control of the model conventionally with the rudder stick *without* having too sensitive steering. This is not the same as simply putting expo or dual rate on the rudder channel because I have full and immediate rudder at all times.

Basically speaking, the normal operation of working the rudder/steering channel of my models now occupies three (3) channels of a radio but I would not have it any other way.

FLAPS, AILERONS, ELEVATORS and RUDDERS

Some modelers like to slave the operation of one function such as an aileron to the other using two channels. The argument for this is that they can get both surfaces dialed in perfectly. Actually if you build and set up you model correctly in the first place the through and centering of the above functions is easily obtainable without wasting extra channels. Indeed if you tried this on such a model as the DV8R, you would need eight channels for the flight surfaces alone, add Retracts, Brakes, Throttle, Turbine kill switch, a gyro and we're up to 13 channels already!

My DV8R utilizes "Y-harnesses" on all of the above and saves valuable channel space. In addition, operations like "Crow" are not necessary on DV8R, it has great slow down capabilities with the flaps.

FLAPS AND LANDING

One last note deals with flap operation. Most radios have the ability to put flaps on a knob or dial. Also many radios have an available three (3) position switch that is either a dedicated flap switch or one that is available as an auxiliary channels. I have found that the three-position switch works best for me for many reasons. When in flight, particularly in the pattern just after take off, at slow speed or just before landing, I want to always be sure of my flap setting. I set the flap operation, on every one of my models on the same switch always. Years of familiarity with the same flap switch have afforded me the ability to look at the operation of the flaps as second nature. This is very important. Many times we have seen modelers fumbling to figure out whether the flaps are up or down or somewhere in-between while making an approach diverting critical attention at precisely the wrong moment.

While it might be helpful to fine-tune the exact position of your flaps at a given moment, experience has shown that our models react little differently with minute adjustments of flap. Rather, a properly setup model will see a significant improvement in lift up to some point as the flaps are lowered. From this point on the lift curve stays almost constant while the drag curve begins to turn up sharply.

What this means is that if we set first position to be where there is the greatest amount of lift traded for the resulting drag (Take-Off Flaps) and the position the yields an effective amount of drag (Landing Flaps) as the second flap position, we have effectively covered the gamete of what the flaps have to offer us aerodynamically. Don't worry I have figured this out for you, read on.

Overview of the Systems Installation

Needless to say the operation of all systems within the model (radio, engine, retracts and so on) is of the highest importance. The success of your model depends on these systems working properly. The manufacturers of these systems will include information pertaining to their operation, if you have experience in these areas you will have no problem, if not we strongly recommend that you seek assistance in the installation and operation of these systems.

CONTROL THROWS

Set these throws for your first flight. After getting to known your model better, adjust to suit your needs.

Ailerons

Full rate……..…1/2 inch up and down
Dual Rate……..…..3/8 inch up and down

Flaps

First Position (measured at root)……..2 Inches
Second Position (measured at root)……..…….3.5 Inches

Flap to Elevator mix (down elevator with first position)……..…….3/16th Inch
Flap to Elevator mix (down elevator with full flaps)…….……1/4 Inch

Elevators

Full Rate…….1.5 Inches up and down
Dual Rate……..…1 Inch up and down

Rudders

Full Rate……1 ¼ Inches left and right

CG……...……9 and 5/8ths (measured from Front of wing)

FLYING DV8R

The DV8R is truly one of the smoothest jets you may ever fly. It has no bad manners and performs like a very large pattern model. If you set your model up as mentioned previously you will have no problems on your first flight.

For your first flight, pick a day when you are comfortable with the surroundings and conditions. Line up on the runway; hold the brakes if you have them and apply full power. At the same time hold back 50% elevator and the model will fly off when ready. Don't worry; it will not leap off the ground before it is ready. Establish a climb angle at fly to a comfortable altitude.

- As you might expect ground handling and tracking is great with the DV8R. Make sure that the steering is not overly effective and you will have no problems during rollout.

- The prototype weighs 24.5 pounds without fuel. With a JetCat P-80 the model needs about 100 feet of pavement or Grass to get airborne when max-Performed and can be taken off easily within 200 feet.

- You can use 1st position flap on take off, anymore is only increasing drag.

- When properly trimmed, the model will exhibit no tendency to "leap" of the ground or be pitch sensitive.

- Make a few laps to get used to the model and get it trimmed.

I want to thank you for choosing this model. I think you will enjoy it as much as I have. If you have any questions or technical problems I will be more than happy to assist you as best I can. I look forward to seeing you at the field. Good Luck.

Patrick McCurry