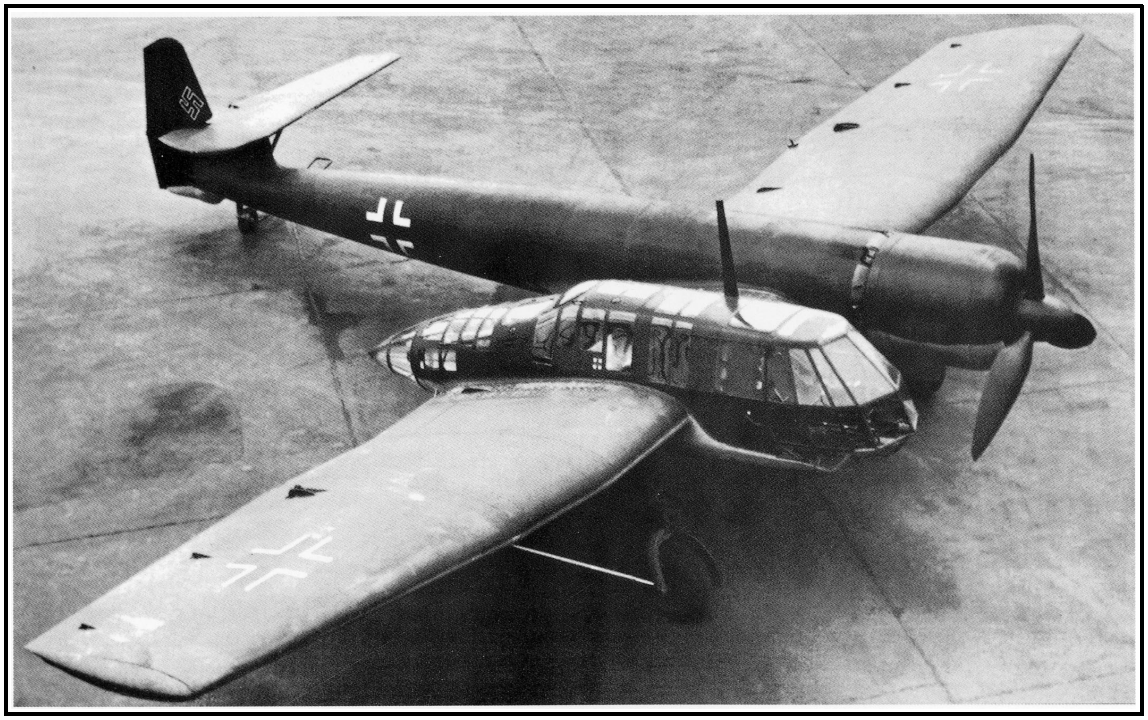
# Blohm & Voss
# Bv 141B



a Radio Controlled Model
in 1/8 Scale

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# 1 General Building Notes

This model features mostly conventional construction methods and so should present few problems to the experienced builder. The crew nacelle will require some special care, particularly if the builder chooses to install clear glazing.

## 1.1 Getting Help

If you need help or advice, please don't hesitate to contact us. Email and phone are listed on the title page.

## 1.2 Building Options

There are a number of areas where both a semi-scale (simplified) and true-scale construction are noted. You should decide at the outset how scale you wish the model to be.

## 1.3 Engine Choices

The model will fly well with a .90 if it is light (10-12 lbs). If you install retracts and much scale detail you will most likely go beyond that weight. For a 12-15 lb weight I recommend a 1.0 or 1.20 engine.

The Bv 141 features a fairly narrow cowling. The only way to have a completely hidden engine is to go electric or use the RCV 1.20.

The prototype model was flown using the Evolution 1.00NX. This is an excellent engine for this model. Ours ran perfectly right out of the box and we have **never** touched the needles. Be aware, however, that the Bisson Pitts-style muffler available for this engine **does not** fit within the Bv 141 cowl.

## 1.4 Retracts

This model was more or less designed around the Robart 630 series retracts with 1/2” Robostruts. See plans for details. Other retracts can be used of course, but keep in mind that the retraction angle is roughly 96 degrees because of the wheel wells being in the outer wing panels. If you plan the retract installation properly, you should be able to fit all of the equipment in the wing.

# 2 Upper Fuselage

Fuselage construction begins with laying down and securing the 3/16” square crutch pieces (4) over the plans. There is a joint in the crutch at former F9. Next glue the formers to the crutch, starting with F1 and moving aft. Use the former jig to get the correct angle to the building board. **Don't use a square.**

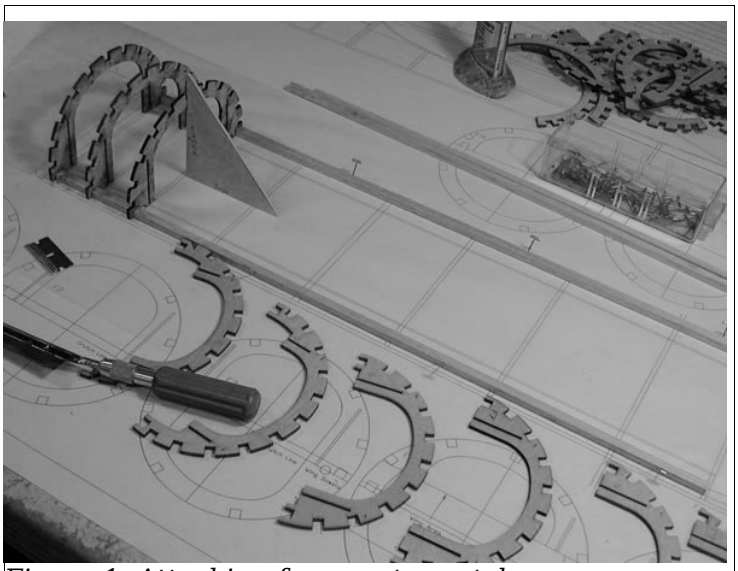

*Figure 1: Attaching formers to crutch*

F1 is the only former where this is critical, but it is better if they are all aligned perpendicular to the flight direction. You can use CA glue for all formers as none of these joints are structural. Most of the crutch will be cut away later anyway.

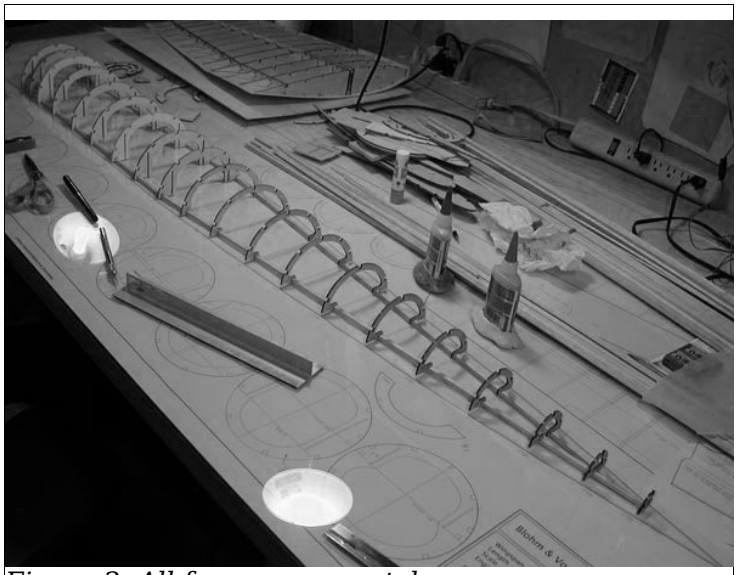

*Figure 2: All formers on crutch*

## 2.1 Upper Fuselage Stringers & Sheeting

Next the 3/16” square stringers are glued into the notches in the formers. A little care here will result in a very smooth base with little sanding required before sheeting.

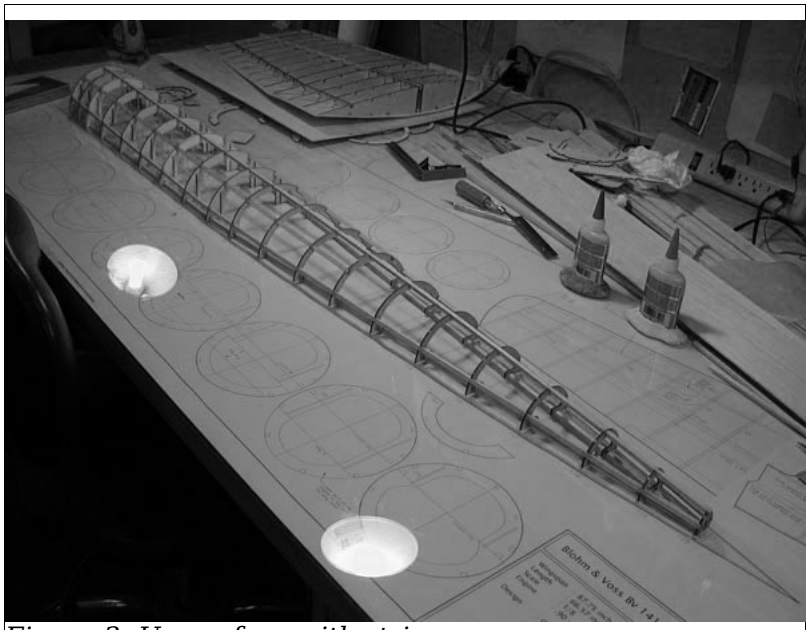

*Figure 3: Upper fuse with stringers*

Now sheet the top of the fuse down to the bottom stringer using your preferred method. We recommend that you use contest grade balsa (4-6 lb) aft of the wing trailing edge for a lighter tail.

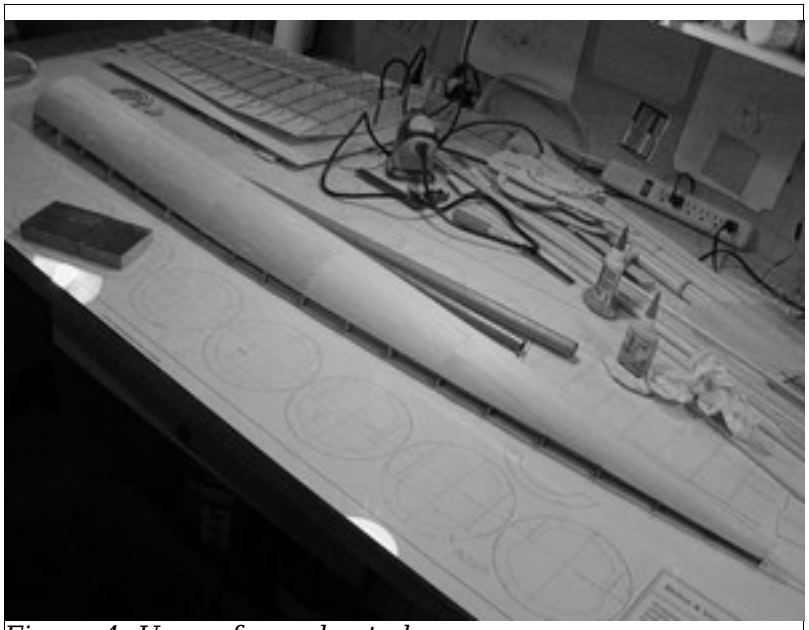

*Figure 4: Upper fuse: sheeted*

## 2.2 Lower Fuselage Formers & Stringers

Once the glue is dry on the top sheeting, you can remove the upper fuse from the building board. Turn the fuse over and cut out the crutch from F9 all the way to the tail. The crutch is no longer needed and this will result in a lighter tail.

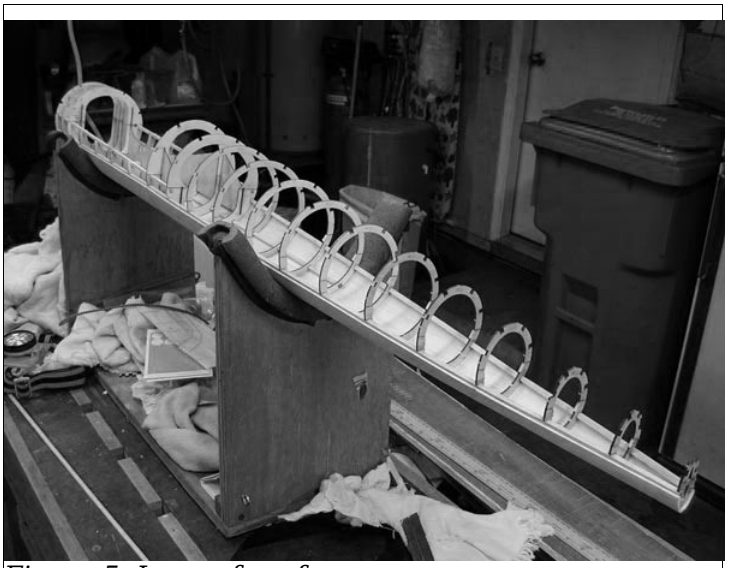

*Figure 5: Lower fuse frame-up*

Next, install the 1/16” fuse stiffner/wing saddle into the slots on F1 – F9. Use epoxy for this glue-up. Install the lower fuse formers (F1) – (F20). Once again, use epoxy on all joints involving aircraft ply (but not lite ply). The (F7) pieces should be epoxied to each side of F7 and the 1/16” stiffner. The remaining lower fuse formers can be attached with thick CA.

*Figure 6: Fuse stiffner & wing saddle*

Note that (F8) needs to be cut at the wing TE and repositioned at an angle. Use the stringers and/or a ruler as a guide, it should end up flush with F9 & F10. In other words, you can put a ruler up against F9 & F10 as a guide to positioning (F8). It helps to have at least one stringer in place to hold (F8) while positioning and gluing it in place.

When the glue on the lower formers is dry, you can install the 3/16” sq. stringers. Use soft light balsa sticks aft of the wing trailing edge if possible, again to make the tail ligher. Also cut away the crutch and the lower part of formers F4 – F6 in the wing saddle area. The formers should be flush with the wing saddle in this area. Don't sheet the lower fuse yet.

## 2.3 Stab Support

Install the stab support strut plate between F18 & F19. See plans for details. The plate and it's balsa facing are provided with the laser cut parts.

# 3 Wing Center Section

## 3.1 Box Spar Construction

The wing center section is built around a lite ply box spar. This is to allow the remainder of the wing structure to be cut away in the crew nacelle area. There is no wing structure in the full size crew nacelle, only a box covering the spar, which was tubular in the full size.

The box spar is made up of five lite ply pieces and 1/4" triangle stock reinforcement. The light ply pieces feature tab lock construction and should be self-aligning. Start by attaching the side pieces to the building board. Next attach the 1/4” triangle stock pieces to each of the side pieces, securing them with pins and/or weights. Use epoxy for all construction on the box spar.

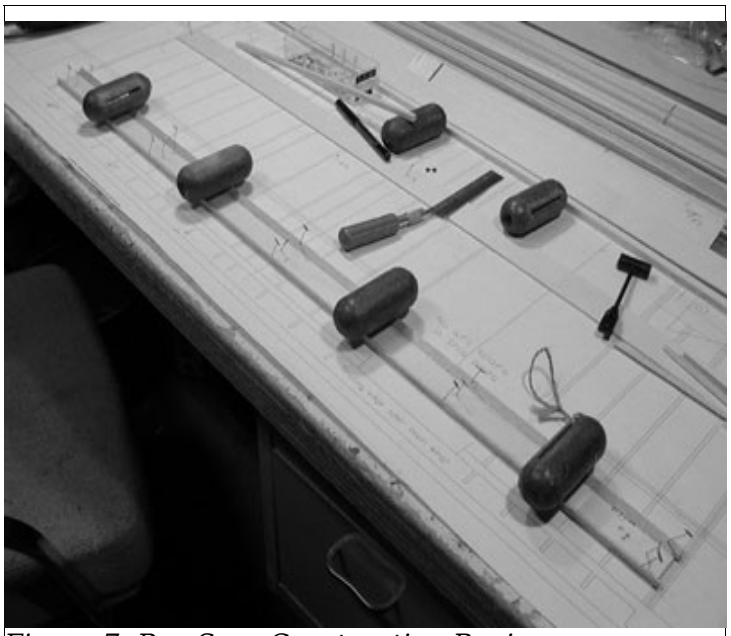

*Figure 7: Box Spar Construction Begins*

Next, attach both side assemblies to the bottom piece. Secure them with pins and/or weights. After this cures, remove the pins/weights and glue the top piece on. Secure with weights. When this cures, glue in the dihedral brace support pieces in the end.

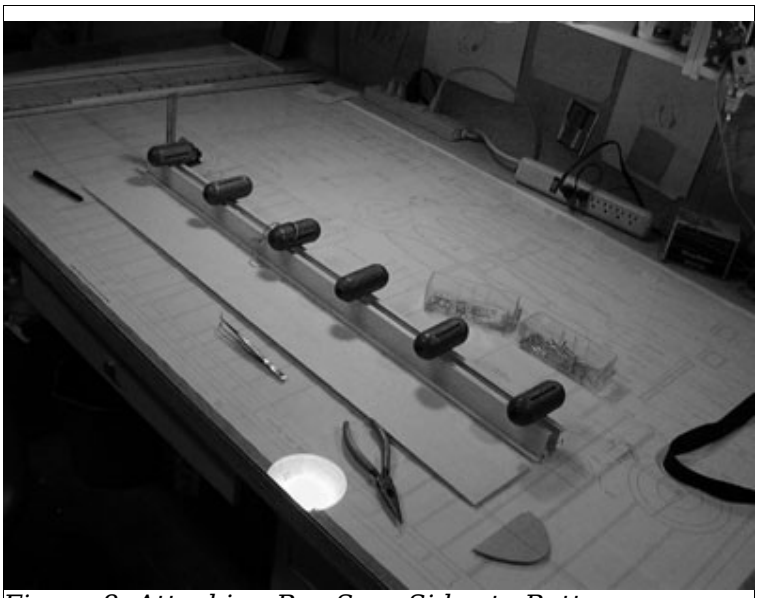

*Figure 8: Attaching Box Spar Sides to Bottom*

## 3.2 Attaching the Ribs, Stringers & Rear Spars

Block up the box spar on the plans by 1/4" with scrap or the rectangular rib knockouts, but don't secure to the building board yet. Place blocks at four locations:

1. at the left end between W22 & W23
2. in the fuselage area between W10 & W11
3. in the nacelle area between W15 & W16
4. at the right end between W19 & W20

Laminate the retract plate support doublers W4D, W5D & W6D to their respective ribs with epoxy.

Slide the center section ribs onto the box spar in sequence, grouping them into three groups. Place them right side up, so that the top of the wing is upward, and the bottom faces the building board. Once the spar is secured to the blocks, you won't be able to move the ribs across the blocks.

Take care when installing ribs on the left side of the center section. You need clearance to the side of W4/W5/W6 to slide in the retract plate before gluing in the ribs next to this area. On the right this isn't a problem because you have a lot of room between W15 & W16. Glue in the retract plates with epoxy once their respective ribs are in place.

Now within each section, bunch all of the ribs together at the far right. Slide them over one at a time to the far left, aligning them over the plans and gluing

them in place.

*Figure 9: Attaching Ribs to Box Spar*

### 3.2.1 Stringers and rear spars

When the glue on the ribs is dry, glue in all of the 3/16" and 1/8" top stringers. The stringers and sheeting will be cut away later in two places. The first is the fuselage area forward of the stab. The second is the Nacelle interior, should you choose to install one. However, it is easier at this stage to just install the stringers and sheeting across the entire center section. These areas can be cut away later after assembly.

*Figure 10: Stringer and Rear Spar Installation*

Also at this time, install the lite ply and 3/16” sq. balsa rear spars.

## 3.3 Leading Edge & Wing Dowel Supports

Install the 1/4” x 3/4” leading edges. Note that there is a laser cut LE between W9 & W10, and also between W11 & W12. These parts have a pre-cut 1/4” hole for the wing dowel. The leading edge can also be installed after sheeting at the builder's preference. It's better to install WD1, the rear dowel support, before sheeting the top of the wing. It can also be done later.

## 3.4 Sheeting the Upper Center Section

Using a large T-bar sander or sanding block, sand the upper surface of the center section smooth. If you've taken care in building you should have a fairly smooth surface to begin with and a lot of sanding won't be necessary. When this is done, you can sheet the top of the wing center section using 3/32” balsa. Once again contest balsa is recommended aft of the CG. When the glue is dry, flip the center section over and secure it to the building board.

## 3.5 Equipment Installation in the Wing Center Section

Now is the time to think about all of the working parts you will be installing in the wing. Once the bottom sheeting is on, it becomes a lot harder to install anything.

Keep in mind that most of the radio equipment will be installed in the fuselage. The retract gear can all be mounted within the wing if you plan the installation

carefully. You will have to route wires and air lines to where these items are installed. The box spar makes a great conduit for some of this.

The air tank for the Robart gear should be installed at this time. It will fit within the wing, but once installed and the wing sheeted, you will not be able to remove it.

*Figure 11: Equipment Installation in Wing Center Section*

## 3.6 Flaps

You should also decide at this time whether you will install flaps or not. The flaps on the Bv 141 are in five pieces, three on the center section and two more on the outer wing panels. This makes for a certain amount of complexity that is unavoidable. The flaps themselves are the split variety and so are simple in operation. You can either use five small servos, or link the outer wing flap sections mechanically. If you do this it is possible to drive all five sections with two servos, one on either side of the nacelle. Flaps were not installed in the first prototype. Flying experience has shown they are not really needed. You may still want them for scale effect of course.

## 3.7 Rear Wing Hold-down

Laminate the wing rear hold-down plate from the laser cut 1/8” and 1/16” ply pieces using epoxy. This makes a finished thickness of 3/16”. Glue the plate and the two rib doublers (WFD) using epoxy. Install 1/4” balsa triangle stock on the sides and rear of the hold-down plate to reinforce it.

## 3.8 Conduits

Before sheeting the bottom of the center section, make sure you have provision for running any servo wiring and air lines through this area. I like styrene plastic tubing for servo wires. It works well for air lines also. If you're planning to do a scale interior in the nacelle, run any necessary wiring and air lines through the box spar. You can cut small holes, up to 3/4” diameter, in the front or back of the box spar without compromising its strength. Make sure they are centered though.

## 3.9 Outer Wing Panel Attachment Bolts

See the upper right part of the wing plan for details. The bracket for the blind nut should be installed on the front of the box spar before you sheet the bottom of the wing. You can install the blind nut now, or later when attaching the outer wing panel. If you wait until later, you will have to cut some sheeting away for access.

## 3.10 Sheeting the Lower Center Section

When you're satisfied that all internal work on the wing center section is done, you can sheet the bottom.

# 4 Vertical Stab & Rudder (Semi-scale)

The fin is constructed from 5/16” x 1/4” sticks and sheeted with 3/32” balsa. Once again contest grade sheeting is recommended for the tail. You should decide at this point if you want to go semi-scale or precision scale. For semi-scale, you also need to decide if you want to use an internal (hidden) elevator linkage. A flexible pushrod can be used on the elevator, curving up from the fuselage. However, in addition to not looking very good, this arrangement will most likely result in a lot of slop in the linkage. I wouldn't recommend it.

## 4.1 Fin

Start by building up the fin framework over the plans. Make sure you build the fin to 5/16” thickness. The finished (sheeted) fin should be 1/2” thick (5/16” + 3/32” + 3/32”).

If you choose to do internal linkage for the elevator, the control lever needs a slot in the fin framework and in the upper rear fuselage. The easiest way to accomplish this is to use 1/4” x 1/8” pieces for this area. You can also dig out a slot after assembly, but this is more difficult. See the plans for details and location of the slots.

Shown in Figure 12 is the semi-scale fin construction. The scale fin and rudder differs mainly in outline and hinge details. The full size featured offset hinges on all control surfaces to reduce stick forces.

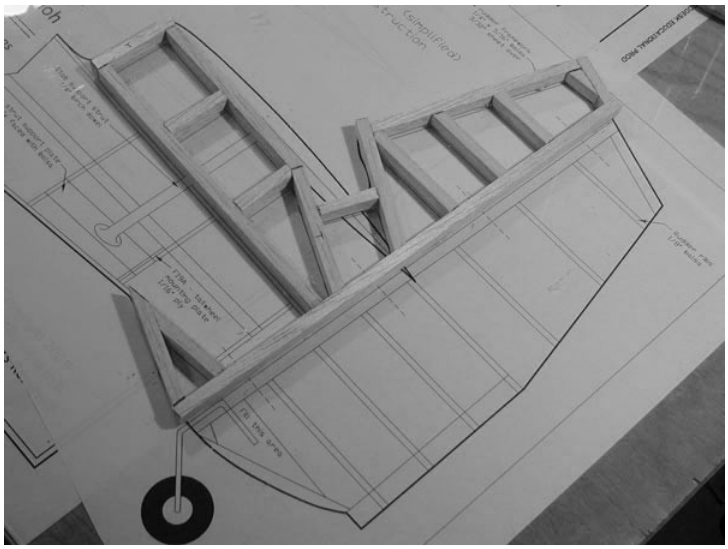

*Figure 12: Semi-scale fin construction*

After the fin is removed from the building board, sand the upper part to an airfoil shape.  Also sand the front of the stab support to give it a rounded leading edge.

*Figure 13: Shaping the fin*

Temporarily mount the fin to the fuselage and work out the elevator and rudder pushrods & linkages.  Shown is a removable lever-type hidden elevator horn, which extends through slots in the framework into the fuselage below.

*Figure 14: Attaching the fin to the fuselage*

In Figure 15 is a close-up of the elevator horn. You can also permanently attach a horn to the elevator if you don't need a removable stab. This was done on the prototype mainly so the elevator incidence could be easily adjusted.

*Figure 15: Elevator horn detail*

Now is also a good time to install a piece of tubing to house the radio antenna in the rear fuselage.

Before sheeting the lower fuse, you should make sure all of the internal installation is done. Check the following:

- Stab support strut hard point (See Section 2.3)
- Rudder & Elevator pushrods
- Receiver antenna wire conduit

Sheet the lower fuse, again using 4-6 lb. balsa aft of the trailing edge. Sand the formers, stringers and sheeting flush with the wing saddle, which is defined by the 1/16” ply fuse stiffener pieces.

## 4.2 Rudder

The rudder is a straightforward build-up of 1/4” x 3/8” spine, 1/16” sheeting and 1/8” ribs. Fill the bottom area with solid balsa and don't forget some extra 1/4” x 3/8” pieces to hold the hinges.

# 5 Attaching the Wing to the Fuselage

The wing center section is attached to the fuselage with dowels in the leading edge and hold-down bolts in the rear. The lower wing fairing is built up from the lower parts of the fuselage formers attached to the wing.

*Figure 16: The Wing - Fuselage Joint*

Start by installing the wing center section on the fuse. Cut a hole in the sheeting as shown. Align the wing carefully and then install the wing hold-down bolts.

Put some wax paper between the wing leading and trailing edges and the fuse as shown. Now glue up the lower wing fairing formers. Figure 16 shows the front and rear formers already glued in place. Once these are glued securely, you can remove the wing from the fuse and finish the fairing as follows.

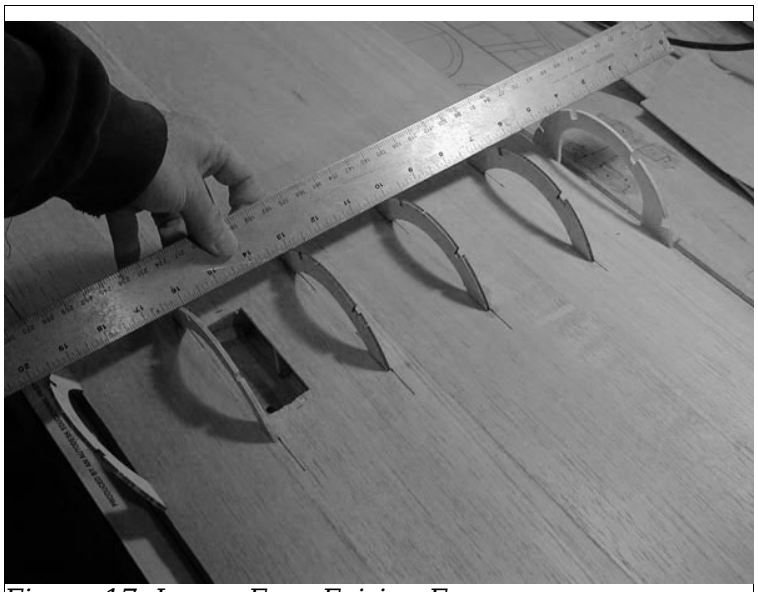

*Figure 17: Lower Fuse Fairing Formers*

Measure and mark the locations of the remaining formers using the plans for reference. Attach the remaining lower fuse formers, aligning them as shown.

Now put the wing back on the fuse. Make sure the front and rear formers are snug against their “mates” on the fuse. Glue in the stringers as shown.

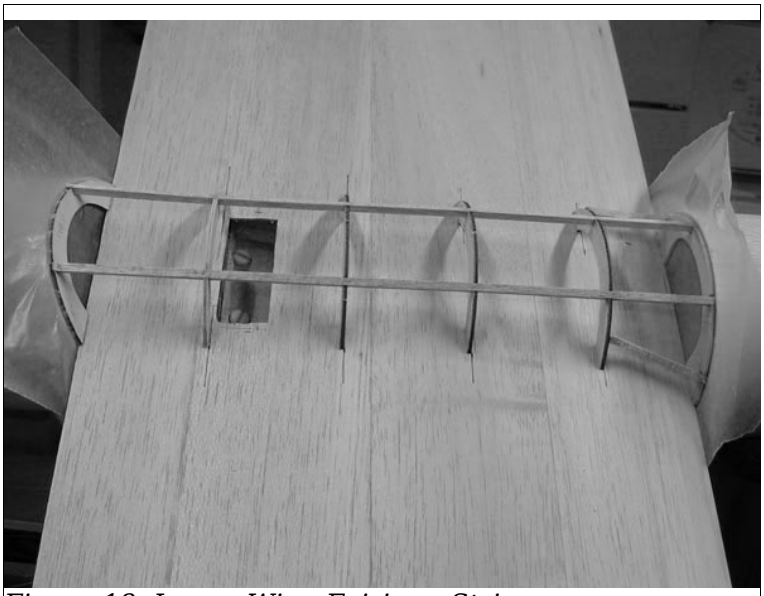

*Figure 18: Lower Wing Fairing - Stringers*

You can now sheet the fairing with 3/32” balsa using your perferred method.

Mount the wing center section to the fuse. Lay the assembly on a flat surface as

shown in Figure 19. Now you can align the fin perpendicular to the work surface and glue it in place.

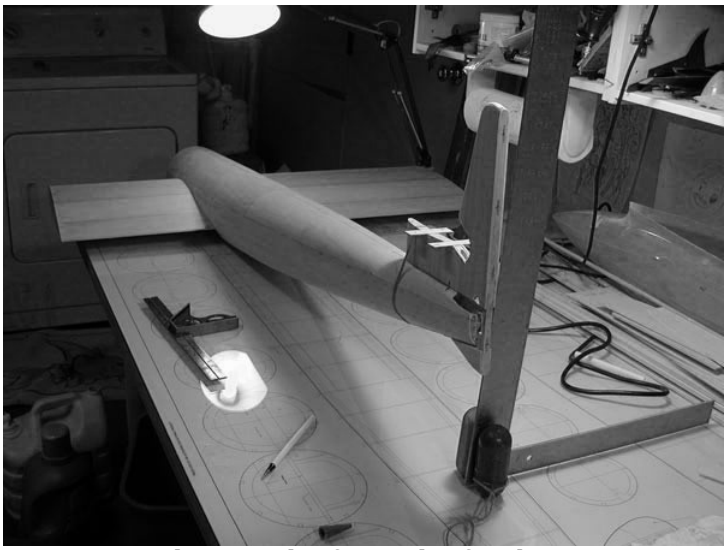

*Figure 19: Aligning the fin to the fuselage*

# 6 Stab & Elevator

The unusual looking offset stab on the Bv 141 was not for any aerodynamic purpose. It was offset simply to give the rear gunner an unobstructed field of fire. The support strut is structural and **required**.

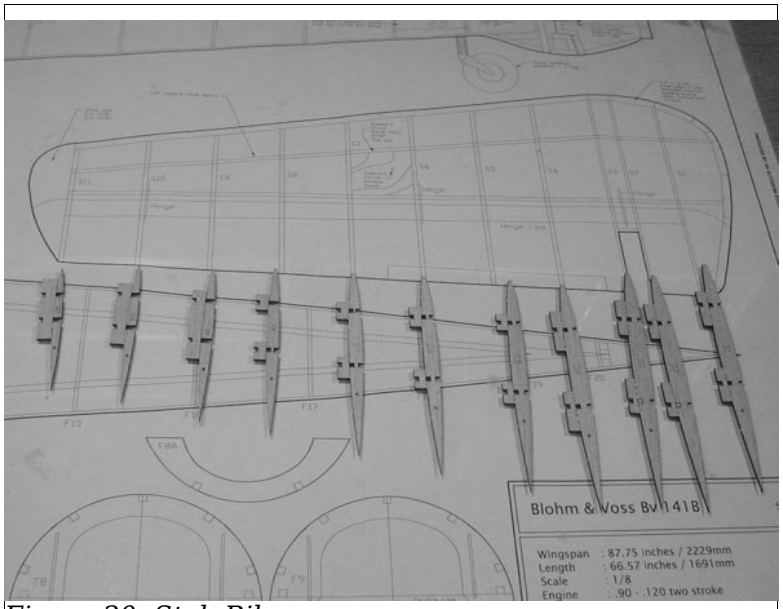


*Figure 20: Stab Ribs*

Because the lower stab spars are “trapped” by the feet, you will need to “skewer” ribs S1 – S8 on the bottom spars before going further.

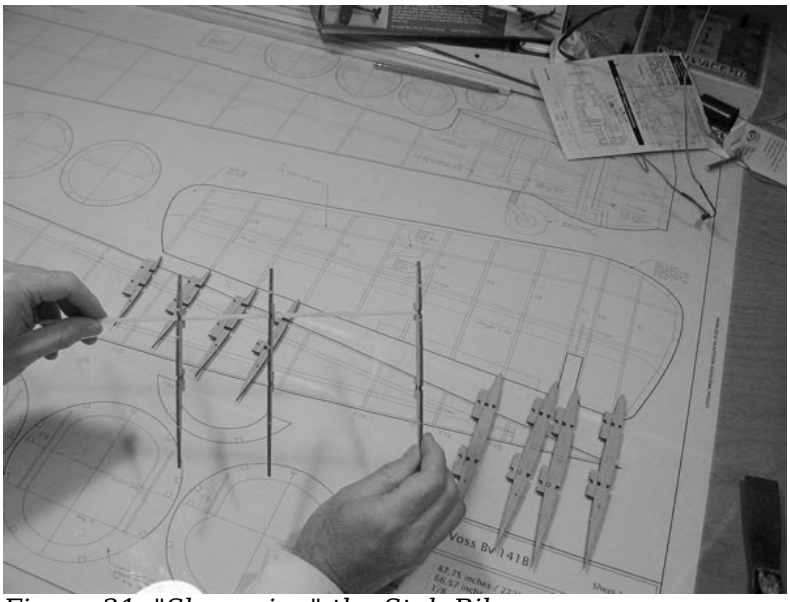

*Figure 21: "Skewering" the Stab Ribs*

Now attach the stab ribs to the building board, aligning them over the plans. If you are using pins, you may need to use very fine pins or pre-drill holes as the feet are narrow and may split. You can also attach 1/8” sq pieces and put the pins through those. Once the ribs are all attached to the building board, glue the remaining 1/8” square spars in place.

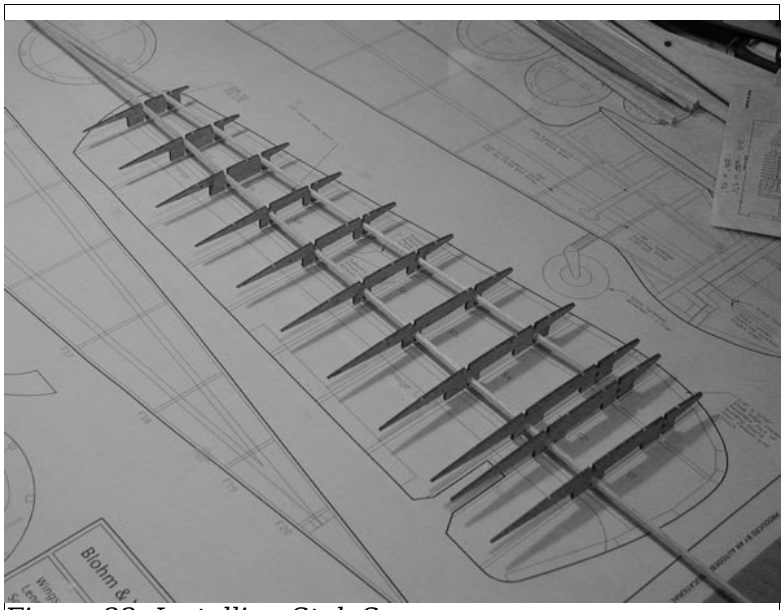

*Figure 22: Installing Stab Spars*

The stab right edge is a laser cut piece due to the unusual shape. Glue it to S1 and S2. Pinch the spars together and glue them to the edge piece.

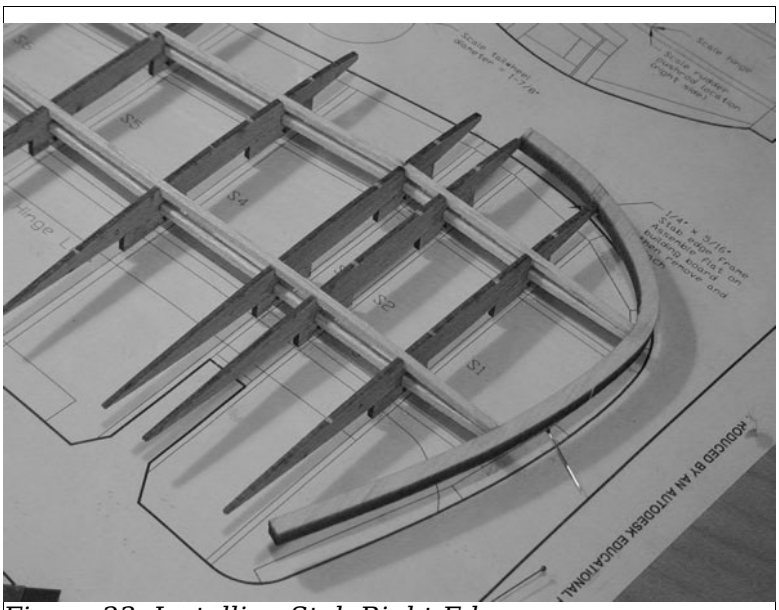


*Figure 23: Installing Stab Right Edge*

It is helpful to glue a reinforcing spacer to the trailing edge area between the right edge piece and the rib S1. Install the 1/4” sqare stab LE. The stab tip is a lamination of two laser cut pieces, ST1 & ST2. You can use thick CA for this. Don't attach the tip until after sheeting the stab.

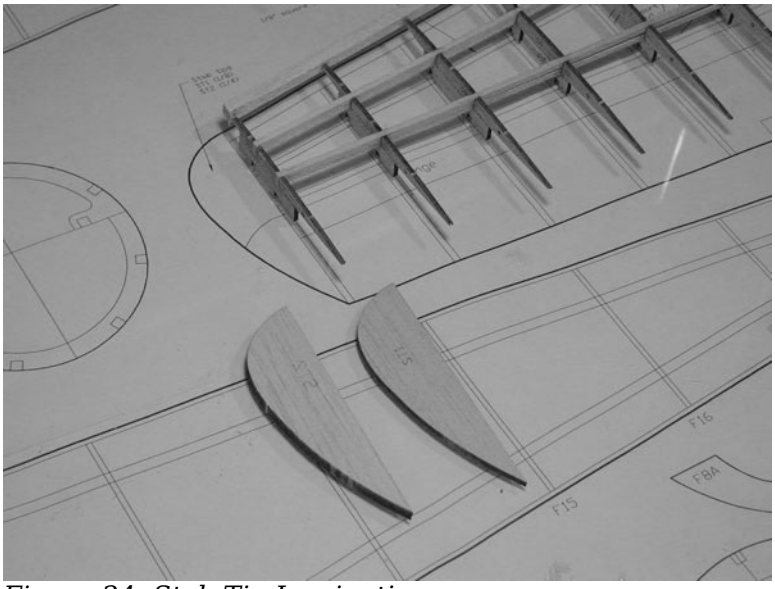

*Figure 24: Stab Tip Lamination*

You can now shape the stab LE and right edge using a block sander, or to make this job easier, a mouse sander is recommended. This tool is a good investment, it makes the finishing process much easier later.

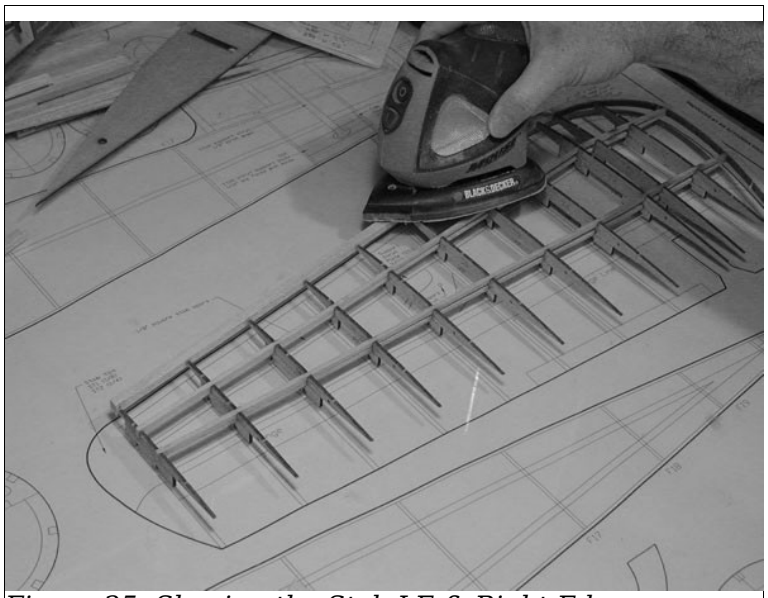

*Figure 25: Shaping the Stab LE & Right Edge*

You want to end up with a nice smooth airfoil shape prior to sheeting.

At this time you should decide what hinging method you will use for the stab. You should install any hinge blocks now. You may also want to install filler blocks around the area where the stab attaches to the fin to reinforce this area for the installation of an elevator horn. You can also make the stab removable by installing plywood plates to the fin and securing the stab with screws. If you choose to do this, you will need filler blocks or plates to hold the screws.

Once all the internal structure is in place, you can sheet the top of the stab with 1/16” balsa. We recommend sheeting the right-hand part (from S1 – S3) separately because of the slight compound curve. After sheeting the top, you should be able to remove the stab from the building board by gently rocking it back and forth to 'break' the perforated feet off. Sand the bottom smooth. Install the stab strut support plate (3/32 lite ply – laser cut) Laminate a piece of 1/8” or 3/32” balsa to this plate and sand it to conform to the ribs. This will provide a firm foundation for attaching the support strut. **Do not omit the support strut. It is functional and required!**

Once you're satisfied all needed internal structure is in place, install the bottom 1/16” sheeting. Using a scroll saw or band saw, cut the elevator off, finish and hinge.

# 7 Engine and Cowling

## 7.1 Firewall Fairing

Glue the circular 1/4” balsa firewall fairing pieces to the front of the firewall. Sand to a rounded shape as shown on the plans.

## 7.2 Firewall extension box

The supplied firewall extension box is sized to fit the RCV 1.20 since it mounts directly to the firewall. It should also be adaptable to other engines in this size range with an adjustable composite engine mount. The box is made of laminated 1/8” pieces. Glue these up and then build up the box. The firewall extension can be made removable with some long bolts if desired.

## 7.3 Cowling

Finish the fiberglass cowling in the usual way. See notes in Section 9.1 for details. The nose ring is custom weighted to order. When you know its desired weight, give us a call and we'll make one for you. Maximum weight of the front ring is about 9 ounces. A simple solid resin ring weighs about 3-4 ounces. If you need more than 9 oz, attach some lead to the inner front edge of the cowling itself. If you go much beyond the nine ounces, I would recommend reinforcing the cowl support framework with fiberglass or carbon fiber.

# 8 Outer Wing Panels

The outer wing panels feature polyhedral. The outer sections do not require shear webbing because they are so short. The reason for the polyhedral, near as we can tell, was to allow room for the wheels on retraction. You will notice that you can place a ruler on the bottom of the outer wings and it will touch all the way out. The polyhedral really only shows on the upper skin.

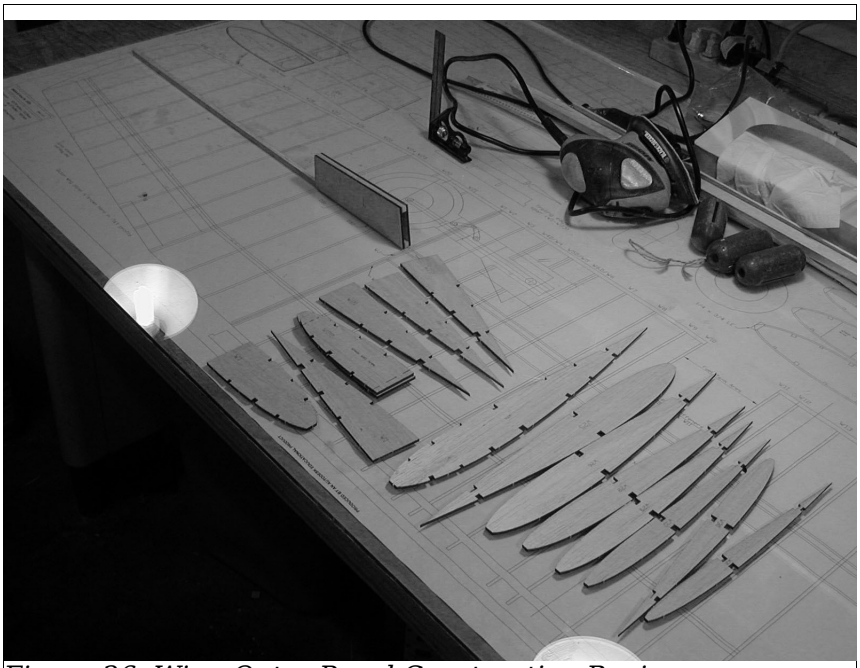

*Figure 26: Wing Outer Panel Construction Begins*

## 8.1 Basic Construction – Left Outer Wing

Start by cutting the 1/4” sq. spars to length and gluing them to the outer dihedral braces DB1 & DB2 using epoxy. Make sure you get the orientation of these two parts correct, they are not identical. We'll start with the left outer wing. Gather up the ribs W1 and W21 – W32.

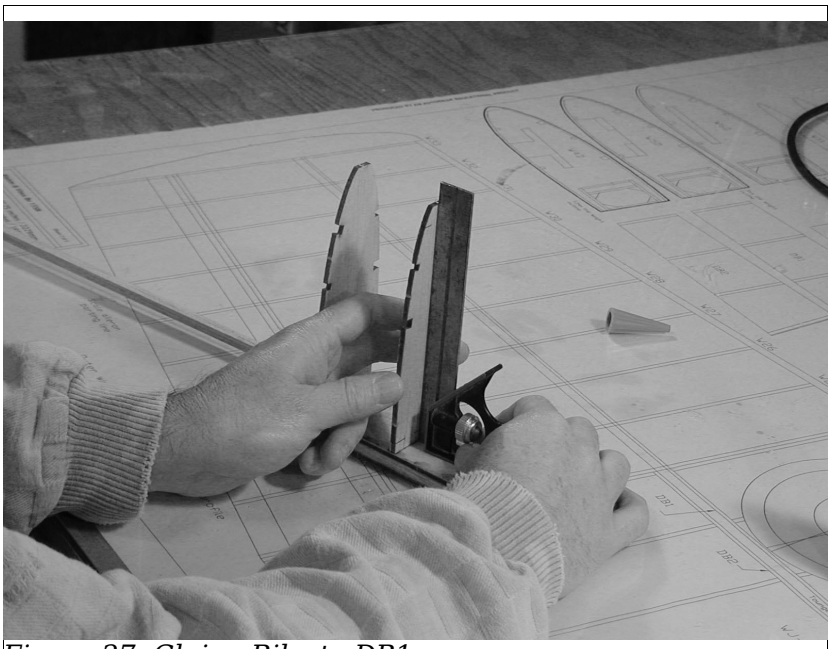

*Figure 27: Gluing Ribs to DB1*

Glue the front half of ribs W1, W21, W22, and W23 to DB1. Mind the dihedral angle built into DB1 & DB2. Rib #1 should be glued flush to this edge. Next glue the rear half of these same ribs to the back of DB2.

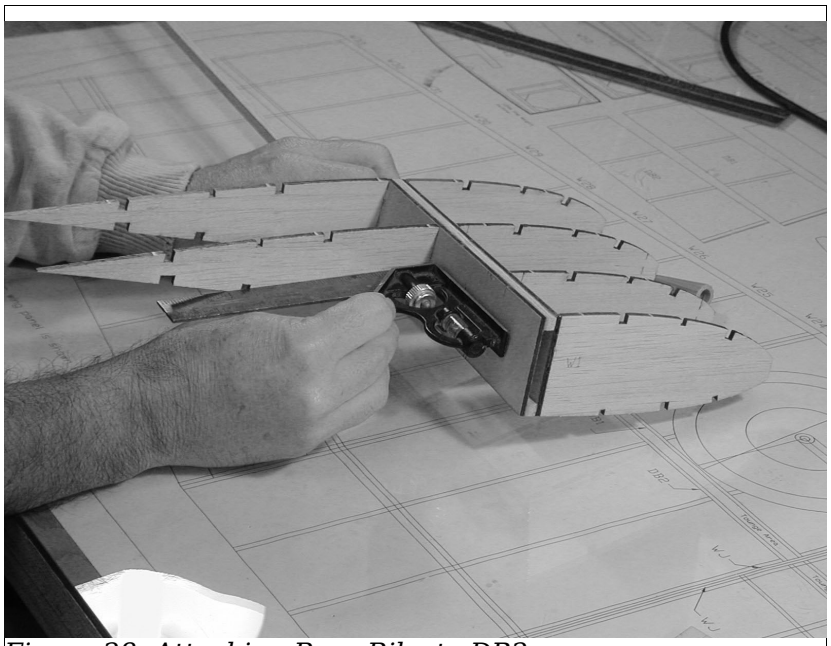

*Figure 28: Attaching Rear Ribs to DB2*

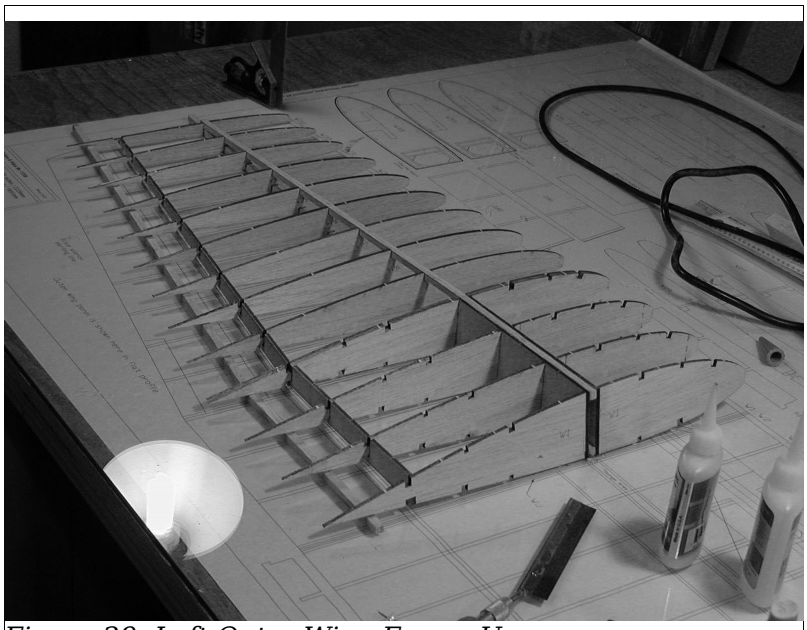

*Figure 29: Left Outer Wing Frame-Up*

Next attach this assembly to the building board and block up the trailing edge with 1/4” sq balsa. Install the remaining ribs and upper spar. Install the rear spars and stringers. Don't install stringers in the wheel well area, as these would have to be cut out later anyway. Decide on your hinging method and install any needed hinge blocks. Sand smooth, sheet the top of the wing and remove it from the building board. Don't worry about the twist (wash) of this panel yet. The wash isn't fixed until we install the bottom sheeting.

## 8.2 Outer Wing Panel Attachment

The outer wing panels are secured to the center section using a bolt accessed from the wheel well. Once the upper sheeting is installed on the outer wing, use the wing joiner (tounge) to join the panels and install the attachment bolt. You will also need an alignment pin at the rear spar. The 1/32” ply wing end caps are pre-drilled for the alignment pin.

## 8.3 Aileron Servo Support Rails

Install the provided support rails if you don't mind having the servos protruding from the wing. If you want an internal installation, install the required framework now. Also don't forget you will need some kind of conduit for the aileron servo wire. It's easy to route the aileron servo wire through the box spar and then through the outer wing with some plastic tubing.

## 8.4 Bottom Sheeting

When you are satisfied that all needed internal structure is in place, attach the outer wing to the building board again and block up the root and tip trailing edge to give the desired washout. The prototype was built with 4 degrees of washout. This can be achieved by blocking up the root at zero incidence (LE and TE same distance from board) and then blocking up the tip TE at the trailing tip of the rib W33 with a 1/4” sq balsa piece. See Figure 30. You will have to push the trailing edge of the wing down and secure it. You should then block up the leading edge to provide a firm foundation for sheeting the bottom. We would advise at least 2 degrees of washout, which would mean blocking up the trailing edge by a larger amount. You'll need an incidence meter if you want to measure this precisely.

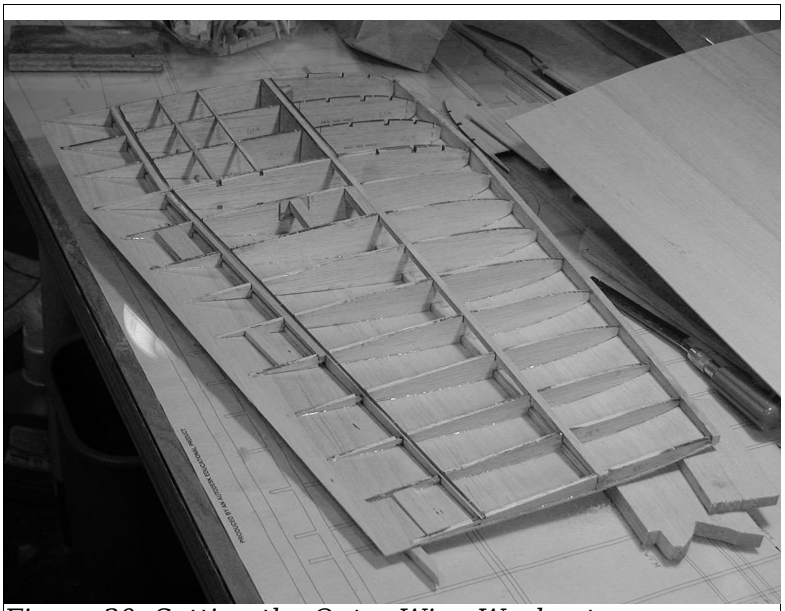

*Figure 30: Setting the Outer Wing Washout*

Check once more to make sure all internal structures are in place. Sheet the lower wing with 3/32” balsa.

## 8.5 Right Outer Wing

The right outer wing is built up in the same way as the left. One difference is that you will need ballast in the right wing tip because of the assymetric design of the Bv 141. If you think you may make changes to the model after it flies for the first time, it may be advisable to install a ballast box in the right wingtip. It is then easy to vary the amount of ballast as you make changes in the model's configuration. This is particularly advisable if you plan to do the interior of the nacelle after the first flight.

# 9 Crew Nacelle

The fiberglass crew nacelle makes it possible to produce a really scale looking model of the Bv 141. It also makes this strucrure much easier to build. Previous designs required building up this structure from wood and then attaching clear pieces. A very time consuming and laborious process. That's not to say that this will be fast or easy, even with the fiberglass parts. It will, however, be easier than building it up from wood.

## 9.1 Preparing Fiberglass Parts

Begin with the usual preparation steps. Wash the parts first with warm water and detergent. Give the outside a light sanding with 320 or 400 grit sandpaper to remove any surface flaws and make the paint adhere better. If you plan to install clear glazing, wipe down the inside with Acetone. This is to remove any waxy residue so the glues will adhere better. Also rough up (key) the areas where the window frames will be, for the same reason. Spray the outside of the parts with a light coat of primer. Automotive spray-can primer works well. Fill any surface flaws with automotive spot putty or other filler and sand smooth. Don't use high-build primer or too many coats of primer as you will fill in the scribed window and panel lines rendering them invisible.

If you don't have a Dremel Moto-Tool, get one. Trimming and fitting fiberglass parts without one is way too difficult. You'll need the following attachments:

- drum sander
- 1/8” router
- circular saw

Believe me, once you have one, you'll wonder how you lived without it! The cutoff wheel is one of the most useful attachments, for cutting and deburring metal parts.

### 9.1.1 Trimming and fitting

The fiberglass nacelle parts come rough cut. They need to be trimmed all the way around. In the areas where the two halves meet, there is a cut line scribed into the fiberglass. See Figure 31 and Figure 32 for location of cut lines. On the faceted nose area of the nacelle, the cut line is not scribed. Once the scribed part is cut, you can see where the front part needs to be trimmed. It may be helpful to contact glue a piece of sandpaper to a board to help sand the halves flat in the nose area.

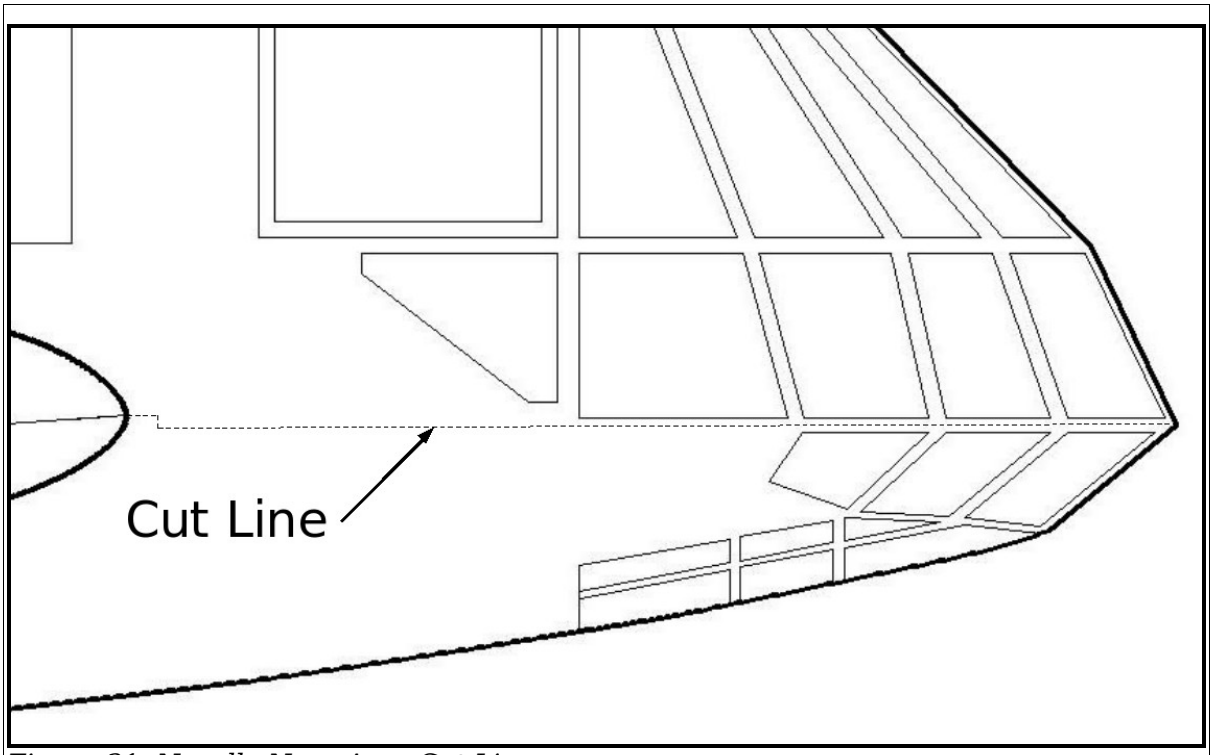


*Figure 31: Nacelle Nose Area Cut Line*

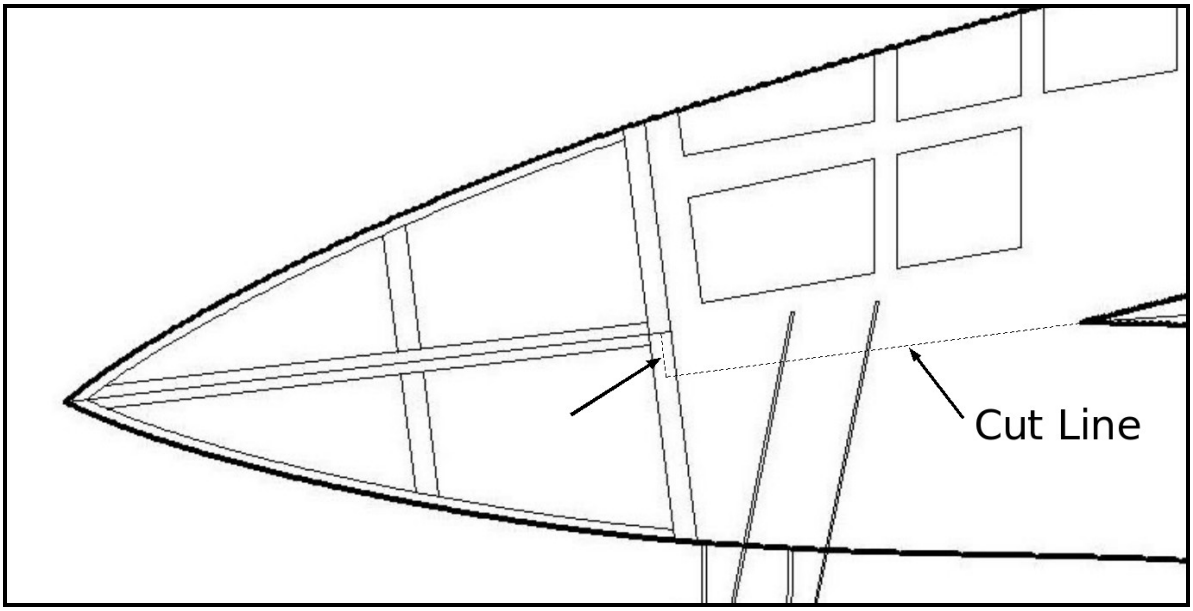


*Figure 32: Nacelle Tail Cone Area Cut Line*

In the fillet/wing saddle area, you need to trim/sand back the parts so that they mate properly with the wing.  This is because the nacelle mold included the

fillets and a stub of the wing itself. To achieve a proper fit, you have to sand away the part where the wing goes. See Figure 33 for an illustration of this. You should end up with a sharp edge, though I would advise sanding it dull so you don't cut yourself! A dremel with a sanding drum is a good tool for this.

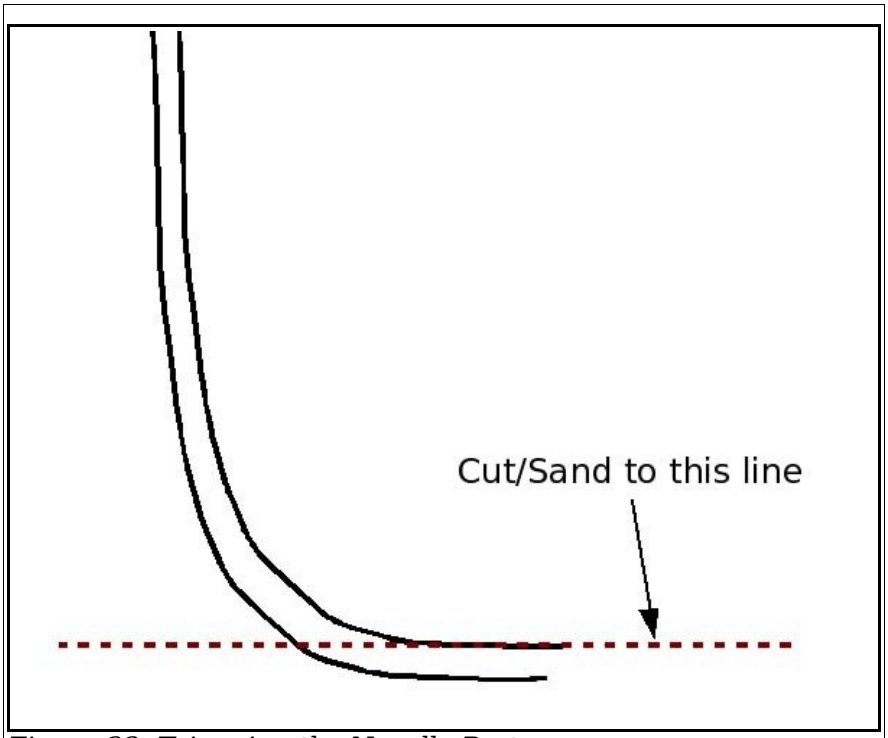


*Figure 33: Trimming the Nacelle Parts*

When you've trimmed both halves, test fit them on the wing center section. Continue trimming until you get a good fit. It doesn't have to be perfect. You can fill in small gaps later.

If you are going to install clear glazing, cut out the window areas now. The best tool for this is a Dremel with a circular saw attachment. Go slowly and carefully to avoid cutting through the framing. You can finish cuts with a razor saw to avoid this. Save some of the cutouts for testing glues later. After the openings are cut out, sand the cut edges smooth. A 'blade' sander works well for this. Just attach some sandpaper to a piece of thin plywood or plastic. Make it narrow enough to fit through the smaller window openings.

*Figure 34: Cutting out the Nacelle Windows*

Once all the window areas are cut out, some parts of the nose area and the rear cone have thin framework and are somewhat fragile. It's a good idea to use masking tape or similar to wrap these areas to protect them against breakage during handling when you're not working on those areas. They will be much stronger when the glazing is installed. It's not a bad idea to even 'splint' these areas by covering them with a backing material like cereal box cardboard. We broke these parts several times while building the prototype and they are a pain to deal with once they are broken.

At this point with everything smooth the nacelle is ready for attachment. If you are planning to install a scale interior, you can also install the floor and any formers at this time. Attach the bottom half of the nacelle to the wing permanently using epoxy.

*Figure 35: Attaching the Lower Nacelle Half to the Wing*

It is possible to attach the upper half of the nacelle to the lower half with screws or other fasteners. This makes the upper half removable, which is useful if you plan to finish the interior after flying the model. Just make sure whatever method you use is strong enough. You don't want the upper half separating in flight! Even a small gap or air leak can cause pressure to build inside the nacelle during flight and pop it off!

If you're going to permanently attach the upper half, don't do it yet.

## 9.2 Installing Clear Glazing

It is easiest to paint the model before the clear glazing is installed. Otherwise you will have to mask all of the windows. During the finishing process, try not to get paint on the inside of the window frames as this will weaken the window glue bonds. Some wide masking tape applied to the inside of the nacelle works well to prevent this.

We recommend 20-30 mil clear plastic for the flat clear panels forward of the CG. The windows that are curved need a thinner plastic to more easily conform. As many of these windows are aft of the CG, this has a weight benefit as well. 10 mil plastic is good for this. A variety of adhesives can be used. Test whatever you plan to use on some scrap pieces first. A vacuformed part is necessary for the area around the dorsal gun blister, as this area contains compound curves.

Once all the windows are installed you can detail the interior, if desired, and then permanently attach the upper half to the bottom half with epoxy. The seam area can be sanded and have touch-up paint applied.

# 10 Trimming for Flight

## 10.1 Center of Gravity

Note the CG on the plans. On this aircraft, the CG is definitely two dimensional. The lateral balance is **critical** and **is not** centered on the fuselage as with a normal plane. Depending on how the nacelle is constructed and its final weight, you will need to install some ballast in the right wingtip. On the prototype model with an empty shell for the nacelle, a little more than 7 ounces of ballast was required in the right wingtip. After clear glazing was installed, another 1.5 oz was required since the nacelle became lighter. With more internal structure and detail in the nacelle, less ballast may be required.

Balancing fore/aft is conventional. The CG marked should be considered the aft limit. You should start with the CG about ¼” forward of this and then adjust to taste. If you've kept the tail light, you shouldn't need a lot of ballast in the front cowl ring. When you have determined how much you need, give us a call and we will custom weight one for you.

## 10.2 Balancing Method

This is very important. **DO NOT** try to balance the model by hanging from a cord or rope. This method is unreliable. Mark the CG with lines on the bottom of the wing. Hold the model with your thumbs on the lines to balance, or use a commercial balancer. Do the fore-aft balance separately. Then do the lateral (left-right) balance. Recheck both before flying.

## 10.3 Recommended Control Throws

The control throws are not all that different from a conventional warbird. We recommend the following to start with:

| | |
|---|---|
| Aileron | 1/2” up/down |
| Elevator | 1/4” - 3/8” up/down |
| Rudder | 3/4” - 1” left/right |

## 10.4 Gyro for Rudder

The prototype model has been flown with and without a gyro on the rudder. The gyro is not needed at all in flight. It does, however, make ground handling easier and for this reason is worth installing in our opinion.

# 11 Flying the Bv 141

## 11.1 General Flying Characteristics

In general, the Bv 141 flies more like a sport plane than a warbird. Generous wing area and the resulting light wing loading means it has a wide speed range, among other benefits. It also means that this plane may seem like a floater to you if you're used to warbirds with heavier wing loading. The polyhedral wing makes it very stable in the roll axis.

## 11.2 Aerobatics

The model will easily perform all the basic maneuvers. The roll is actually crisper than one would expect given the asymmetrical configuration. Loops, rolls, split-S, Immelman, Cuban Eight, stalls (including vertical stalls) should present no problems. The prototype showed no tendencies to drop a wing or enter a spin from the stall.

So-called “provoked” spins have not been attempted and are **not recommended**.

## 11.3 Airfoil

The airfoil used is the Eppler 374. This is a very efficient laminar flow airfoil with a large speed envelope and is also very close to the scale profile. This model will fly fast on full throttle, but will slow to a crawl for landing.

## 11.4 Approach and Landing

On approach, keep the fuse level and use the throttle to control the descent. The model will slow down nicely. Don't try to fly it in hot. It isn't necessary and you will have trouble getting it to stay on the ground. Keep a click or two of throttle until you're over the numbers, then chop it back to idle and flare gently. A little more throttle will be needed on approach if it is windy.

| | |
|---|---|
| *Wing Area* | *1227 sq. in. (8.52 sq. ft.)* |
| Wing Loading @ 12 lb. | 22.5 oz. / sq. ft. |
| Wing Loading @ 15 lb. | 28 oz. / sq. ft. |