



*Dan DeBingio*

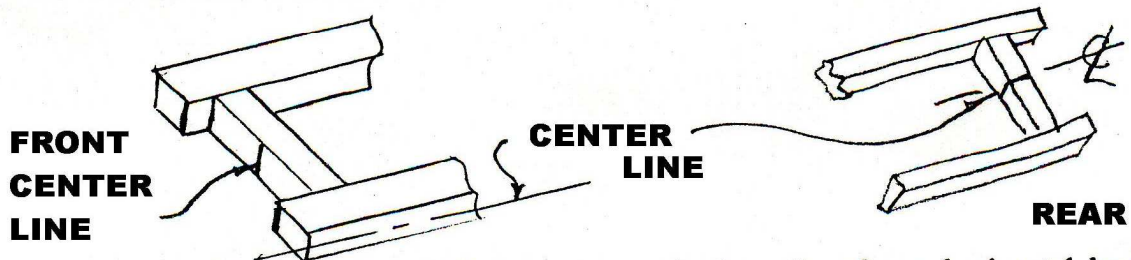


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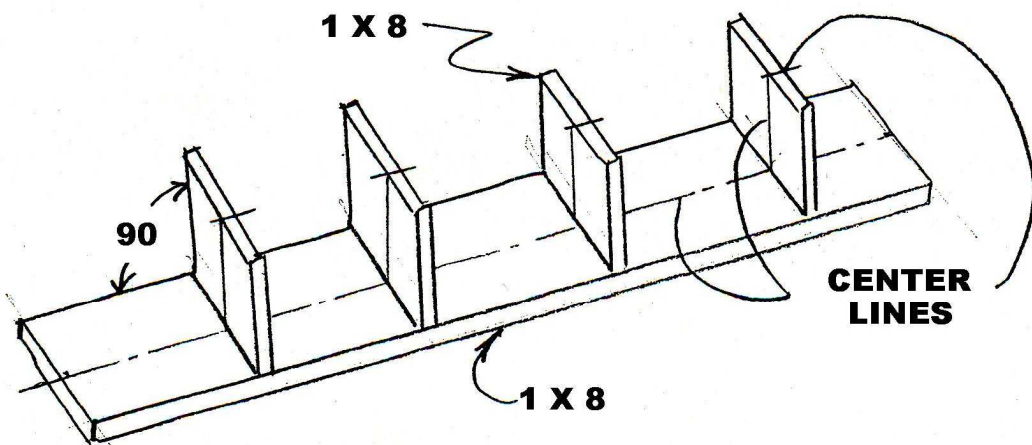
## FUSELAGE ASSEMBLY

Before beginning construction of this model, take the time to review the outline steps and compare them to that specific area of the plans. Review them several times, and if you have any questions, please call Meister Scale. REFER TO THE PHOTOS SUPPLIED WITH THE ASSEMBLY MANUAL.

1. Locate the crutch assembly on sheet #1. We will assume you have cut your bulkheads #B1 through B10. Place these bulkheads, one at a time, with the notches at the correct location, on the crutch. You are doing this to make certain your crutch (paper shrinks and expands) is the correct width at each station. If not, mark with a pencil/pen on one side of crutch drawing only, and then construct the crutch using the pencil mark to build the crutch. This difference between the kit parts and the plans happens sometimes when parts are cut by a kit cutter, and you are now trying to match them to "your plans". Locate a centerline on each side of the crutch from front to back, and the crosspiece where B10 is located?



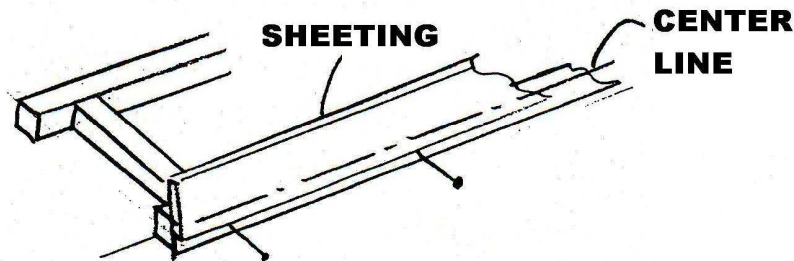
2. For round bottom fuselages, I usually construct a fuselage jig of one horizontal board; 12" wide x 8' with several (three or four) vertical pieces (same heights and parallel to each other) located at the bulkhead stations (use 1" x 8" x 8').



3. A simpler method is to cut two pieces of 1/8 or 1/4 ply 12 x 6 exactly the same height, and put aside. I use door skins, because they are flat with no warps in them. I also use 1" x 8" pine boards as shown in the photo section. Using epoxy or white glue, assemble B1 and B1A making sure you lay them flat to dry together. Using a 90° square, locate and glue B1, B4, (NOTE – B4, B4A, B4B, B6, and B6A can be assembled as a unit before installing on crutch) and B8 to crutch. Tack glue on each (3) of the 12 x 6 pieces to the backside of each bulkhead at the bottom edge of bulkhead. Locate a convenient spot on your table, and place the fuse and crutch assembly. You now can level and shim the 12 x 6s by eye to take out any warp in the crutch. You can use a level and 90° triangle – see photo section. After you do this, mark the location on your table of the 12 x 6s. If you move your set up, you can now relocate it.
  
4. Install the remainder of the bulkheads except for B10 making sure they are 90 degs to the crutch.
5. Locate horizontal stab platform (HF-1), and glue to crutch. Be careful to locate rear portion accurately – side to side. Line up CL. This will accurately locate the aft portion of the vertical stab.
6. Splice together seven sets of 3/8 x 36" stringers.  
  
Install between B1 and B8  
  
NOTE: Make sure when installing these stringers they are not warping the fuselage.
7. Locate top stringers (3) between B1 and B2/B2A then between B3 and B8 (1).
8. Install B10 using a 90° square. This is important, sooo, get it close.

## SHEETING:

1. Locate the center of the 3/8 crutch on each side.



2. Install pins along CenterLine of crutch about 12" from each other.
3. Install sheeting starting with FS1A/FS1B on each side, locating edge up against pins and, locating bulkhead, mark on FS1B on B8. Then, working toward the top alternately with FS2A/FS2B and FS2, install inside doubler, FS1B, one each side now.
4. Now install NY-rods in fuse, and brace every 6 inches or so. If you use outside NY-rods for the elevators, I usually cross them in the fuse, locating the left-hand elevator servo on the right-hand side of the fuse, etc. Do this before installing horiz stab.
5. Install top, front and back sheeting and maybe leave the bottom rear sheeting off for a while to make certain you are satisfied with your control rod setup etc. When you are satisfied with your rods and cable, set up, finish sheeting the bottom. On a personal note, I always leave access to the fuse through the bottom until the very last minute.
6. After removing fus from crutch, install B1A to backside of firewall – see photos. The piece is used to help form and glue wing saddles doublers FS4A on sheet #3. Add additional stringers to bottom of fuse between B9A and B10 after you install rods, cable, retract T.W. mechanism.  
  
See photo section.

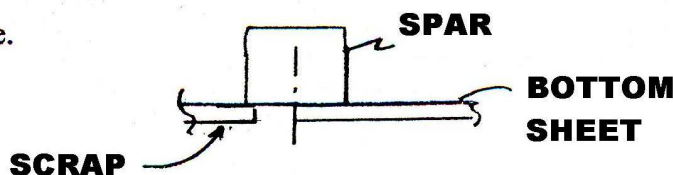
## WINGS

NOTE: This wing design has a flat bottom, thus no need for jigs, etc. However you will need a FLAT surface to build your wing on. The best flying airplanes have parts built with as little warp

as possible. Check your flat building surface with a 36 or 48 inch aluminum ruler. Spend the money. It's worth it. I build on a sheet (50" x 36") of 1/4" plate glass. I have mastered this, so it is easy for me.

Start with the left wing.

1. Check spar notches on ribs in width and depth. They should be 3/4 and 3/8 respectively.
2. After assembling your wing sheeting and marking it, notice your bottom sheeting is shorter than the top sheeting – notice the training edge of your top sheeting is longer.
3. Locate your aileron on sheeting, measure, and cut sheeting. Use masking tape to hold in position. Make sure tape is on bottom of bottom sheet.
4. Locate bottom sheeting on plans with front edge on mid-line of spar.
5. Install bottom spar on sheeting, locating front edge over plans, and glue to bottom sheeting. Use a straight edge to keep the spar straight. Use scrap balsa – 1/8 thick – to keep spar flat on front edge.



6. Locate and install W2 through W7 in place. Be sure they are 90° to sheeting.
7. Locate 3/8-sq. rear bottom spar between W1 "position", then W2 and flush on opposite side of W7.
8. Use a steel, etc. straight edge to make sure 3/8 sq. spar is straight before gluing to bottom sheeting.



9. Install rest of ribs.
10. Sand down back 3/8 sq. spar - Do the same for the area on aileron. These two spars can be used to locate your hinge line for your split flaps if you decide to install them.

11. Install gear sub ribs W4A and W6A. Make sure rear bottom edge is flat to bottom sheeting behind spar. Use clamps to secure to W4 and W6.
12. If L.E. of wing is "in your gut", install shear webbing on backside of top and bottom spar.
13. Install spar brace up to centerline. Trim out rib pockets as necessary.

TIP: Put 2 layers of scotch tape on bottom of spar brace before "creating" pocket

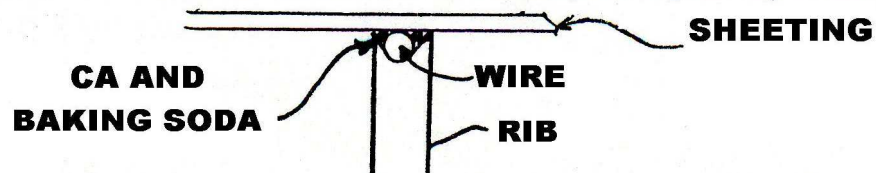
14. Install sub spares between each set of ribs on top of spar brace.

**BIG TIP: Do one rib pocket at a time and remove spar brace, check for glue, wipe off, reinstall brace after glue is dry, and do the next spar pocket. If you do 2 or 3 rib pockets and glue the spar in, forget it. You have a one-piece wing now, or at least the spar fixed in this wing half.**

15. After the spar pockets are made in both wings, install aileron and flap servo wire access tubes and front shear webbing. NOTE: Shear webbing in wing bays (front) is 1/8 ply between R5 and R6.
16. Don't forget to mount the wing tab into wing before sheeting bottom front. You can now install your top rear wing sheeting. See Sheet 1 for making the sheets. By now, you should have picked out the version of the ZERO you want to do because the wing span is different. Install pins from W2 to W13 on the center line of the top spar. Locate sheeting to pins and CA to spar after applying white glue to top of ribs. I usually put 5# steel weights on the top skin to make it bond to the ribs. NOTE: When I am almost finished with both wings, I do not plank the front bottom and top on the wings, especially 2-piece wings, until I have assembled the wings and trial fitted the retract plates with the retracts mounted to them. You can do this by assembling the wing upside down with a brace in the middle, assembly one gear assembly,

locating and making sure it retracts "OK", then use this as a guide to "EYE" up the other gear assembly before permanently installing the gear plates.

17. You now can remove the wing and temporarily install your retract mounting, plates and retracts, removing the wood as shown on the ribs by the dash lines you applied. These are a "guide" for you.
18. Look at W2. One of the tricks I use to remove a "lot" of wood and still maintain rib shape is to cut a "V" shape groove in the top of the ribs from the spar to L.E. bend 1/32 wire to shape and use CA and baking soda to install the wire in the groove. Plank over this, and when you open the wheel well, you can now sand or grind down to the wire. Before you grind it down, run a fillet of CA and baking soda on each side of the wire. Finish planking the bottom of the wing only. Cut out for your retracts and install them. By leaving the top unsheeted at this time, you now can install your gear doors flush to bottom sheeting and be able to view and adjust the attachment points. After this is done, you can finish planking the top of the wing.



19. Install tip (NOTE: Scratch building the tips requires a forest of wood – only kidding. You can make this from a piece of 1 1/2 x 4 x 48 balsa.
20. Look at the wing drawing and see which of the pattern is for the tips you need to assemble for the Model Zero, you intend to build.
21. Install the leading edges, sand them and cut out the ailerons and optional flaps before you cover with your finishing technique.
22. Do the right wing.

**SEATING THE WING:** After you have completed both wing halves, try this method for seating the wing to the fuselage after the wing is glass and sanded. Assemble wing halves. Support wings so you can assemble the fuse over the front tab on the wing. Use 50 to 80 grit sandpaper and begin sanding (alternately) the saddle as shown in the photo pack. Keep sanding each side until top of wing is seated on B4B. You will note a 1/32-inch gap now, between the saddle and the wing fillet. This gap is filled up with the wing fillet (Sheet 2). At this point, you can disassemble and reassemble upside down and locate your wing hold down bolts. **Make sure** your wing is seated and square.

**UNDER BELLY:** This portion of the wing is made up of your scrap balsa and is attached, per your choice, to the wing. You can make it one-piece removable with screws or two-piece split in the middle and attached to the wing like the prototype is. We are planning on a one-piece fiberglass cover in the near future. Check with Meister Scale for availability.

**HORIZONTAL STAB:**

1. Draw a straight line on your workbench 36" long. Center both HS1s onto this line. Glue the HS2 onto the HS1s. pin the assembly to your work surface in a convenient place to work.
2. Be sure you have the 90-degree braces on hand, six of them. These are made from 1/8-balsa scrap. Glue the two HR1s together. Put approximate rib location marks onto the HS1 and HS2 NOW.
3. Pin the HR1 in place (onto the HS2). Install the 90-degree brace on each side and glue base to HS2.
4. Repeat step 3 to install both of the HR2 ribs.
5. Install HR8s. Use 90-degree brace.



6. Install cap trips now between HR2 and HR8. Use hard straight balsa. Install small leading edge between HR2s across HR1s.
7. Install all ribs now. Be sure that they are not over length, as they will cause a bow in the cap strip (use a straight edge along cap strip at this time).
8. Important: Drill the inboard hinge location NOW!! Do not forget!! This depends on how you want to hinge the elevator, because you might have to go through the 1/4" ply HS2.
9. Sand an angle to top and bottom of cap strips to match the flow the ribs. Same for HS1s.
10. Make up four A, B, C 1/8 balsa panels. These panels should be 1/8" larger than the frame.
11. Trial fit the panels to stab frame. Trim inboard edge so that it centers on the HR1s.
12. In order to avoid warping of the stab frame, it is advisable to install the top and bottom panels at the same time. Do this as follows:
  - a. Pin a top and bottom panel to HS1, being sure that they center on HR1 and overhang the cap strips by 1/16". This is a check. Remove and apply white glue to all the ribs, top and bottom, on that side. Apply thick CA to HS1 top and bottom and install panels.
  - b. Pull both panels down onto frame and C.A. front edges to the cap trips.
  - c. Sand the panels flush with the cap strip and H1.
  - d. Install the 3/8 x 1.0 leading edge. Shape.
  - e. Install horizontal trips. Do not shape these until you make the elevators and hinge and then sand to shape.
  - f. Reinforce the center section with 1" wide reinforcing tape and thick .C.A. or your choice of glues. IMPORTANT!

#### VERTICAL FIN AND RUDDER:

1. The vertical fin assembles the same way as the horizontal stab.
  - a. Pin the rudder post to work surface.
  - b. Install F5 and F1 ribs – be sure they are 90 degrees both ways.
  - c. Install FL1.
  - d. Install balance of ribs. Do not force them, as they will cause FL1 to distort. Use straight edge to keep FL1 straight. Drill holes or slots, etc. to mount the rudder hinge locations now.
  - e. From the supplied templates, make up the fin sheeting from A, B, C, templates.
  - f. These fin sheet parts must install flush to top of F1 and overhang F5. The lower edge will eventually be trimmed to fit the top of the horizontal stab. Install the vertical fin sheeting doubler to the inside of the A, B, C sheeting adjacent to F5 and glue this doubler to the vertical fin sheeting. This is important.

#### RUDDER:

NOTE: All control surfaces on the full scale had their trailing edges end in a thickness of 1/16". In order to duplicate this, a bit of patience is needed in properly sanding to the correct angle the two cover sheets and the center R3. Study the cross section before proceeding.

Decide now if you want to hinge in scale fashion.

1. Make the R3 parts from the template. It should be as hard as you have on hand. Should be "C" grain. Do one side of rudder at a time.
2. Install fin post.
3. Install ribs from 1/8 scrap balsa and sand to shape.

4. Install pine block for rudder control. This block is installed through R3. No cutout is provided, so make one to fit your pine block. Be sure to drill the hole for your rudder control. Notice I used an aluminum tube to help support the rudder control assembly.
5. Do the other side.
6. Sand each trailing edge side to very thin section.
7. Install scale looking sheeting- see sheet 3.
8. Install RT1 tip.
9. There is extra thickness on the rudder, so do not sand until you finish the vertical fin and can decide on how to hinge it. Then sand "thickness" together. Remove rudder and finish rudder leading edge and cover with Super Coverite. See Sheet One for the way I did it.

#### CANOPY INSTLALATION:

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

SPINNER/ASSEMBLY INSTRUCTION: NOTE: It is important that the back plate skirt matches even with the spinner skirt.

1. Using a #10 or 12 x 1-1/4" wood screw, secure the back plate to your work bench (skirt down). Just make it snug – do not bend backplate.
2. Cut your proper blade exits in the spinner.
3. There should be four holes for 4 - 40 x 1/4" bolts spaced between the cut-outs to secure the spinner to the back plate. Place these holes 3/18" up from spinner skirt bottom. Tap 4-40 threads through the spinner and back plate.

4. Alternate Methods – follow instructions using clinch nuts and screws furnished with spinner (**highly recommended**).

ENGINE: The prototype used the Quadra 75s for the following reasons:

1. Has rear exhaust.
2. Has good factory muffler.
3. Fits inside conveniently.
4. Is 4.4 cubic inches.

SUGGESTED COVERING AND PAINTING SYSTEMS:

1. Fiberglass cloth and Polyester Resin on the fuselage and super Coverite on the flying parts. Again, we use interior latex trim paint. NOTE: We assume you will be using a gas engine.

CONTROL THROW SET UP:

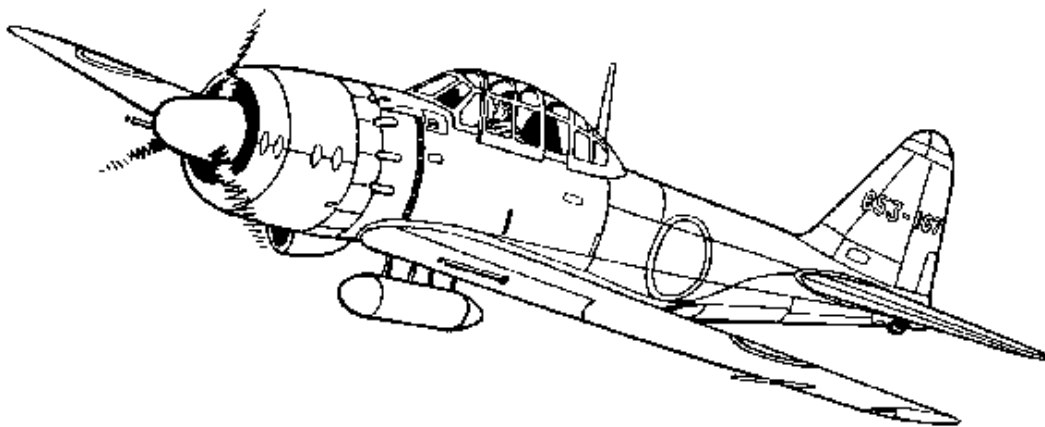
1. Ailerons 1" up and 1" down.
2. Elevators 1" up and 1" down.
3. Rudder 2" each way.
4. Throttle must be set to a low idle to allow the model to fly slowly enough to land.

NOTE: The above can be changed to individual taste after initial flights.

FLYING:

1. The ZERO has the same “Fun Scale” characteristics as its predecessors. Very slow take off and landing capabilities, so do not use much throttle on first take offs if you want realism.
2. The ZERO is very acrobatic if set up for it, so help yourself.

# TORA TORA TORA !!!!



# MS SCRATCH BUILD A6M ZERO WOOD LIST

## (FUUSE)

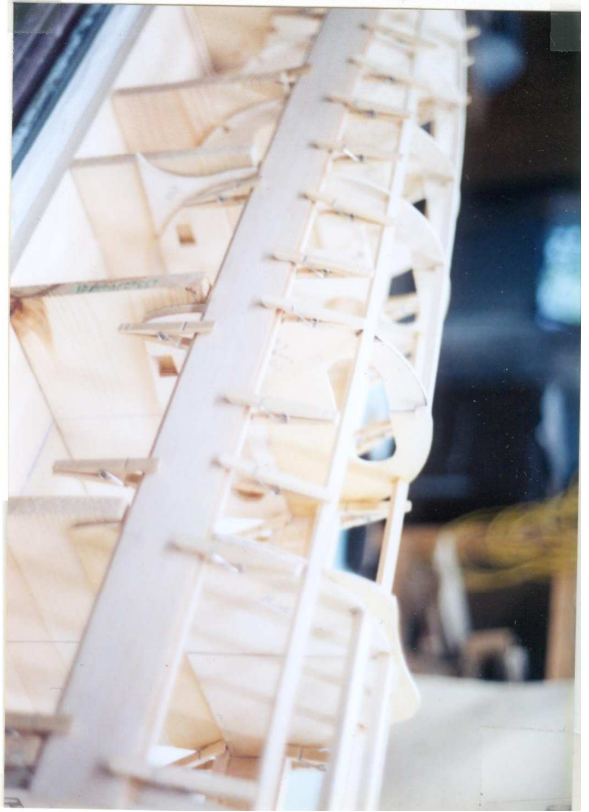
(SCRAP) 1/32	Armor Plate Temps
20 - 1/8 x 4 x 36	Sheeting, Saddles (4)
1 - 1/4 x 12 x 48	Bulkheads - Ply
20 - 3/8 x 3/8 x 36	Hard Balsa or Spruce
1 - 1 x 3 x 36	Cowl Radius

## (FIN & RUDDER)

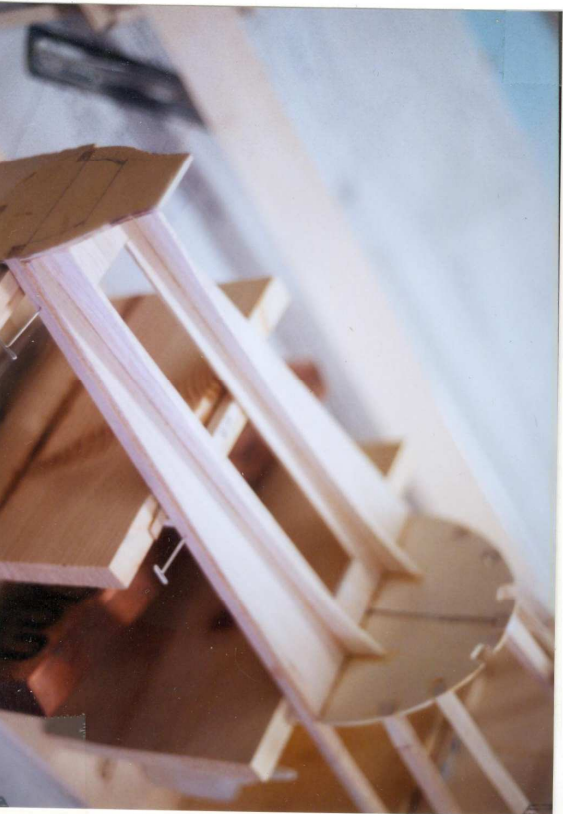
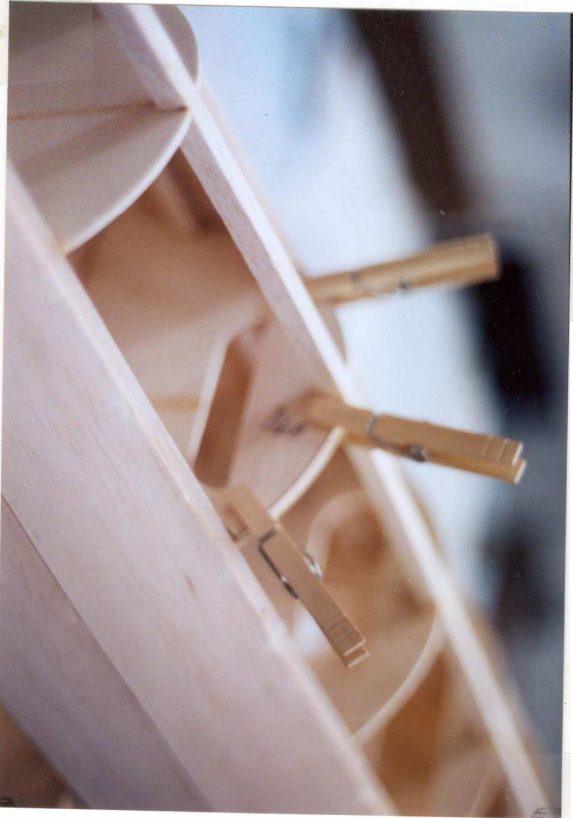
3 - 3/8 X 4 X 48	Tips for Vertical & Horizontal
20 - 1/8 x 4 x 48	Sheeting, Ribs
2 - 1 x 1/2 x 24	Bass
1 - 1 1/2 x 1/2 x 14	Balsa Rudder Post
1 - 1 1/2 x 1/2 x 14	Balsa Fin Post
1 - 1/2 x 1/2 x 36	Fin Post

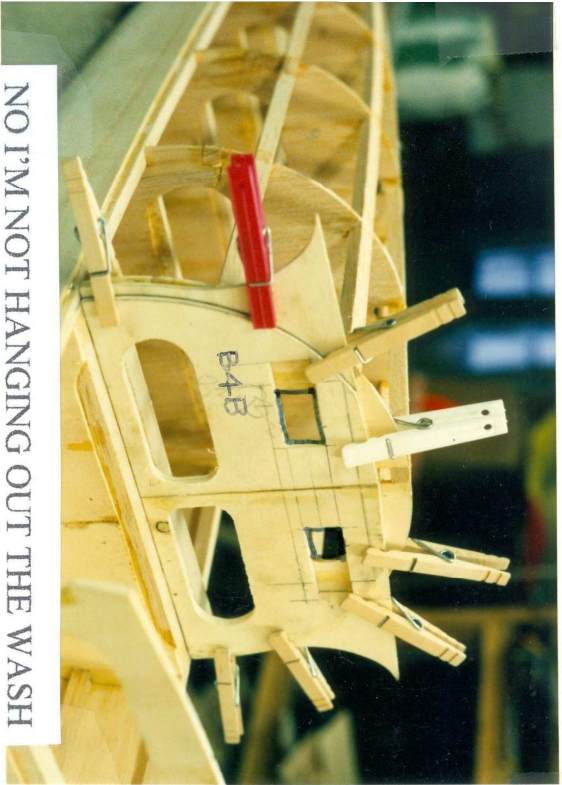
## (WINGS)

24 - 1/8 x 4 x 48	Sheeting - Balsa
2 - 1 x 2 x 48	L.E. - Balsa
1 - 1/8 x 2 x 4	Ribs GR1-W6 - Light Ply
4 - 1/8 x 4 x 48	Ribs W6-W14 - Balsa
4 - 1/8 x 3 x 36	Shear Web - Balsa
1 - 1/8 x 3 x 12	Shear Web - Light Ply
5 - 1/2 x 3/4 x 48	Spars - Hard Balsa or Bass
2 - 3/4 x 1 x 36	Aileron L.E. - Balsa
2 - 1/8 x 3 x 36	L.E. Cap Strips - Balsa
1 - 2 x 8 x 36	Wing Tip - Balsa (SOFT)
1 - 2 x 4 x 48	Wing Tip - Balsa (SOFT)
1 - 1/4 x 6 x 16	Gear Plate - Ply
1 - 1/2 x 1/2 x 12	Gear Plate Reinforcement - Maple
1 - 4 x 8 x 1/4	Wing Hold Down Doubler - Ply
1 - 3 x 48 x 3/4	Wing Dihedral Brace
	Wing Hold Down Blocks
2 - 1 1/2 x 7 x 16	Wing Fillets - 1 sheet 1/32 x 12 x 48
1 - 1 1/2 x 4 x 48	Wing Fillets - 1 sheet 1/32 x 12 x 48
1 - 12 x 24 x 1/32	Gear Doors - Ply
1 - 1/4 x 1/2 x 36	Servo Pocket - Spruce



MY BUILDING JIG FOR ROUND BOTTOM FUSELAGES. USE A STRAIGHT EDGE AND A LEVEL TO SHIM THE JIG AND THE Balsa FUSE. CRUTCH MAKE SURE YOU HAVE THE VERT PINE CENTER LINE AND THE HORIZONTAL CENTER LINES LINED UP. SHIM LEVEL AND TACK GLUE THE FUSE. CRUTCH TO PREVENT ANY WARPING IN THE HORIZONTAL DIRECTION. THIS IS A MUST FOR INSTALLING THE BULKHEADS AND STRINGERS.

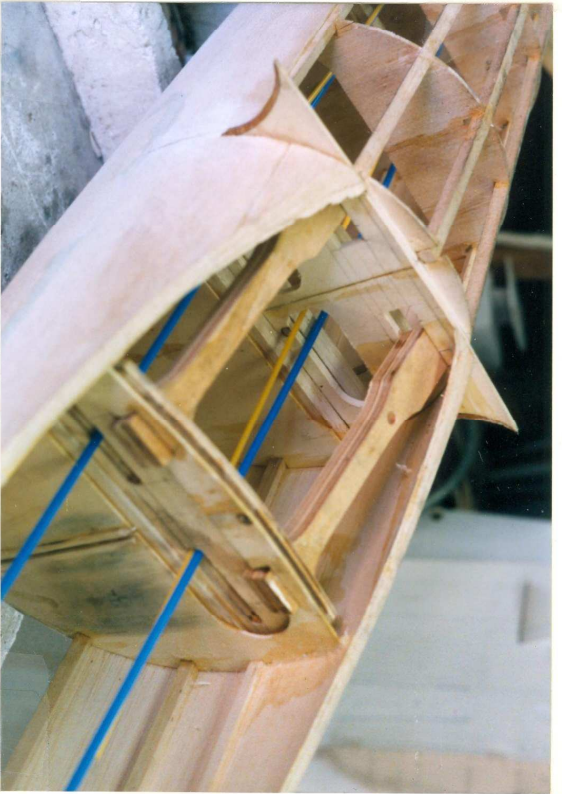




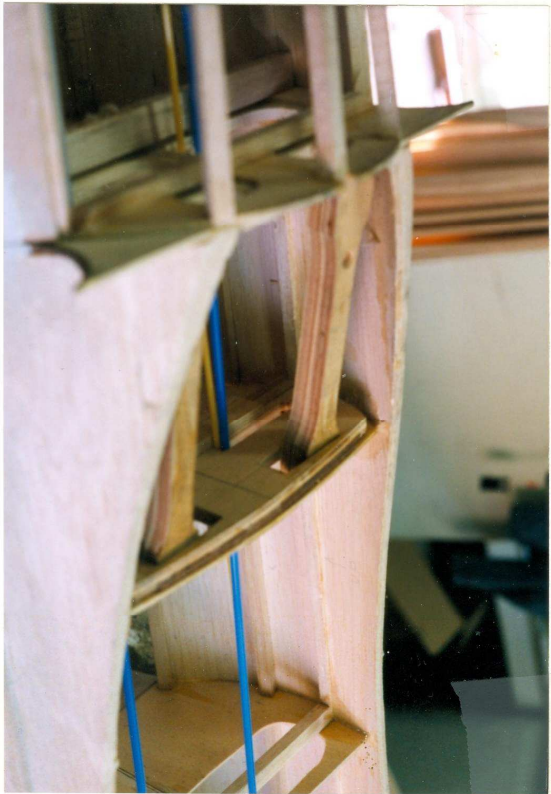
NO I'M NOT HANGING OUT THE WASH



HOW I SANDED THE SADDLE TO FIT THE WING PERFECTLY YOU END UP WITH A 1/32 GAP (SAND PAPER SHOULD BE 1/32 THICK)



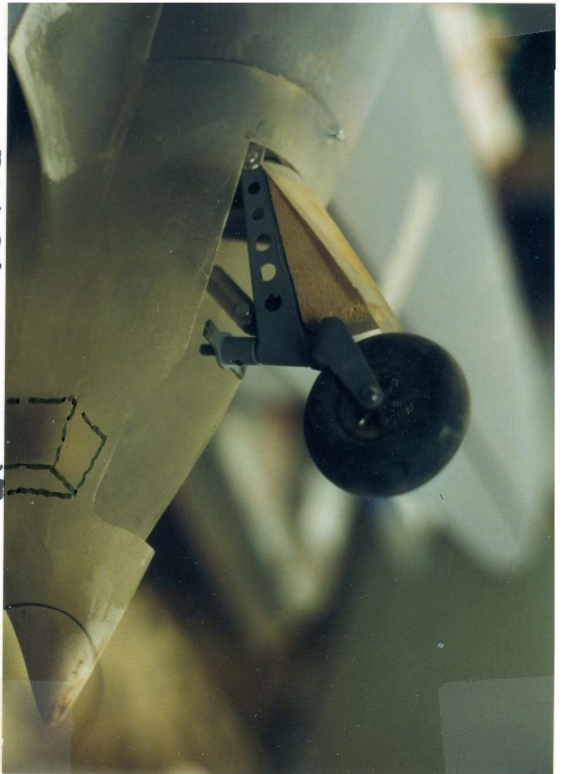
WING HOLD DOWN BLOCKS—YOU CAN'T SEE THEM BUT THERE ARE ANGLE BLOCKS ON THE BOTTOM TO HOLD THE 1/4 BLIND NUTS





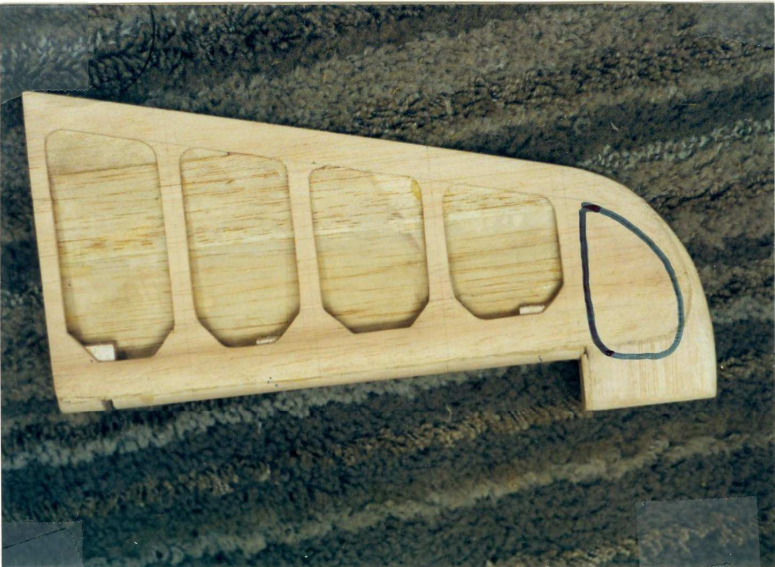


NOTE B1A IN THE UPPER LEFT. THIS IS USED TO GLUE THE FS4A SADDLE DOUBLERS. THERE ARE TWO PER SIDE ON THE INSIDE. NOTE ALSO WHEN YOU GLUE THE OUTSIDE SKIN FS4 THE AREA IN THE WING SADDLE IS SHORT. THIS IS OK BECAUSE YOU WILL SAND THIS DOWN TO SEAT THE WING AND "HIDE" IT WITH THE WING FAIRING. NOTE ALSO THERE ARE NO NOTCHES IN B10 FOR ADDITIONAL STRINGERS. JUST BUTT JOINT AND GLUE AFTER YOU ARE SURE YOU DO NOT HAVE TO "ENTER" THIS AREA AGAIN.

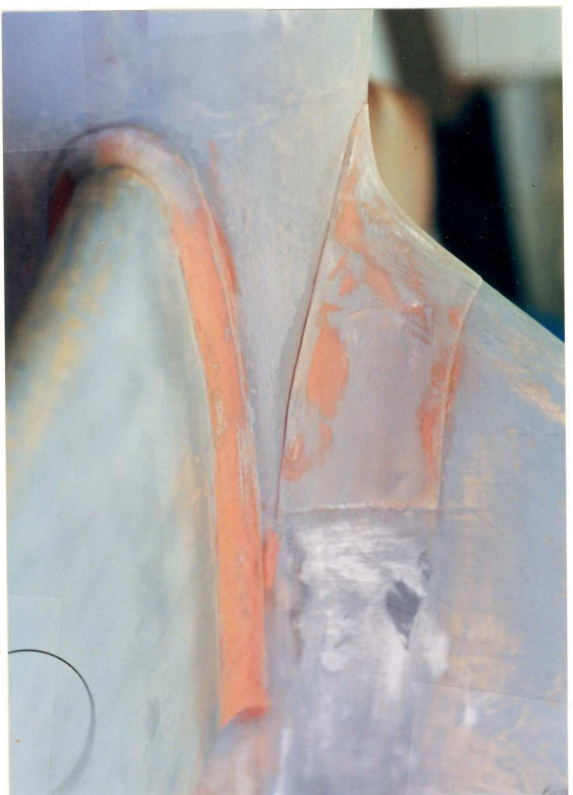


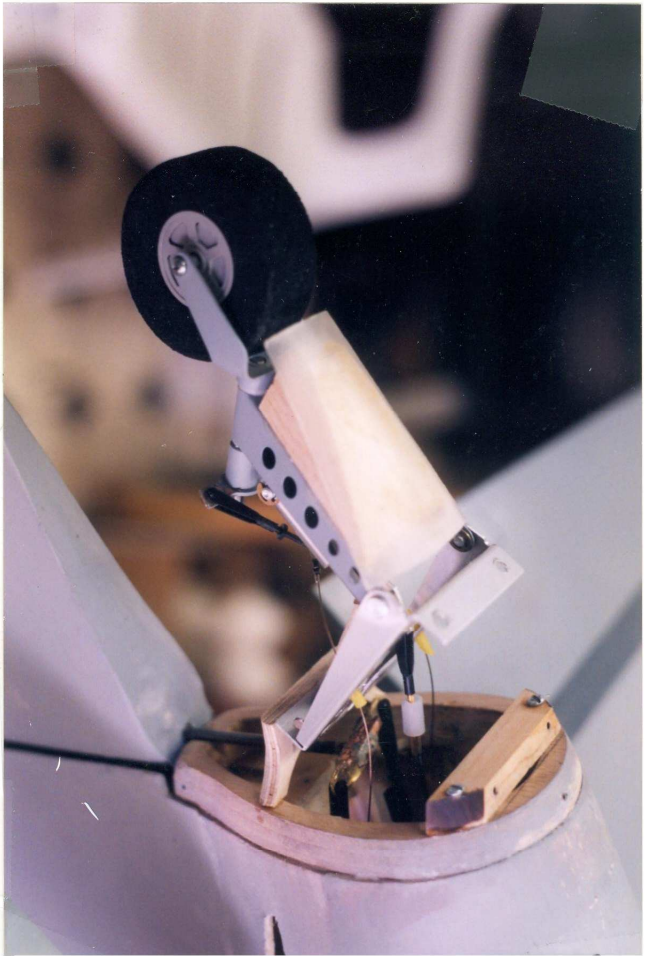
This is how I used the Robart retract assembly to fake a Zero tail wheel. After using the cutout temp to cut the hole in the tail cone, save the fiberglass piece. PFM or goop a block of balsa to the bracket. Goop another block into T.W. cone so the wheel hits it and stops at the correct depth. See photo of where block is. The tail wheel shown is the correct diameter only for installation. Sand the balsa block to bottom contour, Cut, trim and goop fiberglass piece on balsa block, and there you are – a fake Zero tail wheel assembly.

These panels were outlined with 1/64 ply and the area filled in with balsa, filled, sanded, and glassed to simulate the fin and horizontal stab fillets. Duplicating the raised compound curves is a tedious, time consuming operation but necessary to add realism, and don't forget the obvious – hide open joints, etc. Thank God there are only a few of these.

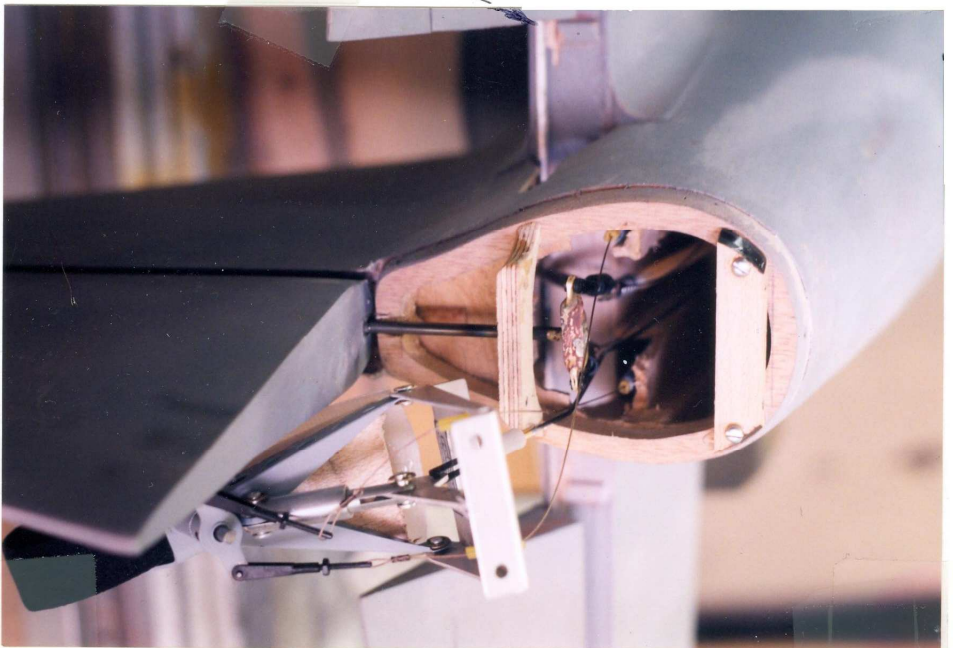


You see the rudder here 95% finished. I simply faked the cutouts and with a #11 blade cut the panels out. Before you cover with fabric, locate your hinge positions. I used the Robart single point and hinged it like the real one. The area outlined still has to be relieved on both sides. I laid the balsa on thick (1/8 sheeting, etc.) and then sanded the joint line to the rudder post. When using the single point hinges, I epoxied aluminum tubing into both sides of the fin and rudder.



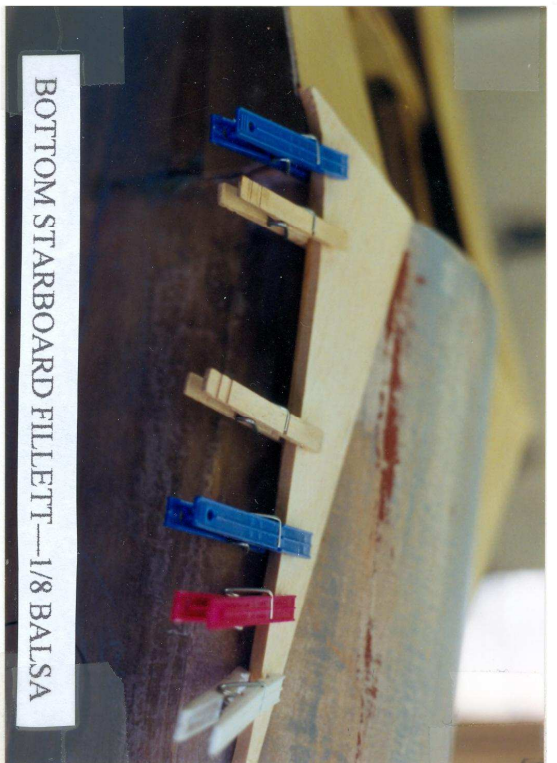


Tail wheel, retract, rudder, and elevator linkage is shown here. I used 1/4 scale rod for the elevator and cable for the rudder and tail wheel steering. Blue nyrod with an air cylinder is used to retract tail wheel. You will note at this stage I removed all the balsa and cut out the former **F 10** to gain access to interior. You do not need this for structural integrity. Note the 1/8 steel elevator control. If you do it this way to hide the elevator control rod, you **"MUST"** silver braze the control horn to the shaped 1/8 rod. **DO NOT LEAD SOLDER THIS.** Note the two pieces of hardwood used to mount the R.T. bracket. Also, note the lip for mounting the fiberglass tail come flush to fuse. Note the correct shape of the tail wheel.



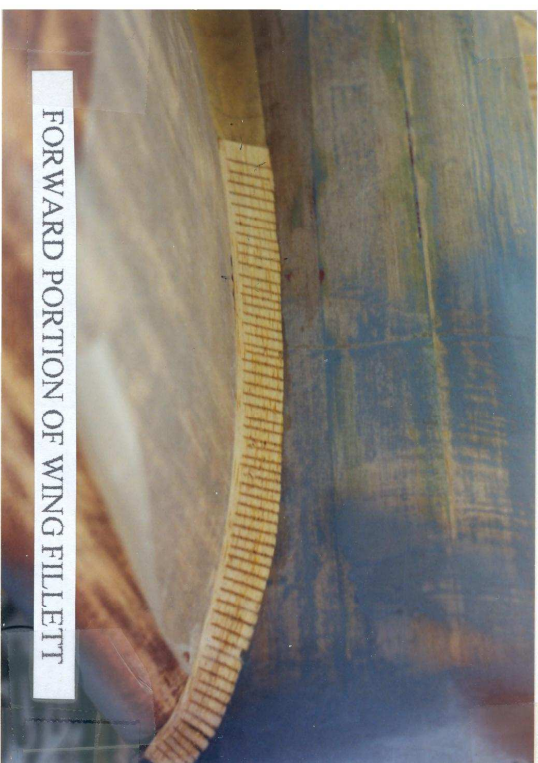
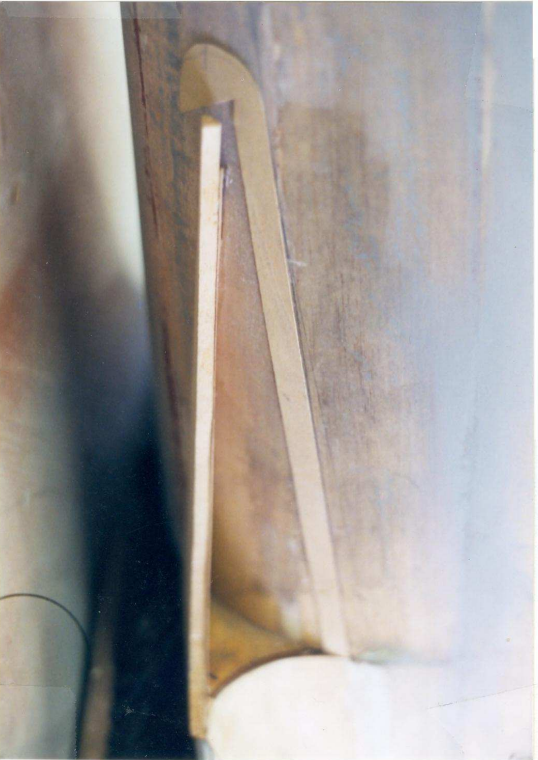


PLYWOOD FILETT WAS ADDED TO  
THE FUSE AFTER IT WAS FIBERGLASSED

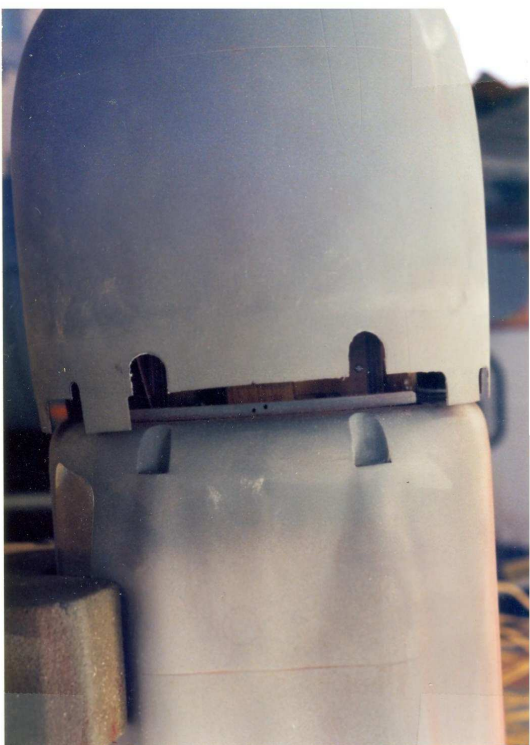


BOTTOM STARBOARD FILETT—1/8 BALSAA

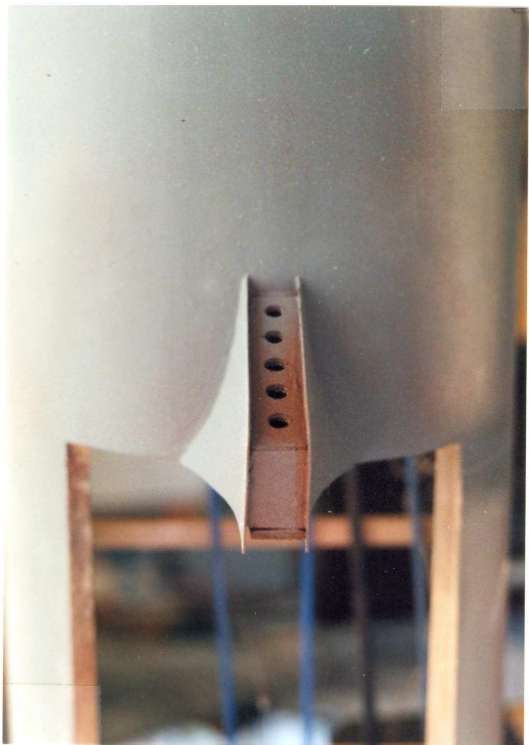
WING  
FILETTTS

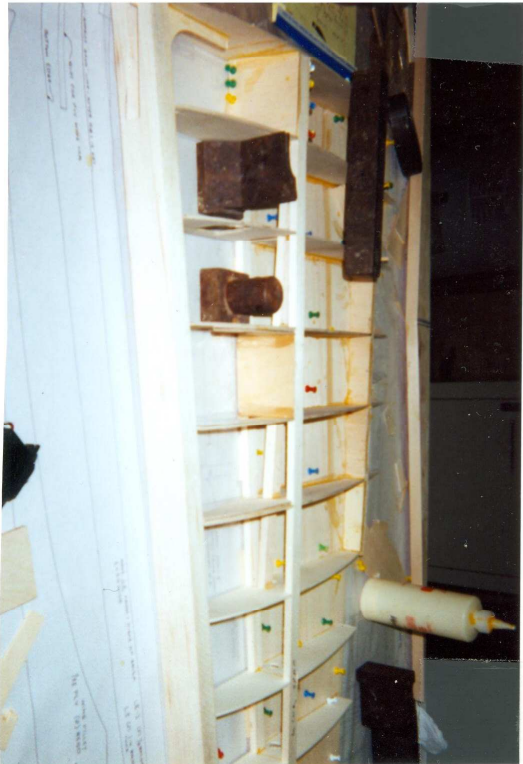
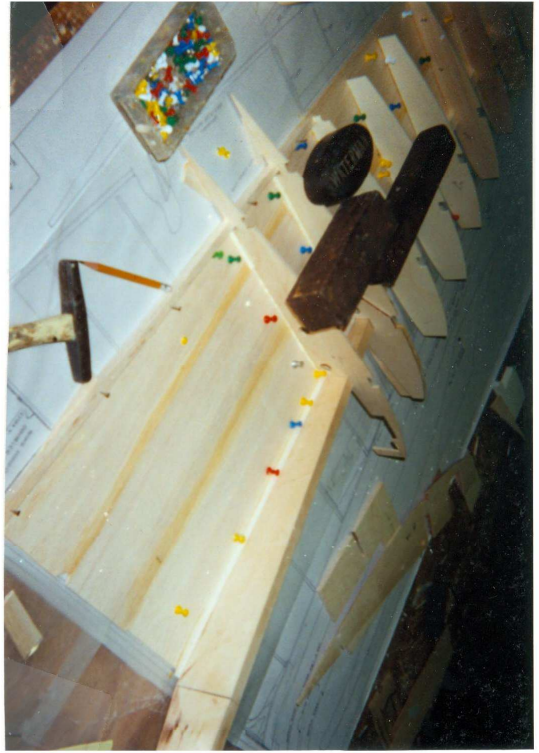


FORWARD PORTION OF WING FILETTT



RIGHT TO LEFT, TOP TO BOTTOM. TOP OF COWL AND  
FORWARD FUS., R.H. EXHAUST STACK CUTOUTS.  
REAR VIEW OF ARMOURD HEADREST



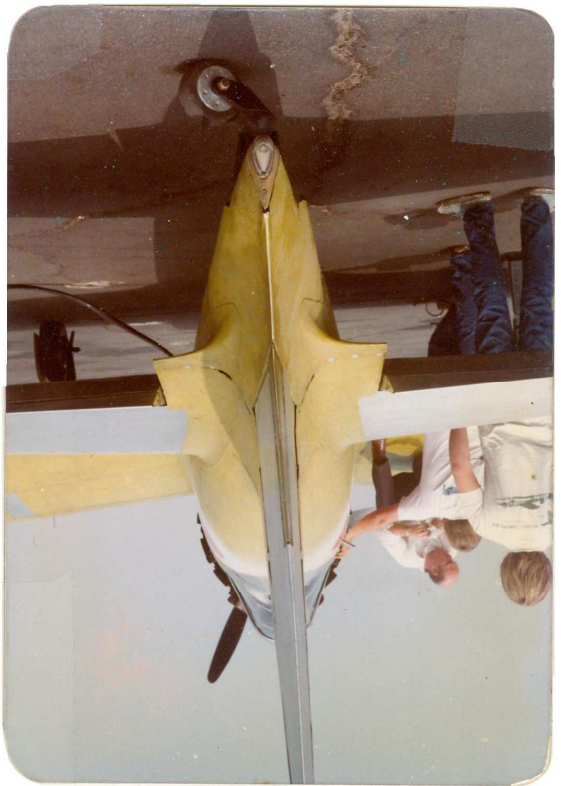


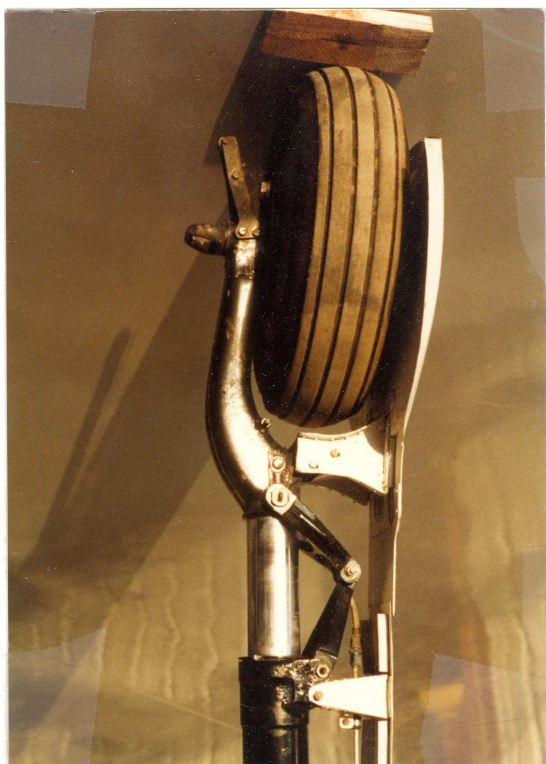
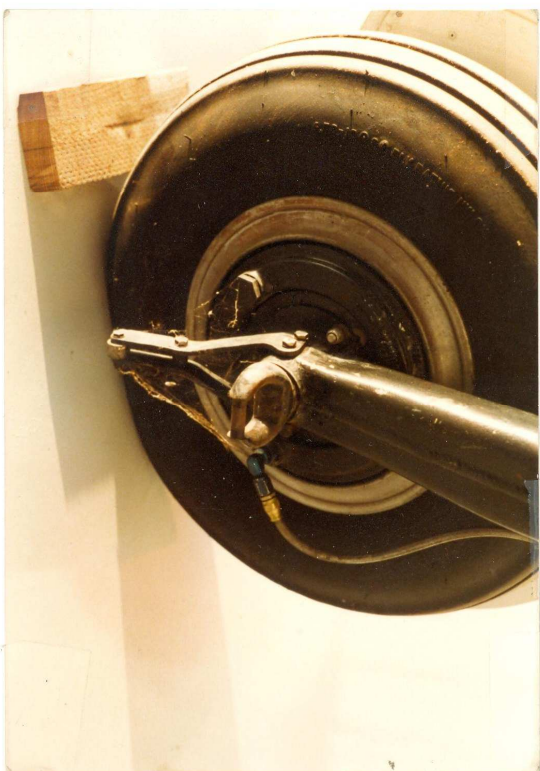


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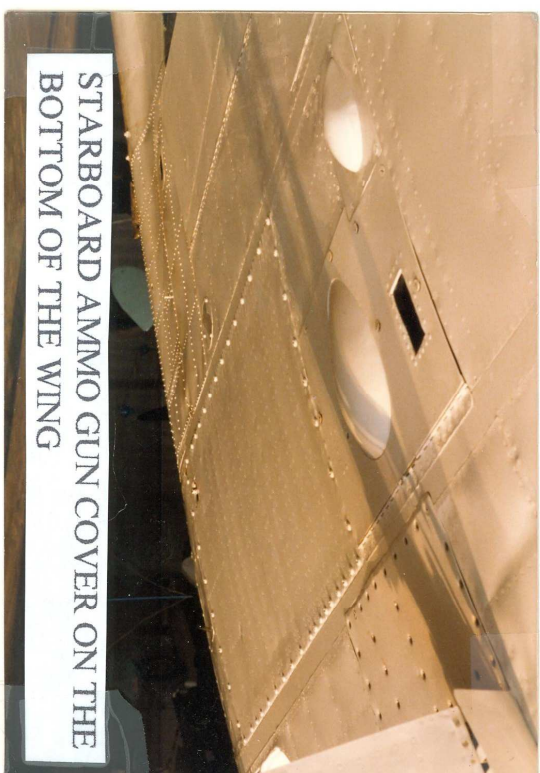




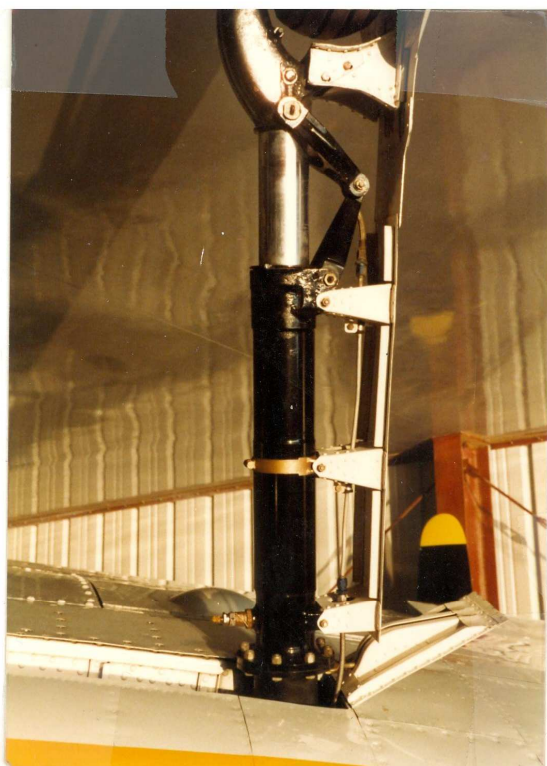


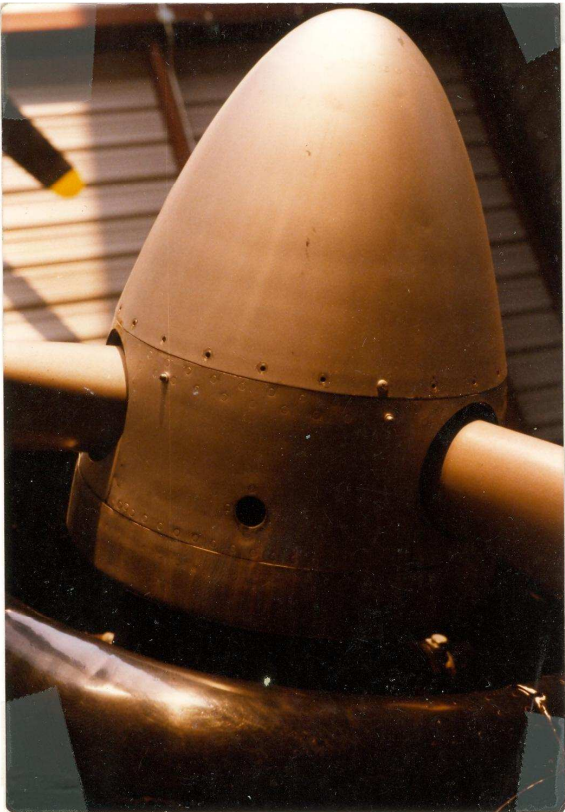


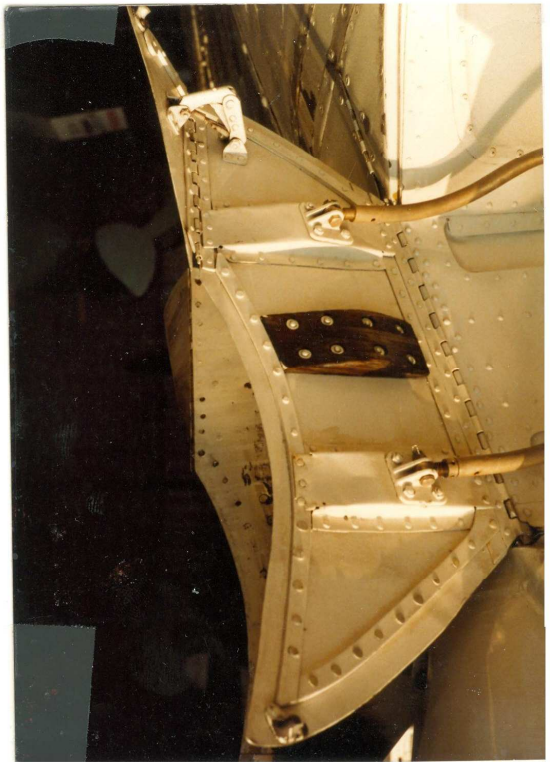
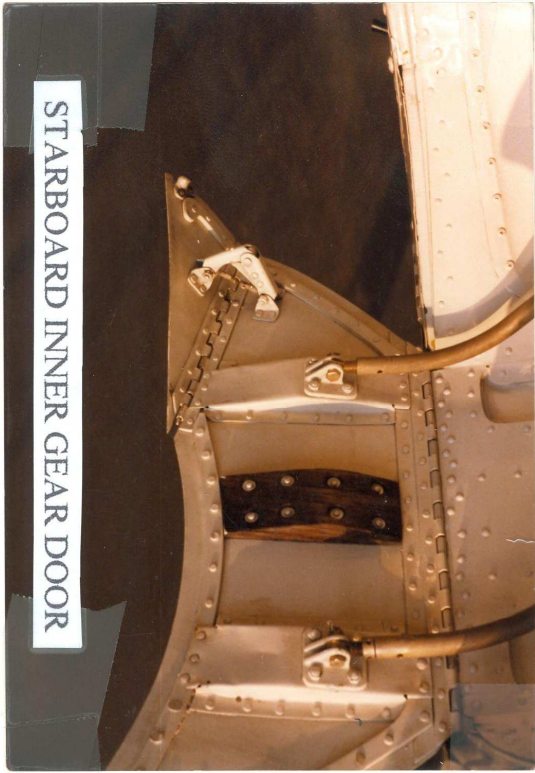
STARBOARD LANDING GEAR



STARBOARD AMMO GUN COVER ON THE  
BOTTOM OF THE WING







STARBOARD INNER GEAR DOOR