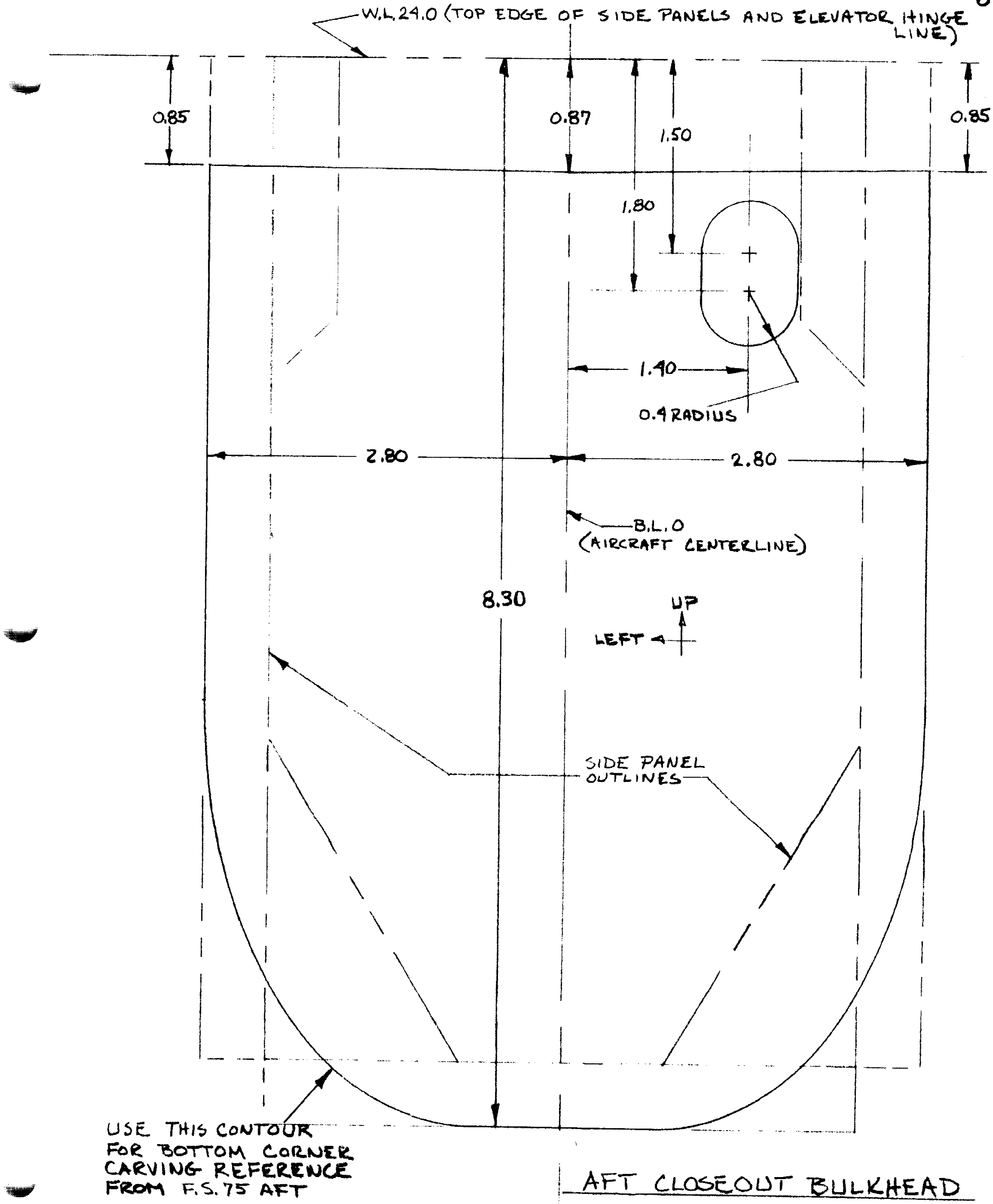
Fuselage Bulkheads

The adventure fuselage has four bulkheads. Each bulkhead is basically a flat slab of core material with a glass cloth/epoxy skin on both sides. There are inserts buried in the foam and places where the skins (sometimes called facings or face plies) come together.

Start the bulkheads by making the small bulkhead which closes out the tail end of the airplane. The aft closeout bulkhead starts out as a 5.8 inch wide, 7.45 inch long piece of quarter inch thick marine grade plywood (aircraft plywood is ok, just more expensive). Mark the B.L. (Butt Line) 0 centerline on the plywood with a bold marker for future reference. Mark and cut the outline shown on page 62. And cut out the elevator pushrod hole. Use some care along the top edge, the dip in the center is intended to match the horizontal stabilizer. Notice the phantom lines (——— – – ——— – –). These are used to show the position of the fuselage side panels on the bulkhead for the assembly of the fuselage. Lightly sand the surface of the plywood to remove any dirt or grease before laminating. Cut 4 each 7x8 inch pieces of 45° BID, 4 each 7x8 inch pieces of 0-90° BID, and 4 strips of 4 inch wide peel ply 6 inches long. Lay up one side of the closeout bulkhead with alternating 45° BID, 0-90° BID, 45° BID, 0-90° BID plies to a total of four plies (2 ea. 45° and 2 ea. 0-90°) on one side. Peel ply the whole bulkhead. Knife trim the edges and the hole. Cure until tack free (won't stick to your table). Flip over and glass the other side similarly.

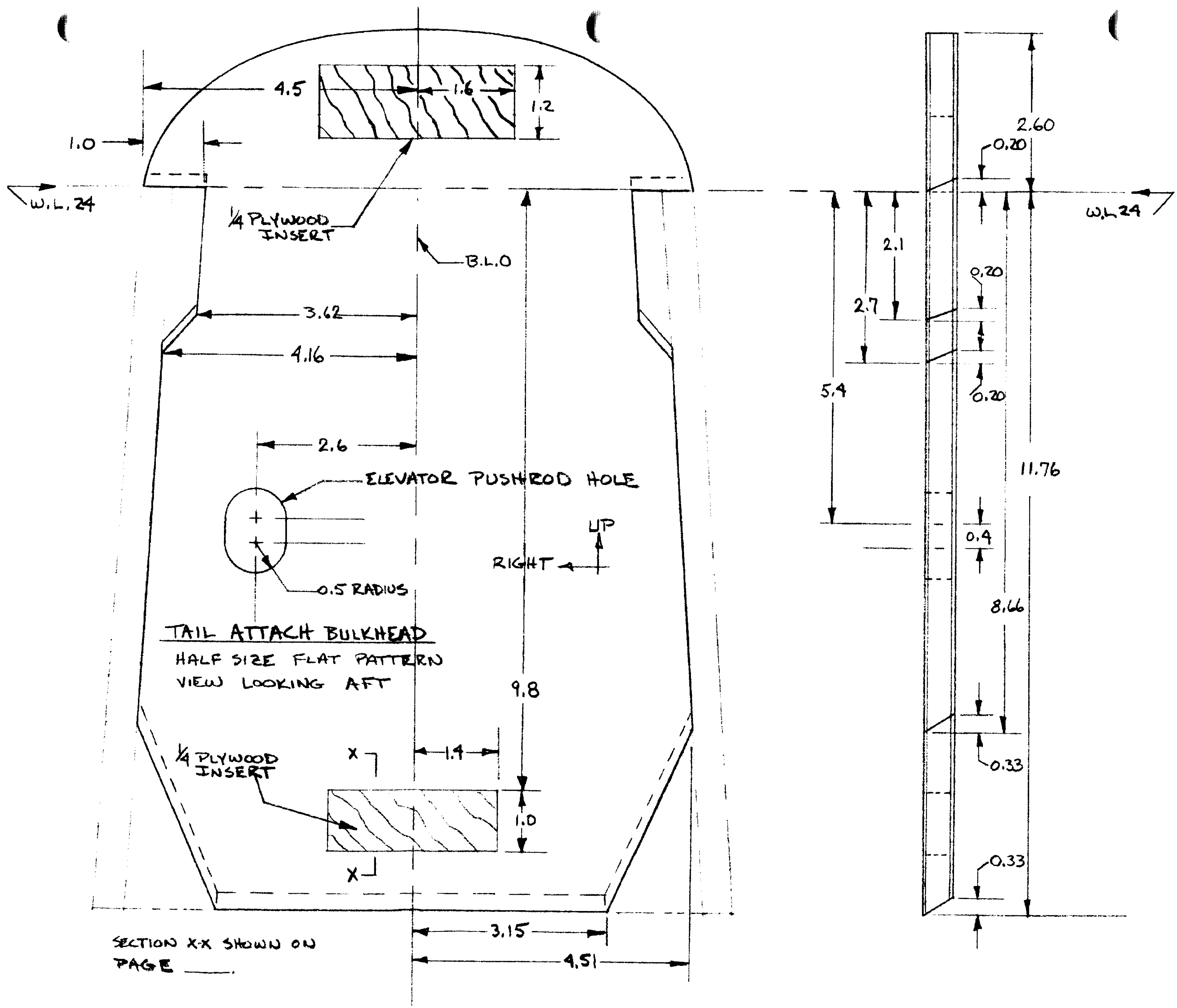
Start the tail attach bulkhead (shown on page 63) with a 14.5x9.5 piece of 9mm (.35 inch) thick slab of 6 lb/ft.^{3} ridgid P.V.C. foam (American Klegecel is red in color). Cut one 1.2x3.2 piece of 1/4 thick marine plywood and another 2.8x1.0. Cut the Klegecel bulkhead out to allow these inserts to be centered up in the foam slab's greater thickness. Bond in place with 5 min/micro and keep the squeezeout to a minimum. Mark the edges on the front side of the bulkhead shown (half size) on page 63 and the top contour as shown on page 122. Cut the bulkhead core out using the front face markings, then mark the backside for the chamfered edges, using the front face cuts for reference. Use a coarse file to chamfer the edges. Note that in one place on each side you have to cut to a back side dimension for the chamfer to work properly. Refer to the Section X-X on page 66 and sand the foam core to obtain a smooth transition around each plywood insert from foam to plywood. Cut out the pushrod hole. Go cut eight plies of 45° BID 10X15 inches, eight patches of BID (fiber orientation optional) 1.7x4.0 inches, and eight patches 1.5x3.2. Cut four strips of 4 inch wide peel ply 15 inches long and four short pieces about 2 inches long. Lay up four plies of 45° BID over one side of the bulkhead. Add four patches of BID over each insert with each patch scissor cut slightly (1/4 inch on each side) smaller than the last.

Peel ply both long edges with 4 inch peel ply strips and put the smaller pieces at top, bottom and over each insert. Knife trim and cure 24 hours. NOTE: Occasionally a piece of the P.V.C. foam will have a bow in it from being stored on edge or whatever. If your bulkhead material is bowed, don't panic. Use some small 5 min/micro dabs to fixture it down against a flat surface while the



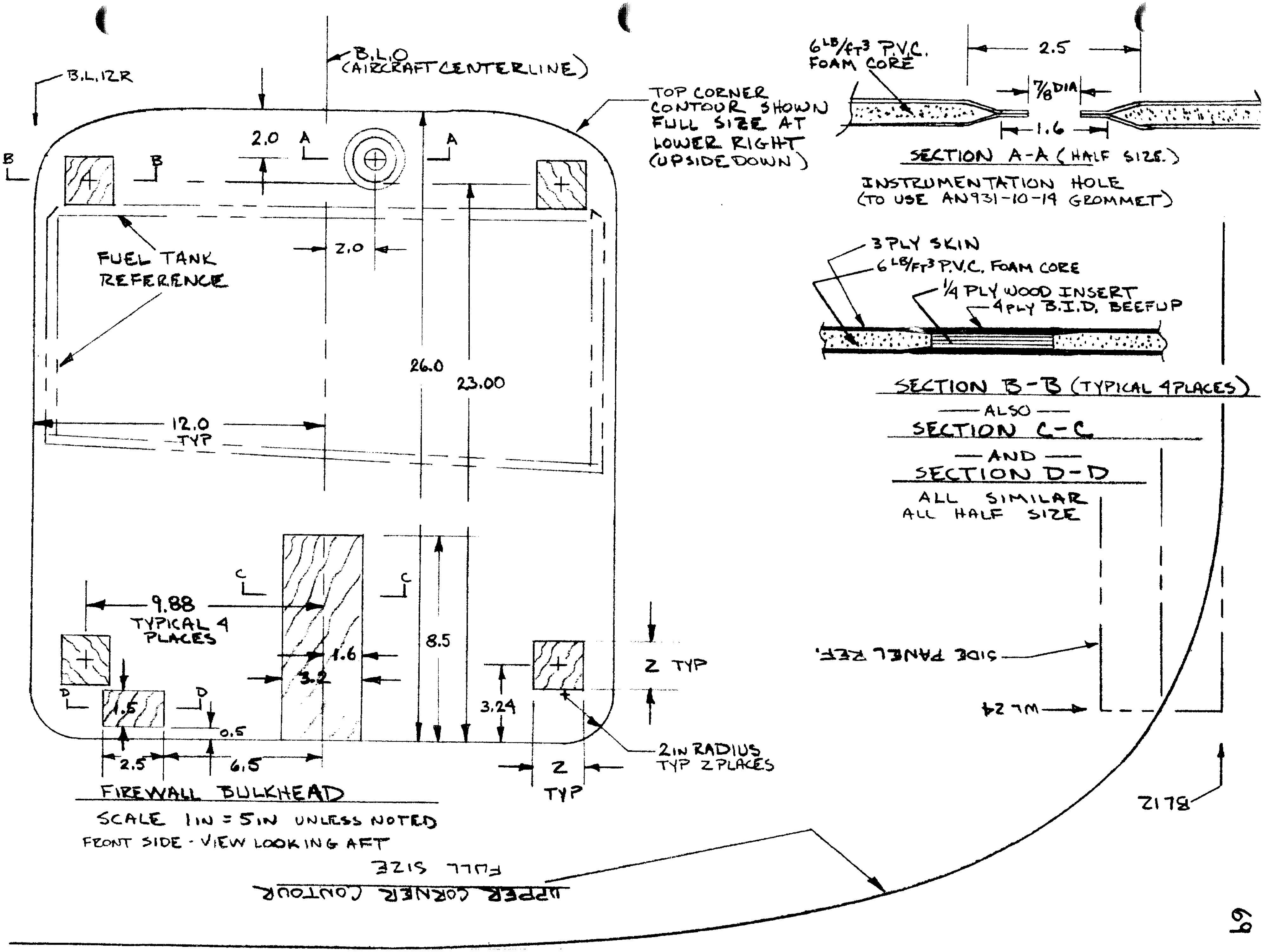
AFT CLOSEOUT BULKHEAD

FULL SIZE (LOOKING FORWARD)
1/4 PLYWOOD CORE WITH FOUR PLY BID FACINGS (2 ea 45° BID, 2 ea 0-90° BID EACH SIDE)



TAIL ATTACH BULKHEAD
HALF SIZE FLAT PATTERN
VIEW LOOKING AFT

SECTION X-X SHOWN ON PAGE ____


B.L.12R
B.L.0 (AIRCRAFT CENTERLINE)
TOP CORNER CONTOUR SHOWN FULL SIZE AT LOWER RIGHT (UPSIDE DOWN)
FUEL TANK REFERENCE
2.0
2.0
12.0 TYP
26.0
23.00
9.88 TYPICAL 4 PLACES
1.6
3.2
1.5
0.5
2.5
6.5
8.5
3.24
Z TYP
Z TYP
2IN RADIUS TYP 2 PLACES
FIREWALL BULKHEAD
SCALE 1IN = 5IN UNLESS NOTED
FRONT SIDE - VIEW LOOKING AFT
UPPER CORNER CONTOUR
FULL SIZE
6 LB/FT3 P.V.C. FOAM CORE
2.5
7/8 DIA
1.6
SECTION A-A (HALF SIZE)
INSTRUMENTATION HOLE (TO USE AN931-10-14 GROMMET)
3 PLY SKIN
6 LB/FT3 P.V.C. FOAM CORE
1/4 PLY WOOD INSERT
4 PLY B.I.D. BEEFUP
SECTION B-B (TYPICAL 4 PLACES)
ALSO
SECTION C-C
AND
SECTION D-D
ALL SIMILAR
ALL HALF SIZE
SIDE PANEL REF.
WL 24
BL12

Fuselage Side Panels

Study the 1/10 scale side view and sections shown on pages A-9 and A-10.

The side panels are built up from 24 inch wide, 96 inch (8 ft) long sheets of 1/2 inch thick blue styrofoam (Dow brand I.B.) and hot wire cut blue foam corner blocks of various shapes. Wooden and metal inserts are added in a number of places to accomodate the installation of wings, tails, landing gear, control systems, entry step, etc. later on. The process of building the side panels is simple, you start by hotwire cutting a batch of 24 inch long corner block material, then cut the side panel outline from 1/2 inch thick foam, bond the corner blocks in position, install the various inserts, and glass the inside surfaces. It is helpful for later assembly to mark the locations of bulkheads, side consoles, flap and aileron pushrod holes, wing attachments, step mounting holes, etc. on the foam surfaces before laminating. Later assembly will be simplified by peel plying the bulkhead and console joint areas, edges and some other areas where mating assemblies are to be bonded later.

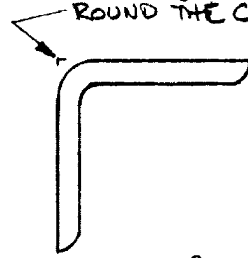
Let's begin by dragging out your hotwire and trim templates to cut corner blocks, drag out a block of 2 inch thick foam and cut 10 each 24 inch lengths of 1.5 x 2.5 triangular corner block material (13 x 24 x 2 required foam block). Then change to 1/2 inch thick blue foam and lop off 10 lengths of the top edge block material (Section B-B page A-10). Put the hotwire back into storage for a while.

Next cut the outline of the side panel from 1/2 inch blue foam. The side is too long to cut from a single sheet of foam so you'll have a butt joint in the core 96 inches aft of the firewall. Protect the foam edges at the butt joint on the outside surface (against the table) with masking tape and protect the table under the joint with waxed paper. Join the foam slabs with wet micro. Try to avoid copious squeeze-out. The joint is small and not much micro is required. Paint the joining surfaces of the side slabs and the corner blocks with micro slurry and nail the corner blocks into position. Start from the rear and work forward so that the corner blocks serve to hold the side slabs in position at the butt joint. Try to starve the joint of micro slurry where the corners are carved away later (first 1/2 inch in from the edge of top forward and bottom forward blocks and first 1 inch bottom aft). Let the micro cure for 12 hours then remove the waxed paper and tape.

Cut out two 5 x 14 x 1/4 pieces of plywood for the wing/gear attach insert, one (right side only) 1 x 2 inch piece of .020 2024-T3 aluminum for the downspring attach insert, and one (left side only) 1/2 x 3/16 x 2 piece of 2024-T4 aluminum bar for the canopy latch insert.

Cut the blue foam core away to admit the plywood insert. Space the insert up off of the table 1/8 inch with a metal or masonite shim. This should center the insert in the foam core thickness. Bond the plywood in place with 5 min/micro. Clean off all squeeze-out. Locate the downspring insert on the right side panel, brighten and bond to the foam surface with 5 min/micro. Locate the canopy latch insert in the left side panel, flush with the foam surface, brighten and bond in place. Sand the foam core surrounding the plywood insert for a smooth transition over a two inch slope surrounding the insert as shown in the sketch below.

Go cut two 8 inch long pieces of 1 x 1 1/2 x 1/8 thick 6061-T6 extruded angle. File the sharp corner down to a smooth radius of about 3/16 inch as shown in the sketch. Cut a piece of peel ply which will cover the outside of the angle (8 1/2 x 3) from 4 inch wide material. Cover the angle with masking tape and wax the tape with automobile paste wax.

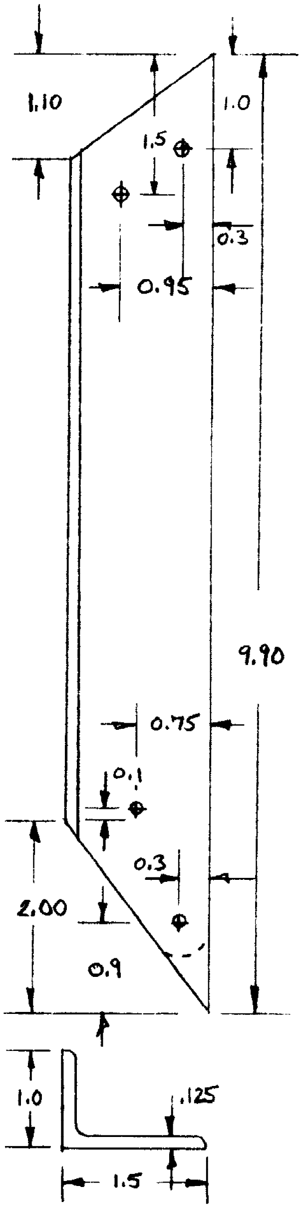


Go cut four strips of 2 inch wide, 16 inch long, 0-90^{0} BID tape. Also cut six strips of 3 inch wide, 13 inch long 45^{0} BID. Round up three clamps to hold the aluminum angles against the bulkhead and each side of the intercostal.

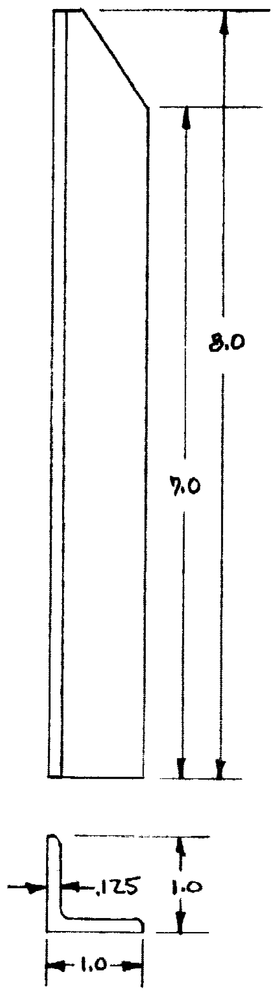
Sand any glossy cured glass within 1 1/2 inches of the intercostal dull for structural glass to glass bonding. Lay up two plies of the 0-90^{0} tape from tank to intercostal on both sides. Don't lap the 0-90^{0} tapes onto the firewall. Next, lay up three plies of 45^{0} BID from firewall to intercostal. These plies overlap 1 1/2 inches onto each side of the corner and additionally about 1 inch onto the fuel tank bottom. Next, wrap the taped and waxed angles with the peel ply strip and position them in the intercostal to firewall corners and clamp lightly (just enough to keep them in position). The ends of the aluminum angles should be 1/2 inch inside the airplane from the bottom edge of the firewall to allow for the bottom panel to be mounted later. The long leg of the angle goes against the firewall and the short against the intercostal. Cure. Following the cure, pop the angles loose and clean off all the tape and wax.

Go build the nose gear attachment assembly shown on pages 89 and 90 . Note that the side brace is installed on the right side only. Locate the assembly on the firewall and drill the eight 1/4 inch mounting holes through the firewall bulkhead and the intercostal side support angles. Locate and drill the two outboard side brace attach angles into the insert provided in the firewall bulkhead. Once you have everything assembled and drilled into the firewall, you can take it all off and store it for a while. These parts are final assembled after the front bottom panel has been bonded in place.

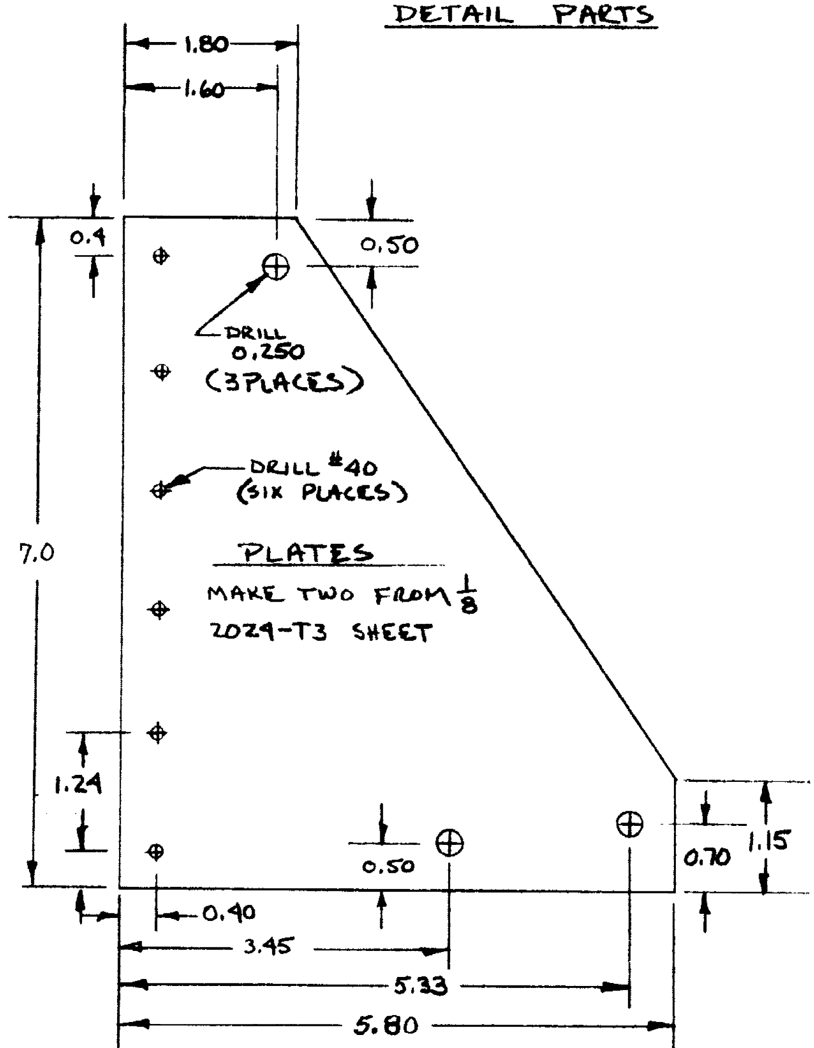
NOSE GEAR ATTACHMENT DETAIL PARTS

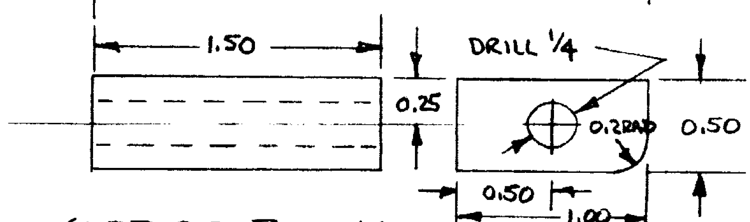


SIDE BRACE
MAKE ONE FROM
6061-T6 EXTRUSION
DRILL #40 FOUR PLACES

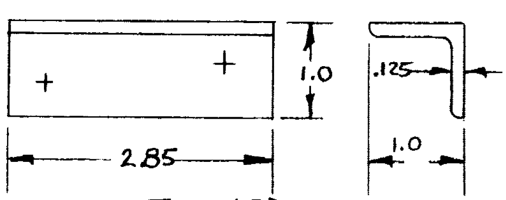


UPRIGHT
RIGHT HAND SHOWN
MAKE ON LEFT & ONE
RIGHT PART FROM
6061-T6 EXTRUSION

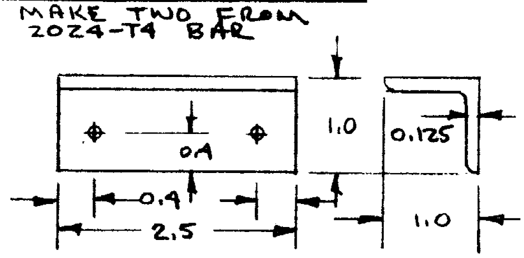




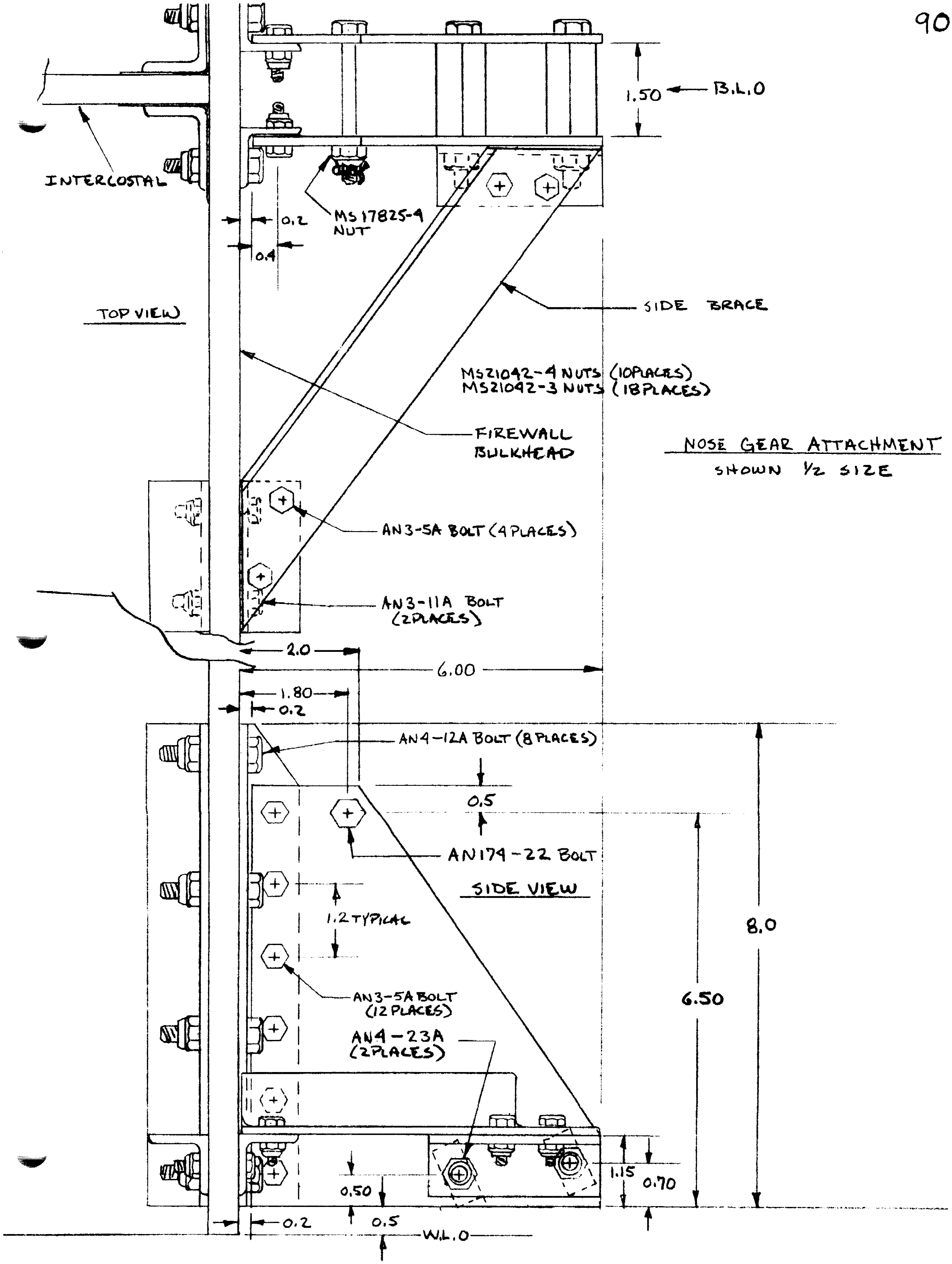
SUPPORT BLOCKS
MAKE TWO FROM
2024-T4 BAR



INBOARD
SIDE BRACE ATTACH
MAKE ONE FROM
6061-T6 EXTRUSION

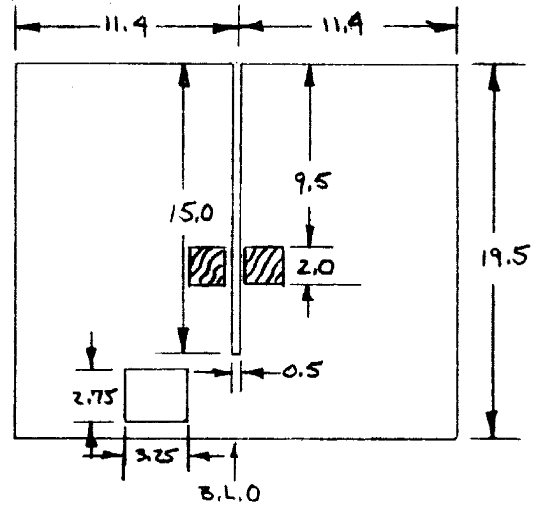


OUTBOARD SIDE BRACE ATTACH
MAKE TWO FROM
6061-T6 EXTRUSION


1.50
B.L.0
INTERCOSTAL
MS17825-4
NUT
0.2
0.4
TOP VIEW
SIDE BRACE
MS21042-4 NUTS (10PLACES)
MS21042-3 NUTS (18PLACES)
FIREWALL
BULKHEAD
NOSE GEAR ATTACHMENT
SHOWN 1/2 SIZE
AN3-5A BOLT (4PLACES)
AN3-11A BOLT
(2PLACES)
2.0
6.00
1.80
0.2
AN4-12A BOLT (8 PLACES)
0.5
AN174-22 BOLT
SIDE VIEW
1.2 TYPICAL
8.0
6.50
AN3-5A BOLT
(12 PLACES)
AN4-23A
(2PLACES)
1.15
0.70
0.50
0.2
0.5
W.L.0

Forward Bottom Panel

Cut a piece of 1/2 inch thick blue styrofoam 22.8 x 19.5 inches. Cut a 1/2 inch wide slot down the center as shown in the sketch. This foam block forms the core of the bottom panel extending from the firewall aft to the wing attach area. Mark one side to be the inside (upper) surface and insert two 2 x 2 x 1/2 inch wood blocks in the core as shown. Fit check the foam core to the fuselage assembly. Next go cut two pieces of 45° BID 21 x 24, and one piece 6 x 24. Cut 2 inch peel ply for all four edges and both sides of the center slot (3.4 yards total). Lay masking tape on your work table top in a strip 24 inches long and 3 inches wide. Put some small 5 min/micro dabs on the outside surface of the foam core and glue it to the table with the aft edge overlapping the tape one inch. Next sand a ramp into the aft edge of the foam to allow a smooth transition to the table and tape from the top of the foam surface.



Carefully wipe automobile paste wax on the tape (not the foam!) and let dry. Mark a one inch addition to the aft edge on the tape. Cut out a 3 1/4 x 2 3/4 rectangle of foam in the location shown. Sand the edges of the hole for a smooth transition to the outside (table) edge of the hole. Protect the table and outside foam adjacent to the hole with tape.

Lay up a strip of peel ply over the edge tape and hole, then two 45° BID plies over the foam and tape, then add the 6 inch wide strip of BID across the panel from the inserts forward. Peel ply the front and side edges and both sides of the slot. Knife trim and cure.

Remove from the table, pull off any tape, and fit to the fuselage. Prepare the fuselage side panel edges for a small flox corner. Remove any peel ply from the firewall's bottom edge, from the intercostal and from the bottom panel. Fill the flox corners on the fuselage sides, position the panel on the fuselage, mix 5 min/micro and put a dab here and there outside to hold the panel in place. Wait until the 5 min hardens then carefully turn the fuselage right side up. Stand in the center hole and lay up three 45° BID plies (4 inches wide) from the fuselage bottom panel to the firewall bulkhead. Lay up 2 ply 0-90° BID tape (2 inches wide) from the sides and intercostal to the bottom panel. Cure. Peel ply only the areas that the nose gear support structure covers when installed.

The front spar bolt holes should be centered up vertically in the bulkhead's plywood inserts and 1.1 inch either side of B.L.O. (centerline). The top mount bolt holes should be continued through the spacer and horizontal stab attach pad. Stick bolts in all four holes to maintain alignment and take your drill back to the rear end. Use the two bottom stabilizer hinge mounting holes as pilot holes and drill two #11 mounting holes through the closeout bulkhead. Add two more #11 mounting holes through the rear spar 1/2 inch below the top of the closeout bulkhead and spaced 1/2 inch either side of center.

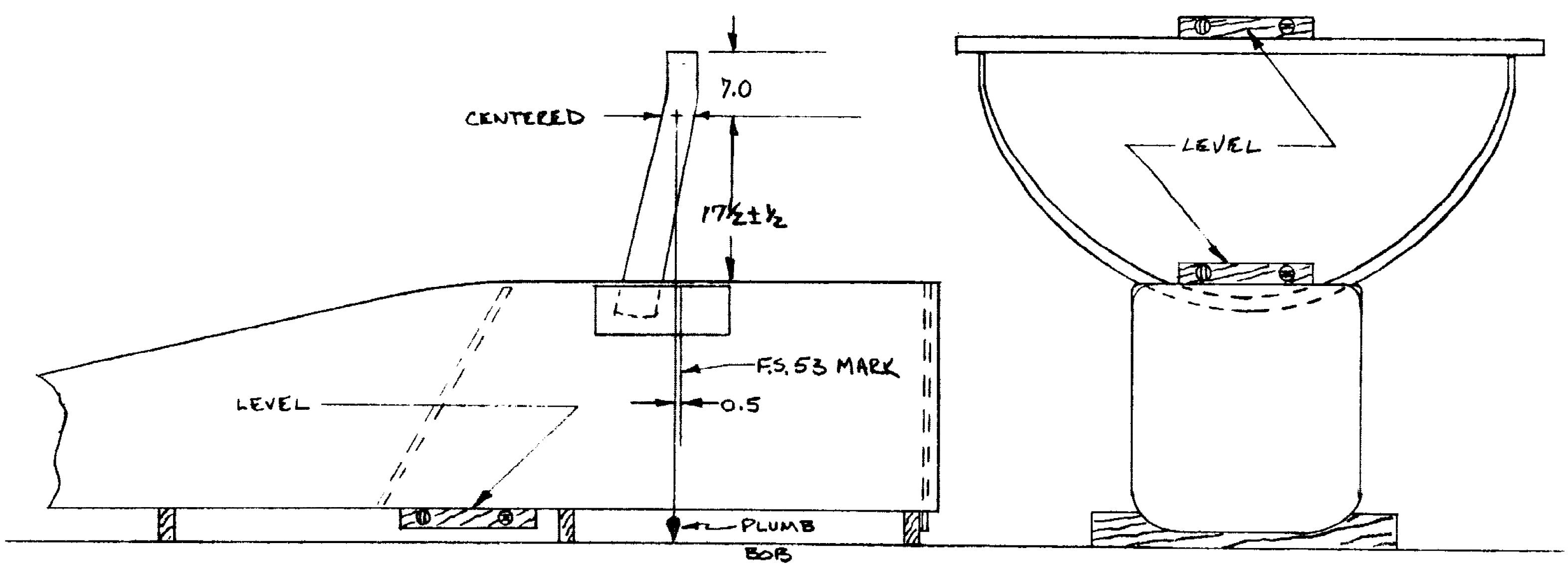
Make up four metal (.020 aluminum) plates with K1000-3 nutplates installed to mate up with each of the four pairs of bolt holes. Brighten the mating faces of the plates and bond in place with 5 min/flox. (8 each K1000-3's and 16 each AN426A-3-3 rivets required). The rear mounting bolts (2 AN3-8A's and 2 AN3-6A's) install from the rear side. The front mount bolts (2 AN3-8A's and 2 AN3-12A's) install from the front side of the vertical stabilizer spar.

Landing Gear

Bite the bullet and buy the main and nose landing gear springs. These parts are not easily home grown or I'd have you build them from scratch.

Go get your nose gear support assembly out of storage. Brighten all of the parts which mate to the firewall bulkhead or intercostal (metal to glass) for bonding. Sand the areas on the bulkhead and intercostal dull for bonding (mostly in the corners where the bottom panel was taped on) and remove any remaining peel ply. Install the support assembly with all glass to metal mating surfaces wet with flox. Install the bolts wet with flox to fill any imperfections in the bolt holes. Now press on with the main gear installation.

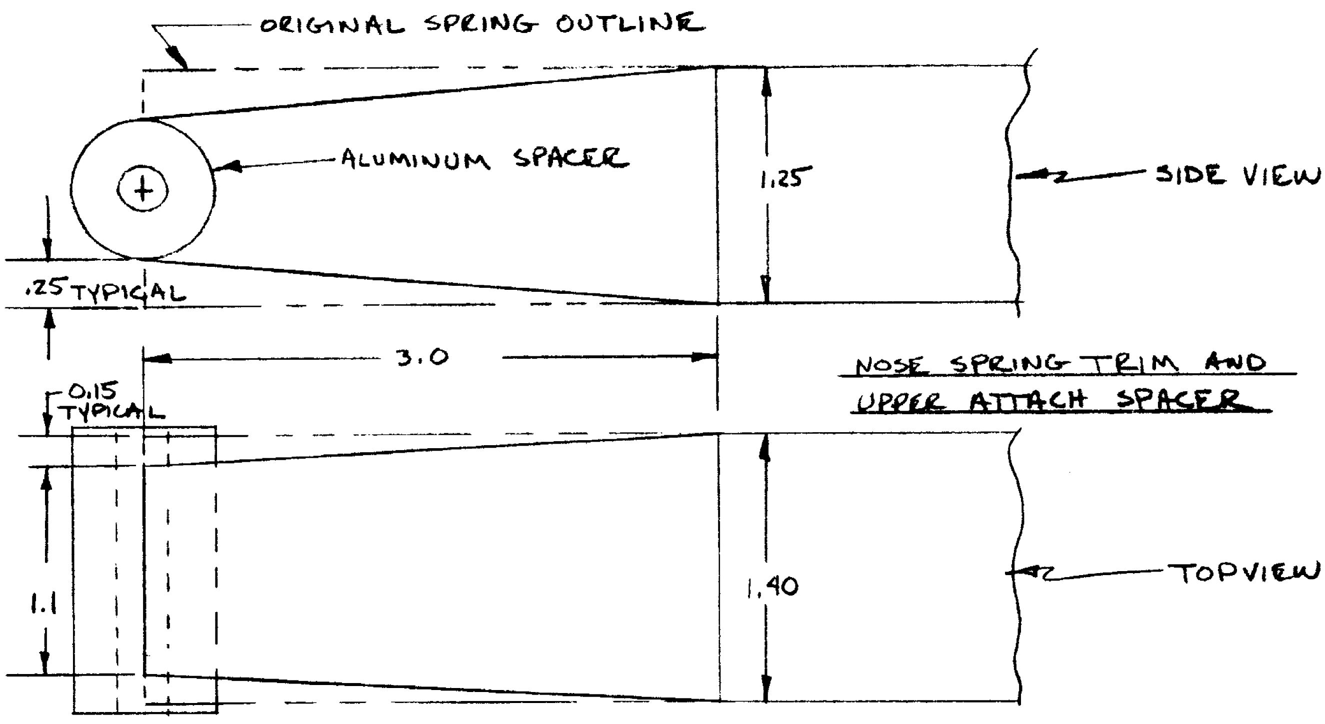
Turn your fuselage belly up, with the top edges resting on some 2 x 4 lumber (on the floor). Position the main gear spring on the fuselage as shown in the sketches which follow. Carve the cockpit bottom hole's edge flange away to allow the top surface of the spring to just touch the inside (BL 11.5) edge of the side panel at the bottom outside contour of the fuselage (W.L. 0.0). Use a reasonably straight board to bridge the ends of the gear spring. Place a level along it and along the bottom of the fuselage to locate the gear in the roll axis. Tilt the spring forward so that the axle centerline marks are both aligned along F.S. 53.5 (1/2 inch behind the reference line marked inside the side panels. A plumb bob is a handy tool here along with tape to mark the floor and a six foot straight edge.



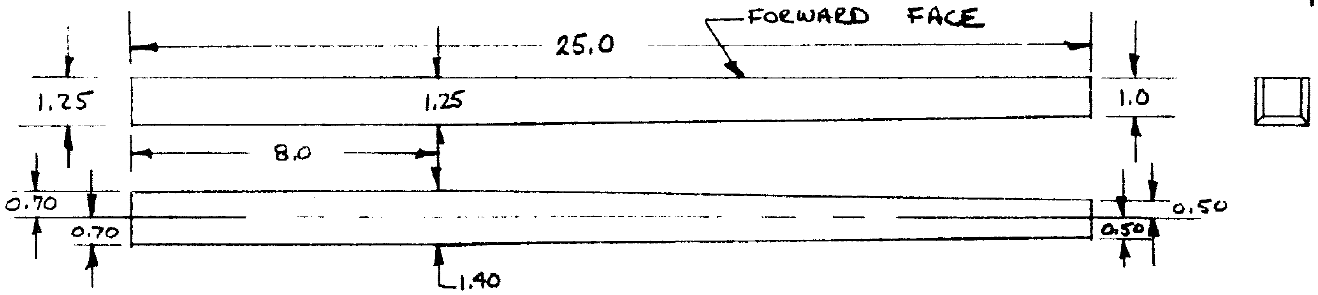
Drill the four (each axle) #11 mounting holes through the brake plate and spring. Make tapered washers from 1/2 x 1/2 x 3/16 pieces of 2024-T4 aluminum bar which will allow the attaching bolts (AN3-20A bottom and AN3-25A top) to have a flat surface for the nut to seat against while mating with the sloping spring. A file and a lot of patience are required to do this right. With bolts and nuts installed, recheck the toe-in carefully and eyeball the camber. Shim as required. Bond the axles, brake plates, bolts and tapered shims in place with flox when everything is set.

Install the brakes and wheels. Install a bleeder fitting in the bottom port (1/8 NPT) of the brake caliper (teflon tape to seal threads). Install a hi-duty #89-LA 3/16 x 1/8 male elbow in the upper caliper port (more teflon tape). Trim the 3/16 OD nylon tubing to jamb into the end of the elbow and torque the compression nut down to attach the tubing to the elbow. The torquing swages a collar around the tubing for a leak proof high pressure connection. While you're at it you can fit the brake master cylinders into position and install the same hi-duty connectors, size the length of the tubing and torque. The caps will stay attached to the brake lines following this operation and the master cylinders can be stored away until final assembly. Mount the 3:40 x 3:00 x 5 tires and tubes on the wheels, install the wheels on the axles (don't forget to pack the wheel bearings with grease). Install the castle nut and cotterpin and your mains are ready to roll.

Take the nose gear spring and cut the bevels shown below. Make one 1 1/2 long x 3/4 OD x 1/4 ID spacer from 2024-T3 rod. File a semi-circular groove in the top end of the nose spring to fit the spacer's outside diameter. Round all four corners of the spring, full length. Brighten the spacer and bond it into the groove with 5 min/flox.

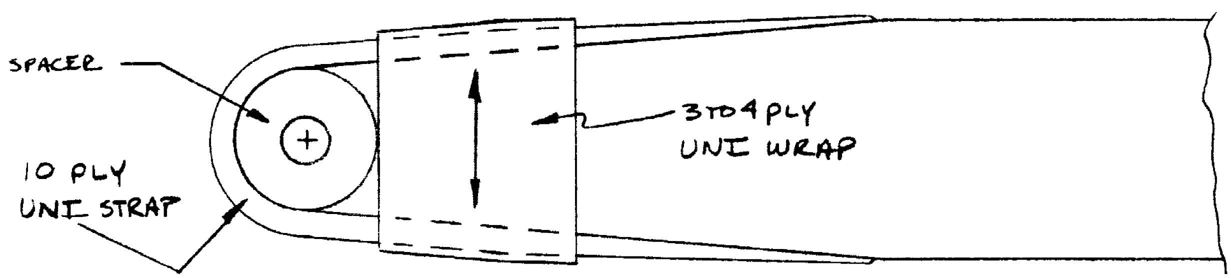


NOSE SPRING TRIM AND UPPER ATTACH SPACER



NOSE GEAR SPRING GEOMETRY

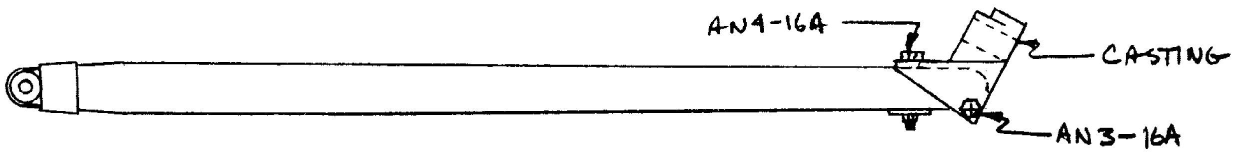
While the 5 min is curing go cut up some UNI scraps into the following lengths of one inch wide (start wider to allow for some frazzles) 0^{o} UNI strips: two 7 inches long, one 6 1/2 long, one 6 long, one 5 1/2 long, one 5 long, one 4 1/2 long, one 4 long, two 3 1/2 long, and one strip 12 inches long. Cut some peel ply to fit each of the spring's faces on the spacer end. Lay up the ten UNI strips starting with 3 1/2 long and working up to the 7 inch strips around the spacer's diameter and overlapping equally on to the top and bottom of the spring. Lay up the twelve inch strip by wrapping it (and wetting) around the spring just below the spacer. The strip will go around the spring about three to four times before it is used up. Peel ply the new lay up on the faces and don't worry about the corners. Cure.



Radius the bottom forward corner of the spring and the forward edges at the bottom end to obtain a sloppy fit (.030 to .050 slop) with the top casting of the brock nosewheel assembly. The spring's end should seat well into the bottom of the casting. Cut 3 pieces of 45^{o} BID 4 x 4 inches. Brighten the inside of the top casting for bonding with your rotary file. Lay up the three BID plies over the bottom end of the spring such that they cover the front and sides of the spring but not the aft face. Trowel a bunch of wet flox around inside the casting. Then squeeze the spring in place and clamp with a "C" clamp on the front face of the casting and aft face of the spring. Clean up the squeeze-out.

Next, lay up a two ply, 45^{o} BID wrap around the spring from the UNI warp at the top to the fitting at the bottom end. Don't overlap the aluminum casting. This wrap is accomplished using a single 20 x 11 inch piece of 45^{o} BID. Use your vice to clamp the aluminum spacer at the top end and keep the new lay up from bonding to the table while you work on the spring. Knife trim the aft edges at the casting and cure.

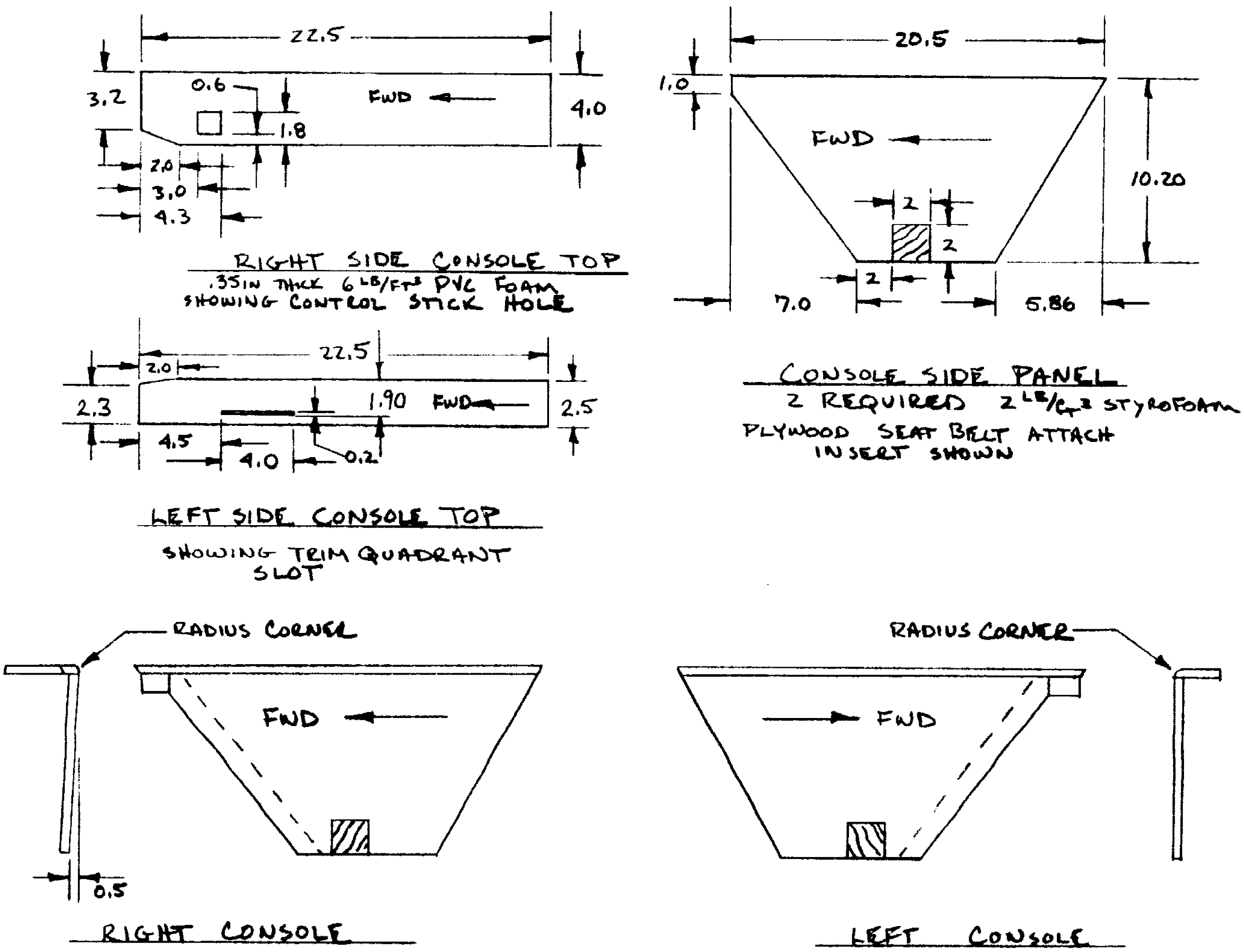
After an over night cure, drill a 1/4 inch mounting hole from front to rear through the casting and spring 0.4 inches down from the top edge of the casting and centered. Install one AN4-16A bolt with an AN970-4 washer and MS21042-4 nut on the aft face of the spring. Next, drill a #11 hole through the bottom aft corners of the casting side to side. This hole is not supposed to go through the spring over more than half the hole diameter. This requires crowding the edges of the casting very tightly with the bolt hole and only 0.2 inch edge distance is used. Install one AN3-16A with MS11042-3 locknut. This bolt is a retainer only. If the trailing edge of the spring protrudes from the bottom face of the casting grind it flush.



Install the completed spring assembly on the nose gear support structure. The bottom support blocks should fit against the spring tightly without any perceivable slop. If the spring build-up has gone as planned, it will be slightly oversize for the space between the blocks. Remove the forward block and file it down to achieve a good tight fit. Should your spring be undersize, sand the top surface of the spring dull and lay up BID patches to fill the gap. Repeat this procedure side to side to get a tight fit. Install the nosewheel and fork. Don't panic, the airplane won't sit on its nose until the engine has been installed.

Consoles

Cut out two 6 lb/ft^3 (red) P.V.C. foam blocks as shown in the sketch and two 1/2 inch thick blue 2 lb/ft^3 styrofoam blocks for the top and sides of the consoles. Fit check the top foam cores to the fuselage sides and seat bulkhead. Cut out the control stick hole and the trim lever slot in the two top foam panels. Bevel the edges of the control stick hole as indicated on page A-11. Cut two 2 x 2 x 1/4 pieces of plywood and bond into the side panel foam cores. The plywood should be flush with the inboard sides of the panels. Sand a smooth transition to the inserts on the outboard sides. Sand a 0.2 inch radius (or any reasonable approximation) on the inboard edges of the top (red) foam panels. Fit the side panels to the top panels as shown and bond with 5 min/micro. Add a one inch foam block to the uncovered front end of the top panel. This block provides a



form to lay up a one inch wide lip along the top edge. Go cut the following 45^o BID and peel ply:

45^o BID: 2 pieces 15 x 24 (right), 2 pieces 13 1/2 x 24 (left), 4 pieces 2 x 2.

Peel ply: 2 strips 2 x 23, 2 strips 2 x 13, 2 strips 1 x 16, 2 patches 4 x 4

Slurry the foam, then lay up one inch peel ply strips along the forward edge of the side panels (dashed lines above) and along the little extension block. Don't lap the peel ply onto the top panel. Lay up two plies of 45^o BID over the top and inboard surfaces. Add two BID patches over each insert. Peel ply the edges which adjoin the seat bulkhead and fuselage side, and the insert area. Knife trim and cure.

Cockpit Bottom Panel

Use a piece of scrap cardboard box to make a pattern for the cockpit's bottom panel foam core. Fit the cardboard closely to the edges of the bottom center hole but very loosely around the landing gear spring. Add a close fitting patch around the gear legs on both side by taping it to the larger piece of cardboard. Use this pattern to cut out the 9mm thick red foam (6 lb/ft^3 P.V.C.) core for the bottom cover. You will have to file a bit on the inside edges to get clearance around the gear spring. Keep a good fit at the outside surface but the inside fit isn't critical at all, the inside foam edges will be carved away later to make a glass to glass edge joint.

Fixture the foam panel flat with 5 min/micro and lumber as required. Protect the outside edges of the hole with masking tape and automobile paste wax. Locate the foam core with its outside surface flush with the edges of the hole fixture the foam panel in place with a few 5 min/micro dabs inside the fuselage if required. Mark a knife trimming reference line on the tape protecting the fuselage. The trim line should allow a one inch overlap of the bottom panel and the lip around the hole. Tape the main gear spring to protect it from overslop. Go cut one 62 inch length of full width (37 inch) UNI and a 23 x 25 inch piece of 0-90° BID. Also cut two 24 inch strips of 2 inch wide peel ply. Split the peel ply into four one inch wide strips. Cut a peel ply patch to fit around the spring cut out in the foam panel (1/2 inch wide). Lay up the peel ply strips along the fuselage hole edges which adjoin the foam panel. Also, lay up the peel ply patches around the spring cut out. Lay up two crossing plies of UNI that are oriented diagonally from corner to corner then add the 0-90° BID ply with fibers 0° and 90° to the aircraft center line. Knife trim and cure.

Before removing the panel from the fuselage, get inside and mark the bottom foam panel to show the location of the seat belt attach inserts in the side consoles. Remove the bottom panel from the fuselage and sand a smooth transition from the full depth of the panel inside to the glass skins outside all around the edges, carve the first 1/2 inch of foam away from the edges of the landing gear cut out and provide a smooth transition to the outside skins. Remove the peel ply all around Cut another 62 x 37 UNI piece and one 23 x 25 piece of 0-90° BID. Cut two 4 x 4 peel ply patches. Lay up the 3 ply skins as before getting a good overlap of the outside skins all around. Peel ply the seat belt insert areas marked. Knife trim and cure.

Fit the completed bottom panel back on to the fuselage bottom. Mark and drill #11 holes in the four corners of the panel each hole being 1/2 inch from the edges of the panel. Mark and drill four more holes, one each side of the spring cut out. Maintain 1/2 inch from all edges. Now add 4 more holes, each being centered between the corner and spring cut out holes already drilled. Add six equally spaced #11 holes (about 3.14 between centers) to each of the edges forward and aft. Install 24 K1000-3 nut plates to the inside of the fuselage flange using AN426A-3-4 rivets (48 required) use 24 AN 525-10R-6 screws to install the bottom panel. Cut two two-inch long pieces of .063 formed 2024-T3 angle (2 inch legs). Fit one angle in behind each side console (underneath) so it is against both the seat belt insert and the bottom panel. Close the right side angle slightly (3°) to fit the acute angle of the console. brighten the bottom side of the fitting, remove the peel ply from the panel and 5 min/flox bond to the bottom only. Remove the bottom panel and drill two #11 mounting screw holes through the angle and bottom panel install two AN 525-10R-10 screws each side with MS21042-3 locknuts. Reinstall the panel with a few screws to locate it. Drill through the center of the seat belt attach inserts and the aluminum angles behind. Size these holes up to 5/16 diameter to accept AN5-10A bolts which attach the seat belt fittings. Remove the panels and install K1000-5 nutplates on the outboard sides of the angles with two cherry MSC 42, flush pop rivets each side (AN 426AD-4-5's may be used).