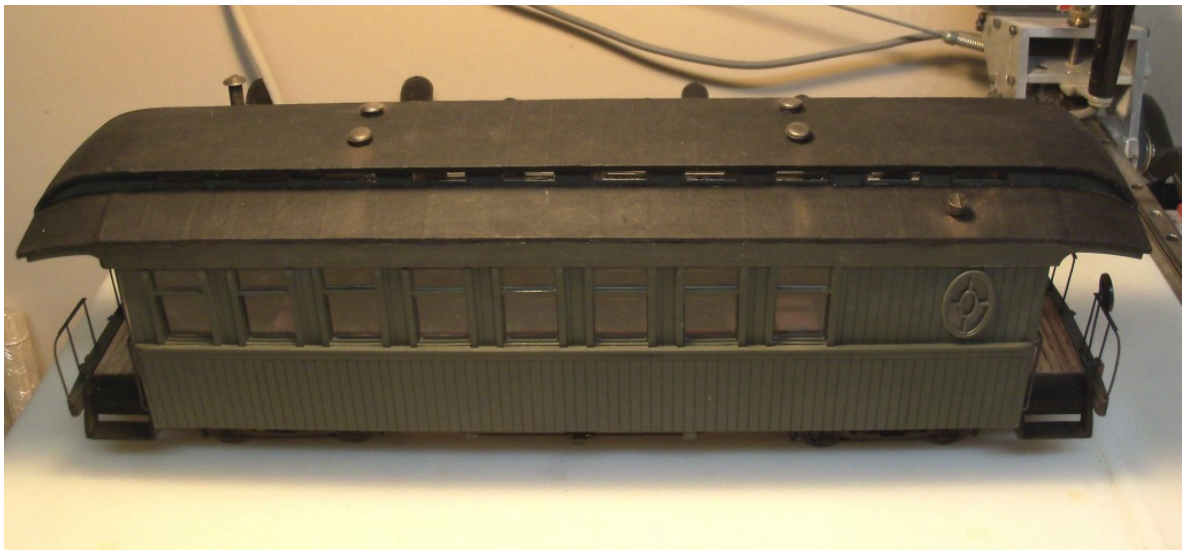
Phil's Narrow Gauge

Short Passenger Car Coach Kit

Part # PNG-012



Tools Needed:
Sand paper
Wood Glue
ACC Glue
#'s 66, 62, 55, 54, 52, 49, 48, 46 & 31 drill bits
Drill press and hand held "Dremel" type drill
Xacto knife
Needle nose pliers
Diagonal (wire cutting) pliers
Various plastic and metal small clamps
18" or 24" Ruler
Needle Files

Parts List

Wood

Item	Qty	Description
W-1	1 ea.	Frame, basswood, pre-assembled
W-2	1 ea.	Floor, poplar plywood, scribed both sides.
W-3	2 ea.	Outside car ends. Laser cut poplar plywood.
W-4	1 ea.	Inside bathroom car end. Laser cut poplar plywood.
W-5	1 ea.	Inside stove car end. Laser cut poplar plywood.
W-6	1 ea.	Outside bathroom side. Laser cut poplar plywood.
W-7	1 ea.	Inside bathroom side. Laser cut poplar plywood.
W-8	1 ea.	Outside stove side. Laser cut poplar plywood.
W-9	1 ea.	Inside stove side. Laser cut poplar plywood.
W-10	2 ea.	Bathroom walls. Laser cut poplar plywood.
W-11	2 ea.	Outside window rail. 1/8" X 1/16" basswood.
W-12	2 ea.	Outside window rail. 3/16" X 1/16" basswood.
W-13	3 ea.	Inside chair rail. 1/8" X 1/16" basswood.
W-14	16 ea.	Window panels, 1 upper, 1 lower, laser cut 1/32" birch plywood.
W-15	4 ea.	End doors trim. Laser cut poplar plywood.
W-16	2 ea.	Outside end doors. 1/16" laser cut birch plywood.
W-17	2 ea.	Inside end doors. 1/32" laser cut birch plywood.
W-18	2 ea.	Bathroom door trim. 1/16" laser cut birch plywood.
W-19	2 ea.	Bathroom doors. 1/32" laser cut birch plywood.
W-20	2 ea.	¼" X ¼" X 4-1/2" basswood car width spacers.
W-21	2 ea.	¼" X 3/8" X 18" clamping boards.
W-22	2 ea.	¼" X ¼" X 9" clamping boards.
W-23	4 ea.	1/8" Quarter Round X 3-3/4".
W-24	1 ea.	1/16" X ¼" x 10" basswood stick for bathroom wall trim.

Window Bag

WB-1	16ea.	White metal side windows.
WB-2	1 ea.	White metal oval bathroom window.
WB-3	16 ea.	Lexon lower window glass.
WB-4	16 ea.	Lexon upper window glass.
WB-5	1 ea.	Lexon oval bathroom window glass.

Chair Bag

C-1	16 ea.	White metal chair ends.
C-2	32 ea.	White metal chair rocker arms.
C-3	16 ea.	1/8" laser cut chair seats.
C-4	16 ea.	Chair back, back, 1/64" laser cut birch.
C-5	16 ea.	Chair back, middle, 1/64" laser cut birch.
C-6	16 ea.	Chair back, front, 1/8" laser cut basswood.
C-7	64 ea.	#20 brads

Bathroom Bag

B-1	1 ea.	White metal sink.
B-2	1 ea.	White metal toilet.
B-3	1 ea.	White metal tank.
B-4	1 ea.	White metal tank to toilet pipe.
B-5	1 ea.	1/16" laser cut basswood toilet seat.

Stove Bag

S-1	1ea.	White metal stove base
S-2	1 ea.	White metal stove ash drawer (middle section)
S-3	1 ea.	White metal stove body
S-4	1 ea.	Laser cut poplar plywood stove platform
S-5	9 ea.	3/8" X 3/8" X 1/8" fire brick
S-6	1 ea.	¼" diameter X 1-1/8" long stove pipe with 1/16" brass support.

Roof Bag

R-1	2 ea.	Cast resin roof ends with birch and poplar plywood carlins attached.
R-2	4 ea.	Laser cut poplar plywood carlin spacers marker C-2.
R-3	2 ea.	Laser cut poplar plywood inner end wall carlin marked C-3.
R-4	9 ea.	Laser cut poplar plywood main carlins.
R-5	1 ea.	Balsa wood center roof. 2.9" X 17.5" X 1/8".
R-6	2 ea.	Balsa wood side roof. 1.4" X 17.5" X 1/8".
R-7	2 ea.	Side roof trim. Laser cut 1/16" basswood.
R-8	2 ea.	End roof trim. Laser cut 1/16" basswood.
R-9	2 ea.	1/8" X ¼" X 17.5" basswood roof edge.
R-10	4 ea.	1/8" laser cut basswood cast roof end trim.
R-11	4 ea.	1/16" laser cut birch plywood cast roof end trim.
R-12	2 ea.	1/16" X 3/8" X 17.5" laser cut clerestory panel
R-13	20 ea.	1/16" laser cut birch plywood window trim.
R-14	20 ea.	1/16" laser cut Lexon windows
R-15	1 ea.	Pattern Ease for papering the roof.
R-16	4 ea.	White metal roof vents
R-17	1 ea.	White metal bathroom vent
R-18	1 ea.	Stove vent

End Platform Bag

EP-1	4 ea.	White metal end rails, 2 left, 2 right.
EP-2	4 ea.	White metal hand rails, 2 left, 2 right.
EP-3	2 ea.	White metal lock pawl.
EP-4	2 ea.	.051" X 2" music wire brake staff.
EP-5	2 ea.	White metal horizontal brake wheels.
EP-6	2 ea.	White metal vertical brake wheels.
EP-7	2 ea.	1/32" X 6" brass retainer airline.
EP-8	2 ea.	White metal retainers.
EP-9	8 ea.	White metal truss rod NBW.

Platform Steps Bag

PS-1	8 ea.	1/16" laser cut inner step sides, 4 with NBW holes, 4 without.
PS-2	8 ea.	1/32" laser cut outer step sides, 4 with NBW holes, 4 without.
PS-3	4 ea.	1/16" laser cut upper step.
PS-6	4 ea.	1/16" laser cut kick plate.
PS-7	4 ea.	1/16" laser cut bottom step.

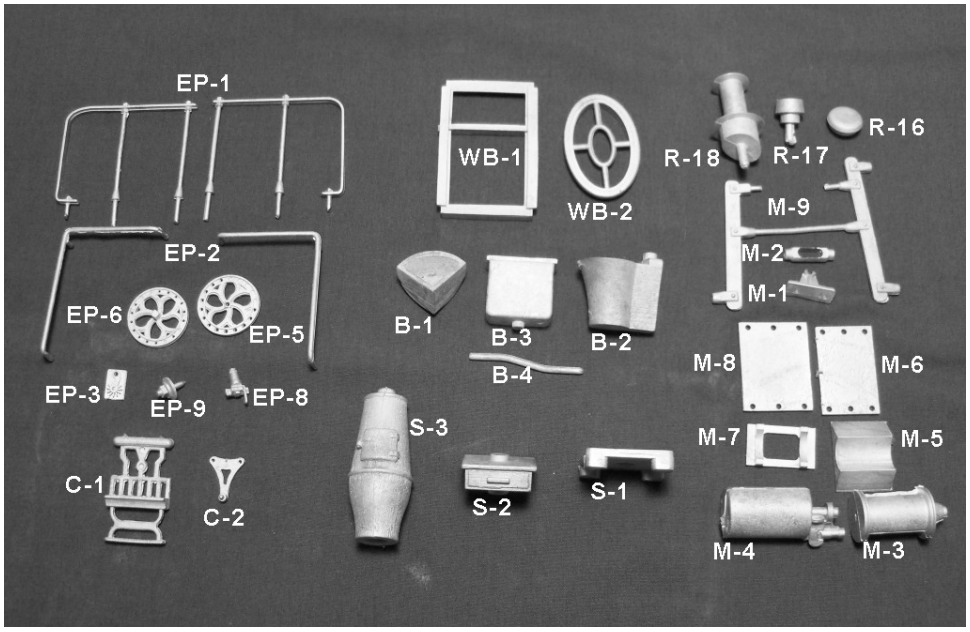
Under Car Bag

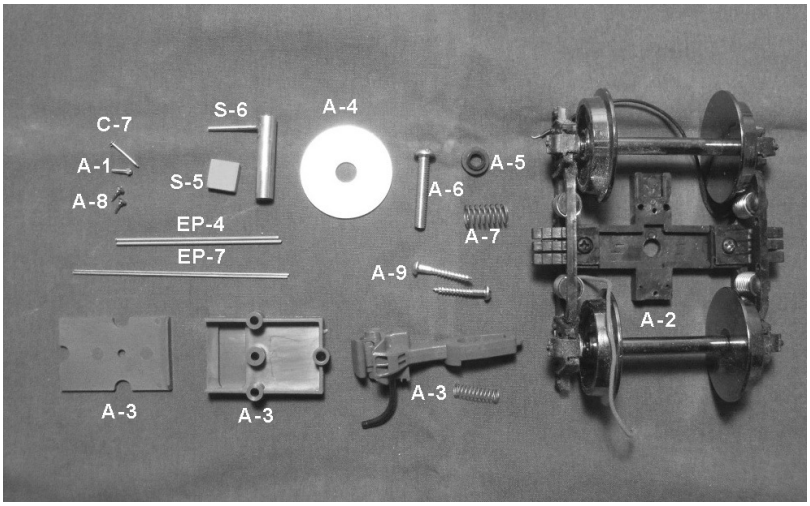
M-1	8 ea.	Queen post.
M-2	4 ea.	Turnbuckles.
M-3	1 ea.	Brake cylinder.
M-4	1 ea.	Air tank.
M-5	1 ea.	Brake cylinder saddle.
M-6	1 ea.	Brake cylinder mounting plate.
M-7	1 ea.	Air tank saddle.
M-8	1 ea.	Air tank mounting plate.
M-9	1 ea.	Brake lever assembly.
M-10	4 ea.	16-gauge aluminum, 15” truss rods.
M-11	2 ea.	16-gauge aluminum, 15” (brake pipes & rigging).
M-12	2 ea.	Turnbuckle boards, 1/32” basswood.

Misc. Parts

Item	Qty	Description
A-1	20 ea.	Brass Nut/Bolt
A-2	2 ea.	Aristocraft Short Passenger Trucks
A-3	2 ea.	Kadee 906R Couplers
A-4	2 ea.	Fender washers, truck spacers
A-5	2 ea.	Black plastic truck mounting screw centering washer
A-6	2 ea.	8/32 truck mounting blots
A-7	2 ea.	Truck mounting springs
A-8	5 ea.	Dollhouse doorknobs.
A-9	2 ea.	#4 Wood Screw (attach Kadee coupler)

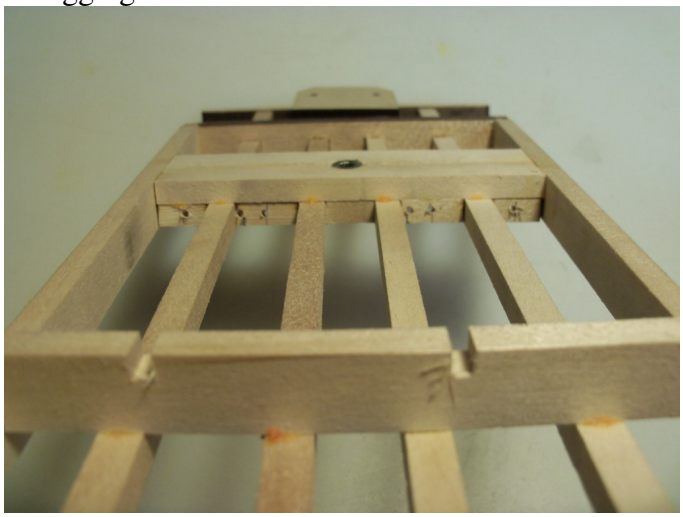
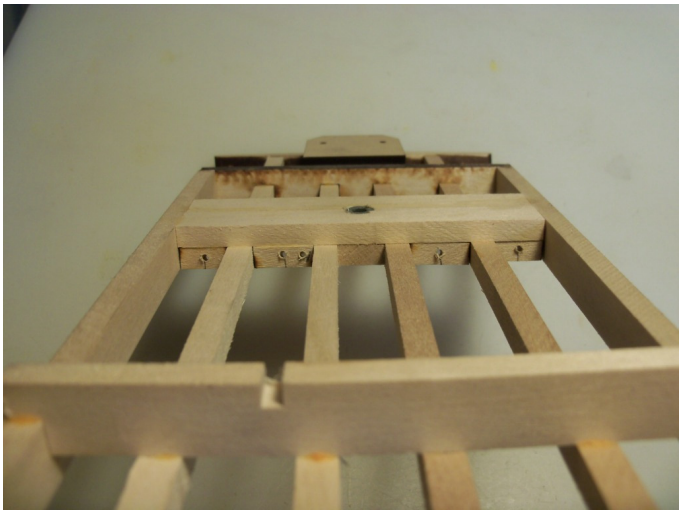
White Metal Parts



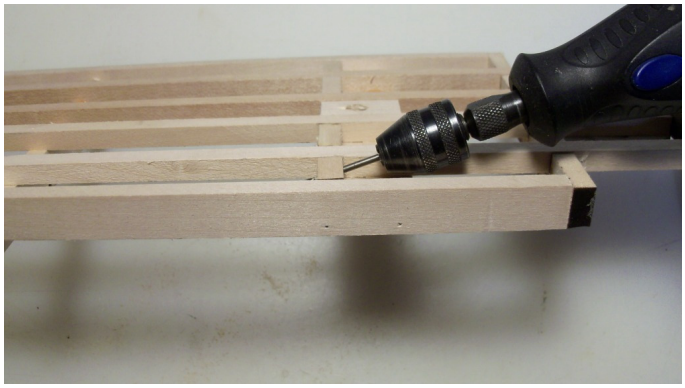
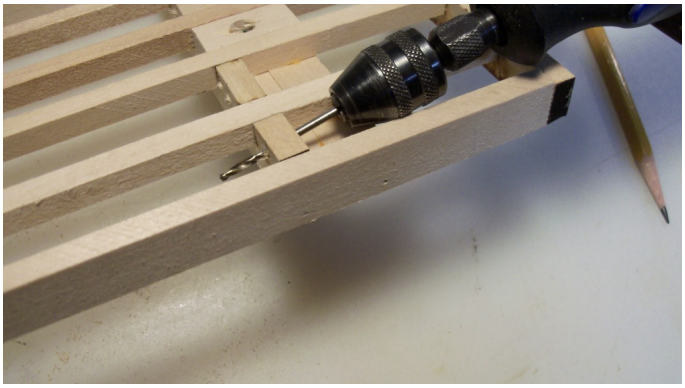


Step 1.

Clean up any saw cut fuzz left over from my assembly of the frame. Also, any glue that squeezed out that would hinder attaching the walls, floor or steps. With a #49 drill bit, drill 8 holes for the truss rods and 3 holes for brake rigging in the blocks above the car bolsters as shown.

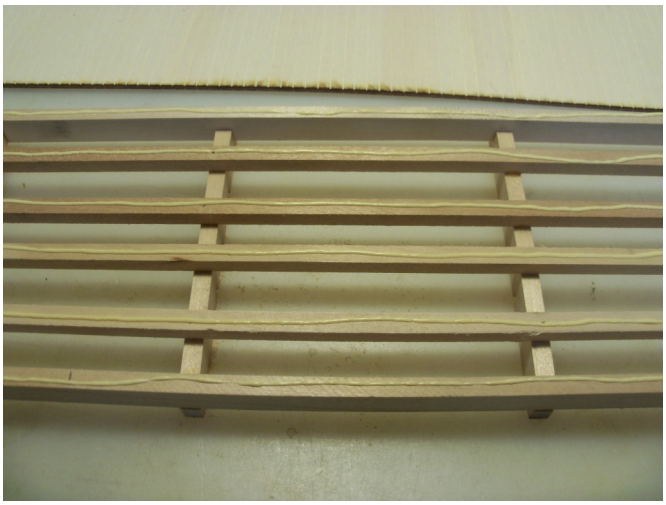
Centered in the outer blocks for the truss rods and next to the sills as shown for the rigging.

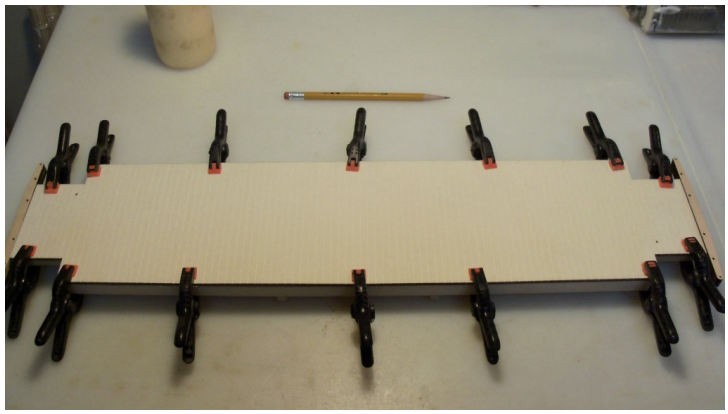



Drill the holes from the top of the frame angled down as the truss rods and rigging rods will enter these holes at a steep angle.

Step 2.

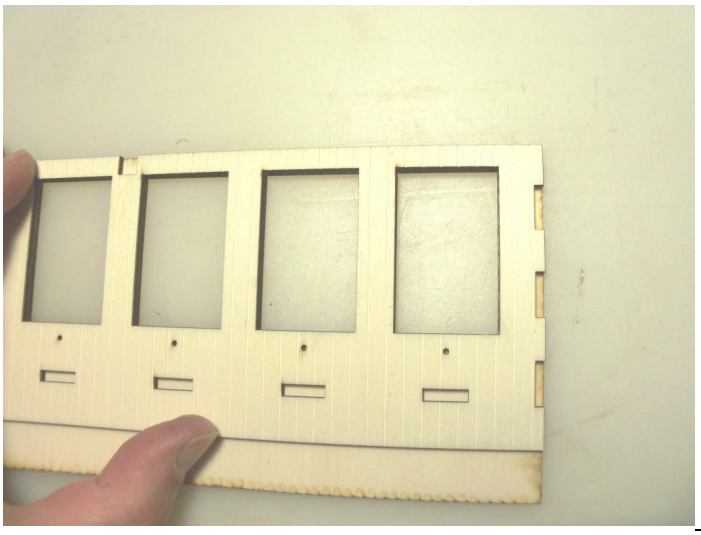
Apply glue to the tops of all the sills and car end beams. No glue on the end platform beams. Then attach the floor and clamp until dry.

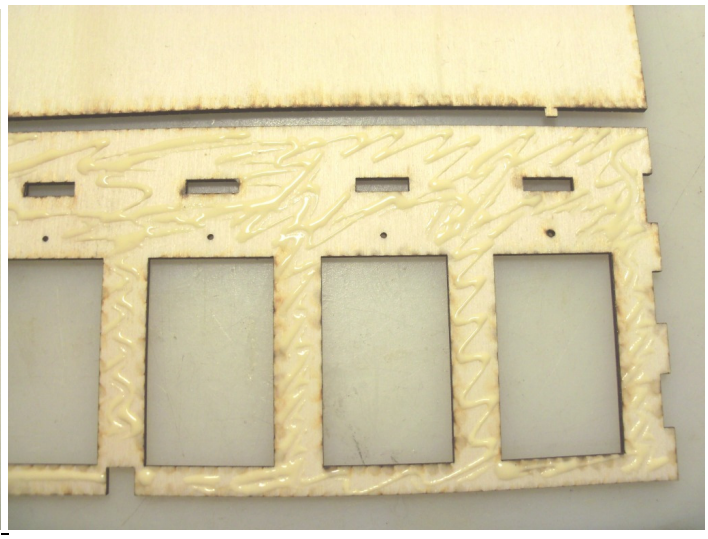




Step 3.

Gather the 4 side walls. Each wall is different. An inner and outer bathroom side and an inner and outer stove side. Test fit for the purpose of understanding how they will glue together. Scribed sides towards the outside of the car and inside of the car. Apply glue to the inner side minding not to let glue get into the holes for the seats.





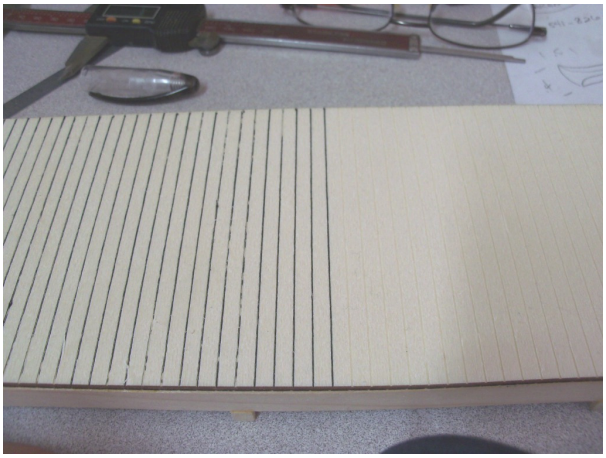
You need a real flat surface and weights to hold the walls flat as they dry so they won't warp. Aircraft plywood is extremely prone to warpage. My saw table is very flat for this purpose and I use scrap plywood and old, heavy, rubber spin casting molds for the weights.

Be careful that as you do this, the 2 walls don't slip out of alignment. Besides keeping glue out of the seat holes, keep it out of the corner tabs. When the halves are dry, inspect them for any glue that may have squeezed into a tab area and remove if necessary.

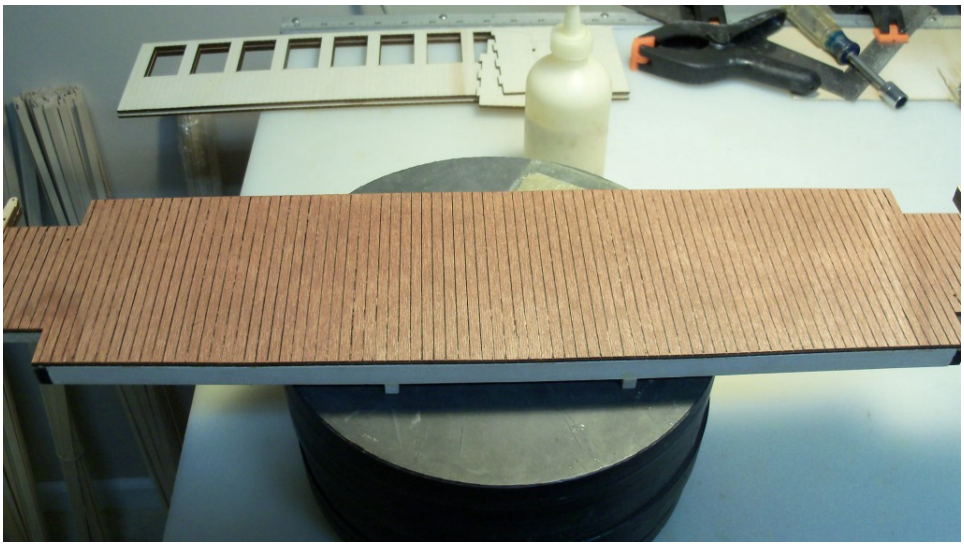
I can't emphasis this process enough. Your walls need to be perfectly flat and perfectly aligned. A piece of glass placed over the walls before adding the weights is also a good idea. The inner and outer walls when glued to together will be .220" thick so adequate weight is needed to insure the 2 walls are firmly glued together. When the side walls and end walls are glued together, they all need to be perfect. Also, the roof will not fit if the walls are not glued properly.

Step 4.

This step is optional. To darken the scribed lines in the floor, I use a fine tip marking pen. This pen came from Staples but I'm sure similar pens can be found almost anywhere.

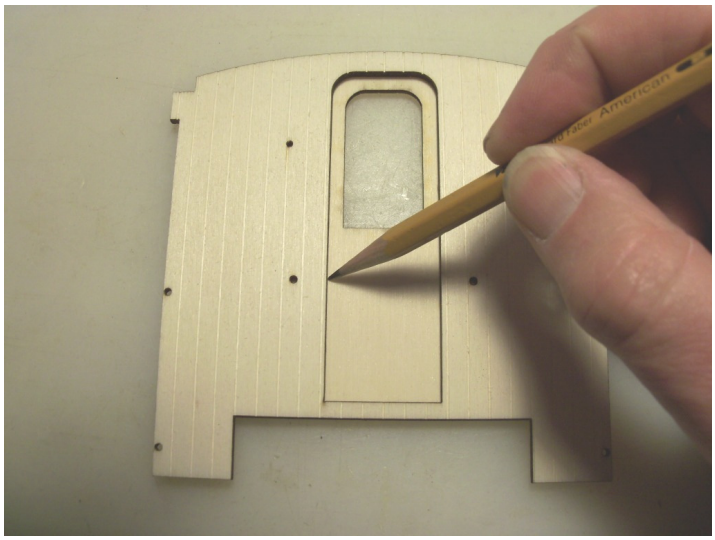


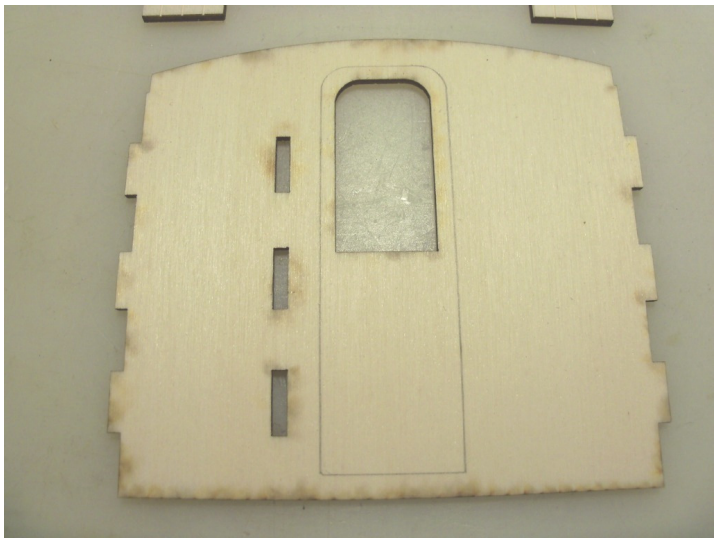
I stained the floor with a Cherry stain from Min-Wax. Dirt collects between the floor planks and I think the black pen marks help accentuate the look. Once the stain was dry, I masked off the end platforms and took it outside to rattle can the bottom Dark Forest Green. Picture of the paint can is in step 10.



Step 5.

Now gather up the 4 end walls, the 2 end outer doors and 2 of the end door trim pieces. The outer walls are identical, but the inner walls are not. It doesn't matter which combination you glue them together. The outer doors are 1/16" thick birch. The inner doors are 1/32" birch. The door trims are identical.

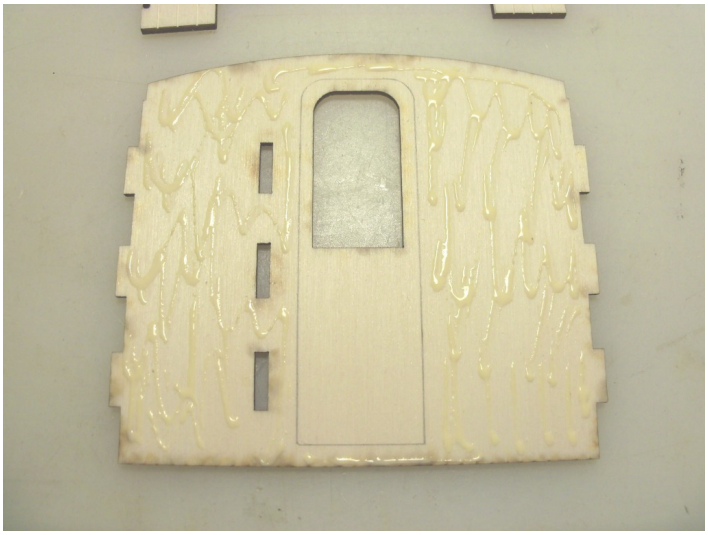


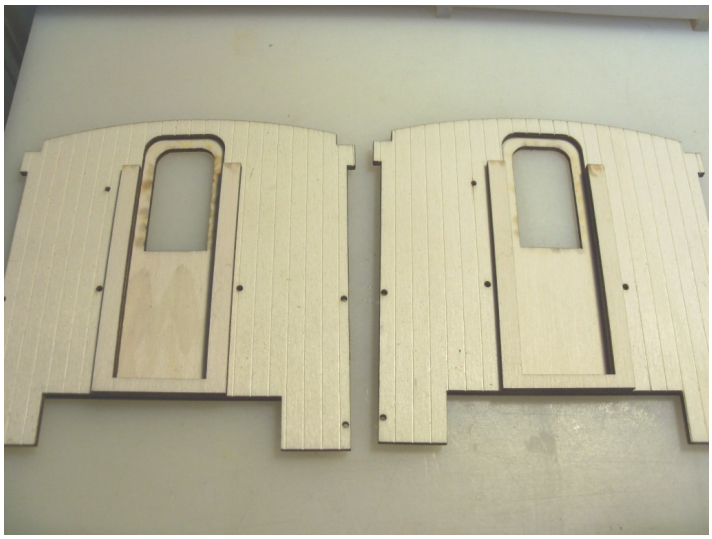


Place an outer end over an inner end to mark the doorway. You don't want to put glue in that area.

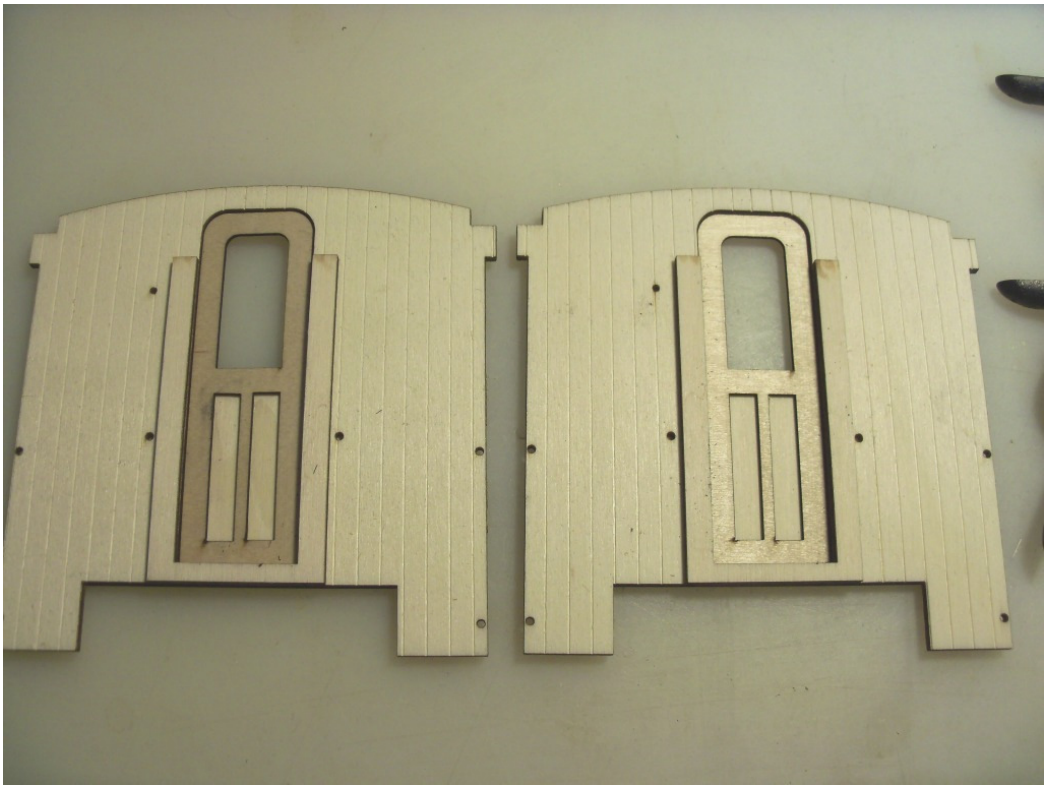
Add glue to the areas outside the door marking on the inner end wall, keeping all tabs clear. Glue the outer and inner walls together following all the rules laid out for the side walls.

Allow to dry. Then glue the door trims to the outer end walls as pictured.





Finally, glue the outer end doors into the openings and allow to dry.



The inside doors and trim won't be glued in until painting the outsides and staining the insides is completed.

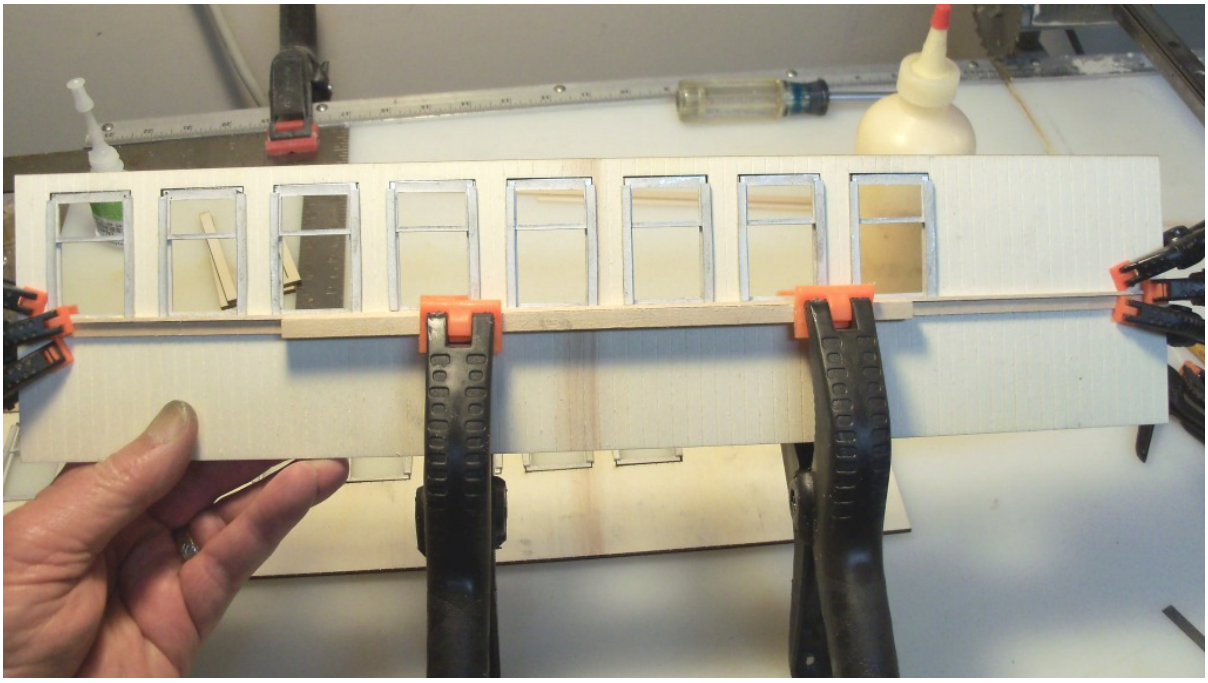
Step 6.

Gather the 16 white metal side windows and the single oval bathroom window. Clean any flash from the parts. Bevel the top and bottom edges of the side windows. I've found they
Stick up a little above the wood car side and can impede the letter board of the roof from seating down firmly to the window's top edges. One of the window masters was a tad longer than the others. I've tried to weed them out of your kit, but you may find 1 or 2 windows to long to fit. If so, I apologize. You'll need to file or sand the top edge to fit.

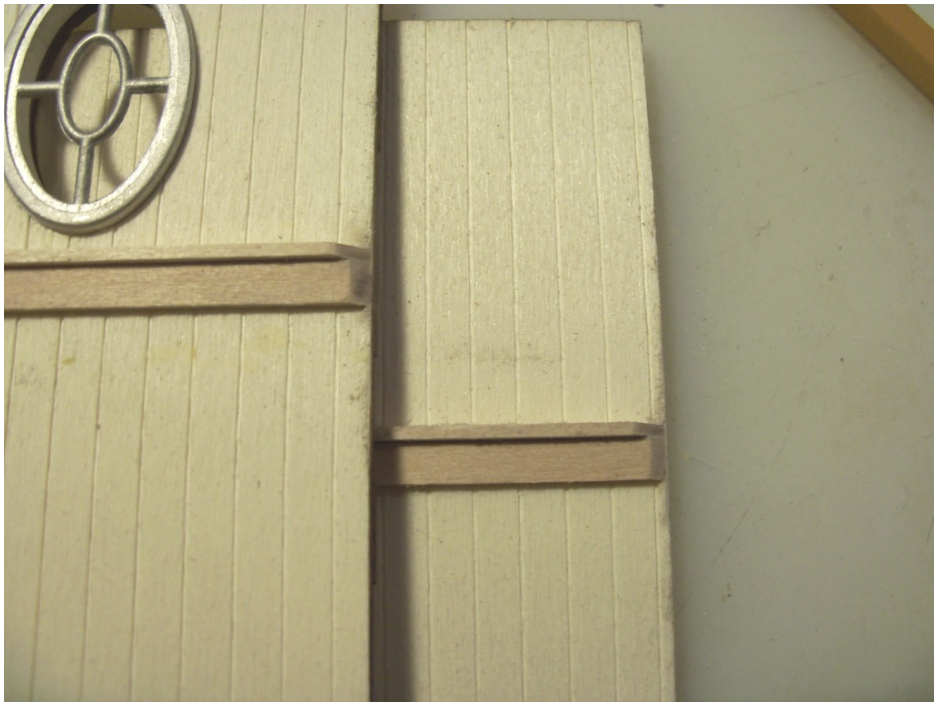
Glue all the windows in with an ACC. Push all the windows up as far as they go so any gap is at the bottom of the window.

Step 7.

Gather 2 each of the 1/16” by 1/8” by 18” long basswood sticks and 2 of the 1/16” by 3/16” by 18” basswood sticks. These make up the outside window rails. Measure and cut a 1/16” by 1/8” stick to fit the length of the outside wall. It’ll be approx. 17” but I hold it to the side and mark it to fit. Glue this on edge butted up against the wings of the windows. Cut the 1/16” by 3/16” the same way and glue it flat under the first piece. I supplied 4 basswood sticks to use as clamp guides. Using one of the ¼” by ¼” by 9” sticks and other clamps, hold these 2 pieces firmly against the car and under the windows until dry.

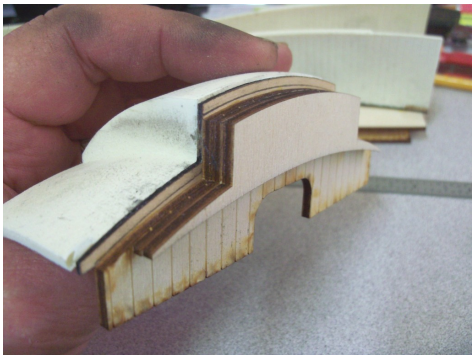
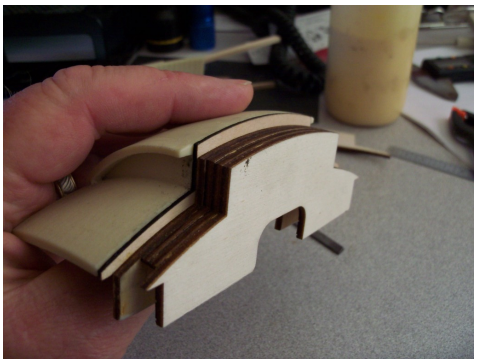
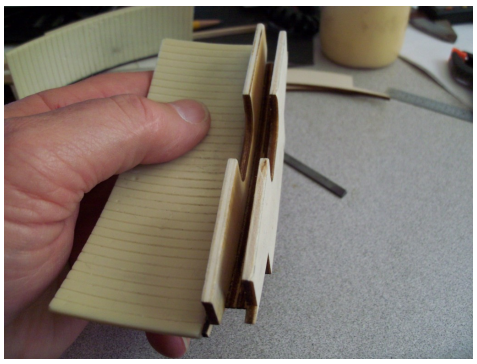


Allow to dry and then sand the ends to be beveled to the side of the wall. Repeat this for the other side wall.



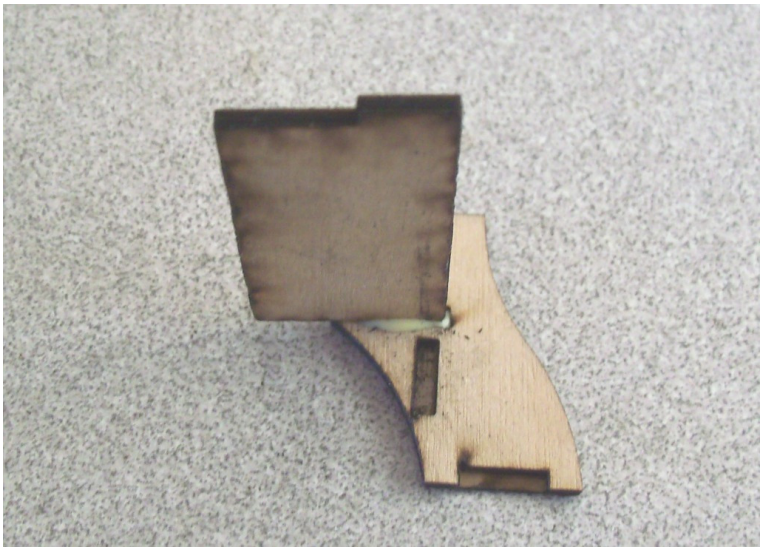
Step 8.

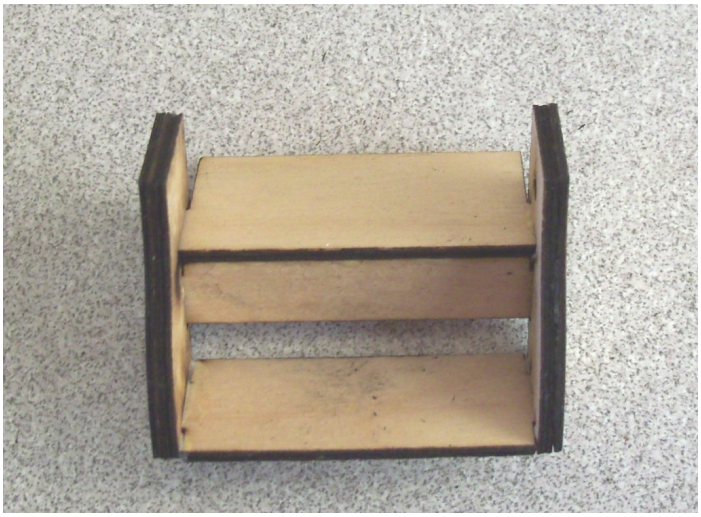
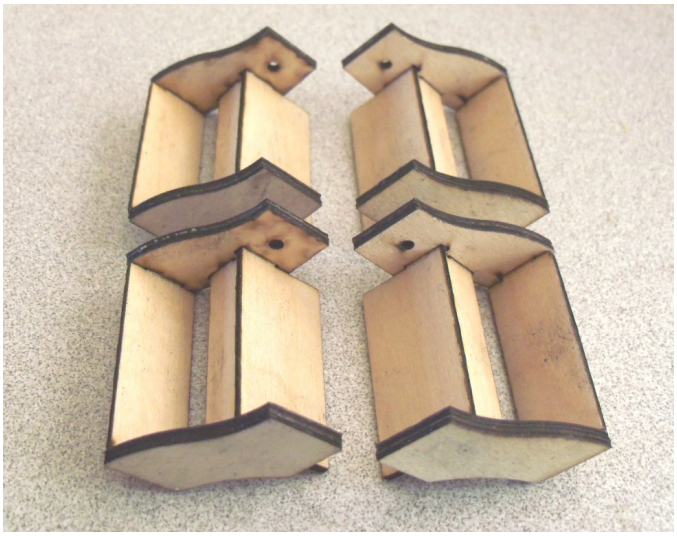
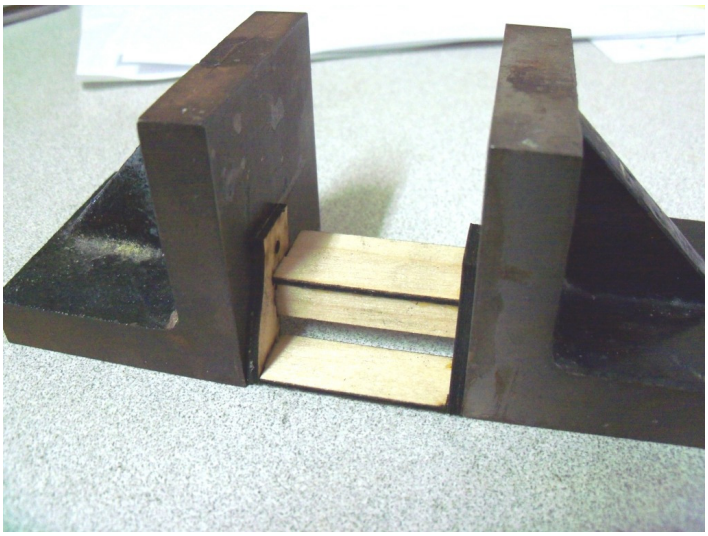
Gather up the 6 carlins marked C-2 and C-3. The 4 C-2's are spacer and the 2 marked C-3 are the inside carlins. Also grab the 2 roof ends. You'll see I have already glued a 1/16" birch carlin to the resin end and carlin C-1 to that with a 1/8" offset for the balsa roof. Following the top edge of C-1, glue the 2 C-2's onto it followed by the C-3. This creates roof ends that firmly fit down over the car end walls.

Step 9.

The steps. Grab the bag marked steps. There 7 pieces to each step. 2 outer sides, 2 inner sides, a top step, a kick plate and a bottom step. First thing is to match up the inner and outer sides. 1 each has a truss rod NBW hole and the other doesn't. The side with the NBW hole will go next to the car. The other side next to the platform beam. Glue the 2 pieces together for each side. Then with one side lying flat, add glue to the tab of the top step and kick plate and glue into the side. Add glue the other end tabs and glue on the other side. Finally, glue on the bottom step. This sounds easy but I sure developed a procedure that will create some blue smoke on your bench!! It did mine!!

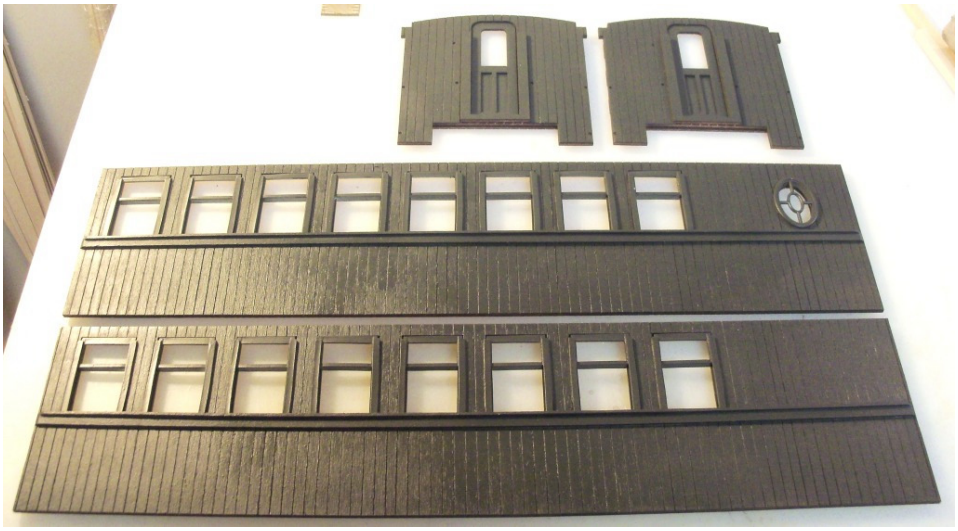
You should end up with the 4 steps with the NBW holes as pictured above.

I have a couple angles I bought from Micro Mark 20 years ago. They worked well to hold the steps square while drying. As pictured.

Step 10.

Painting. I used a rattle can paint from Rust-Oleum called Camouflage Forest Green. I also use a matte medium from Rust-Oleum Pictured here.

It took 2 thin coats (better than 1 heavy) plus a little touch up here and there to paint both the sides and ends.

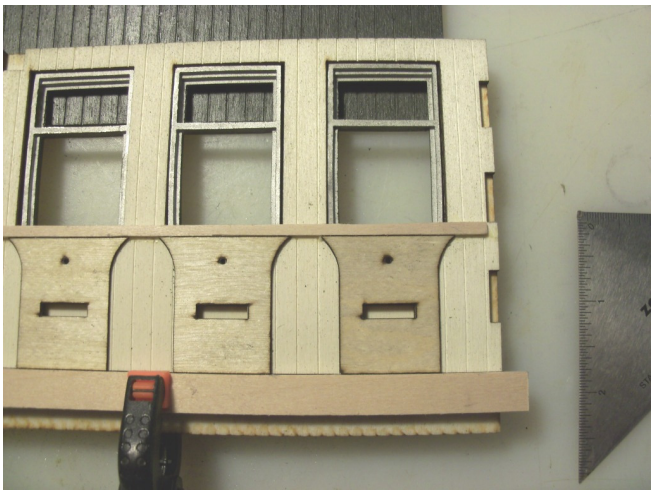


I let the paint dry a solid day before spraying the matte medium to seal it. Then let them dry another full day before proceeding. Black and white doesn't show the hue so go to my web-site on the coach page to see the actual color.

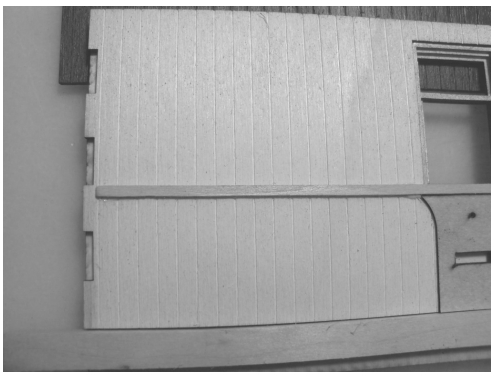
Step 11.

Now gather upper and lower window panels and the remaining 3 sticks of 1/16" by 1/8" by 18" basswood which will be the chair rails. Before gluing these pieces in, verify the round holes under the windows for the seat back rocker arms are clear of glue and that the rectangular holes under them for the seats are clear. If need be, use a rocker arm and a
seat bottom to test those holes. Also grab the 2 clamping sticks, ¼" by 3/8" by 18". Clamp one on the bottom edge of a side to the outer wall and butted up against the bottom on the inner wall. This will help act as a guide for the lower window panels.

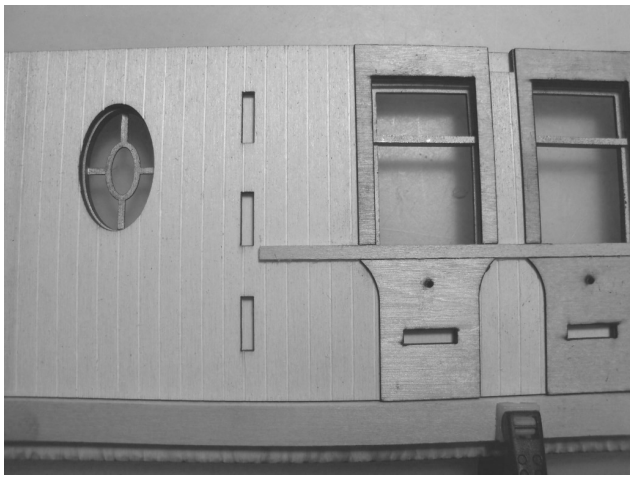
Glue the 8 lower panels in place lining them up with the round and rectangular hole in the inner wall.



Now measure and cut the chair rail and glue it butted down tight to the tops of the lower panels. Don't go all the way to the ends with the rails as it will block the corners from fitting together. Leave the tab area plus a 16^{th} for good clearance.

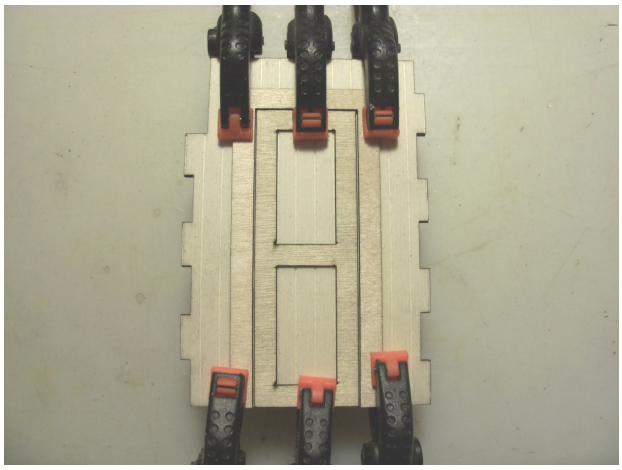
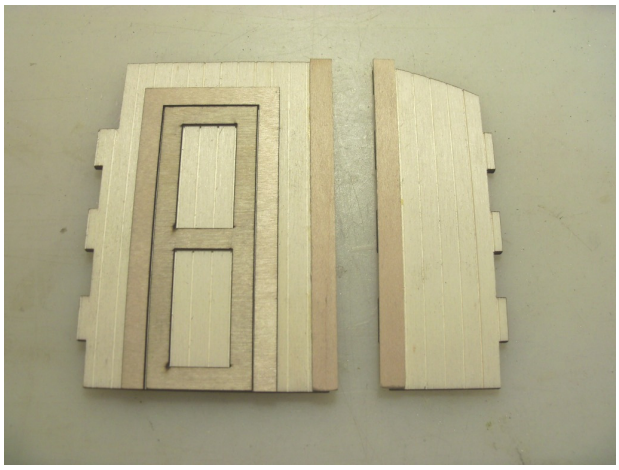
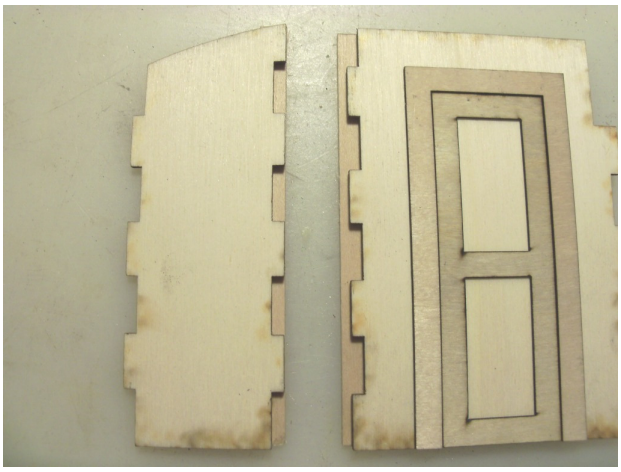
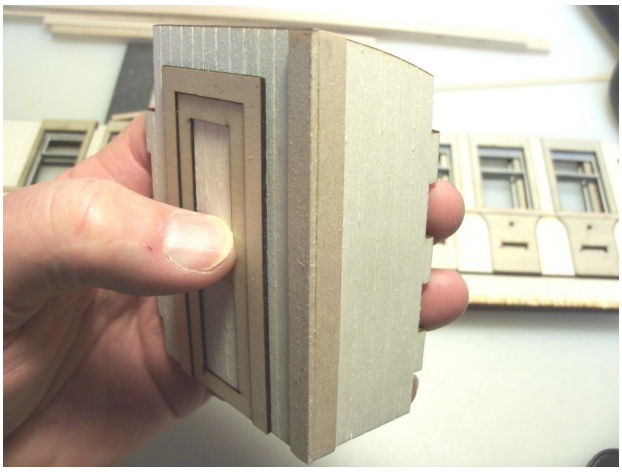


On the stove end, extend the chair rail to almost the end of the wall. Then glue the 8 upper window panels in place. On the bathroom end of the wall, end the chair rail at the tabs for the bathroom wall.



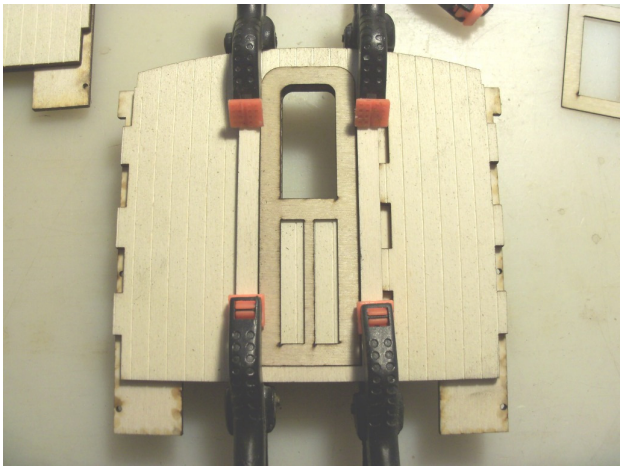
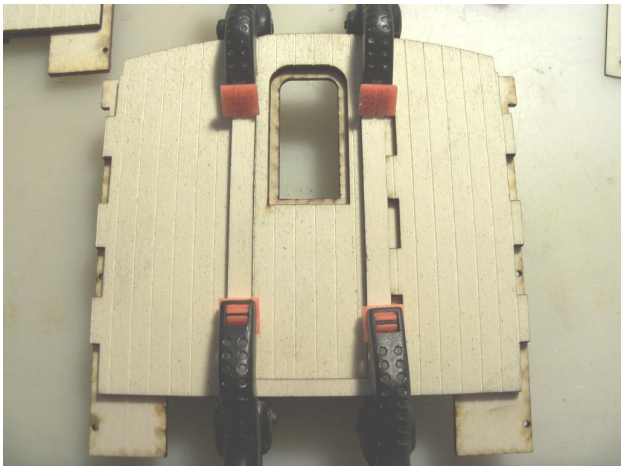
Now add the chair rail to both end walls maintaining the same height of the rail as on the side walls.

Grab the 2-bathroom inner walls, the 2 doors and the 2 door trims. Glue the doors and door trim to both sides of the wider wall. Cut to fit the 1/16" by ¼" basswood to cover the tab side of both walls to hide the tabs once glued. One wall will be flush with the tabs while the other wall will extend over 1/16th inch.

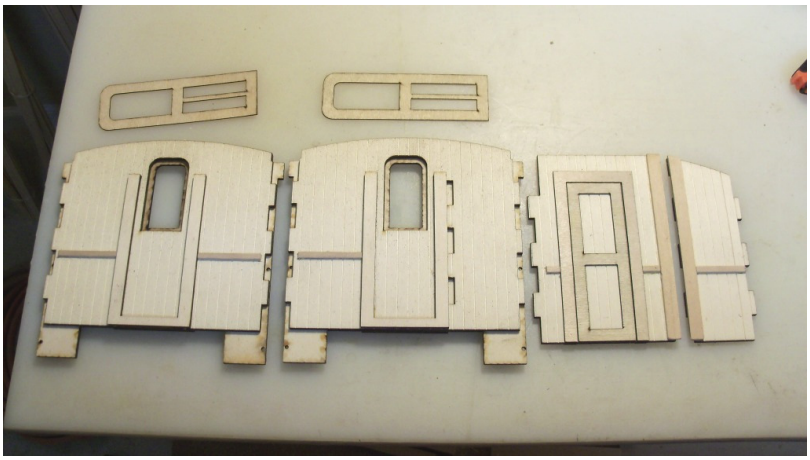





Left is the inside of the walls and right is a test fit of the 2 walls.

Grab the 2 end walls, inside doors and door trim. Use the door as a guide for gluing the trim on but don't allow the door to glue down. Once stained, the window must glue before the door. Make sure the door trim doesn't cover the bathroom wall tabs.

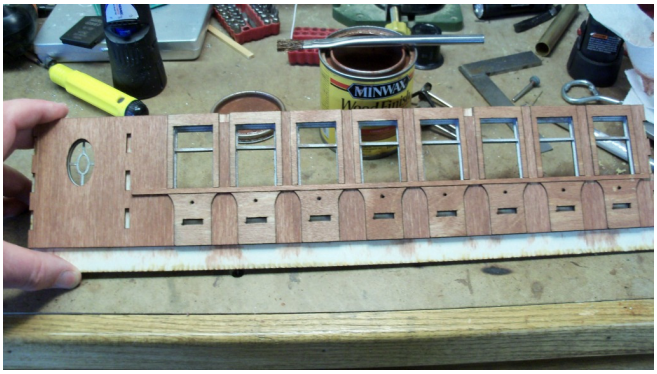



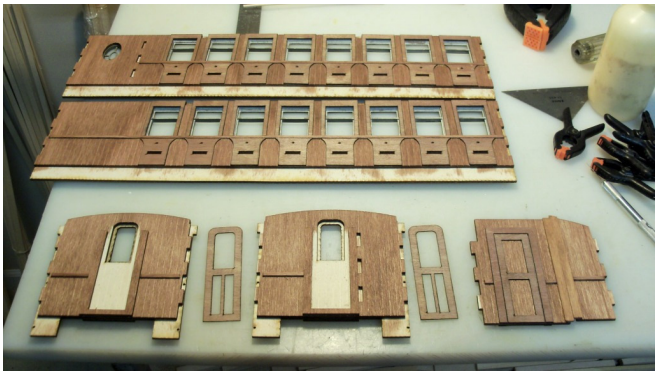
Here's the 2 end walls and the bathroom walls to show the chair rails, bathroom trim and door trim on the inside of the end walls. The Inside end doors are not glued in yet as they need to be stained and the window glass glued in first.



Step 12.

Stain the inside of the side and end walls and both sides of the bathroom walls. Set aside to thoroughly dry.

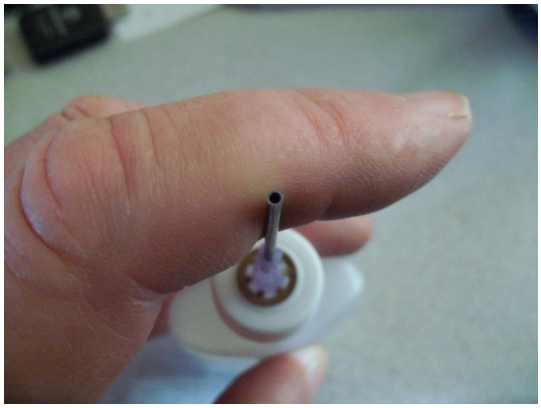




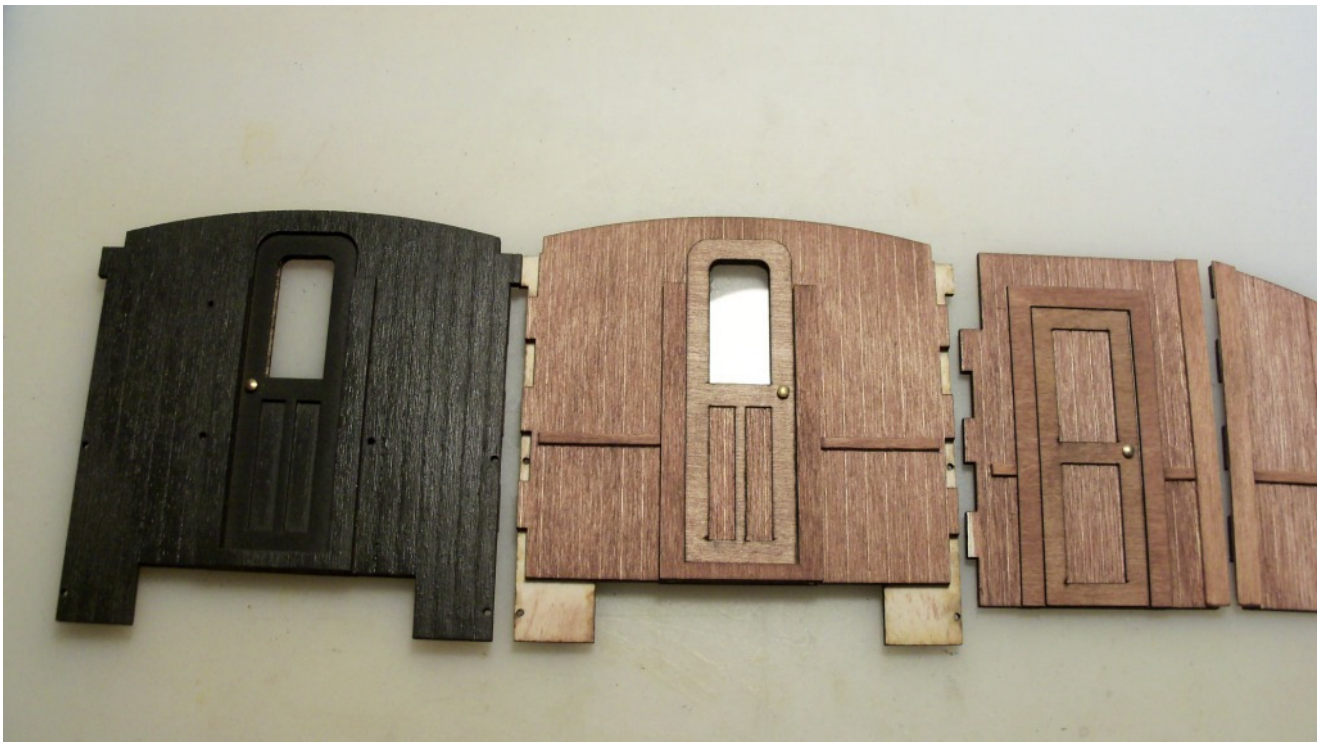
Step 13.

Gather up the lower and upper side windows and the one oval bathroom window plus the 2 end door windows. Peel the blue protective skin off the Lexon. I've found using an exacto knife at the corner helps to get the cover started enough to grab it with my fingers. Lasering these out of a 1' by 2' sheet has a nasty habit of bonding the skin to the plastic. For gluing, use a glue that will dry clear. I bought a small bottle of Micro Scale Kristal Klear. Once I opened it, I'd be willing to bet it's matte medium like the Mod Podge sold at Hobby Lobby or Walmart.

I also found this applicator at McMaster-Carr for a couple bucks. It can be had with different size syringe tips. I bought a couple with 16-gauge needles (largest diameter). I bought 2 so I could use 1 with hot water to flush out the needle after use. When finished gluing, I unscrewed the cap and needle and screwed it on the battle with hot water and in a sink, flushed out the tip until clean.



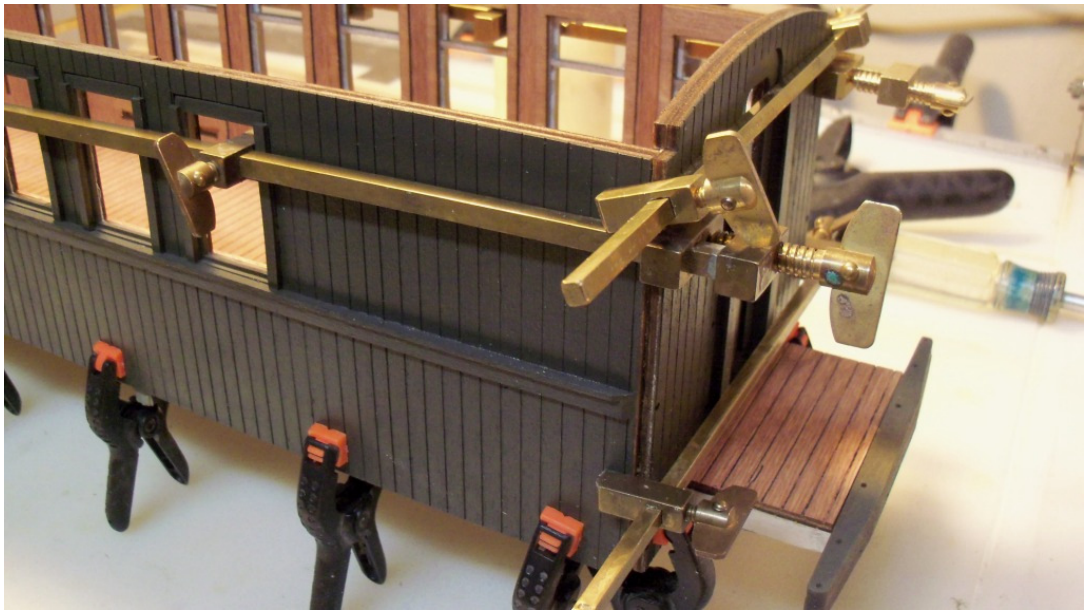
Glue all the lower windows in on both sides but only 12 of the upper windows. Leave a window at each end of both sides for a clamp to fit into for the next step, gluing the 4 walls to the frame. After gluing the end door windows in, glue the inner door in place and touch up the stain. Pictured is an outside end, and inside end and the bathroom walls.

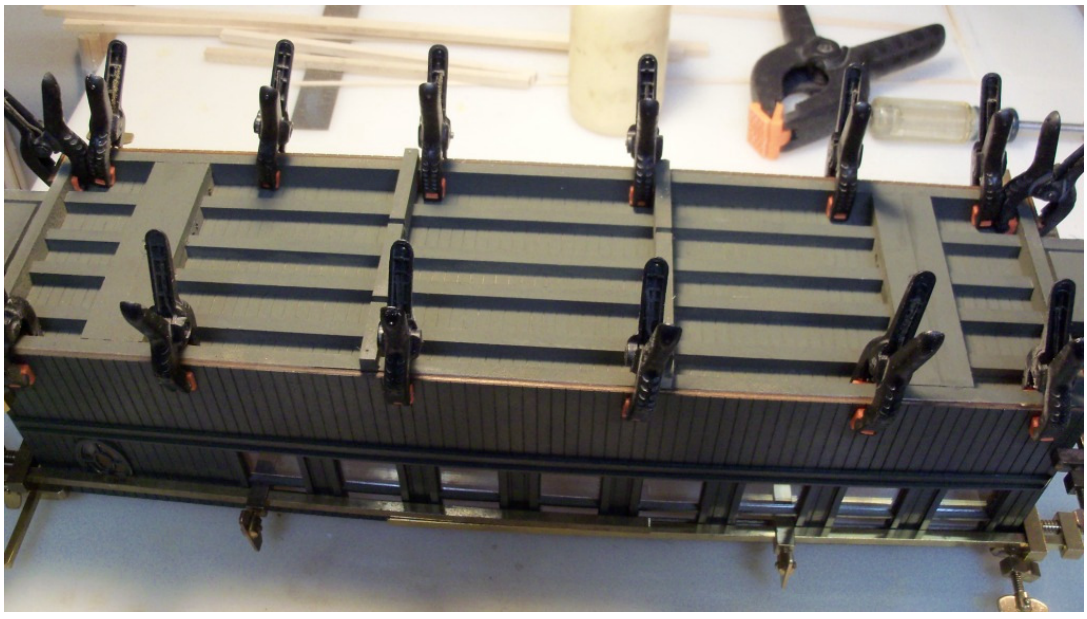


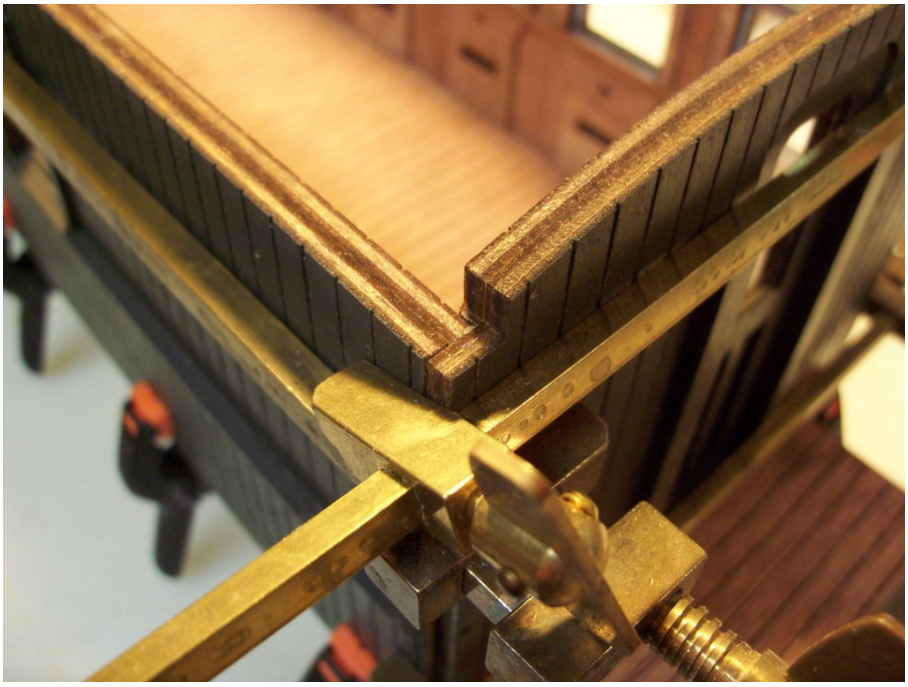
In the bag of brads and NB's are 5 dollhouse doorknobs. Using a #62 drill bit, drill holes in the doors for the knobs. 2 knobs are supplied for the end doors and 1 for the bathroom door. For the end doors, the door knob shank is to long and needs to be cut down to 3/32" or so. Otherwise one door knob will push the other out of the hole. With only 1 knob on the bathroom door, just glue it into place.

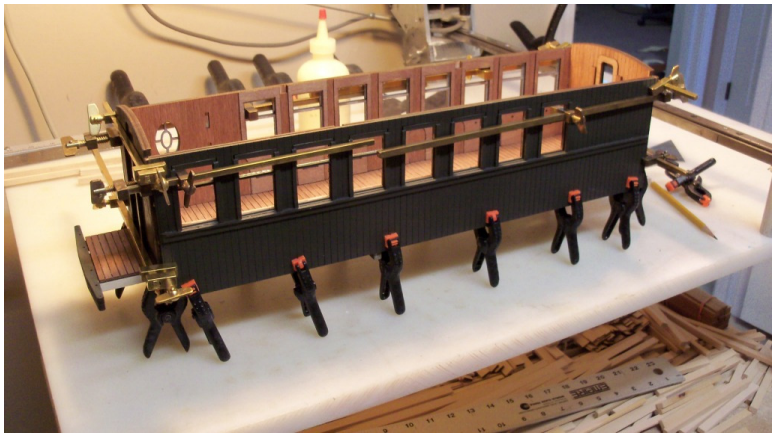
Step 14.

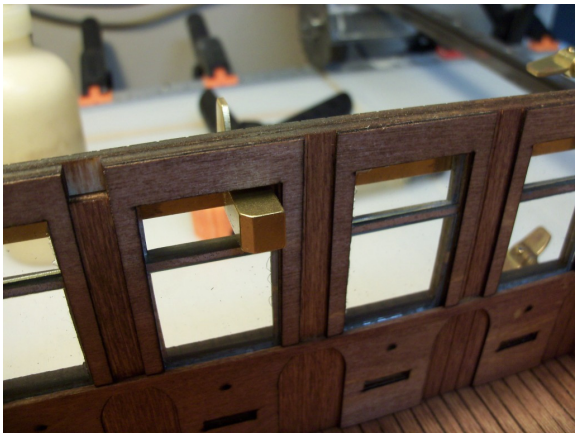
Time to glue the walls and ends to the frame and floor. Test fit them together on the frame holding with clamps along the bottom edge to verify all 4 corners are going to fit securely. Check the length of the side walls to the frame / floor and if the frame is a tad long, sand it to match the length of the walls. The ends and side were precision cut on a laser, but the frame was built buy hand and there could be minor length discrepancies. The open corners will be filled with the supplied quarter round pieces. When your satisfied with the fit, apply glue along the bottom inside edge of one side and glue and clamp with just a couple clamps to the frame. Repeat for the other side. Add glue to the inside bottom edges of an end wall making 100% sure your matching the bathroom end to the appropriate bathroom wall (bathroom wall tab holes) and the stove end to the stove wall (no tabs holes). Also add glue in the tab slots at both side of the ends and glue and clamp to the frame. Adjust positioning of all 4 walls if necessary and add more clamps along the bottom and longer clamps to hold the sides together and from and open window hole to the ends. 2 pages of pictures follows. Look them over before you start. Notice the top picture of the next page. The corners must fit tight as shown.





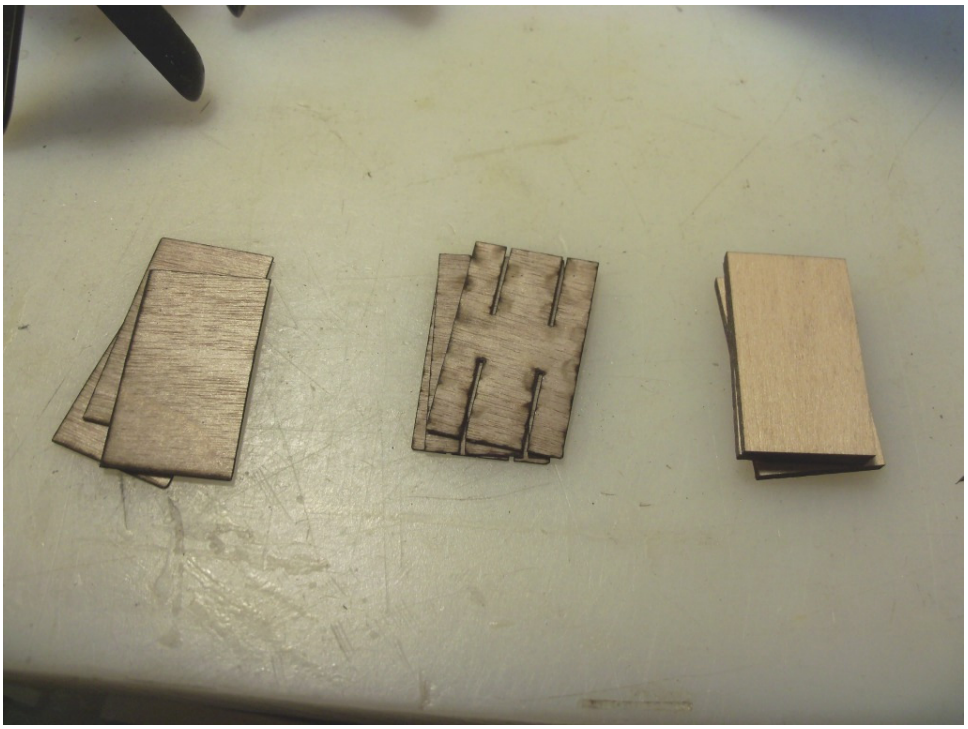




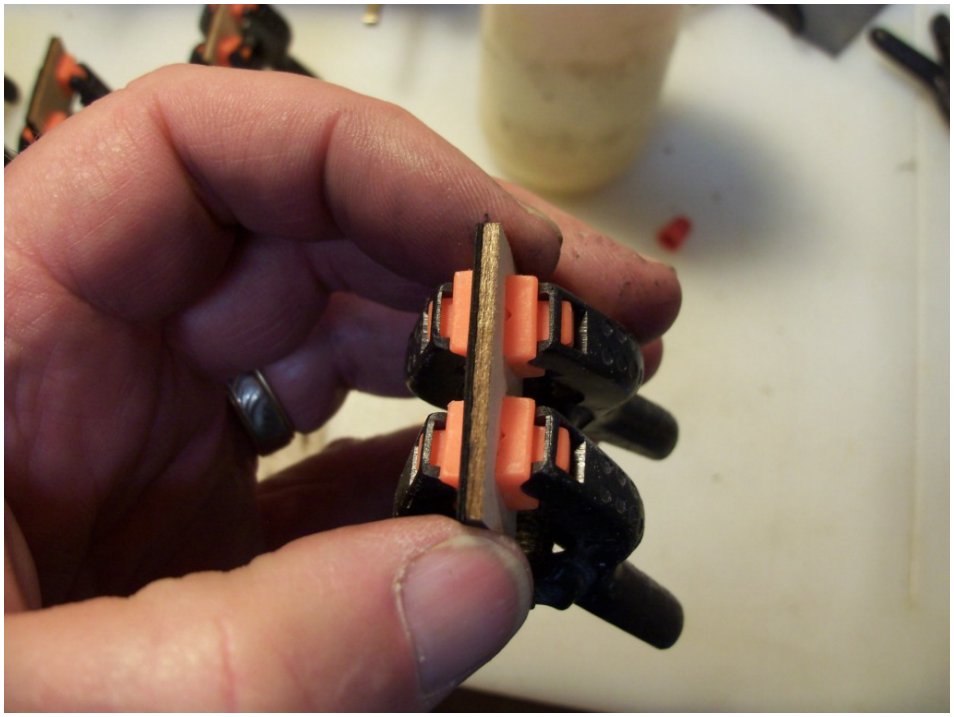


Step 15.

Time to get the seats started. Gather up 16 white metal seat ends and 32 white metal seat rocker arms also the 16 seat bottoms and 48 seat backs parts. These are basswood and birch. Identify the 3 parts of a seat back. All 3 pieces are the same size length and width. The very back is a 1/64" thick solid piece. The middle section is also 1/64" but has 2 laser notches and both ends. The third is the front section or cushion section of the seat back.

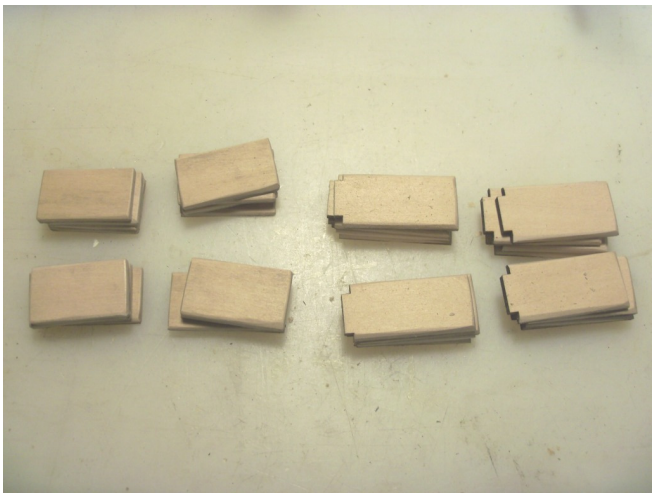


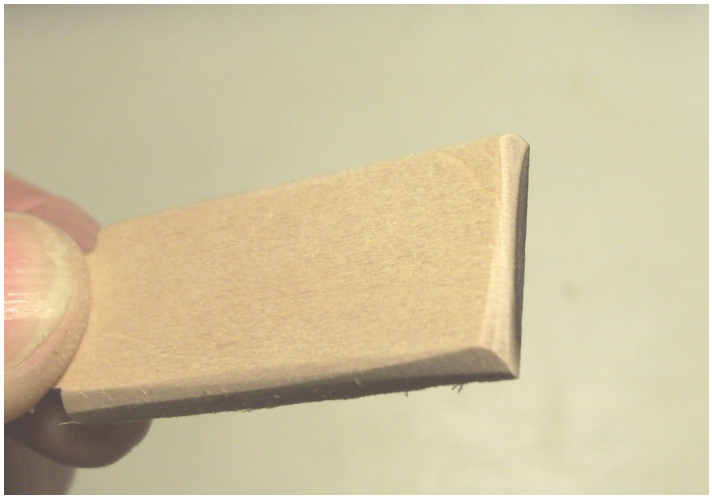
Glue the 3 pieces together. Enough glue to securely hold but try to keep as much as possible out of the notches. Clamp and let completely dry. They'll need to be drilled and have the brads nailed into those notches and we don't want them splitting apart.



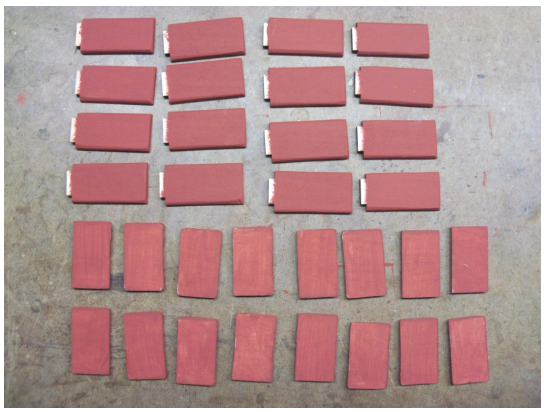
While the seat backs are drying, clean up any flash on the seat ends and rocker arms. Most of the flash will be on the top of the arm rest where the casting gates meet the casting. I used a patina to color my white metal seat parts, but you can also paint them. Patina's come in black and copper. I've never tried the copper. Would be interesting if it gave a bronze look. Once patinaed, I buffed them with handheld Dremel and wool buffing wheel.

Back to the seat backs and bottoms. Sand the top edges of the bottoms for a rounded look and the front edges of the seat backs. Don't sand the tab end of the bottoms.



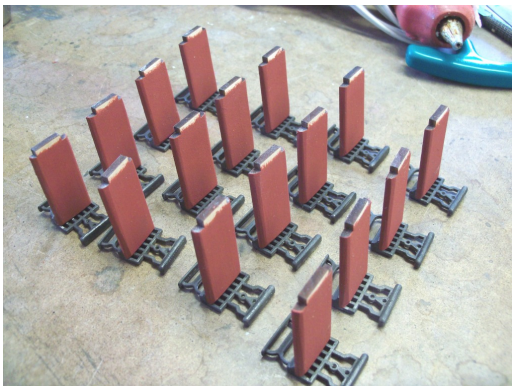


I used a Heritage Brick acrylic paint to represent a leather color for my bottoms and backs. You can use whatever color pleases you.

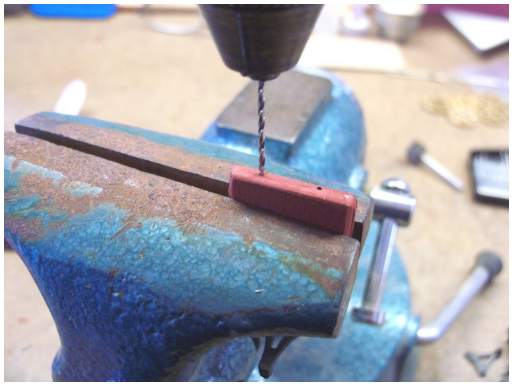


Leave the wall tab end of the seat bottoms unpainted for gluing. Also, you can paint both sides of the bottoms, but I found the paint interferes with gluing them to the white metal seat ends. Do paint both side of the seat back as they will be visible. When dry, I used a small sharp pick to clear the notch holes at both ends of the seat backs. That helped finding the holes when drilling them out for the brads.

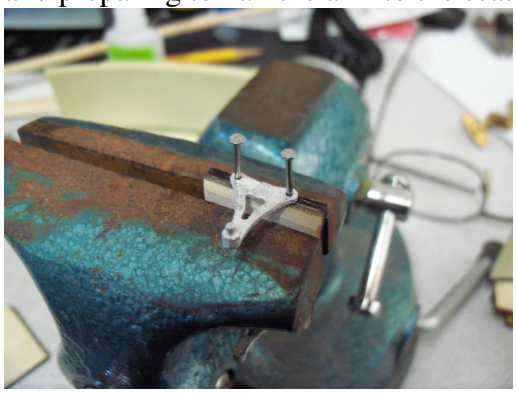
Next, sand or file the seat bottom support of the seat end of any paint or patina. This aids in gluing as I've found paint and or patina seems to interfere. I used an ACC goo verses the traditional thin or thick ACC. E-6000 is another goo type of glue that will work. Glue all the seat bottoms to the seat ends.



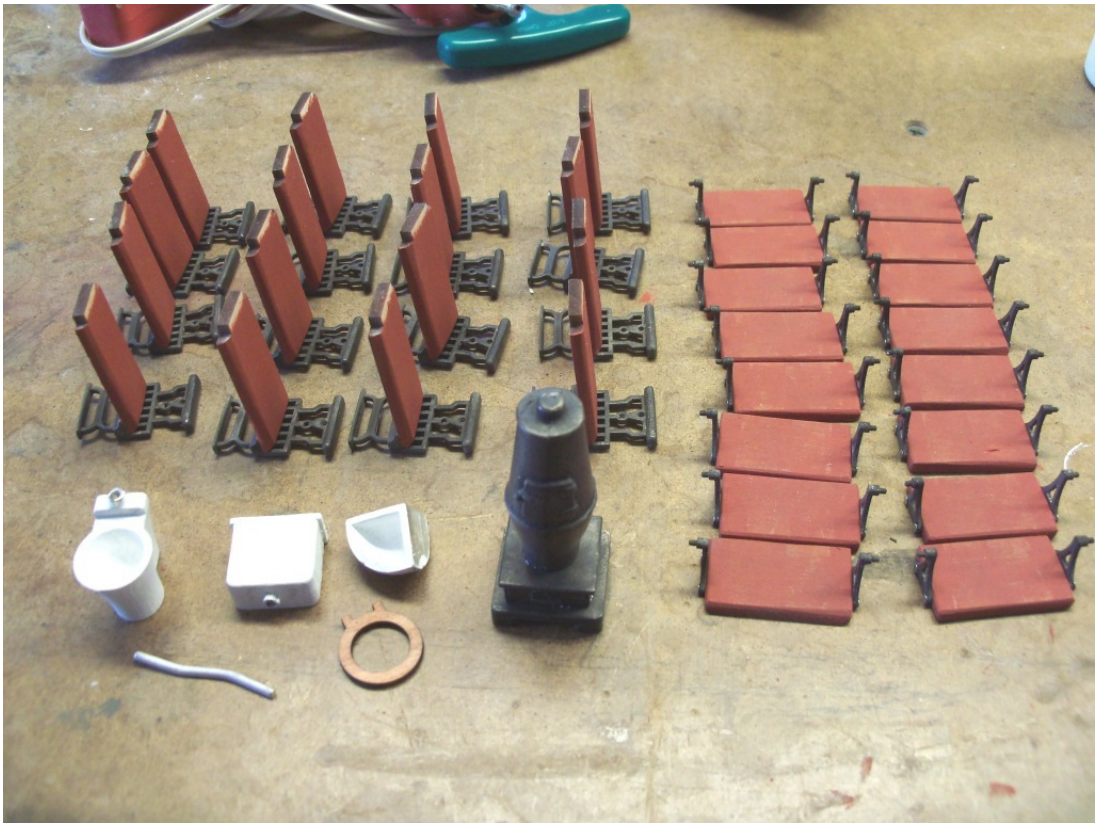
Now get the 64 #20 brads, a small vise, small hobby hammer, a #61 drill bit and drill, the 16 seat backs and 32 rocker arms. Ever so carefully, drill out the notched holes of glued that filled them during gluing the 3 sections together. Don't force the drill. Let it "find" it's way.



Drilling and preparing to nail the arm to the seat back. Rocker and back are unpainted for clarity.



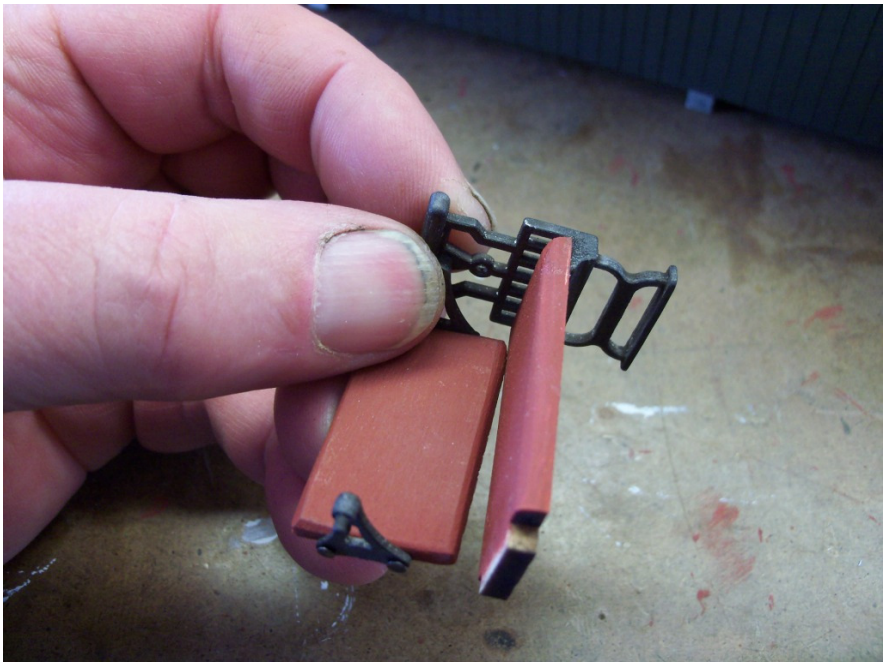
Again the rocker arm and seat back is unpainted for clarity. Line up the brads through the arms and into the holes and lightly tap in with the hobby hammer. Notice the pin is pointing up. Turn the back over in the vise and add the opposite end arm the same way. Touch up the nail head with patina to blacken it to match the arm.

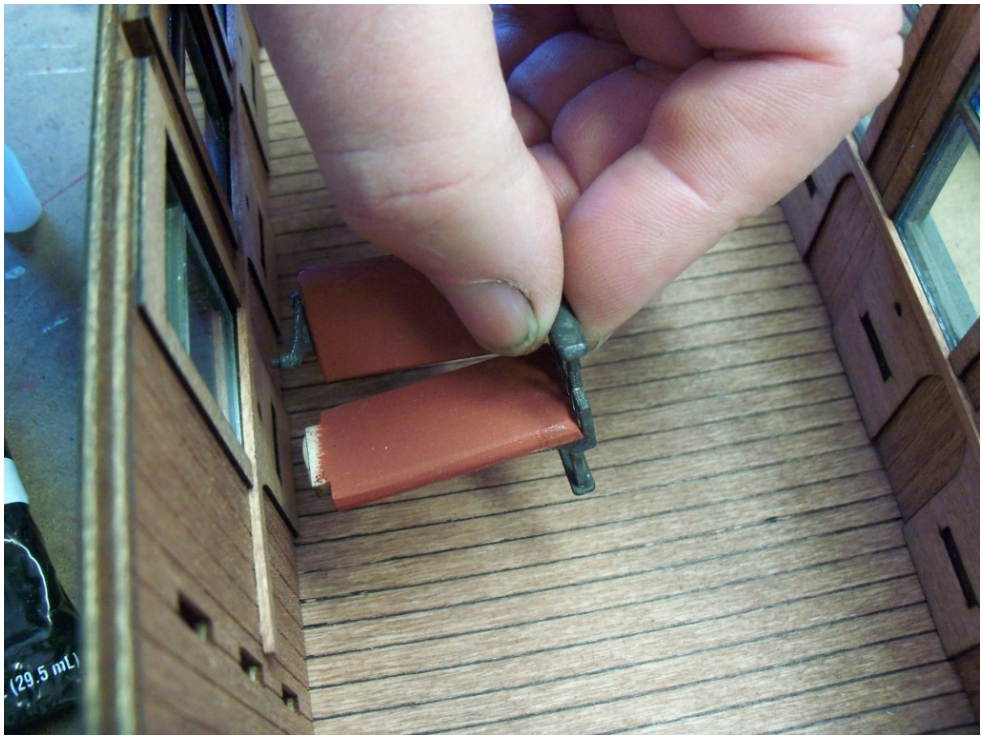


I've blended a couple steps into this picture. For you to "catch up", dill a #48 hole in the top of the toilet top back. There is a hole there, but you need to enlarge it to a #48. Also drill out the hole in the bottom of the tank with the same drill bit. Paint the toilet, tank and sink white for porcelain or you can just buff them up for shinny stainless. Stain the toilet seat and glue to the top of the toilet. Patina the 3 parts of the stove and buff with the wool wheel on your Dremel. Using the ACC goo, glue the 3 pieces together. Now where all caught up!!

Step 16.

This is how I hold an arm and seat preparing to glue into the car.





Apply wood glue to the end of the tab only of the seat bottom. Apply the ACC Goo to the bottom of the seat leg. Fit the rocker arm pin into the hole under the window and the tab into the hole under that. Then press the seat leg down to the floor and verify the seat is firmly against the wall. If the seat wants to move away from the wall, it's because the rocker arms are bent out a tad from the seat back. Hold the seat down to the floor and against the wall and move the seat in and out against the wall and seat end. This should "relax" the pressure pushing the seat out from the wall. Be gentle as this is white metal and not steel.

One side finished. Now repeat for the other side.

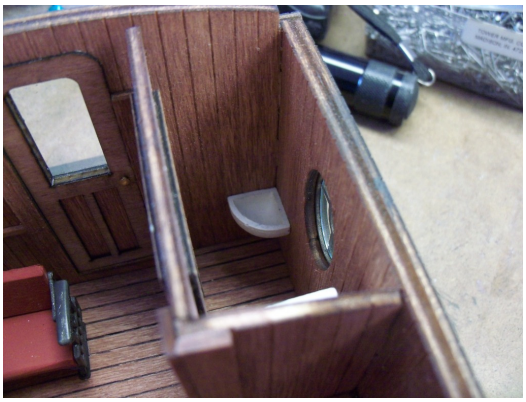
Step 17.

Gather the bathroom walls, toilet, tank, pipe, sink, stove, stove platform, firebrick and stove pipe. Using the ACC Goo, glue the toilet to the inside of the narrower bathroom wall. If you haven't glued the toilet seat on, do so now.


Fit the pipe between the toilet and tank and glue the tank in place using the ACC Goo.
Glue with white wood glue, the stove platform in the corner of the car. Notice the notch for the door trim.


Glue the fire brick into the opening in the platform using the ACC Goo. Glue the stove pipe to the top of the stove also with the goo and glue the stove in place with the stove pipe support glued into the hole in the top of the wall.

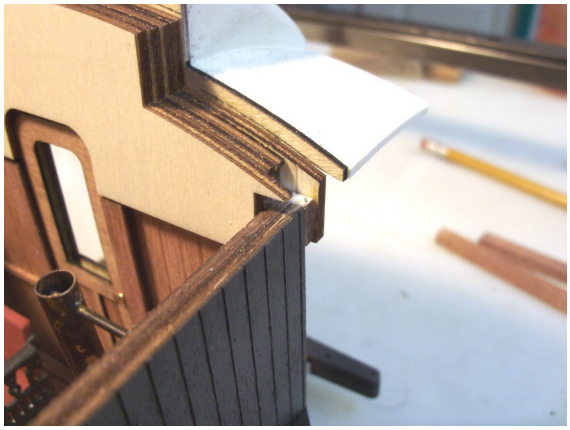
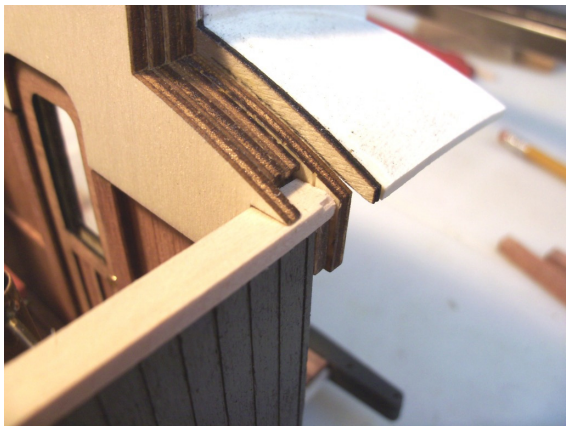

Test fit the bathroom walls together and into the tabs in the bathroom corner of the car. Once you understand the fit, add wood glue to the tabs of the bathroom walls and glue into the car. Make sure all edges are securely into the tab holes of the car wall and end.

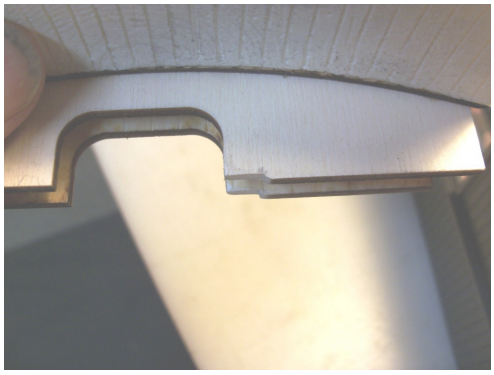
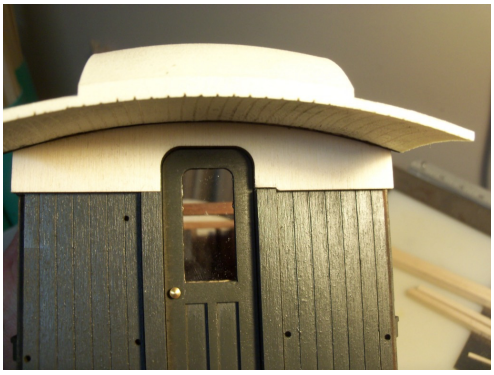
Step 18.

Gather up all the roof parts. The clerestory sides and window trim. The 2 roof ends previously worked on. The main carlins. 2 basswood sticks, 1/8" by ¼" by 24" and a little saran wrap.

Start by placing the roof ends over the car ends. They should fit squarely down only 1/8" above the car sides.

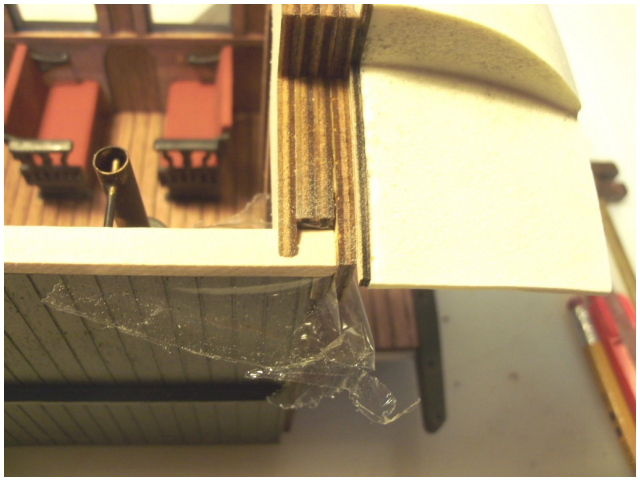
I had a problem with the current car being built for the instructions. The roof sits to high. I've corrected the problem with your kit, but, just in case, this is how I resolved the it.

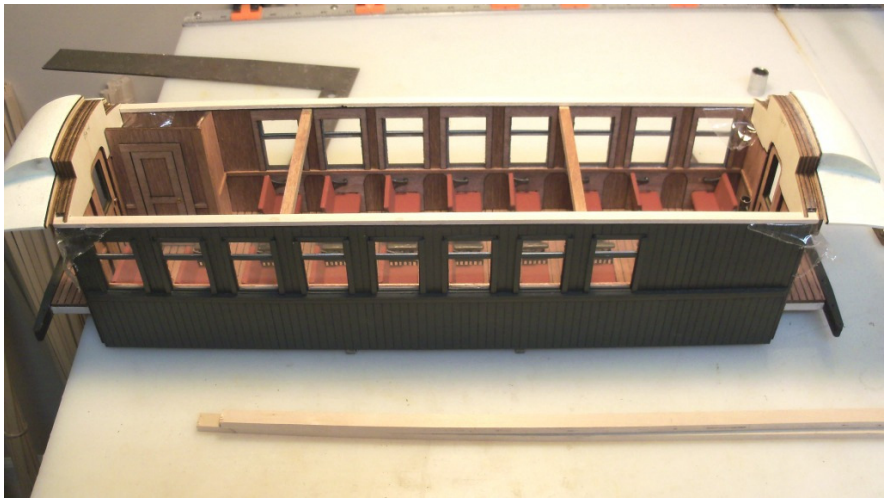



I sanded a small notch in carlin 1 and 3. The carlins either side of the spacers (carlins 3).

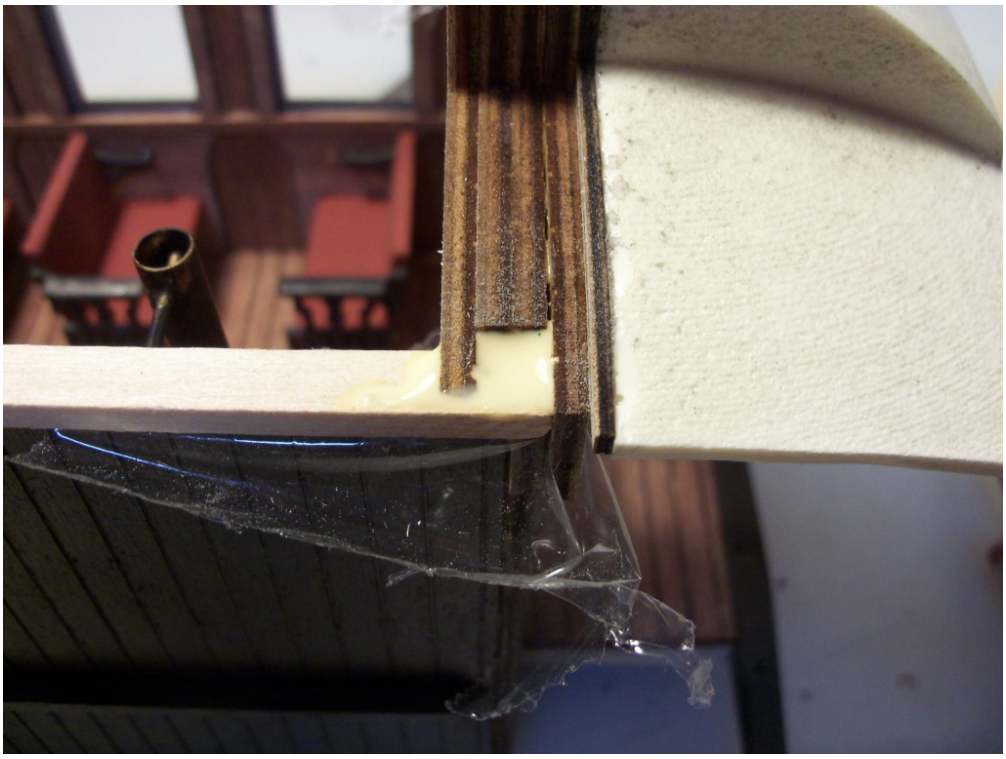
I shortened the door trim and the height of the inner door in my laser CAD drawings as they are the offending parts. But I won't be building another test car so won't know for sure.

With both roof ends on the car, measure the distance between them for the 1/8" by ¼" basswood stick. Easiest way is to fit it in at one end and mark the other for cutting. Once cut, place a 3" by 3" piece of saran wrap under all 4 corners. Also insert the 2 car width spacers.

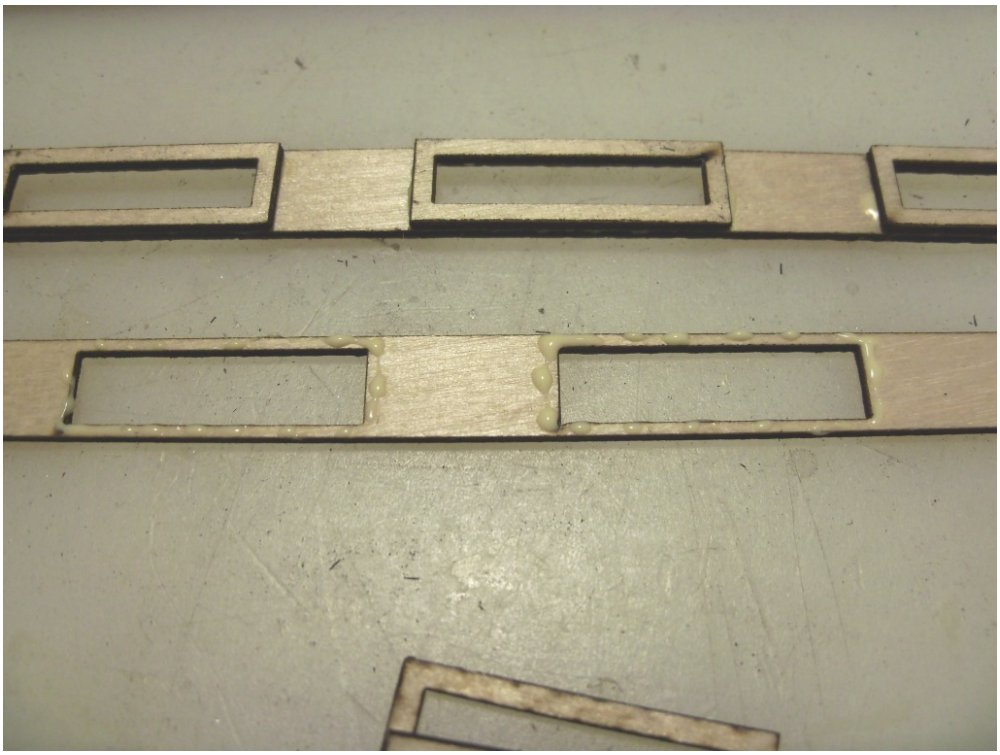




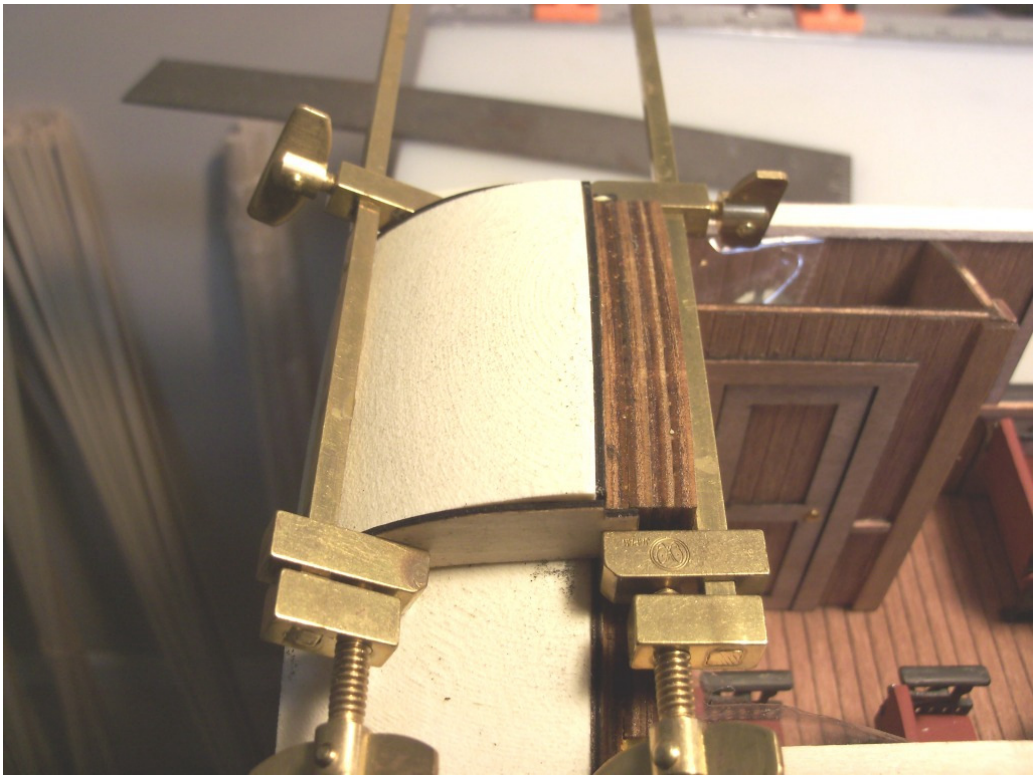
Next, apply glue to the space between carlins 1&3 to glue them to the 1/8” by ¼” wall cap. The saran wrap will prevent glue from flowing down and gluing the roof to the sides.



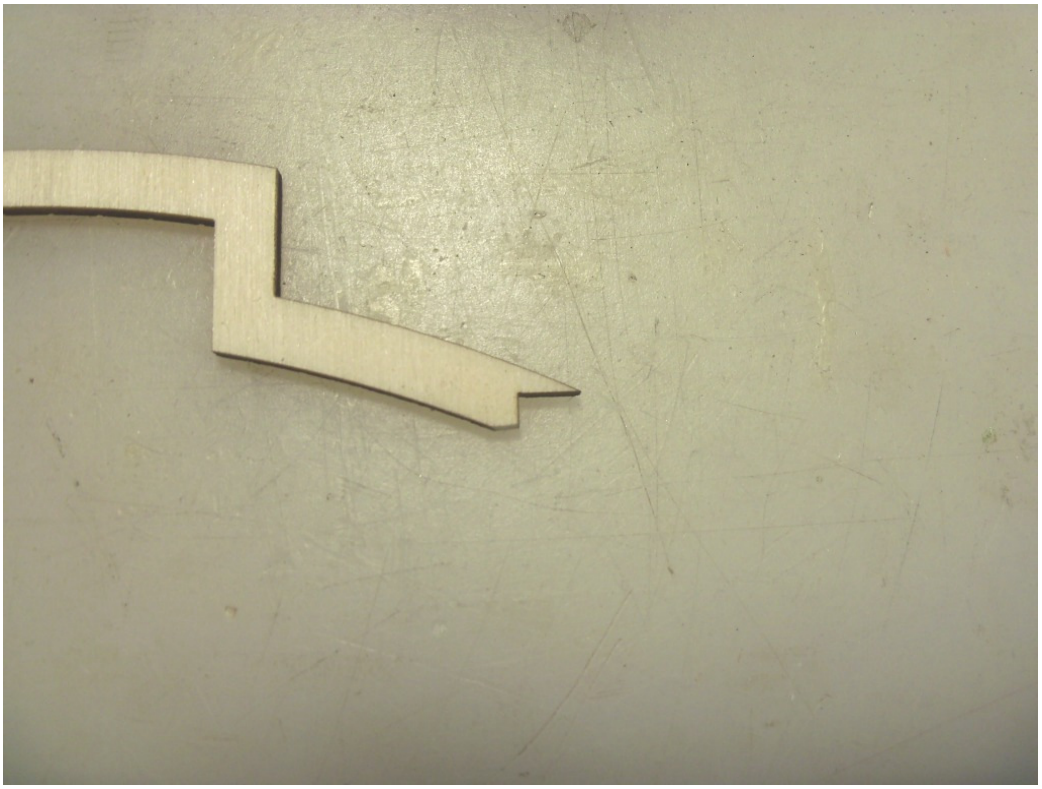
Now glue all 20 window trims to the clerestory sides.



While those parts are drying, glue the clerestory roof end trim to the resin ends. Use wood glue where the trim touches the carlins and ACC where it attaches to the resin. The trim has a notch that should sit right at the point of carlin 1 and the first piece glued to the resin. When lined up properly, it should automatically land at this point.



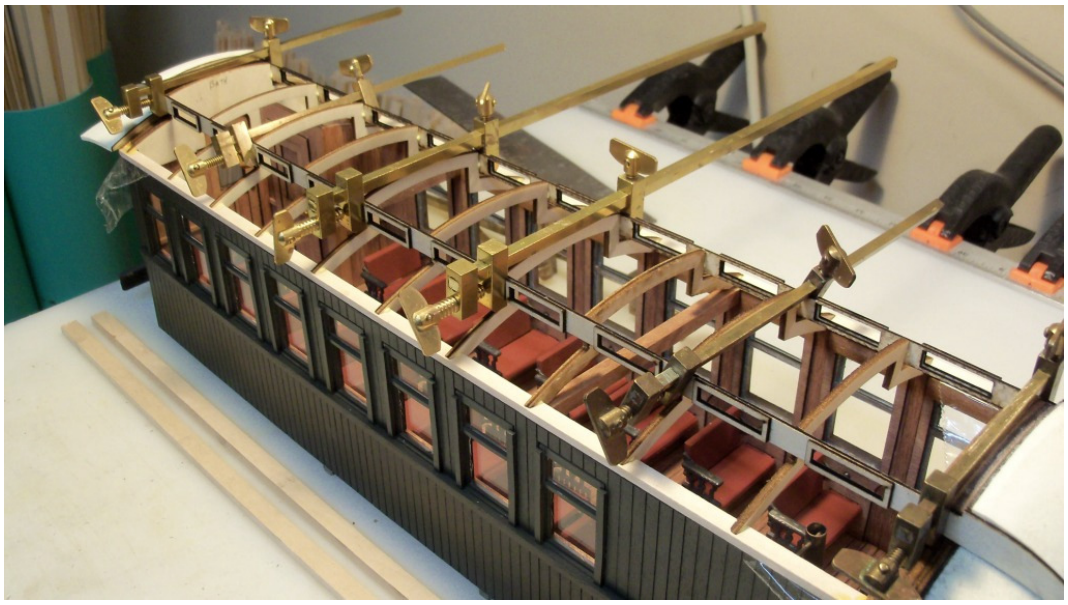
Sand two of the main carlins that will sit on top of the car width spacers like this.



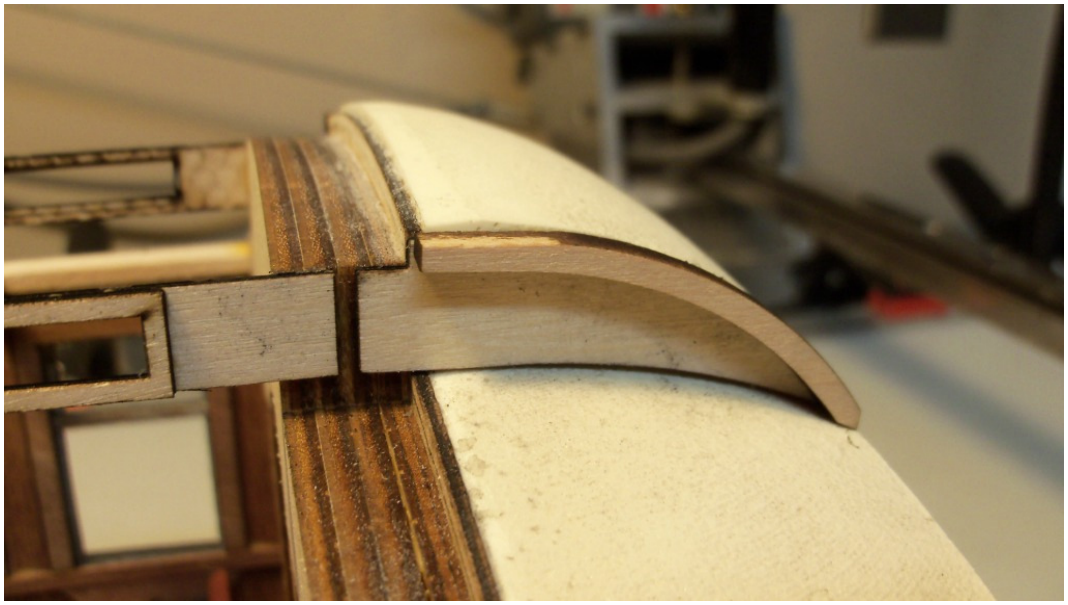
Now glue all 9 carlins to the 1/8” by ¼” wall cap. The 2 carlins you sanded will go over the 2 wall spacers. These wall spacers maintain wall width while building the roof over it. It prevents the roof from squeezing in during this process.

Glue the clerestory sides to the carlins. Keep the sides to the top of the carlins and maintain a 1/8” gap at the bottom. This 1/8” gap is where the side roof section fit under and into to serve as a “catch” for the inner roof edge of the 2 side roof sections. Try to keep any glue from dripping down into this gap. It won’t be fun to remove later.

Clamp the clerestory sides to the carlins until dry.



Now glue the final roof trim to the end resin ends.



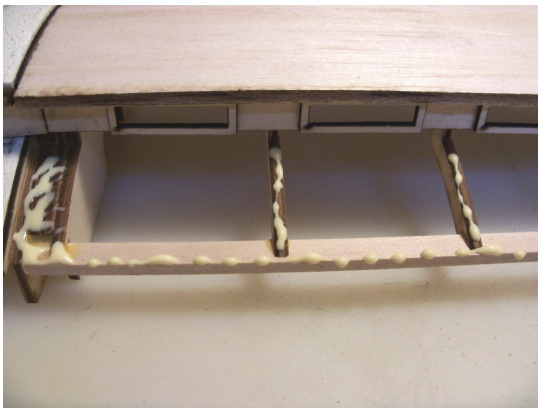
If you ended up with a gap between the clerestory sides and the resin roof end trim, fill it with scrap wood or putty. Sand smooth.

Step 19.

During development, some questioned using balsa wood for the roof. It solved 2 problems. First, it's easily bent and second, at 1/8" thick, it eliminates extra trim pieces. For me, the problem that developed after committing to using it was cutting it. The stuff is so dry and porous that running the laser, even at 100 inches per minute will catch it on fire. I mean a flash fire!!! So, I've had to fall back and cut it the old fashion way, with a table saw. To that end, it's not a perfect fit as would be when using the laser to cut it. I'm cutting the width at correct size but making the length a tad longer. So, you need to lay the pieces in and mark and cut for correct length for your roof.

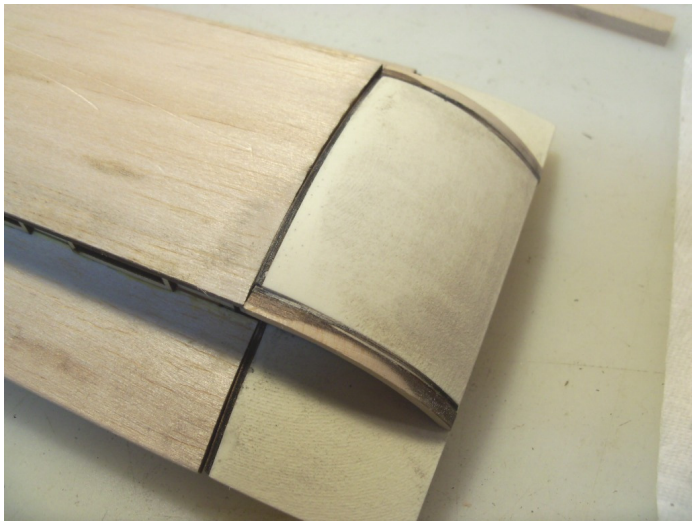
Measure the center roof to correct length, cut and apply glue to the tops of the end carlins and all the main carlins. Use the ¼” by 3/8” by 18” sticks as edge clamps and clamp down. Hook the bottom of the clamps under the clerestory side carefully so you don’t break them. Let dry.

Now measure and cut the 2 side roof sections. Test fit under the clerestory sides and above the carlins to insure nothing is impeding the fit. When good, apply glue to the tops of the carlins and the edge of the wall cap. Also, along the back-top edge of the roof section.



Fit the section in and again using the ¼” by 3/8” by 18” clamping sticks, clamp the outer edge to the wall cap. You’ll need to remove the roof from the car to do this.

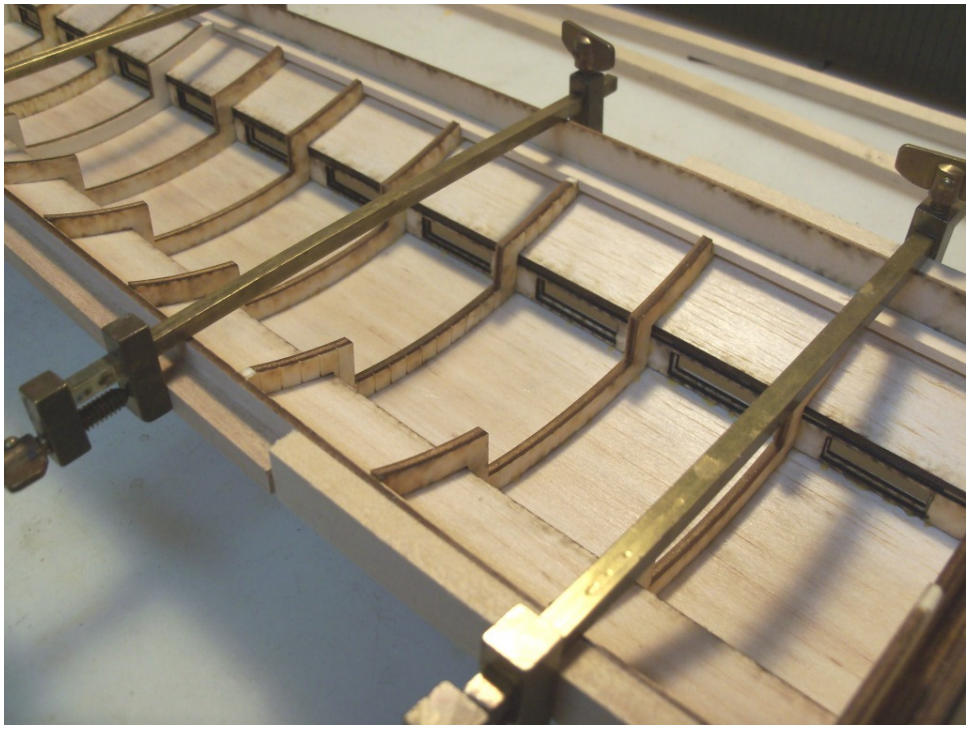
Allow to completely dry.

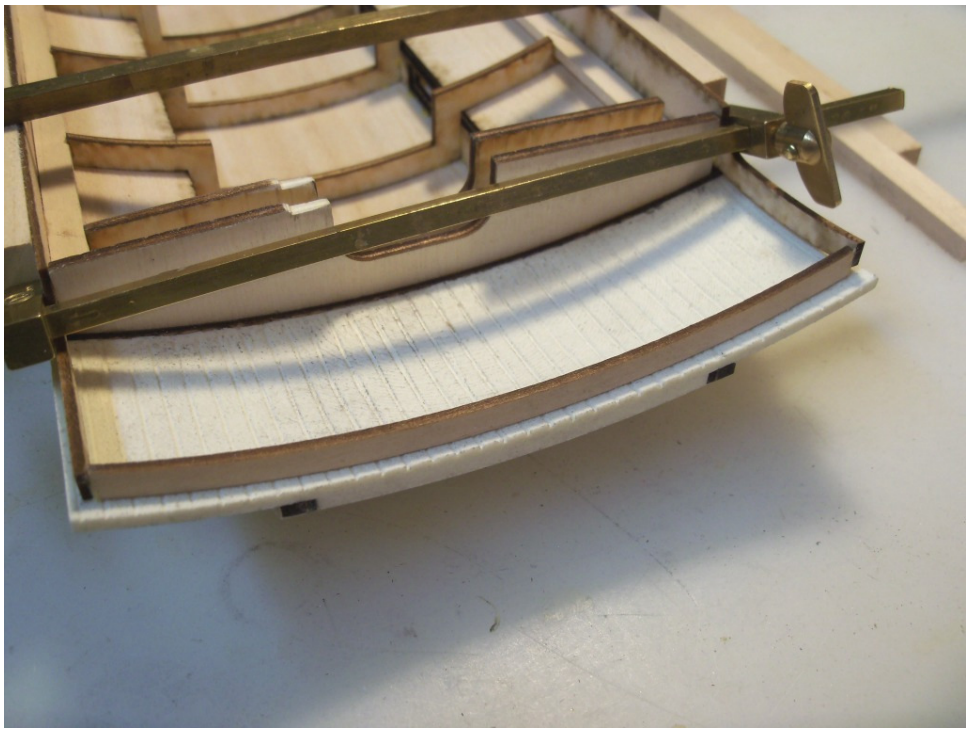


Sand the edges of the center and side roofs to match the width of the resin ends. Sand any uneven joints where the resin end meets the wood. You can fill with putty if necessary and sand smooth. Taper the resin side trim pieces to follow the curvature of the resin. When satisfied, proceed to the next step.

Step 20.

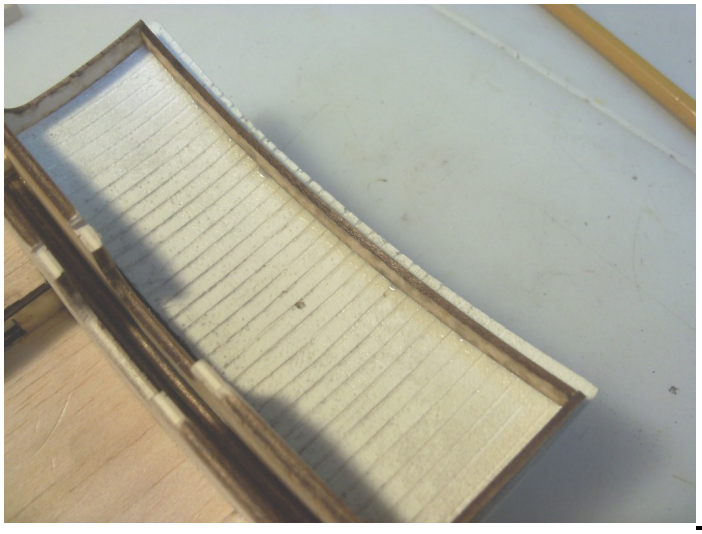
Grab the 2 number boards (side roof trim) and the 2 under roof end trim (end roof trim). Test fit the side trims and clear away any excess glue or possibly edges of carlin 1 or 3. When the fit is OK, add glue to the edges of carlin 1 and 3 and along the outer edge of the 1/8" by 3/16" by 18" roof cap. Glue the side trim on. Repeat for the other side and clamp. I found using all 4 clamping boards supplied helped to hold the side trim firmly in place. We'll glue the end extensions to the bottom of the resin roof end in the next picture.

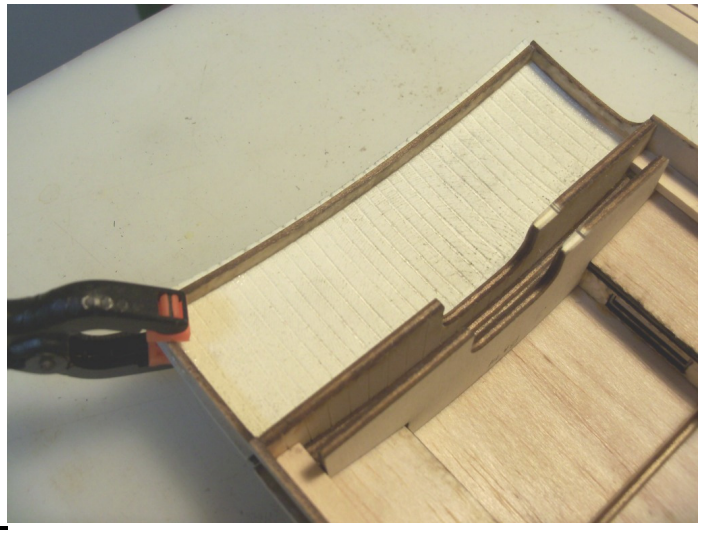




The end trim is cut a tad to long. Test fit, mark and cut to proper length.

Glue with a medium ACC both the side trim and end trim to the resin roof end. You may need to clamp the pieces down to the resin if they don't lie snug on their own.



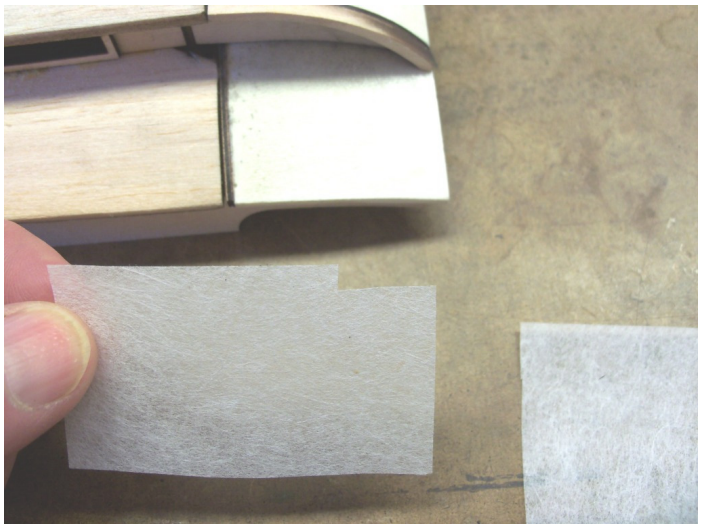
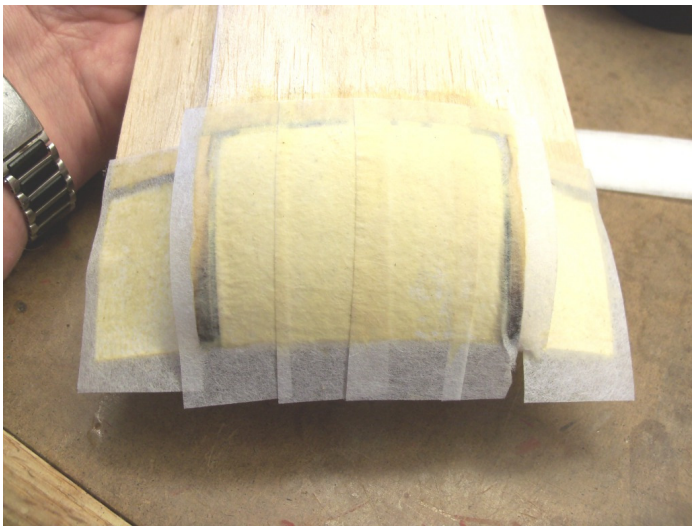


Step 21.

Grab the sheet of Pattern Ease paper and cut ¾'s of it into 1" strips.

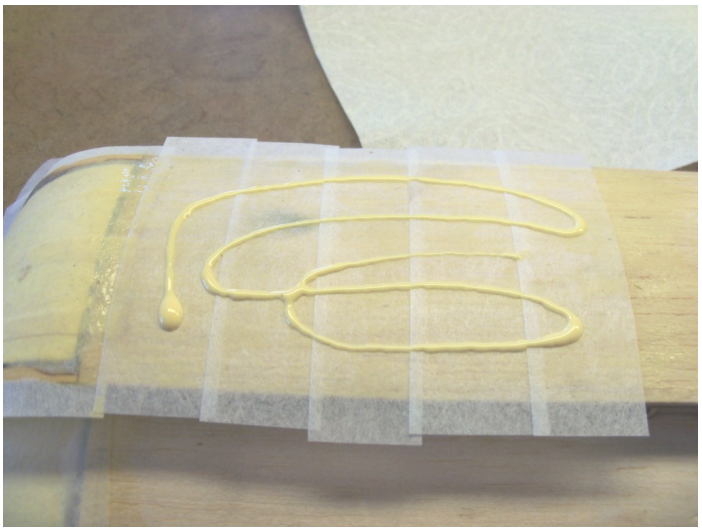
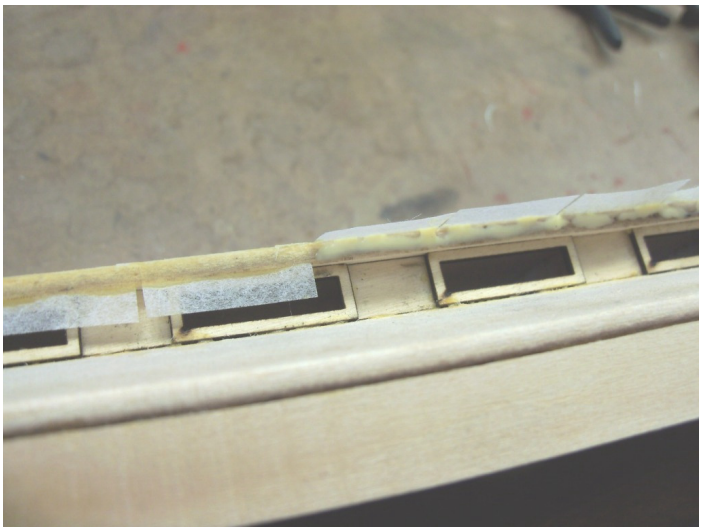
Much more than an inch will buckle on the curved parts of the roof and 1" in 1:20.3 scale is 20" which is close to the width of a roll of tar paper.

I use one of those disposable brushes sold at several hobby outlets for spreading the glue. From the left-over larger piece, cut 4 pieces approx. 2" square. Then trim a corner as pictured below. Do this for both sides of one end. This is to fit in and under the roof end trim. Cut 4 pieces of the 1" strips approx. 2-1/2" long to cover the resin roof end.

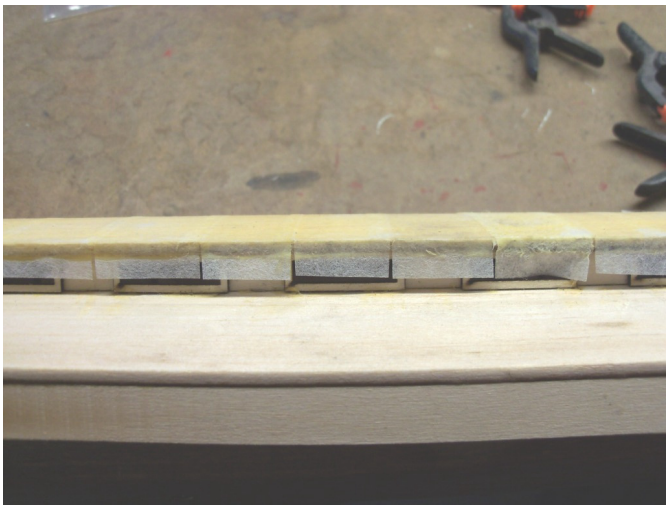
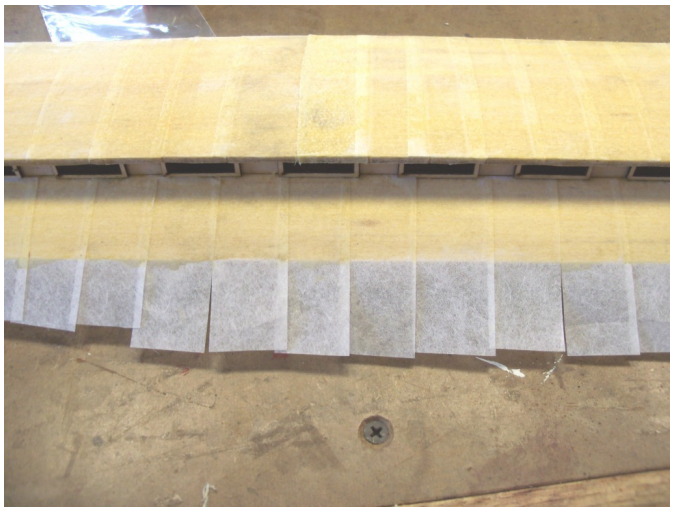



I used the same wood glue used in construction for the roof, Titebond II. Apply it full strength to the 2 corners and glue the Pattern Ease notched squares in place. Then glue down 2 of the 1" strips on the sides with ¼" to 3/16" overhang. The overhang will glue over the edges once the top surface is dry. Do this to both ends.

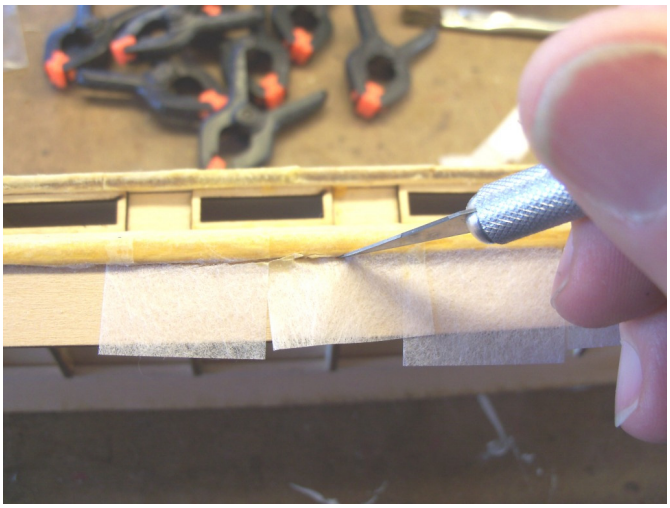
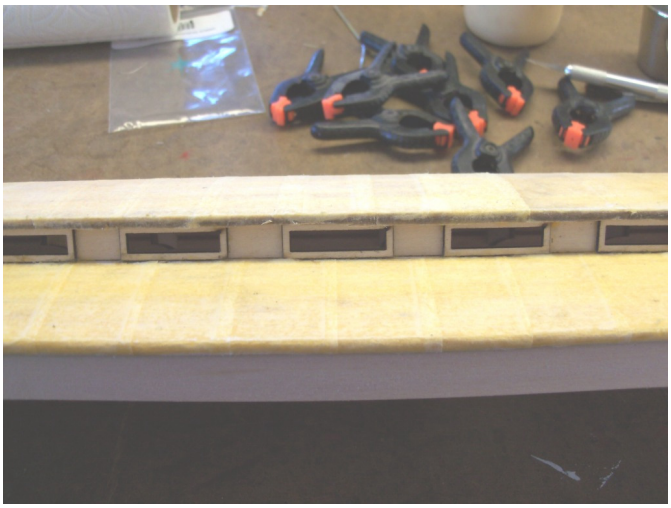
Glue 5 or 6 1" by 4" strip on the center roof with ½" overhang on each side. After gluing, add more glue over the surface and dip the brush in a little water to help thin and spread the glue over the surface. This will soak into the paper and help create a hard shell over the balsa wood. Go to the other end of the roof and repeat. Add strips from both ends until you reach the middle where 1 strip will overlap the strips from each end. Let this dry. Depending on the humidity where you live, a couple hours. Here at 7,100' in Colorado, the glue dries in 30 minutes or so. When dry, add glue along the edges and fold over the paper to glue it down. It won't want to stay down so you'll have to keep pressing it down until the glue sets up enough to hold it down without your help.

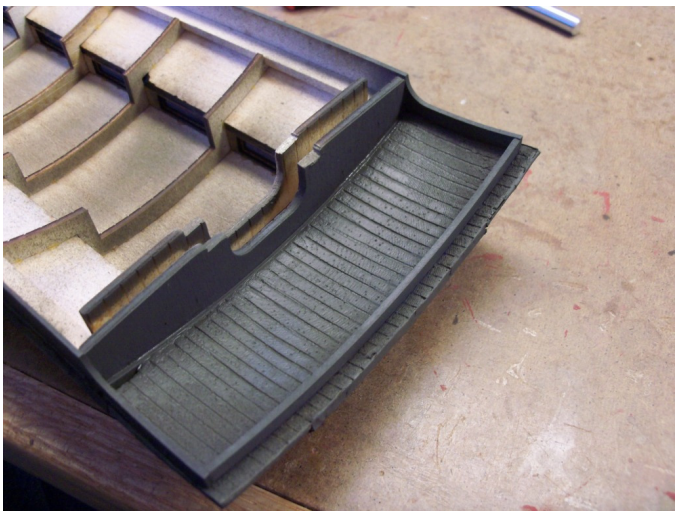
When dry, use an exacto knife or razor blade to trim the excess paper.
Glue 1" by 1-3/4" to 2" strips along the side roofs.

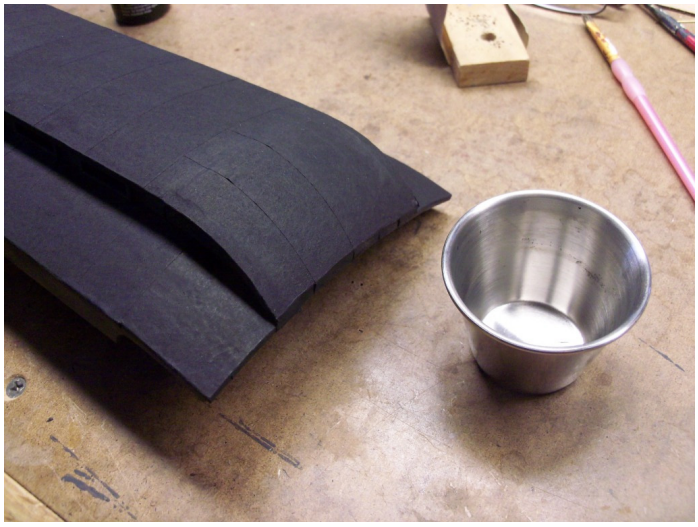
Trim with an exacto knife or razor.

Rattle can paint the bottoms of the ends, the number boards along the sides and the clerestory sides with the forest green or your color of choice. When dry, paint the roofs a flat black or dirty / grimy black. This is a large surface so for economy, I used the $1.00 bottle acrylic black paint thinned with water to flow properly. It can be weathered with chalks later.




Paint the roof center and sides a flat black. I used acrylic paint diluted slightly with water. Took 2 coats to fully cover.



I bought a bunch of the spun metal cups at Walmart years ago. At the time, they were 4 for a dollar. I think they still have them but are $1.50 for 4 now or possible a little more. Great for mixing paints, washing brushes out or sorting parts. I used one at this point to touch up the forest green paint. I sprayed enough from the rattle car to get a little puddle and brushed it on from that. Heck of a lot easier than masking and spraying.

Step 22.

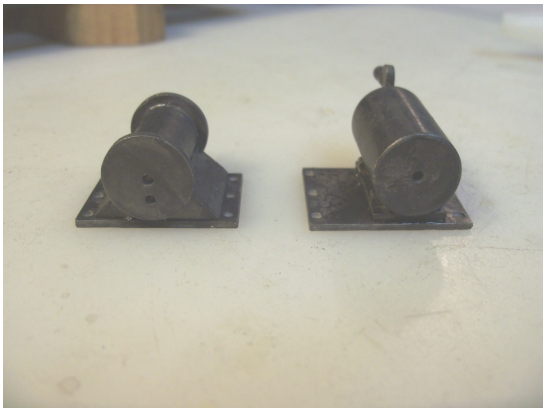
Look at the series of pictures starting on the next page to get an idea of the entire step before starting.

Gather up the 8-queen post, 4-turnbuckles, brake cylinder, cradle and mounting plate. Brake reservoir, cradle and mounting plate and the lengths of aluminum rod. Also, the NB's and turnbuckle boards. Clean up any flash or sprues from the white metal parts. I blackened and buffed mine. You can blacken yours or paint them after installation. The aluminum won't take patina or hobby black, so they'll need paint. Turn the car upside down and place on a couple blocks so it won't rock on the car ends. Position the car so the 2 notched needle beam is to the right and the single notched needle beam to the left. I've pre-drilled all the white metal for the 1/16" aluminum rod to save you that step. I like the aluminum as it bends with the fingers and is very easy to manipulate to the desired shape. Start by gluing the air reservoir and brake cylinder to their cradles and then the cradles to the mounting plates. Position the offset hole in the brake cylinder so it is down or closer to the car. And facing left. The hole in the reservoir should also be facing left. On the reservoir, offset the cradle to one side as pictured. This is so the truss rod and turnbuckle don't "land" right on top of it. See the pictures. Then position the 2 assemblies on the sills and drill #56 holes through the holes in the mounting plates and into the sills. Press 6 ea. NB's into the mounting plate holes to secure the parts. Use a short length of rod to connect the air reservoir center hole to the offset hole on the brake cylinder. Bending and fitting will be necessary to accomplish this. Open the brake lever rod enough to fit into the center holes either side of the brake cylinder and squeeze back together.

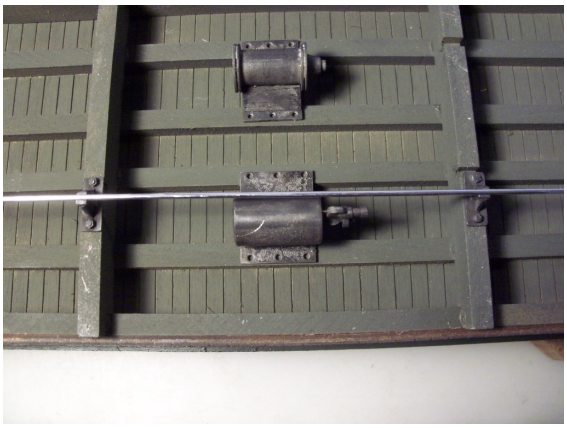
Measure and cut lengths of aluminum rod to go from the brake lever clevis to the holes in the terminating blocks you drilled way back on step 1. A slight bend downward of the rod after clearing the needle beams will be needed. Once the three rods are in position and the connecting rod from the reservoir to the brake cylinder is in position, add a drop of ACC to secure the ends to the clevis and terminating blocks and at the reservoir and brake cylinder. Also, both side of the brake cylinder where the lever attaches. When dry, paint with a flat or grimy black.

Now glue the 8-queen post onto the needle beams locating between the sills. Cut lengths of aluminum rod long enough for the truss rods. Slide a turnbuckle onto each rod and place one end in a terminating block hole, then into the two in-line queen post with the turnbuckle between them and into the opposite terminating block hole. Repeat for the other 3 truss rods. Slide a turnbuckle board into the outer turnbuckles and another into the opposite turnbuckles. Add a drop of ACC at all connecting points and allow to dry. Paint all the rods and parts needing touchup.

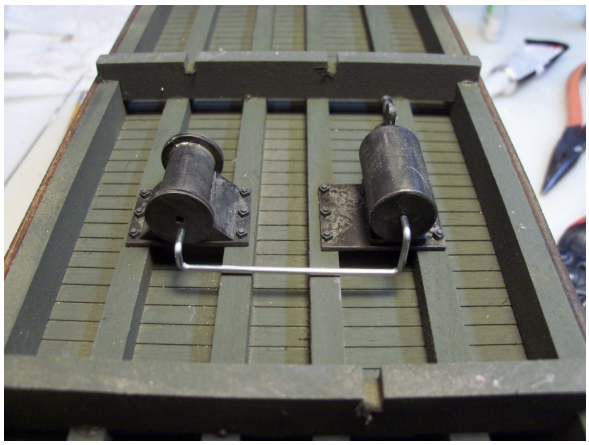
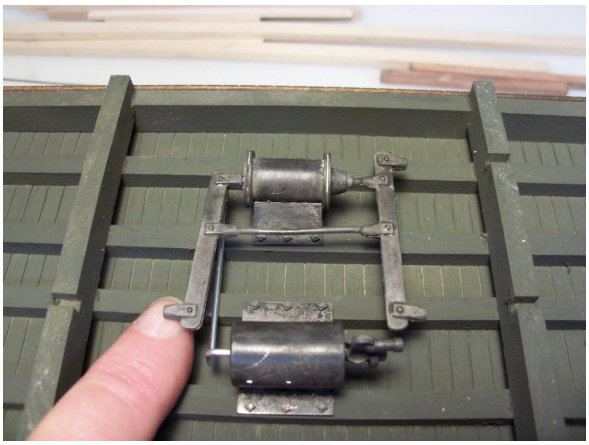
Tid-Bit, I will gently squeeze the top of the queen post with pliers to firmly hold the truss rod in place. Gently as to much pressure will break the queen post off the needle beam.

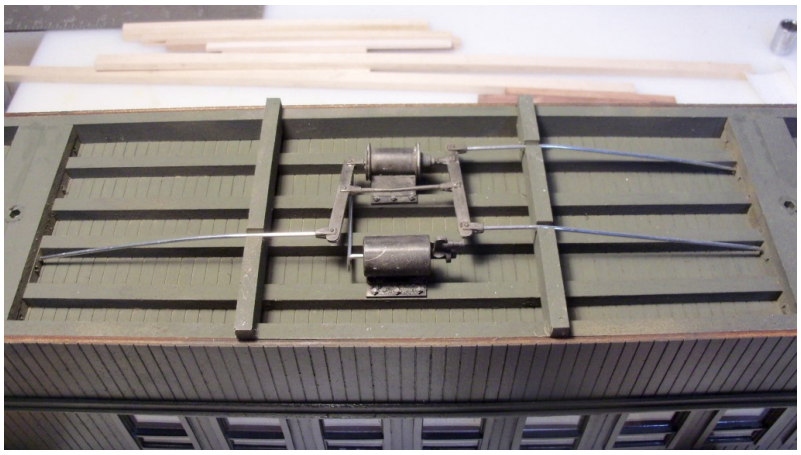
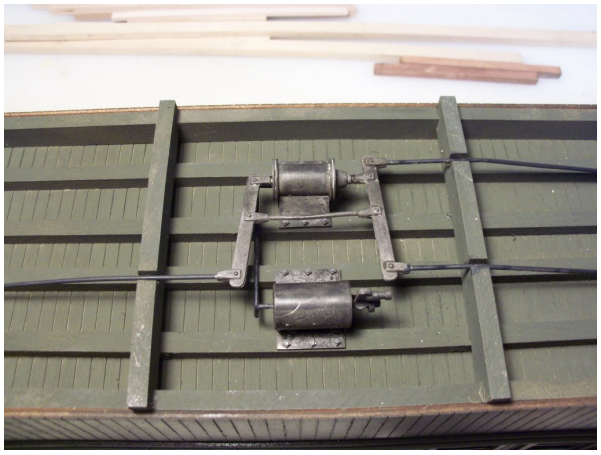
Parts blackened, left. Brake cyl. position & reservoir position on mounting plates, right. Note the air reservoir offset.



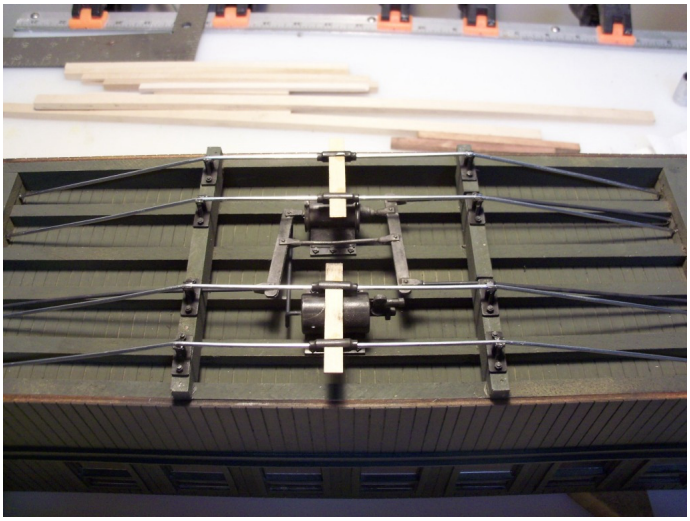
Reservoir offset for turnbuckle clearance.

Connecting pipe from the reservoir to the cylinder and fitting the lever to the cylinder

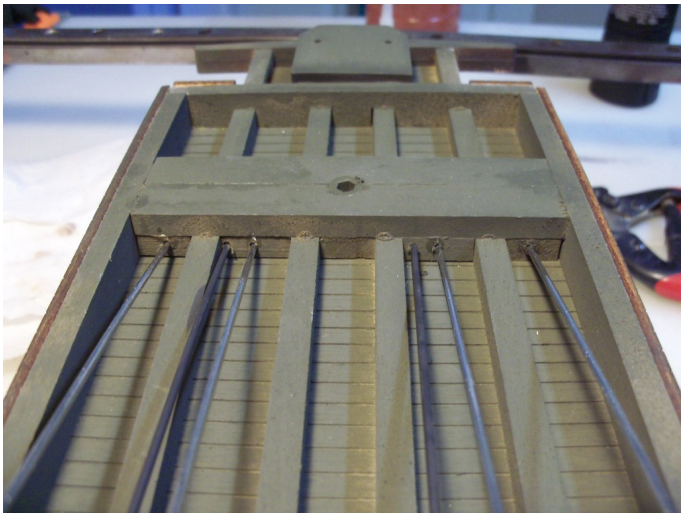



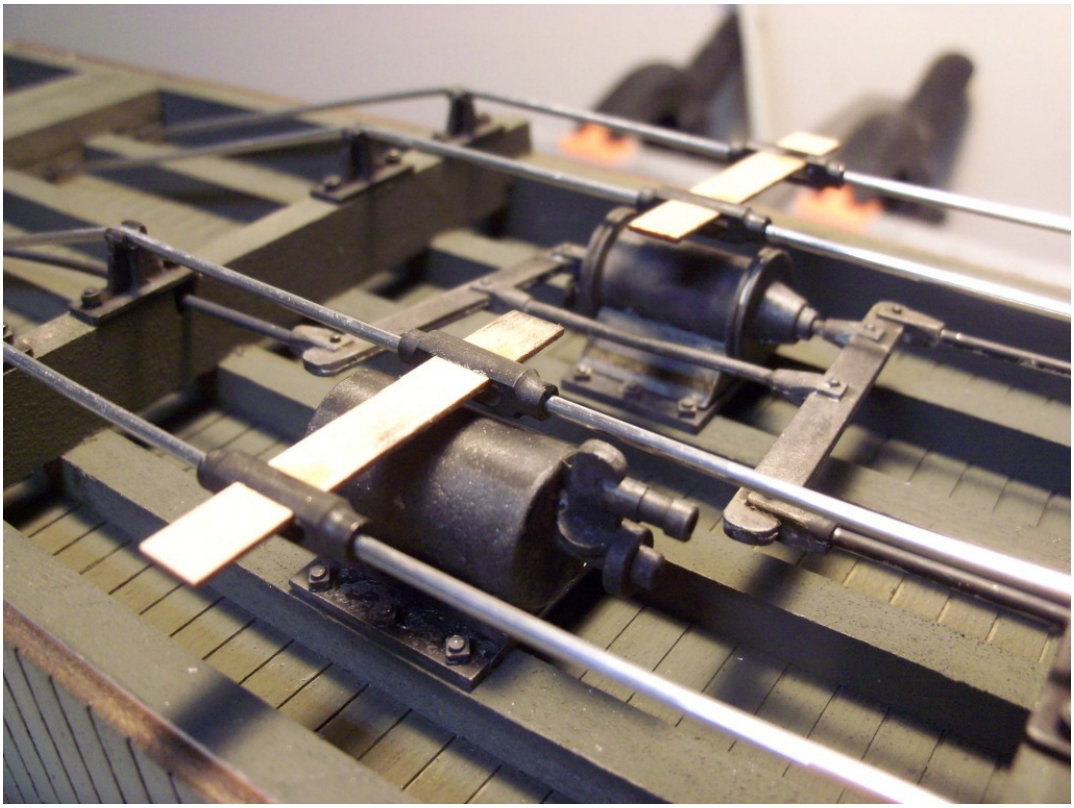
Brake rods fitted in and painted

Queen post glued in place in the left picture. Truss rods and turnbuckles added right picture.

Cut lengths of the aluminum rod, slide a turnbuckle on it and fit into place. Repeat for the other 3 truss rods. Then fit the 2 turnbuckle boards into place. Add ACC at all connecting points, allow to dry and paint the rods. Stain or paint the boards.



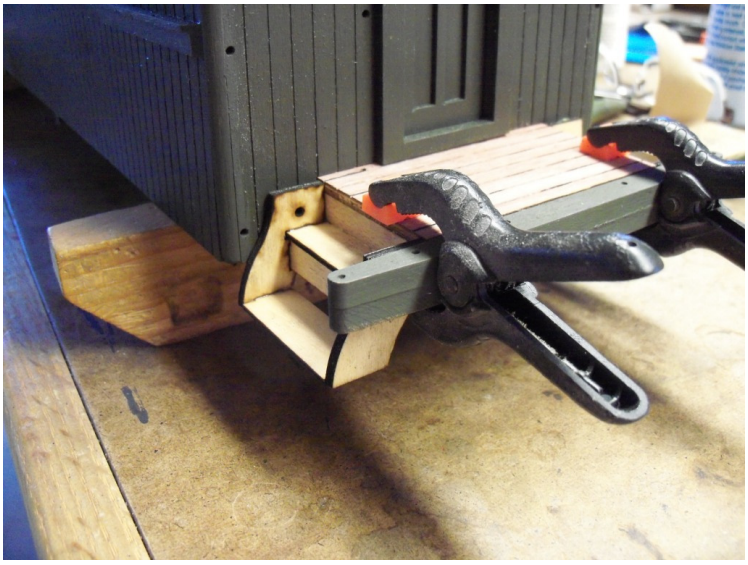
This completes the underbody. You may want to add more plumbing to suit your needs. I'll leave that to you.

Step 23.

Glue the 4 quarter rounds to the corners. You can paint them first or after the glue dries. I glued them on before painting and will spray a little paint into a metal cup and brush paint them.

Step 24.

Locate the 4 steps assembled in step 9. Test fit each into the ends. Considering the platform as the top step, the middle step extends out the back of the step assembly. This extension glues under the outside sill of the platform. Again, test fit first and sand edges if the steps fit to tight. When happy with the fit, glue into place being sure the NBW holes are against the car and not the end beam. When dry, I painted my steps black.



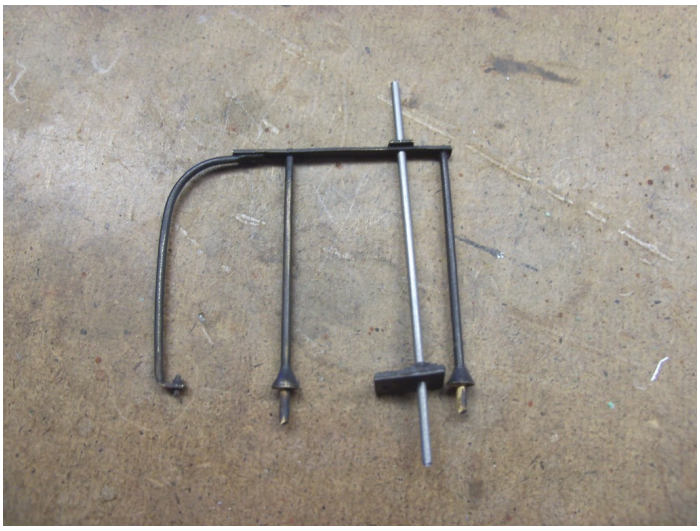
Step 25.

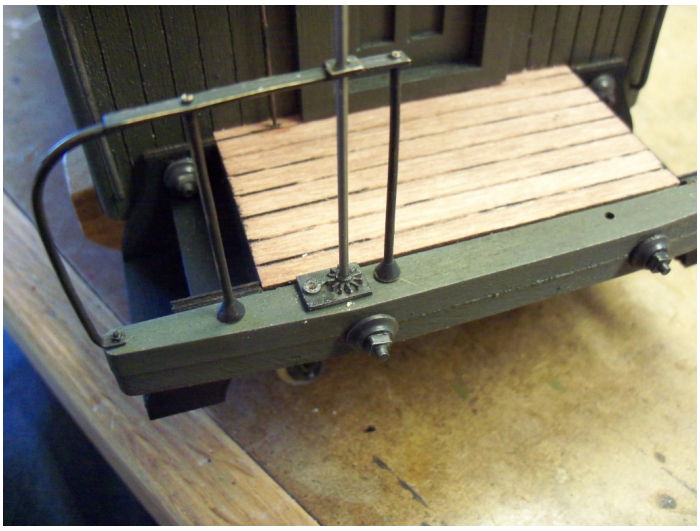
Time to do the end platforms and a big decision for you to make. I designed the car to use Trackside Details end rails. The part number is TD-253. The cost is $22 per car. I'm not suppling them because of the cost. Instead, I made up brass masters duplicating the hole placement but changing the pattern slightly and then making white metal spin casting molds of my parts. Those castings are included with the kits. If you are going to order and use the TD-253 rails, the holes in the platform end beams are correct. If you are going to use the white metal rails I've supplied, you need to drill out those holes. The 4 center holes should be enlarged with a #52 drill bit and the 2 outside holes with a #56 bit. Once drilled, the holes will be far to large for the Trackside rails.

Both the TD rails and the PNG rails come 2 left and 2 right when looking at the end of the car. The 2 left have dimples in the top rail between the 2 post. Drill these out with a #55 bit. This is for the brake staff. While you're drilling, drill the hole in the center of the gear of the lock pawls with the same #55 bit. I've supplied 4 brake wheels. Decide if you want the brake wheel horizontal or vertical. If horizontal, drill the center of both standard brake wheels. If vertical, drill a hole through the square stud on the back side of the second pair of wheels. Drill a #54 hole in the mounting holes of the 2 lock pawls and a #66 hole into the bottoms of both retainers. This hole is for the 1/32" brass airline to the retainers. Drill 2 #48 holes in the end beam for 2 truss rod NBW's. I used patina to blacken all part on the platform ends. You can blacken or paint. These will include the 4 end rails, 2 lock pawls, 2 brake wheels, 4 car side hand rails (2 left, 2 right), 2 retainers, 8 truss rod NBW's, 2 brass 1/32" rods and 2 brass NB's. The 2 brake staffs are stainless and will not blacken. They'll need to be painted.

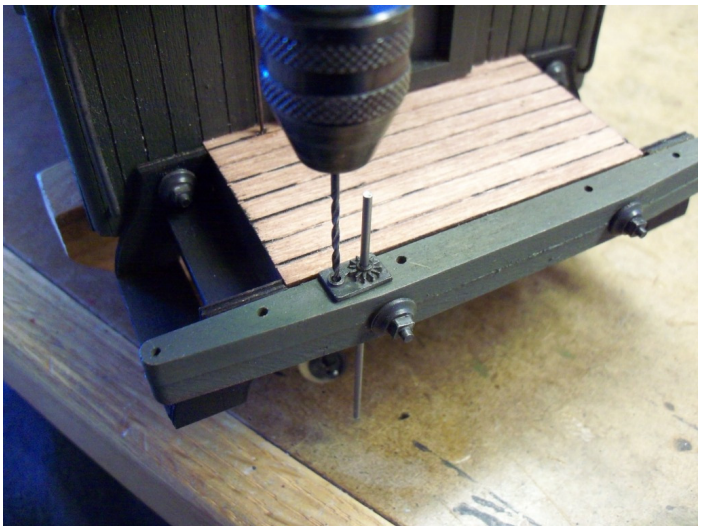

Blackened parts left. NBW's, hand rails, retainer and airline added.

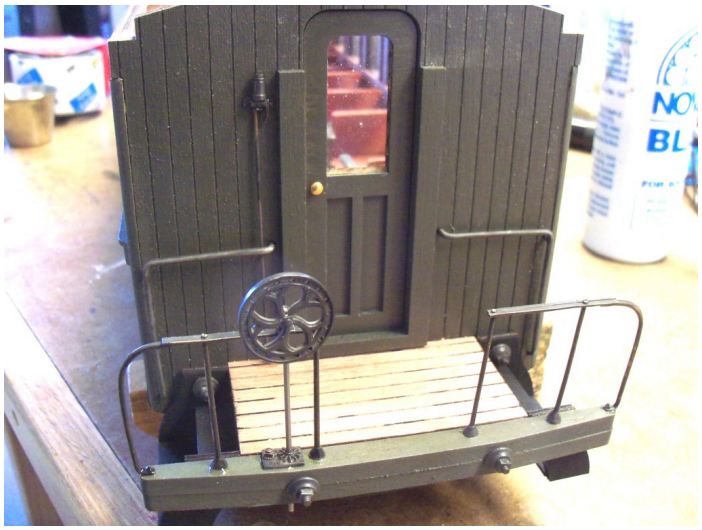
Blacken all the parts. Note, the car handrails aren't pictured but blacken them. Then glue the retainer in the hole left side of the door. Insert the brass 1/32" wire into the hole in the platform floor far enough to then push up into the hole you drilled in the bottom of the retainer. Then test fit the left and right car handrails. Cutting the "legs" a little will make the rails a little closer to the car. Your decision on this. Once in, glue with ACC.





Slide a brake staff through the platform rail and through a lock pawl and place on the end beam to mark where the brake staff hole will be in it. Drill the #55 hole but don't glue anything yet.

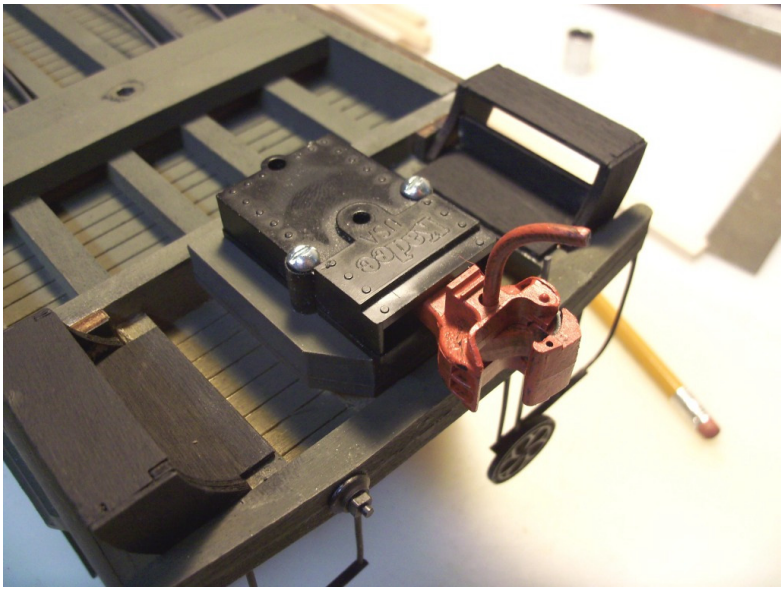




Now drill a #56 hole for the NB. Press it in and re-install the end rail. Push the brake wheels on and glue the 3 end rail feet to the end beam, the brake staff to the lock pawl and end rail and the brake wheel to the brake staff. Glue the right end rail in place. Repeat for the other end.

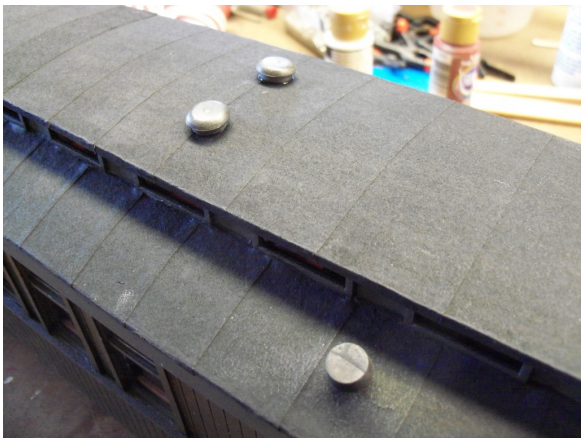
Step 26.

Grab the bag of couplers and assemble. The draft gear flange should be up and the uncoupling bar down. There's a raised area on the shank preventing installation upside down. Screw both couplers with the provide #4 wood screws in place.



Step 27.

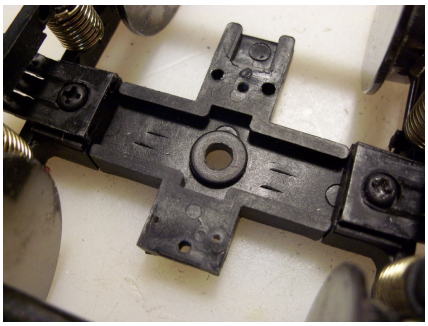
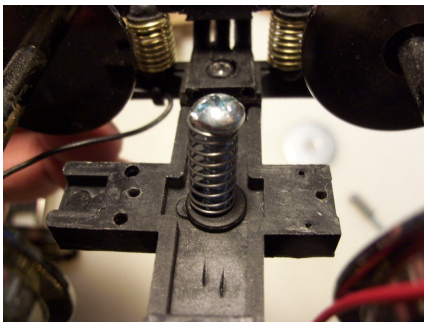
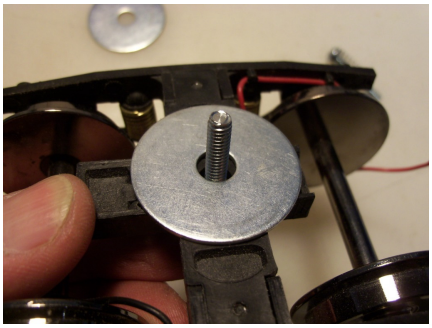
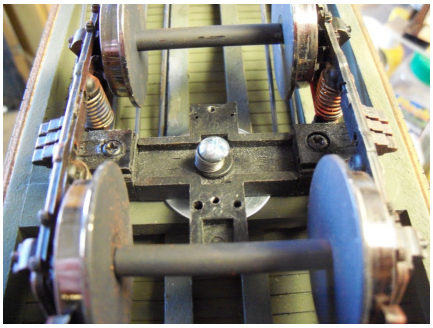
Grab the bag of roof vents. Blacken or paint them. Determine the placement for the 4 roof vents and drill #46 holes in the roof and glue them in. Locate the placement for the stove vent and bathroom vent and drill #31 holes in the roof for them. The bathroom vent glues in at any rotational placement but the stove vent has the base shaped to only fit one way and remain vertical. Glue both vents in place. Last step with the roof is to peel the protective skin off the 20 clerestory windows and glue them in place following the same procedure as the side windows.



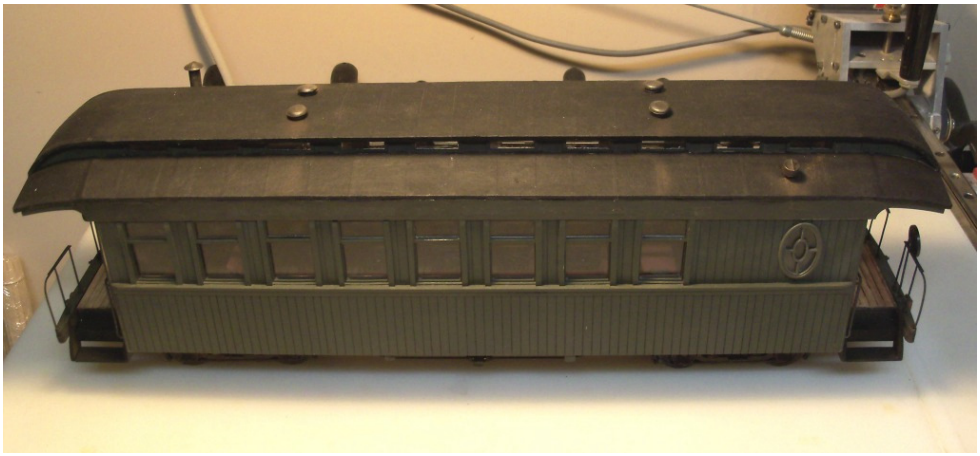
Step 28.

Down to the last bag of parts!! Open the truck bag. The trucks came with the Talgo type coupler arrangement which I cut off before packaging. Also, in the bag are 2 fender washers which act as pivoting plates for the truck bolsters, 2 black plastic shouldered washers for centering the 8-32 mounting screws, 2 springs and 2, 8-32 mounting screws. I left the wires from the pickups should you wish to add track powered lighting. Weather the trucks as you see fit. I dry brushed rust in several hue's and grimy black weathering powders. I also took the frames apart so I could paint the backside and fronts of the wheels as well as the axles. I don't much care for the chrome look or the deep flanges. If you have other wheels in your inventory you prefer that will fit the frames, use them. If you examine the Aristocraft wheels, you'll see only one wheel is insulated from the axle. The non-insulated wheel energizes the axle so the axle tip electrical pickups in the sideframes pickup the track power. If you replace the wheels and want lighting in the car, you'll need to use battery power.

Place the black plastic washer into the mounting hole from the underside of the bolster. Put a spring on one of the 8-32 screws and through the bolster, through the fender washer and into the threaded insert in the body bolster. Repeat for the other truck.

FINISHED!!



Comments are always welcome. Positive or negative. Please contact me for any issues with the construction. My email is phil@philsnarrowgauge.com. Email is the best way to reach me as I check it several times a day and I'm not always near a telephone.

San Juan Decals is stocking passenger car water slide decals. There are a couple other sources for custom decals.

Please send photos of your completed model. I always enjoy seeing my customers work.

Thank you for the purchase and I hope the build was as fun for you as the design was for me.

Phil Dippel
Phil's Narrow Gauge