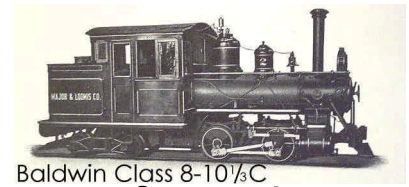


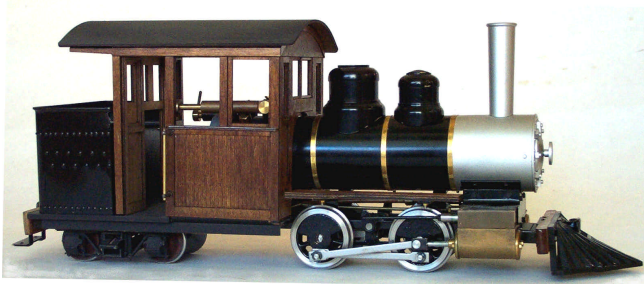


**FH&PB
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Baldwin Class 8-10 1/2 C

Forney Conversion Kit for Accucraft *Ruby*



This kit replaces the metal cab of the Accucraft *Ruby* with an enclosed wood cab, and adds the rear fuel bunker and rear truck characteristic of the Forney type locomotive. Like the *Ruby*, the kit is based on small Baldwin engines such as the one pictured at the top of the page. The kit includes a laser-cut wood cab and deck, brass bunker wrapper, metal trailing truck with metal wheels, and wood running boards. (The “cowcatcher” pilot shown in the photo above is a separate kit, FH&PB Kit RPS, and is not included in this kit.)

Tools and Supplies.

You will need some basic hobby tools and materials to assemble the wood parts of this kit: glue (wood and CA), paint or stain, extra-fine sandpaper, clamps (we recommend office binder clamps) and a small square. To glue the cab, we recommend a good outdoor-grade wood glue. You must provide a 4” length of 1/4” square hardwood, a 3” length of 1/4” square brass tubing, a 12” length of 1/4” brass L-angle, some 1/2” 2-56 screws and nuts, and some 1/8” and 1/4” 0-80 screws. (You may use what you have available, if 0-80 is not available.) Additionally, you will need some basic metal tools to attach the deck to the *Ruby*’s frame: a fine file, a drill and drill bits (.047”, 1/16”, 3/32”), a 0-80 tap, nut drivers for Nos. 0 and 2 and M2 (metric) hex-head screws. Finally, to solder the bead on the top of the bunker wrapper, you will need a soldering iron, paste flux, and extra fine solid-core solder.

Preparing for Assembly.

We have included check-off boxes to help keep track of your progress during assembly. Read through these instructions completely before beginning assembly. If you wish to stain the cab, you may do it before or after assembly. Painting window frames or the inside walls may be easier

before assembly. Keep stain and paint off the surfaces to be glued, if possible, and definitely keep glue off surfaces you want to stain later. Painting suggestions are at the end of these instructions.

The kit is complete as provided, but there are suggestions for variations in the instructions which may require additional parts or materials. Suggested variations are marked with \square . The builder must provide any needed parts in order to build these variations.

Decide now whether you want the cab to be removable or attached to the footplate. You may also make the roof removable or permanently attached. If you are going to mount a radio control servo inside the cab roof, you will want to attach it to the footplate and make the roof removable. This arrangement works with manual control, too, of course. With radio control, you may also install the doors permanently closed, or hinged. If you are manually controlling your loco, you should consider making the doors permanently open, or omitting them altogether.

First, lightly sand all the parts to smooth the wood’s grain and remove the soot from the laser-cutting process. Each wall comes in two layers to create the effect of recessed paneling, window frames, etc. The wall layers must be assembled before the whole cab can be glued together. The layers are offset to form strong joints at the corners, so no additional reinforcement should be necessary. You must take care to align these parts correctly, however, to get a good fit and insure rigidity. We suggest that you check the fit of all pieces and familiarize yourself with how the walls go together before gluing. When gluing the side panels together, use a square to align the specified openings, which will insure the tightest joints at the corners.

Familiarize yourself with the kit by comparing all parts to the pictures on the parts list. There are some features of the parts you should look at before beginning construction:

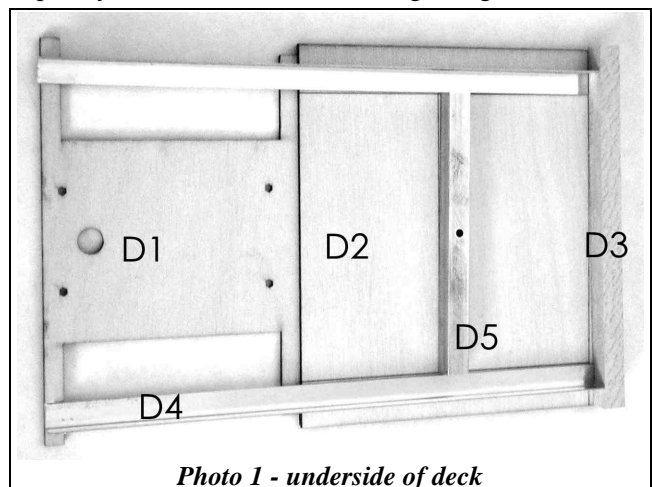


Photo 1 - underside of deck

Take care to assemble the walls with the scribed lines facing out. Note that there are right-hand and left-hand walls. Again, apply glue sparingly -- it prevents wood from taking stain and varnish.

Assemble the Deck.

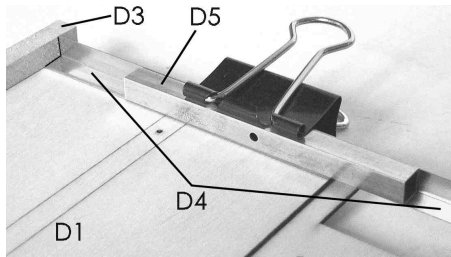
Refer to Photo 1 for the general relationship of the parts.

□ Glue the two layers of the deck together, with the scribed lines facing out. (Parts D1 and D2.) Be sure the predrilled holes are aligned. Clamp pars or place under a heavy, flat object (recommended) while drying.

□ Cut the rear frame member (D3, $\frac{1}{4}'' \times \frac{1}{4}'' \times 4''$) from wood you supply. □ Cut two 6'' long side frames (D4) from $\frac{1}{4}''$ brass angle you supply. □ Cut the bolster (D5) 3'' long, from $\frac{1}{4}'' \times \frac{1}{4}''$ brass tubing you supply. In the center of one face of the bolster, drill a $\frac{3}{32}''$ hole all the way through both sides. Turn the piece over, center the piece using the $\frac{3}{32}''$ hole, then drill through *one face only* with a $\frac{7}{32}''$ bit.

□ Glue and clamp D3 to the rear edge of the bottom deck layer (see *Photo 1* for placement).

□ Lay one D4 between the guidelines along the side of the deck. Put D5 temporarily on top of the angle to permit clamping with a binder clamp as in photo (right).



□ Drill a $\frac{3}{64}''$ (.047'') hole from the top of the deck, through the deck and the brass angle, using the pre-drilled hole in the wood as a guide. Tap it 0-80 and insert a $\frac{1}{8}''$ screw from below, through the brass angle and then into the wood. Place a drop of CA glue in the hole if necessary. Drill and tap the hole at the front of the bottom layer, insert screw. Repeat for the other side of the deck. (*Photo 11.*)

□ Clamp the bolster (D5) in the middle of the deck, us-

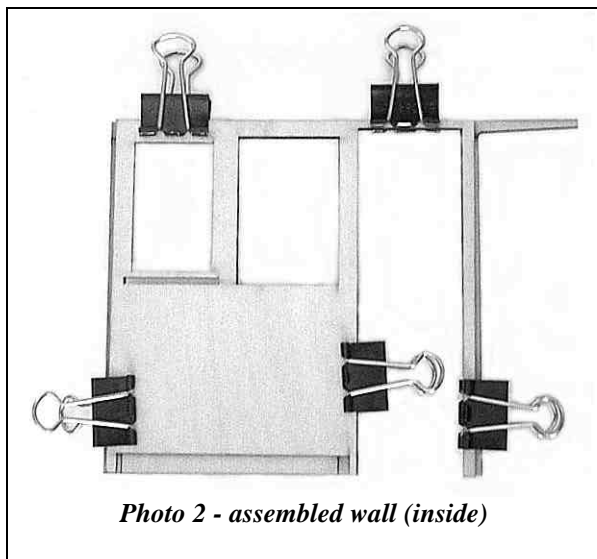


Photo 2 - assembled wall (inside)

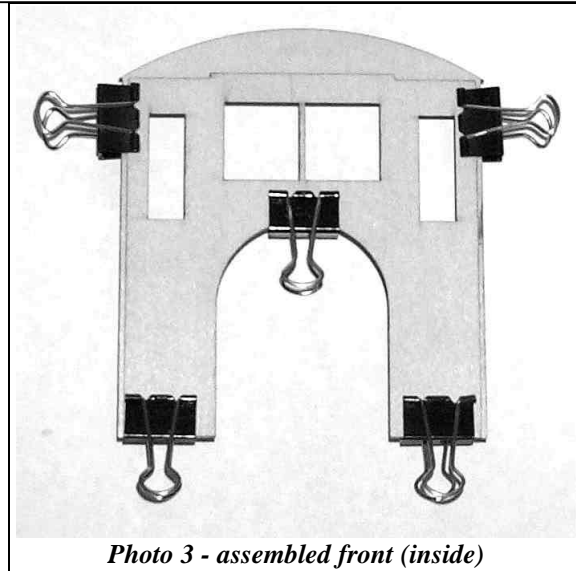


Photo 3 - assembled front (inside)

ing the guidelines and a square to align it, with the large hole against the deck. Drill .047'' holes from above, using the pre-drilled holes as guides. Screw a $\frac{1}{4}''$ 0-80 screw from above, through the wood and into the bolster. If the screw is loose,

don't try to secure it at this step; when you install the bolster and truck assembly later, use CA glue on the screw.

□ Paint the deck and frame members black and set aside to dry.

□ Detach the rear buffer beam from the *Ruby* by removing the two M2 hex-head screws on either side of the coupler. When the paint is dry on the deck, □ mark the center of the rear beam and the center of the rear edge of the deck. With the top of the beam even with the top of the deck, align the center marks, and clamp to the rear frame member. Using the existing holes as guides, □ drill through the rear frame member with a No. 50 bit ($\frac{1}{16}''$ if you don't have a 50). □ Thread the two $\frac{1}{2}''$ 2-56 hex-head screws through the rear beam and into the wood frame with a nut-driver.

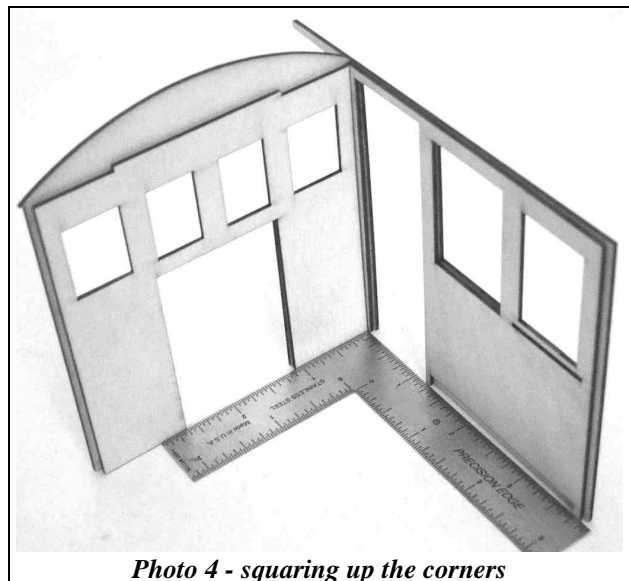


Photo 4 - squaring up the corners

Assemble the cab.

□ For both walls, glue the side layers (C1 and C2) together so the large window openings are aligned. (*Photo 2.*) This will leave a $\frac{1}{16}$ " step on the front and back edges. Scribe lines face out. □ Test fit the armrests (C10) into the slots under the side windows, then glue them in. The front tab of the armrest slides into the slot under the window, while the rear sill rests on top of the window framing.

□ Glue together the two layers of each door (C3 and C4). Scribe lines face out.

□ Glue together the front walls (C5 and C6) so the boiler arches are aligned. (*Photo 3.*) □ Glue the sliding window (C7) over one side of the center windows. □ Glue together the rear walls (C8 and C9) so the center openings are aligned. *Note:* Do not apply glue inside top arches on the outer layer, since the inner layers do not extend up that far.

□ Glue the front to one wall and the back to the other wall. The sides fit under the notches at the top of the front and rear walls. The sides cover the outside edges of both front and back panels.

Use a square to align the corners. (*Photo 4.*) The cab may not fit on the footplate if it's not square. Glue one side to the front, the other to the back, and let dry. When both joints are dry, assemble the complete cab. (*Photo 5.*)

□ Holes for the grab iron stanchions are pre-cut on the outer walls -- drill the inner layer with a $\frac{3}{32}$ " bit. □ Glue the front fascia trim (C11) to the top of the front wall, then □ glue the side fascia trim (parts C12) to the top of the walls and clamp. The front end of the side fascia will overlap the ends of the front fascia.

□ Attach the doors as desired. They may be glued in a

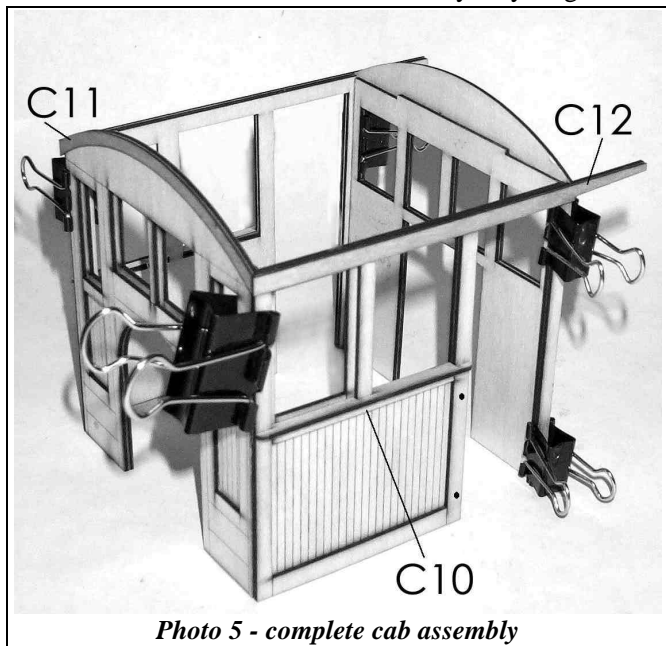


Photo 5 - complete cab assembly

closed position in the door openings, glued to the inside of the back wall, in an open position, or omitted altogether. Before you decide how to attach the doors, consider how you will control the locomotive with the doors in various positions. Your decision will vary depending on the nature of your railway, whether you are installing radio control, etc.

□ Paint, stain or varnish on the cab. Apply lettering as appropriate for your railroad.

□ When the last coat of paint or varnish has dried hard, insert the grab irons (C14) into the stanchions (C13), and glue the stanchions into the holes with CA glue. The cab is now complete.

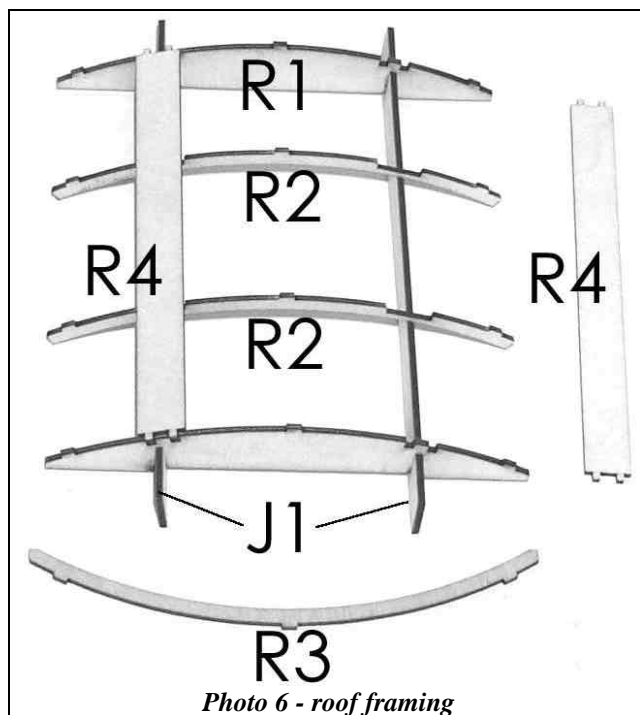


Photo 6 - roof framing

Assemble the Roof.

The roof has nine parts (*Photo 6*): five arches (carlines) which form the roof into a curve, two stringers which connect the carlines and keep them spaced properly, and two layers of roof decking (R5, R6). The main carlines (R1) are notched at the bottom to match tabs on the inside walls. The intermediate carlines (R2) are notched on top for the stringers (R4). The rear carline (R3) attaches underneath the rear of the roof. The inner layer of the decking (R5) is scribed to represent planking inside the cab, and there are locating holes for the intermediate carlines. The outer roof (R6) is plain. Jig pieces (J1) keep the roof framing square and aligned during assembly.

□ To assemble the roof, slide the jig pieces (J1) on to the main arches (R1) from below, just outside the lower notches. Lay the intermediate carlines (R2) across the jig, □ then glue the ends of the stringers (R4) to the main carlines only. Find the arrow indicating the front of the cab on the underside of part R5. The arch assembly with its jig goes towards the front; leave the rear holes open.

□ Lay part R5 on a flat surface, with the scribing up. Apply

glue to the arched side of the carlines and the tops of the stringers, then insert the center tabs on the carlines into the holes along the centerline of the roof. Adjust the intermediate carlines so each tab goes in a hole. □ Bend the sides of the roof down, and clamp them to the ends of the carlines. (*Photo 7.*) Use lots of clamps here to keep the edge of the roof straight while drying. □ Apply glue to the top surface of the rear carline (R3), insert the tabs into the holes at the rear of the roof, clamp and let dry thoroughly. □ Finally, apply glue to the top of the inner roof (R5) and carefully fit the outer roof (R6) so its edges and corners are aligned with the inner layer. Clamp and let dry. Slide the jigs off the main carlines and the assembly is complete. Sand the edges to square up the layers if necessary.

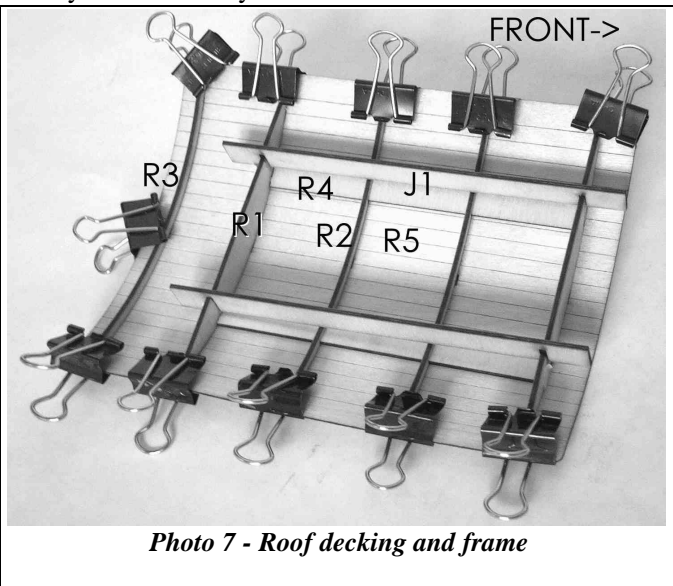


Photo 7 - Roof decking and frame

□ On the prototype, the roof would be covered with canvas or asphalt roofing paper. You may simulate this spreading a very thin coat of wood glue over the top of the roof decking. While the glue is still wet, lay $1\frac{3}{4}$ " (45mm) strips of rough paper on the roof. Overlap the strips about $\frac{1}{16}$ " (1.5mm).

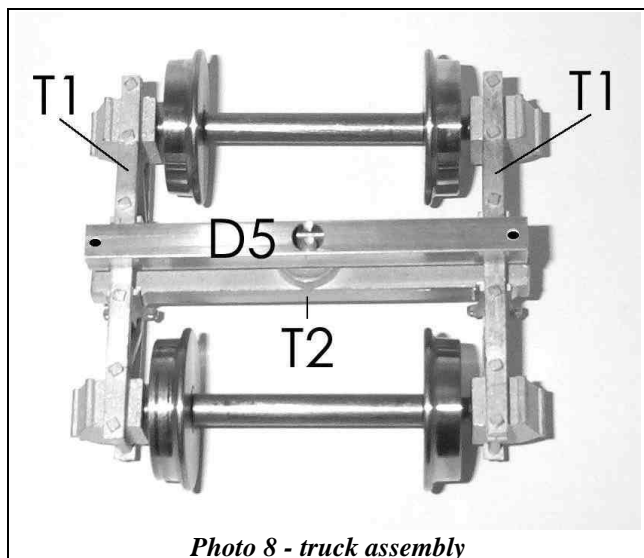
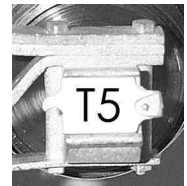


Photo 8 - truck assembly

Allow to dry overnight. Another method is to glue crocus paper (a very fine sandpaper) to the roof. Or leave it bare wood. In any case, after your covering is applied □ paint with flat black or red oxide paint.

Remove the Footplate.

□ Now, you will remove the metal footplate to install the deck onto *Ruby's* footplate. The hex-head screws in the footplate are all identical, so keep track of where they are, but don't worry about getting them confused. □ From above, remove the two hex-head screws in the top rear of the footplate, under the throttle and the two hex-head screws holding down the reversing lever. From below, remove two hex-head screws holding the frame spacer and the acorn nut from the lubricator mounting screw. (*Photo 11*) □ Loosen the coupling where the steam line attaches to the throttle. Pull the lubricator mounting screw up out of the footplate. □ Detach the fuel line from the fuel tank. □ Remove the Philips-head boiler support screw below the footplate. Slide the footplate out from under the boiler, towards the rear of the locomotive, and set it aside.



Assemble and attach truck.

□ Glue the journal lid covers (T5) on the journals and paint the truck parts and wheel before assembly. □ Insert the wheels and axles into one side frame (T1). (*Photo 8.*) Slide the other side frame over the other ends of the axles, making sure that the tops of the frames are oriented the same direction. □ Turn the truck bolster (T2) sideways and slide it through the openings. Twist it so the center plate is up, locking it into the frames. □ Remove the body bolster (D5) from the deck and drop a $\frac{1}{2}$ " No. 2 screw and washer into the large hole and the out the small hole, then insert this screw through the center hole in the truck bolster. Screw on the nut and tighten so the truck and body bolsters may just move. Put a drop of CA glue on the nut to hold it in place, and let dry. □ Slide the truck's spring plank (T3) through the center holes of the side frames. □ Slide the end of the lower leaf "spring" (T4) into the end

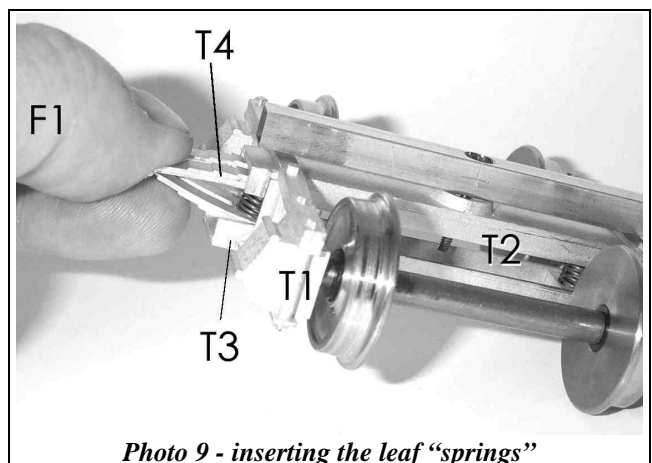


Photo 9 - inserting the leaf "springs"

of the upper leaf. Insert the coil springs between the leaves. Compress the springs with your fingers (F1) and insert them between the truck bolster and the spring plank; push them towards the center of the truck until they snap into place. (Photo 9.) □ Screw the body bolster and truck to the underside of the deck, using the $\frac{1}{4}$ " 0-80 screws. Use CA glue to secure them in the bolster.

A note about radius: we have tested the Ruby Forney conversion on 6-foot radius track and it negotiates these curves without problems. ⇨ Tighter radius curves may cause binding, but you can modify the bolster to alleviate them by making the bolster hole into a slot to allow the truck mounting screw to slide slightly from side to side. Drill two $\frac{3}{32}$ " holes in the bottom of the bolster, leaving about $\frac{1}{16}$ " between them and the original hole. Cut out the metal between the two holes you just drilled, using a cutoff wheel in a motor tool or razor saw. File the edges of your cut so they are smooth, straight, and $\frac{3}{32}$ " wide.

Assemble the bunker.

The bunker consists of seven wood parts for the bunker former, the brass bunker wrapper and a length of half-round brass wire. □ First, decide whether you will build bunker as a water tank (part B3 on top) or as a fuel bunker only (keeping the *Ruby's* side tanks; with part B2 on top). Assemble the parts with the scribed screw locators facing down. □ Start by sliding the jig (B1) over the rear of B2 and B3 as shown in Photo 10. Apply glue to the top and bottom edges of parts B4 and insert their tabs into the notches on the front of B2 and B3. □ Repeat with the side walls (B5). Let glue dry, □ remove jig and attach the back wall (B6).

⇨ If you want to apply "rivet" detail to the brass tank wrapper, □ tape the enclosed template to it and use the circles to locate the rivets. □ Before attaching the wrapper to the bunker former, wash the brass

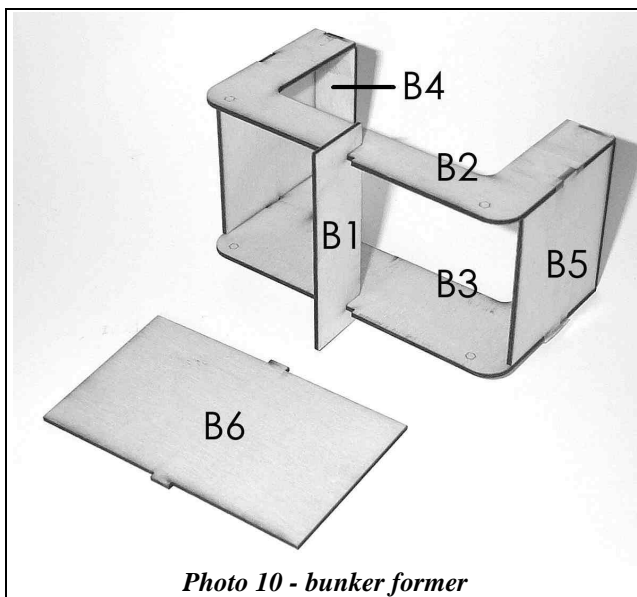


Photo 10 - bunker former

thoroughly. Use hot water, an old toothbrush and a degreasing detergent (there are many brands sold in spray bottles for home use).

□ Align the center of the wrapper with the center of part B6, hold the wrapper flat against the wall, keeping the bottom aligned with the former, mark the brass at the corners. Use the guideline to form the corner curve over a $\frac{1}{2}$ " dowel. Check the fit at the corners, and adjust as necessary. Rubber bands around B5 will hold the sheet on temporarily. □ Bend the sheet around the front corners at B4. □ Drill two .047" holes at the top and bottom of each B4, on the midline,

and insert two brass nails.

□ Solder the brass half-round wire to the outside top edge of the brass tank wrapper. Start at the rear center and work along the sides to the front. Trim the beading at the front corners. Remove the flux residue with degreaser.

⇨ If you are building the bunker as a water tank (part B3 on top) you will want to install a water hatch (not included) on the top of the tank. There are several fine metal castings available, or you can simply glue a short piece of $\frac{3}{4}$ " diameter tubing to the deck and top it with a $\frac{7}{8}$ " circle of styrene, strip hinges and a wire handle.

□ Paint the bunker with the paint of your choice. When painting brass, it must be absolutely clean and "toothy" to hold the paint. Buff the surface with coarse steel wool to give it some surface texture, followed by another cleaning with degreaser. Wipe off with a damp cloth, then don't touch it again with your fingers until after the paint is dry.

Attach the deck to the footplate.

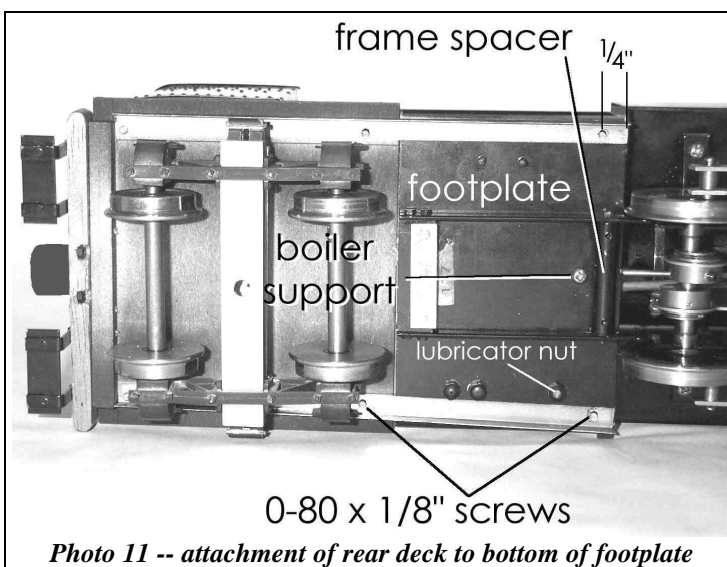


Photo 11 -- attachment of rear deck to bottom of footplate

□ Remove the two hex screws holding the frame spacer to the footplate. Lay the front of the deck on the footplate, with the bolster down, and re-attach the frame spacer, running the screws through the holes in the deck, making sure that the brass angles go under the footplate while the wood deck goes on top. □ Slide the footplate back into place. You will have to raise the boiler a little to get the deck under its support. Set

the boiler support post in the large hole in the deck, and replace the screws in the boiler support and the frame spacer ends. At this point, the deck should be fairly secure on the footplate. From below, drill a .047" hole through the brass angles and the footplate, about 1/4" from the front of the footplate. Tap these holes 0-80 and insert 1/8" screws. (If you can't locate a 0-80 tap, you may drill the holes to 1/16" diameter and use 0-80 nuts to secure the screws.) Replace the M2 footplate screws under the throttle. Put the lubricator in its place and secure with the acorn nut, then reattach the steam line. Reattach the reversing lever stand and the fuel line.

Attach the Cab and Roof.

The cab body slides down over the flanges on the sides of the footplate. If your locomotive is radio controlled, you may wish to install the cab permanently. The logical attachment points are at the flanges on the footplate. You may use CA or silicone glue on this joint, or drill and insert small screws or brass pins. If you leave the cab removable, then you may glue the roof on permanently after attaching the bunker.

Attach the Bunker.

The cab must be in place on the footplate when locating the bunker on the deck. Press the bunker up against the back wall (but not too tightly, or the doors will not close). Glue the bunker to the deck, securing it with rubber bands while it dries.

Painting and Finishing.

Up until about World War I, wood cabs were often left natural and finished only with varnish, to show the beauty of the wood. The woods used were hardwoods like walnut, mahogany or oak. Later, when new engines were usually built with metal cabs, older wood cabs were often painted a color which complemented the paint on the rest of the engine (usually black). Cab interiors were always painted "apple green", a very light green believed to be easy on the eyes. Window frames were sometimes painted a color which complemented the lettering or decorative striping on the tender. After painting or staining, applying several light coats of clear varnish will give the cab the carefully crafted appearance of early railway equipment. Letting the coats harden thoroughly and lightly smoothing with them steel wool will give a finer finish.

Running Boards.

The Forney conversion is prototypically accurate with the side tanks in place, but this configuration was relatively uncommon. After removing the tanks, the supplied running boards (R1), they may be attached by gluing them directly to *Ruby's* tank brackets, or they may be held with screws. If

you glue them, use CA or a silicone adhesive, which will be more resistant to the bumps and handling a locomotive must endure. If you wish to screw them on (recommended), you will need to supply screws, and some 3/32" x 1/4" stripwood (hardwood is best).

Cut four strips of wood, 3/32" thick, 1/4" wide and 1" long. Clamp the strips in place on the brackets, mark holes for drilling and drill 1/16". Insert 1/4" flathead screws into the holes from above and secure them to the brackets with nuts. Glue the running boards to the tops of the mounting strips. Running boards should be painted flat black.

You're done. Stand back and admire your new Forney!

Thanks again for purchasing this FH&PB *Ruby* conversion kit! If you have any questions or comments about the kit, please write.



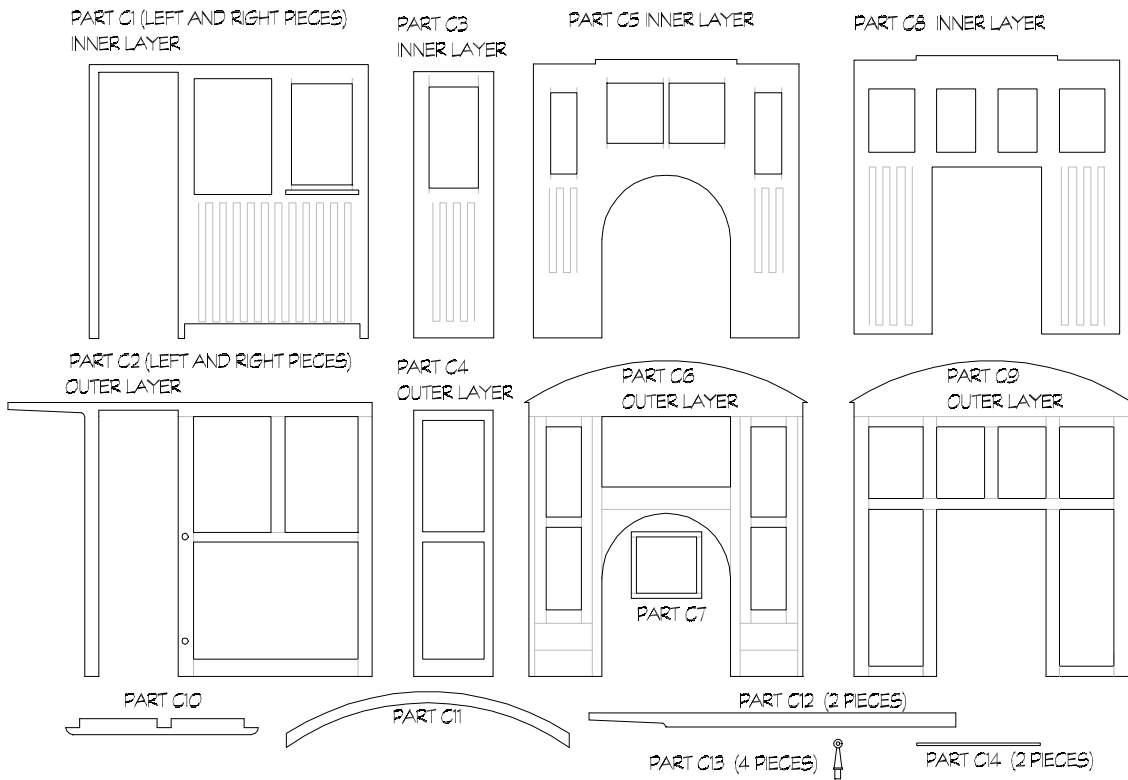
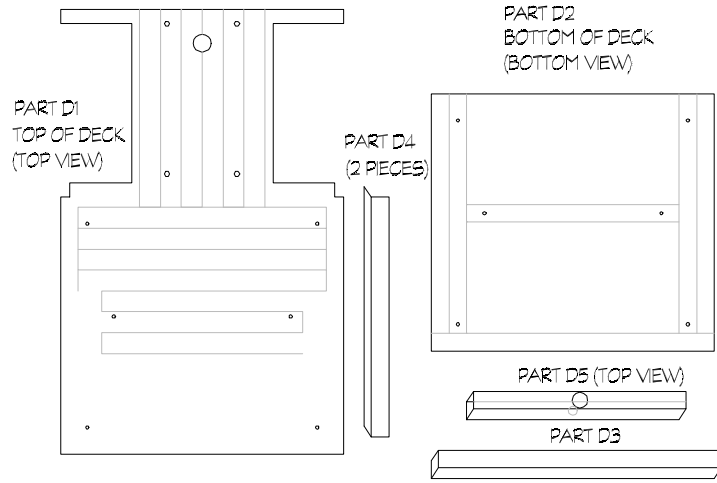
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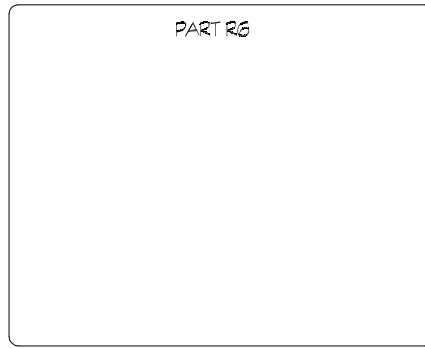
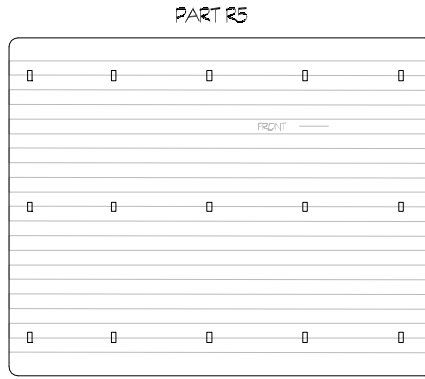
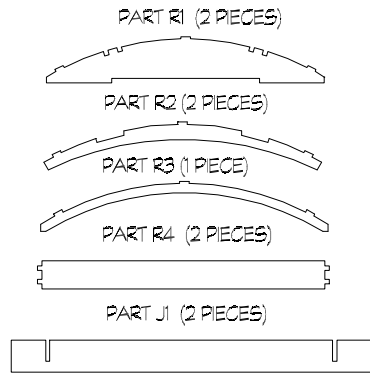
PARTS LIST

Forney Deck and Cab Walls



PARTS LIST

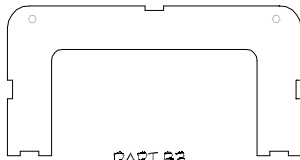
Forney Cab Roof and Bunker



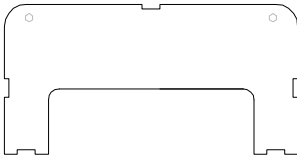
PART B1 (2 PIECES)



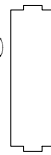
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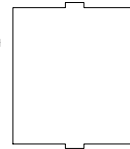
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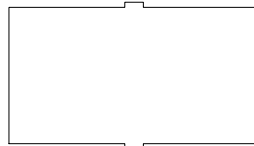
PART B4 (2 PIECES)



PART B5 (2 PIECES)



PART B6



PART R1 (2 PIECES, LEFT AND RIGHT)



BRASS HALF-ROUND WIRE



TANK WRAPPER (BRASS SHEET)

