

Beginner Project: Build a Rustic Structure



**Styrene construction
is easier than you think**

Build a rustic structure

PART 1

Styrene construction is easier than you think

by Ray R. Dunakin III | San Diego, California | Photos by the author

A GARDEN RAILWAYS
PROJECT
BEGINNER



This small, beautifully weathered, “wooden” cabin is made almost entirely of styrene. The techniques used to achieve these effects are thoroughly described in this two-part series.

I love decrepit cabins, rundown buildings, and other heavily-weathered, rustic structures. To model this type of structure realistically, one must scratchbuild it. Fortunately, I love scratchbuilding, too!

Realistic weathering won't happen naturally by leaving a model outdoors. Plastic doesn't weather like wood and miniatures made of real wood don't weather the same

way full-size structures do, nor are they as durable. Light weathering can be applied to a finished structure but extreme effects must be built into the model from the beginning of construction.

Scratchbuilding is not as difficult as many people believe, and it can be a fun and very satisfying part of the hobby. Let's start with some tips for modeling

realistic, rustic structures.

Reference material. If you're modeling a specific prototype, you'll want as many photos as you can get of that structure and its details. If you're modeling a freelance structure, study photos of similar full-size structures and details. The Internet is a great source of reference material. You can use Google Images to find thousands of

photos of old buildings of every description, plus images of weathered wood, peeling paint, etc.

Making mistakes. Sometimes people who have never tried scratchbuilding become paralyzed by the fear of making a mistake. Even experienced modelers make mistakes—they just fix their mistake and move on.

Planning. A little planning will keep mistakes to a minimum. The amount of planning needed prior to construction is up to you. Some folks are comfortable working from a rough sketch and some basic dimensions; others create elaborate, detailed “blueprints.” Do whatever works for you. The amount of planning necessary will often depend on the complexity of the structure. For the simple cabin described in this article, I laid out the dimensions directly onto the styrene. At other times I have built foam-core mock-ups prior to constructing larger buildings. This is especially helpful when the structure has to fit into a specific “footprint” on the railway.

Learn techniques. Too often, would-be modelers think of construction articles as a set of instructions for building a specific model. However, the modeling techniques being described are actually “knowledge tools”—things that can be used to create a wide range of models. You can even learn methods from other hobbies, such as military modeling, and apply them when creating your railroad models.

Tools. You don’t need a shop full of expensive tools! A few basic hand tools are all you really need to scratchbuild structures. Here are some you’ll need for this project:

- X-acto brand or similar hobby knife, with new #11 blades
- Metal ruler to use as a straightedge
- Scale ruler in your preferred scale
- Dremel rotary tool plus various bits, including a large cutting wheel
- Pin vise (this is a simple drill for use with very fine bits)
- Razor saw
- Steel machinist’s blocks (these can be found online, usually called “1-2-3 blocks”)
- A smooth, hard work surface—I use a tempered-glass tray that I picked up from a thrift store

You’ll also need to make a “wood-graining” tool. Use a Dremel with a



This actual miner’s cabin in Ione, Nevada, provided the inspiration for the building described here.

cutting wheel to cut off a ¼"-wide piece from a razor-saw blade. I used a blade with 54 teeth per inch. Insert this into the handle of a hobby knife (**photo 1**). To vary the grain pattern when modeling wood, I occasionally used a piece snapped from a fine-toothed hacksaw blade.

Although not strictly necessary, a tool such as the Chopper from NorthWest Short Line is handy for repetitious cutting of small strips to the same length.

One more note: We’ll be building this structure primarily of styrene. For assembly, I recommend using a solvent-type glue, such as MEK or Plastic Weld.

Let’s get to work

Here’s how I built a replica of an actual miner’s cabin that I saw in the tiny town of Ione, Nevada. This quirky little cabin just cried out to be modeled (see the prototype photo above). Unfortunately, I only had three photos, taken from a distance, and the prototype had a lot of tall weeds and junk surrounding it. Because of this, I also relied on photos and measurements obtained from similar cabins that I found elsewhere.



1. A small piece of razor-saw blade in an X-acto handle is used for wood graining.

The prototype cabin is approximately 12' long x 10' wide. The sides are 7.5' high and the peak is 9.5' high. It has board-and-batten siding, with 12" boards and 3" battens. There is one window in front and one on the side. However, I added a third window to make the opposite side of the structure more interesting.

We’ll start by building the window frames. These may seem daunting but they’re fairly simple. I like to start from the inner part of the frame, and build outward (see **figure 1**). I use .030"-square styrene rod to create the thin, rectangular

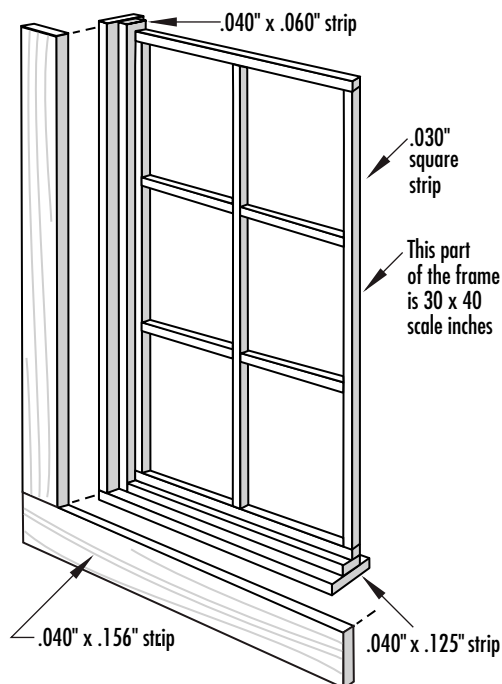


Figure 1: Window-frame diagram



2. The inner frame of the window and the muntins. Steel blocks keep everything square.



3. Strips of .040" x .060" styrene are added around the outside of the frame.



4. The window is raised on strips so that the outer frame will be properly centered.



5. Exterior trim is added to the window. Top and bottom strips will be trimmed later.



6. The window frame, all trimmed up.



7. Cracks and nail holes have been added.



8. Door and door frame are modified moldings from Grandt Line.



9. Cracks are scribed in some boards with a hobby knife with a #11 blade.

inner frame of the window. Steel blocks keep everything square. Then add the muntins, made from the same size material (**photo 2**).

Next, add strips of .040" x .060" styrene around the outside of the frame (**photo 3**). When this is done, add strips of .040" x .125". These need to be centered around the inner frame, so use a piece of .020"-thick styrene to raise the frame while gluing the .040" x .125" strips on two sides (**photo 4**).

Scrape a fine-toothed razor saw down the length of a .040" x .156" strip to simulate wood grain. This will be used for the

trim around the windows. Cut it to length and glue it to the window frame as shown (**photo 5**). Top and bottom strips can be rough cut to their approximate lengths, then trimmed after they are in place (**photo 6**).

Use a hobby knife to carve cracks into the trim boards on the window frames. Then use a .010" drill bit, held in the pin vise, to drill tiny, very shallow holes to represent nail heads (**photo 7**). When you've finished, set the windows aside and start on the door.

I used a Grandt Line molding for door and frame, modifying them to more

closely resemble the prototype (**photo 8**). First, I carved off the molded-in door-knob plate. Then I used the wood-graining tool to add a little grain to the door and frame. I cut out a rectangular opening for the window—the Dremel helps with this. The window frame is simple: just four pieces of wood-grained .040" x .156" strip. A new doorknob and plate will be added later, using either an Ozark Miniatures casting or a doll-house part.

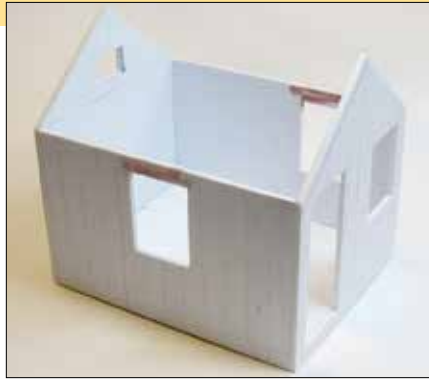
Cabin walls

Now we can start on the cabin walls. Use a scale ruler to lay out the dimensions of the walls on 1/8"-thick styrene, then cut them out. You can cut part way through with a hobby knife, then snap the piece off. Next, wrap a piece of very coarse sandpaper around a block. I used #36 grit. Drag it vertically up and down the styrene walls several times. This creates tiny scratches in the surface that simulate the finer details of rough wood grain.

Now draw lines representing the gaps between the 12" boards. Trace the window frames and door frame onto the walls and cut out the openings. You may want to use the Dremel to do most of this work.



10. Horizontal siding for the back of the structure is laminated to a backing piece.



11. The walls are glued together.



12. Strips are glued to the lower inside walls to support the floor.



13. Additional strips are added near the tops of the walls to support the ceiling.



14. The upper structure of the cabin includes the ceiling and roof "rafters."



15. The roof support structure in place. This should be a loose fit between the end walls.

Scrape the wood-graining tool down the walls to scribe simulated wood grain into the styrene, using the pencil marks as a guide for the width of the boards. You'll want to vary the pattern a little bit on each "board"—straight down on some, curved a little on others. Next, drill a few knotholes and insert short pieces of round styrene rod into the holes for knots. Apply a tiny drop of glue to the rear of the knothole to hold the rod in place.

Use a hobby knife with a brand-new blade to carve cracks into the "boards." For the best results, make one cut with the knife angled slightly to one side, then

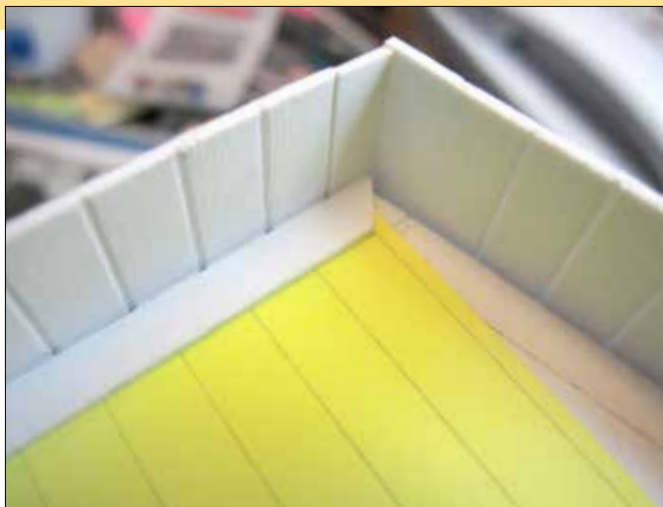
make a second cut with the knife angled the other direction. This will create cracks with a V-shaped cross section (**photo 9**). You may want to practice this method on a scrap piece of styrene first.

I had no photos of the cabin's rear wall, so I decided to give it horizontal boards, using V-groove siding from Evergreen Scale Models. (Mismatched siding was common on these old structures.) I also cut an opening for a small attic vent. The siding was laminated to a thicker sheet of plain styrene, then it was scribed with wood grain (**photo 10**).

Glue the four walls together (**photo**

11). Glue strips of .125" x .250" styrene along the inside bottom edge of the walls to support the floor. Cut the floor from a sheet of .060"- or .080"-thick styrene and glue it in place (**photo 12**). Glue in some strips near the top of the side walls, too, to support a ceiling. A few vertical strips of styrene can be added to the interior walls near window and door openings, to prevent warping (**photo 13**).

Build the ceiling and "rafter" structure from .080" styrene sheet. Rafters are just triangular pieces that support the roof (**photo 14**). The end pieces should fit loosely between the front and rear walls



16. V-groove siding, scribed side down, forms the roof. A spacer is used while gluing on the trim piece.



17. The underside of the completed roof assembly.



18. Battens are added to the sides of the cabin.



19. Splits and nail holes are added to the battens.



20. The interior of the cabin is painted a dark color.



21. Bottoms of the boards and battens are further distressed, as per the prototype.

(photo 15).

The roof is made from V-groove siding, with the smooth side facing up. Lightly scribe some wood grain on the ends of the siding, where it will hang over the walls. Position the roof assembly on the cabin, then use a piece of cardstock as a spacer as you glue the trim to the underside of the roof (photo 16). Be sure to


scribe wood grain into the trim strips first.

Photo 17 shows the underside of the completed roof assembly. Initially, I thought the prototype cabin had rafters that extended beyond the sides of the building, so I added some short lengths of styrene beams to my structure, as seen in this photo. However, I later found out this was incorrect, so I removed some and cut the rest back to a minimum.

We can now begin adding the battens to the exterior walls. In 1:24 scale, these work out to .040"x .125". Scribe wood grain into the styrene strips by scraping them with a razor saw. With the roof assembly in place, cut the battens to fit and glue them in place (photo 18). Some may be cut to look broken. Don't forget the trim on the corners of the walls. Then carve cracks and splits into the battens and add nail holes (photo 19). The interior of the cabin was spray-painted a medium-brown color, and some over-spray is

visible on the exterior walls in these photos. I wasn't going to detail the interior but it would have lights, so I didn't want stark-white walls showing through the curtains (photo 20).

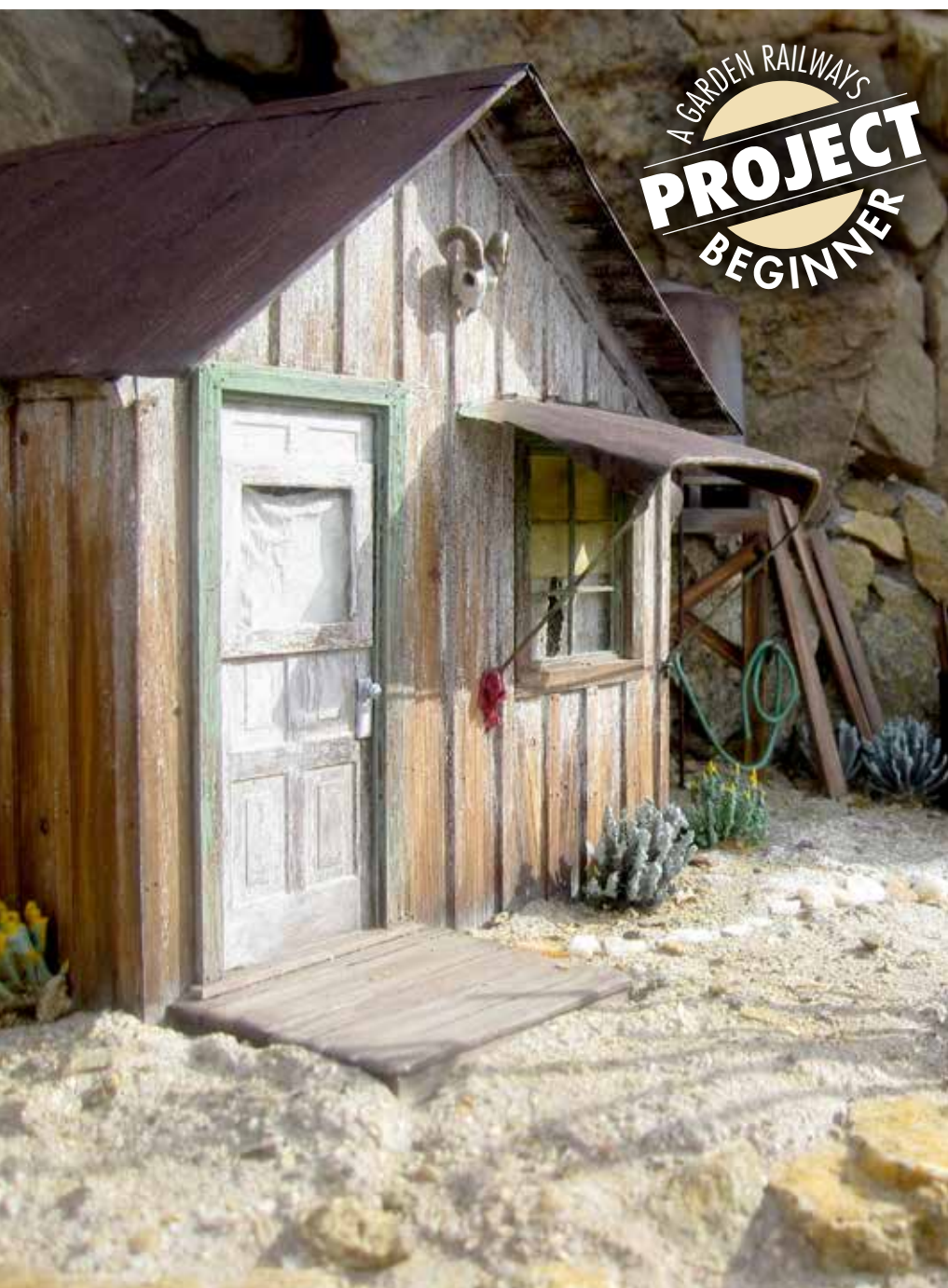
Very old wooden structures usually have more wear and decay along the bottom edges of exterior walls, so carve an irregular edge into the bottom of the wall. Scrape and carve additional graining and cracks along the lower edge too—really rough it up (photo 21).

In the next installment, we'll finish up the structure, then paint and weather it. 

Build a rustic structure **PART 2**

Finishing, painting, and weathering the cabin

by Ray R. Dunakin III | San Diego, California | Photos by the author



In the first installment, I described the tools needed for working with styrene, as well as the construction of windows, doors, “wooden” siding, and the basic cabin. Here, I’ll finish the model, paint it, and weather it.

Awnings

This cabin’s most distinctive features are the unusual, homemade metal awnings. Each awning is unique. I made mine from brass for maximum durability. My soldering skills are not the best but I managed to get the awnings done. The method I use is to “tin” the parts individually with flux and solder before assembly. Then, when you put the parts together and apply the heat, it only takes a moment to melt the solder and join them. Of course, you could leave the awnings off your model or build a different style out of styrene. You should give brass a try sometime, though—if I can do it, anyone can!

The side awning’s frame was built up from pieces of $\frac{1}{16}$ ”-square tube and .032” rod (**photo 22**). The sheet metal is .005”-thick brass sheet, which I shaped, tinned, and then soldered to the frame (**photo 23**). The front awning has a more crude frame made only of .032” rod (**photo 24**). The sheet metal on this awning is somewhat irregular and the top edge is cut and fitted to battens (**photo 25**). The awning over the fictional third window was built in a style combining elements of the first two awnings. I had to carve away some of the trim under the roof to clear the awnings.

This rustic cabin looks like it has been decaying in this spot for decades. In this installment, the author details and weathers the styrene structure.



22. The side awning's frame was made of soldered, square brass tube and brass rod.



23. Thin brass was soldered to the frame to form the awning.



24. The front awning's frame was made only of brass rod.



25. The sheet-metal cover was carefully trimmed around the battens.



26. Colors are built up gradually in streaks.



27. The color changes at the bottoms of the boards.

When completed, I sanded off any rough areas of solder from the awnings. I then cleaned the awnings with solvent and dipped them in acid to lightly etch the surface, which helps paint adhere to it. I cleaned the awnings again after etching to remove residue.

Painting and glazing

Now we'll begin painting the cabin. All styrene surfaces to be painted should first be sprayed with a light coat of white primer. The prototype cabin, like many old desert structures, has lots of rich golden browns and deep, dark accents. I use Apple Barrel and Craft Smart brands of acrylic craft paints. These hold up well outdoors and have nice, flat finishes. The main colors I used for the wood effects were Black, Nutmeg Brown, Espresso, Apricot, King's Gold, and Sandstone. Sometimes these were used straight; at other times, two or three colors would be mixed. All were thinned with water.

I start with lighter colors and apply them in streaks, gradually building up color in realistic patterns (photo 26). This is where you really need to pay attention to good reference photos. Let each layer of color dry before applying the next.



28. A wash of dark brown helps to define the cracks.

Along the bottom edge, I brushed on some pale, grayish color where the wood becomes saturated in wet weather. Then I used a thin, wet wash to create a dark transition between the light gray and the rest of the "wood" (photo 27). Use the tip of the brush to absorb excess color, if needed. Finally, a very thin wash of black/brown was applied over the whole surface, letting the color settle into the grain and cracks (photo 28).

The rear wall of the cabin was painted with less vivid colors to represent the shaded side of the building (photo 29).



29. The rear wall was painted in more muted colors.

The underside of the eaves was painted a dark, grayish brown. Windows, door, and door frame were given similar treatment, using somewhat darker browns and grays, with a bit of lighter, warmer tones on the lower half, which receives the most sunlight (photo 30). Once all the "wood" had been painted, I gave it a light coating of Krylon UV-resistant matte clear.

Now we have a great looking, bare wood cabin. We could leave it at that, but the prototype had traces of faded, peeling paint—white on the walls, a white door, green door frame, and green windows.



30. Lower halves of windows were painted in warmer tones.



31. Peeling green paint is replicated on the windows.



32. The door had more intact paint.



33. Traces of paint remain on the cabin sides, under the eaves.



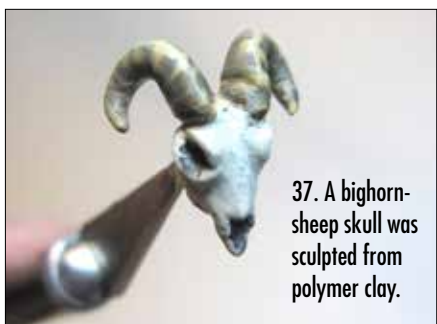
34. A stovepipe was constructed of styrene.



35. The stovepipe assembly prior to painting and installation.



36. The stovepipe installed on the corrugated roof.



37. A bighorn-sheep skull was sculpted from polymer clay.



38. A tiny, wooden front porch was added.

I used a technique I had experimented with before to simulate the look of peeled paint. Start by brushing on some Testor's enamel thinner. While it's still wet, brush on the acrylic paint. The thinner resists the water-based paint, which takes hold in splotchy, random patterns. The effect is quite realistic.

Window frames had more paint on the upper half, and very little at the lower end (**photo 31**). (Do not install the window frames yet!) The door had the most recent paint, with less peeling, so I went over it several times (**photo 32**).

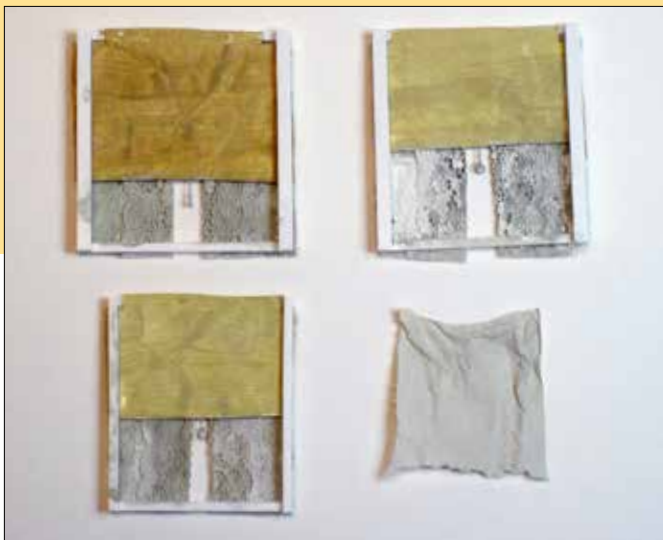
On the walls, you may have to apply more thinner if it starts to dry out too much before you're finished. The sides of the cabin had little paint left—just traces of it under the eaves and awnings (**photo 33**). The front wall had a bit more, especially on the upper portion. The rear wall

also had more remaining paint. When you are satisfied with the paint, seal it with another coat of Krylon UV-resistant matte finish.

It's time to glaze the windows. I used real glass, only .05" thick, which I found online. You could use thin acrylic or polycarbonate sheet instead. Cut it to fit into the back of each window and carefully glue it in place. I used clear silicone sealant for this. You can then install the windows in the cabin walls.

The roof

The roof of the cabin is covered with rusty, corrugated metal. I made my corrugated metal from .005"-thick sheet brass. Usually, I just run it through a paper crimper. However, the metal on the original cabin had fairly small corrugations, so I tried something different. I bought some plastic



39. Shades and curtains were glued to simple styrene frames.



40. Frames with the curtains were glued into the structure.



41. From without, curtains and shades are effective.



42. The finished cabin, installed in its setting, is a rustic jewel.

corrugated sheet, taped the brass over it, and embossed the grooves with a dull pencil. It didn't turn out exactly the way I'd hoped, but it will do.

I then cut the brass into scale widths and glued it to the roof using Liquid Nails. I painted it with a blotchy combination of Apple Barrel's Chocolate Bar, Espresso, and Nutmeg Brown, plus a little Black. The awnings were painted the same way, with the addition of a thin wash of white on the underside and bits of faded green on top.

Another interesting feature of this cabin is its large stovepipe with a clay topper. I built up the body of the stovepipe using telescoping sections of styrene tube. The clay topper was a bit tricky. I heated some $\frac{1}{16}$ " styrene rod and wrapped it around a large dowel, then let it cool. From this I cut short bits of curved rod,


glued them to the top of the stovepipe, and topped them off with a thin styrene disk (**photo 34**). I put a Plastruct lampshade into a drill and reshaped it with a sanding stick and file. This became the peak of the clay topper. I cut the styrene tube at an angle to match the roof, then glued it to a rectangular piece of sheet brass (**photo 35**). Then the stovepipe was painted and glued to the roof (**photo 36**).

Additional details

I wanted the skull of a bighorn sheep for my cabin, instead of the old saw blade that was mounted on the real one, so I sculpted one from Primo brand polymer clay (**photo 37**). I also added a small wooden porch in front of the door (**photo 38**).

Old shades and curtains needed to be made for the windows to prevent a clear view of the interior, while still allowing

some light to show through at night. I made the shades from pieces of Tyvek from a shipping envelope. Curtains are bits of lace saturated with artist's acrylic matte medium, then painted dingy off-white. The shades and curtains were glued to a simple styrene frame to prevent them from curling (**photo 39**), which was then glued into the structure (**photo 40**). The finished effect can be seen in **photo 41**. The window in the door had only a piece of cloth tacked over it, rather than a proper curtain. This was simulated by soaking a bit of paper towel in matte medium, shaping it, and letting it dry. After painting it was glued in place.

The finished cabin (**photo 42**) adds charm and authenticity to my railroad. Scratchbuilding structures such as this one is satisfying, inexpensive, and easy. Give it a try! 

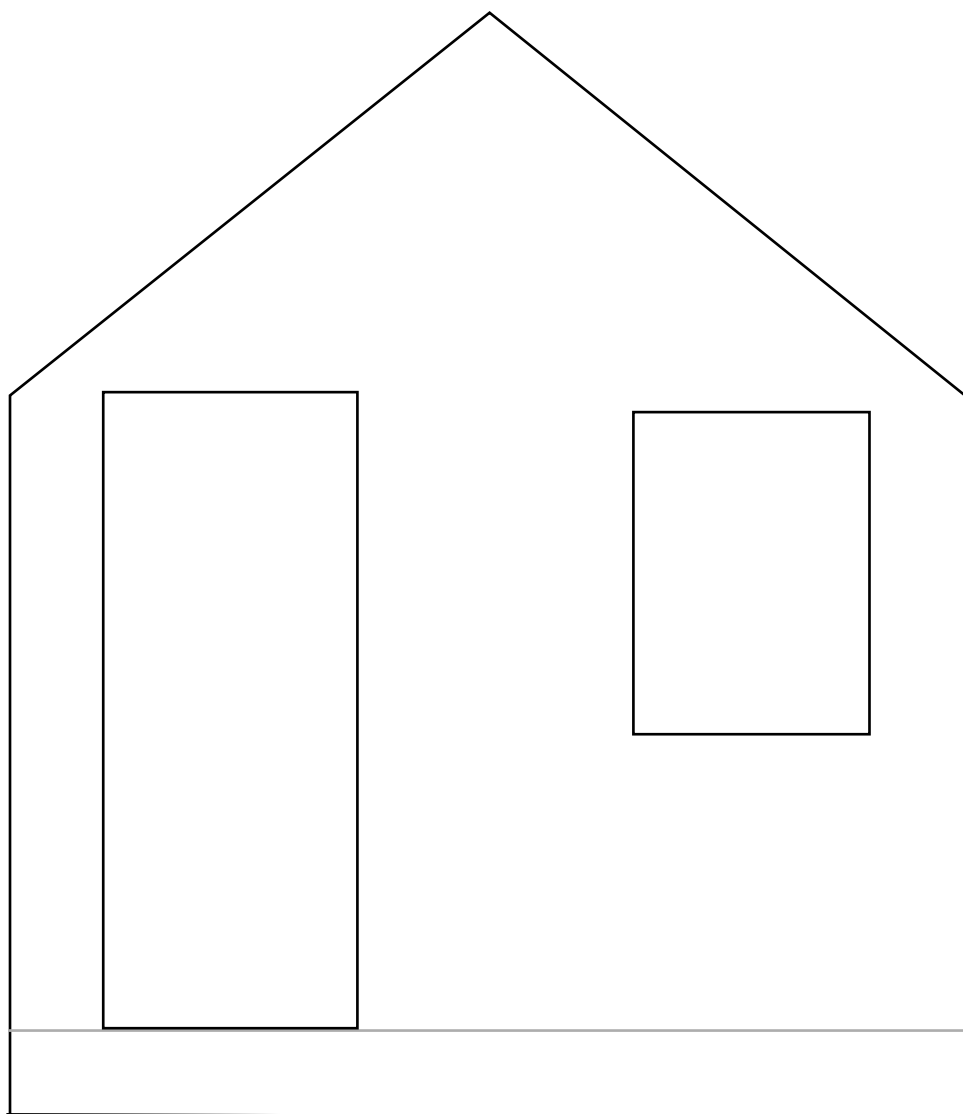
Build a rustic structure

By Ray R. Dunakin III

In the December 2012 and February 2013 issues, Ray Dunakin describes how to make a rustic cabin out of styrene. Use these full-size drawings of the walls as a template, and follow along with Ray to learn how to make this impressive structure.



This small, beautifully weathered, "wooden" cabin is made almost entirely of styrene. The techniques used to achieve these effects are thoroughly described in this two-part series.



Trace door and window frames to determine actual size of openings

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