

THE RED OAK LAYOUT



Red Oak Route





Build the 3 x 7 RED OAK LAYOUT

Part 1: Our new N scale project layout
is built on a door

By Neil Besougloff • Photos by Bill Zuback and Jim Forbes

Fifty miles west of the Chicago, Burlington & Quincy RR division point of Creston, Iowa, lies the town of Red Oak, the inspiration for *Model Railroader's* latest project layout.

Named for the trees that line the Red Oak Creek, the town came into being with the arrival of the Burlington in 1869. Until 1901 the town was known as Red Oak Junction, since the Burlington's branch to Lincoln, Neb., began in Red Oak. Even today, the town recalls its history each summer with a Junction Days celebration.

Built for a small space

Space is always an issue among our readers when it comes to building a model railroad, so this year we went small with our project. The Red Oak layout is N scale and built on a common hollow-core household door laid flat to make a tabletop. The door is 6'-8" tall and 3'-0" wide, so our layout's footprint is, rounded off, 3 x 7 feet.

We built legs with braces and a shelf below the door. However, you don't have to build legs – the Red Oak layout can be placed on a kitchen table or even a pair of sawhorses.

On top of the door we added two layers of extruded-foam insulation

1. *Model Railroader's* newest project is the N scale Red Oak layout, built on a common door. The layout models the Chicago, Burlington & Quincy RR in a small Iowa town in the 1960s.

board plus a 14-inch-tall styrene back-drop divider. Around the edges of the door we installed an 1/8" tempered hard-board (Masonite) fascia.

Track, scenery, structures, and trains came next, and before long we had finished the model railroad you see in the photographs on these pages and in videos on www.ModelRailroader.com.

Getting started

This layout depicts the CB&Q main line west from Chicago in the early 1960s and includes one of the two branch lines that ran north and southwest from Red Oak. The layout is inspired by the town of Red Oak (1960 population of 6,400), but isn't a true model of the town.

The Red Oak layout got its start when I suggested to David Popp, the producer of *Model Railroader Video Plus*, that we needed a fresh idea for a *Model Railroader's* 2015 project layout. I wanted a layout with staging, a branch line, and a clear change of scenery from previous magazine projects, such as the

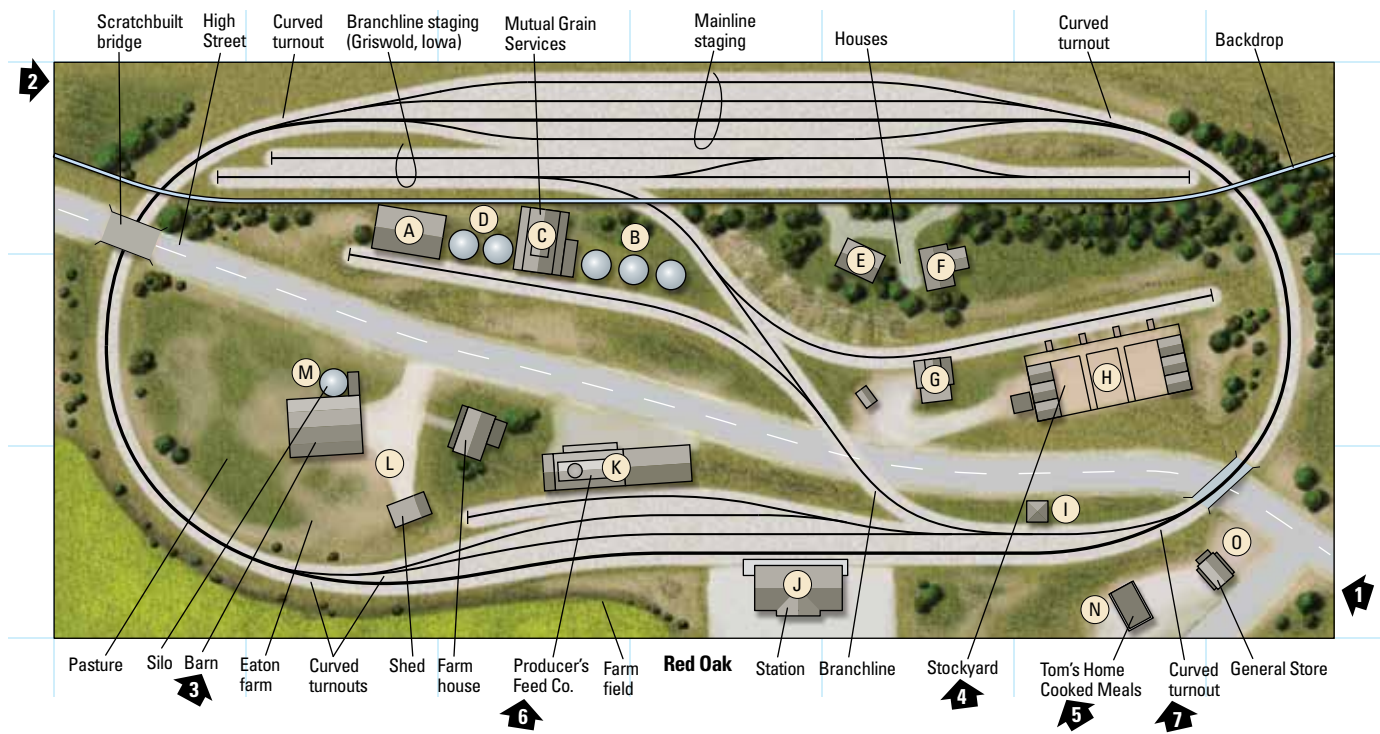
▶▶ The Red Oak series

January: Meet *Model Railroader's* N scale Red Oak layout

February: Benchwork, terrain and track

March: Scenery, roads, and bridges

April: Structures, details, and rolling stock

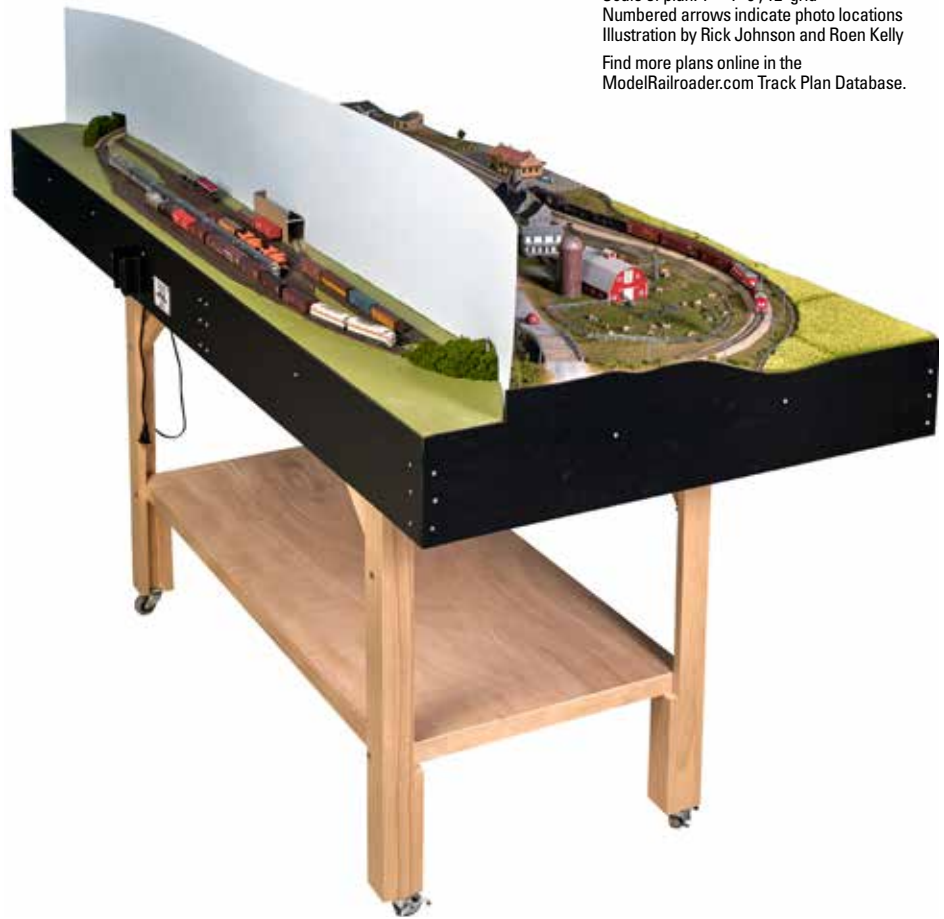


Red Oak

N scale (1:160)
 Layout size: 36" x 6'-8"
 Scale of plan: 1" = 1'-0", 12' grid
 Numbered arrows indicate photo locations
 Illustration by Rick Johnson and Roen Kelly
 Find more plans online in the
 ModelRailroader.com Track Plan Database.

Trackplan structure list

- A** – Walthers no. 933-3230 co-op storage shed
- B** – Rix Products no. 704 40-foot grain bins (3)
- C** – American Model Builders Laser Kit no. 651 Alton elevator
- D** – Rix Products no. 708 Guthrie grain set
- E** – Model Power no. 2554 Sinatra house
- F** – Model Power no. 1558 Diggers house
- G** – Branchline Trains Laser-Art no. 889 grain elevator
- H** – The N Scale Architect no. 10703 stockyard
- I** – Tichy Train Group no. 2601 signal tower
- J** – Walthers no. 933-3803 Santa Fe-style depot
- K** – Walthers no. 933-2615 Sunrise feed mill
- L** – American Model Builders Laser Kit no. 614 Midwest farm combo
- M** – American Model Builders Laser Kit no. 620 silo
- N** – Walthers no. 933-3229 Jim's repair shop
- O** – Life-Like no. 433-7463 William's country store



2. An overall view of the layout shows staging tracks behind the backdrop. Sections of the scenery extend through the track openings in the backdrop to help hide the cutouts when viewed from the front.



3. One of the signature trains on the layout is Kato's *Silver Streak Zephyr* set. Here it passes an American Model Builders Laser Kit farm set. The field in the foreground is from Noch. The fences are from The N Scale Architect.

southern harbor layout the staff built last year and the Virginian Ry. Appalachian layout from 2012.

We tossed around a few options that led David to the David P. Morgan Memorial Library here in Kalmbach's offices (Morgan was *Trains* magazine's long-time editor). David came back from the library with a concept for a Midwestern railroad in the 1960s in the town of Red Oak, including some photocopies of book pages showing the Burlington in that part of Iowa.

At about the same time, a new Walther's N and Z scale catalog arrived in our offices with a pair of Chinese Red Burlington Electro-Motive Division GP20s on its cover. That, and the Kato EMD E5-led Burlington *Zephyr* passenger train we had previously reviewed, sealed the deal for the CB&Q as the prototype for this year's project layout.

Also on the layout is a Kato NW2, and after we started building, Kato released its F2 diesels painted in a gray Burlington freight scheme. Our good motive-power fortune continued when Hornby announced the release of its N scale General Electric U25C locomotive, another 1960s-era diesel, in a Burlington paint scheme.

4. The layout is built on a common interior door and uses a 14" tall piece of 1/8" styrene as a sky backdrop. The fascia is 1/8" hardboard painted black.

▶▶ The layout at a glance

Name: Red Oak
Scale: N (1:160)
Size: 3'-0" x 6'-8"
Prototype: Chicago, Burlington & Quincy RR
Locale: Red Oak, Iowa
Era: early 1960s
Style: island, portable
Mainline run: 15 feet
Minimum radius: 13"

Minimum turnout:
Peco no. 6 medium
Maximum grade: none
Height: 47"
Track: Peco N scale code 55 turnouts and flextrack
Scenery: extruded-foam insulation board and Sculptamold
Control: Digitrax DCC





Track plan and design

We started with a concept similar to the Carolina Central, which was a *Model Railroader* project layout published starting in the December 1996 issue. That railroad featured staging on the back side of the layout, hidden by Appalachian foothills. Since we were modeling Iowa, the foothills were out and a sky blue backdrop was in.

While David was sketching track plans, I was thumbing through contributing editor Tony Koester's book *Realistic Model Railroad Operation*. On the bottom of page 16 was a track sketch titled "Truncated Interchange." It showed an interchange track piercing the backdrop of a shelf layout. I adopted Tony's idea for the branch

line on the Red Oak layout, which features a line that passes through the backdrop to its own staging tracks.

With a little persuasion and some carefully placed curved turnouts, David was able to incorporate the idea into his Red Oak drawing.

If you look closely at the Red Oak track plan, you'll note that the two branch line staging tracks are independent of the four mainline staging tracks. Though they're physically next to each other on the layout, operationally the two sets of track represent places dozens of miles apart.

On the modeled portion of the branch are spurs to two elevators, a small warehouse, and a small stockyard. A feed company is on a track off

the main line. If the stockyard looks familiar, you're right – it was featured in the Step by Step article on page 22 of the May 2014 issue. The stockyard was built on a piece of 1-inch foam insulation board. We simply cut a corresponding hole for the pen in the Red Oak's foam insulation board, shimmed the hole, and dropped the pen perfectly into place.

Now on ModelRailroader.com

Subscribers can now watch our Red Oak Route video journals online and download desktop wallpaper of the image at the top of page 55 at www.ModelRailroader.com.



Backdrop divider

In a way, we cheated when building the sky backdrop on this layout. It is a $\frac{1}{16}$ " piece of styrene without any support structure. The sky doesn't fall because it's wedged into a groove cut in the foam insulation board. The groove is cut at a slight curve at each end of the layout, which gives the self-standing styrene sheet additional support. The backdrop is only 14" tall, 2" of which are sunk into the foam board. If the styrene were any taller, the top edge would start to lean. But in N scale, the backdrop is tall enough to hide the staging tracks.

Structures and scenery

None of us live in Iowa, but some of you do, so we wanted to get the scenery

right. We started with a Google search of the Internet for photos of the Iowa countryside. To keep us on target, during much of the construction phase we kept more than a half-dozen print-outs of the Google photos draped over the backdrop. That way that we wouldn't lose sight (literally) of the scenery we were modeling.

It was obvious in photos that Iowa isn't as flat as everyone thinks it is. So we carved rolling land forms into the foam, using Sculptamold to fill in the rough edges.

The landforms are covered with ground foam, and the trees are a combination of JTT Wire Foliage Branches (twisted-wire trees) with added ground foam and Woodland Scenics Clump

5. The branch line ducks behind a set of Rix grain bins before it passes through the backdrop and into its own staging area. This train is led by a Proto N from Walthers GP20.

Foliage and Fine-Leaf Foliage. Associate editor Steven Otte built the highway using Woodland Scenics Smooth-It. Steven also scratchbuilt the wooden highway bridge from a photo. The bridge hides one of the openings in the backdrop where trains pass through. Trees and structures are used to disguise the other openings.

The crop field is made from two Noch scenery sheets. Noch is a German company whose scenery products are distributed by Walthers. Technically, the Noch field is an HO scale rapeseed field.



6. Freight trains, one led by a pair of Kato F2s, meet in front of a Walthers feed store kit. Along the backdrop are plastic grain bins and a laser-cut wood elevator, both on the branch line.



We liked the material and used it to represent a generic N scale crop.

Structures on the layout are a combination of laser-cut wood and plastic kits. Our goal was to build the models as designed to show how an effective layout can be built even without kitbashing. It took a bit of work to track down all of the structures we desired. A few had to be bought through the mail from out-of-state hobby shops, and a few are our second choices.

Vehicles on the layout are mostly from Classic Metal Works and Woodland Scenics. They help establish the layout depicts the early 1960s.

Control system

For this layout, we chose a Digitrax Super Empire Builder Xtra starter system. We also purchased a second Digitrax throttle, a second plug panel, and a 5-amp power supply that easily meets our layout's needs, since at most we'll have three locomotives running at the same time.

The layout has feeders soldered to each section of flextrack, and all joints are soldered. The layout is wired as one power district. The command station and power supply sit on a shelf built onto one of the sets of legs, and the plug panels were mounted one on each side of the layout. We installed Digital Command Control (DCC) decoders from TCS and Digitrax into all of the locomotives.

We will be using the Red Oak layout as a test layout for new N scale locomotives that the MR staff reviews, so to facilitate reviews of DC-only locomotives, the Digitrax command station/booster is connected to the layout's wiring with a plug and socket. I used a matching plug to make a second wiring harness for DC use. It takes less than a minute to convert the Red Oak into a single block DC layout.

Rolling stock

The locomotives on the layout pull rolling stock from many manufacturers, including Atlas, Fox Valley Models, and

7. The stockyard, an N Scale Architect kit, was built on a piece of foam insulation board and painted and weathered at the workbench before it was dropped into place.

Micro-Trains. The cabooses are from Atlas and Micro-Trains. Associate editor Eric White was given the task of weathering the cars, which he did with powdered pastels and Testor's Dullcote. Otherwise, we left the rolling stock as manufactured (apologies to our N scale columnist Jim Kelly for not converting the cars to body-mounted couplers!).

Looking ahead

We had fun building the Red Oak layout, and in the coming months we will share with you our construction techniques, starting with benchwork and track, and then scenery, structures, and rolling stock. While you're waiting for the February issue to arrive, go to www.ModelRailroader.com to watch the start of the video blog that we recorded as we were building the layout. 



Build the 3 x 7 **RED OAK LAYOUT**

Part 2: Benchwork,
terrain, and track

By Neil Besougloff

Photos by Bill Zuback/Jim Forbes



Model Railroader's newest project is the N scale Red Oak layout. In part 2 of our series, we explain how we built benchwork, started work on the terrain, and laid track.

Last month we introduced our staff-built N scale layout modeling the Chicago, Burlington, and Quincy RR. The layout, built on a hollow-core door, is loosely set in Red Oak, Iowa, in the early 1960s.

Why a door instead of a sheet of plywood? Because it's lightweight, it doesn't flex and therefore doesn't require a frame, and it can be brought home from a lumberyard easily in an SUV or a minivan.

We built legs under our layout, but you can build a door layout and place it on a folding table, a pair of bookcases, or even two sawhorses. When not in use, two people can easily lift a door layout off a table and lean it against a wall to save space.

By using 1 x 2 and 1 x 3 lumber for legs, the Red Oak layout benchwork as shown can be built with nothing more sophisticated than a handsaw and an electric drill.

▶ The Red Oak series

January: Meet *Model Railroader's* N scale Red Oak layout

February: Benchwork, track, and rough scenery

March: Scenery plus roads and bridges

April: Structures, details, and rolling stock

BENCHWORK CONSTRUCTION



Fig. 1 Simple and sturdy. The completed benchwork is made from a hollow-core door and dimensional lumber.



Fig. 2 Bracing for legs and shelf. This underside view shows the L-girder legs and diagonal braces.

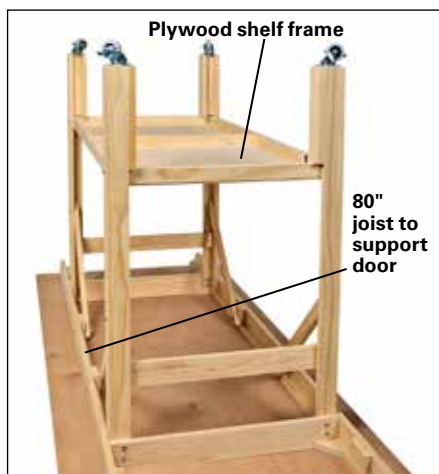


Fig. 3 End view of leg assembly. Another look at the underside shows that the door is glued and screwed into place.

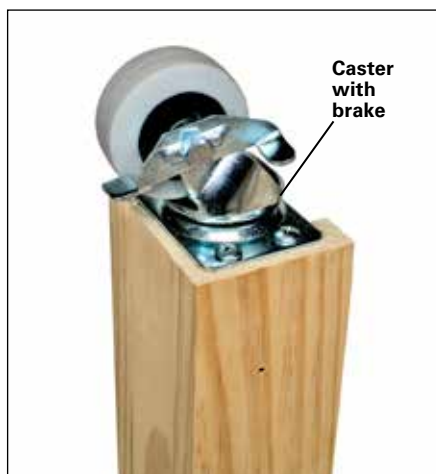


Fig. 4 Legs built up for casters. The legs are made from 1 x 2 and 1 x 3 lumber, but the ends are built up to accommodate casters.

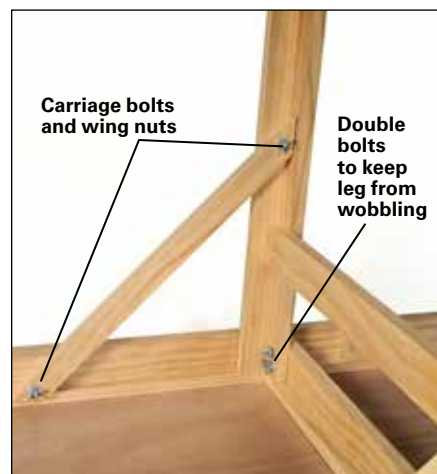


Fig. 5 Diagonal braces. Carriage bolts hold the legs and braces in place. They are doubled at the top of the leg to prevent wobbling.

Follow along to learn how we built the benchwork, roughed in the terrain using extruded-foam insulation board, and laid traditional cork roadbed and code 55 track.

Benchwork construction

The Red Oak layout is built on a hollow-core door, the type used in home

▶▶ Benchwork materials list

Lumber

- 1 x 3 – 8 feet (4)
- 1 x 3 – 6 feet (1)
- 1 x 2 – 8 feet (5)
- 1 x 2 – 6 feet (2)
- 2 x 4 plywood (shelf)
- 36" hollow core door

construction for bedrooms, bathrooms, closets, and other interior locations. We bought an unfinished lauan plywood door measuring 36" x 80" from a home center down the street from *Model Railroader's* offices.

David Popp, producer of *Model Railroader Video Plus* and our former managing editor, built our benchwork, shown in **figs. 1** and **2**.

The assembly uses 1 x 2 and 1 x 3 pine, some of it fastened into L girders, with a plywood shelf near the bottom of the legs, as shown in **fig. 3**. The pieces are glued and screwed together for strength. At the bottom of each leg we used additional pieces of 1 x 2 and 1 x 3 to build a base for the casters shown in **fig. 4**. As long-time readers of *Model Railroader* know, we like to put our layouts on wheels, but the choice is yours.

We used carriage bolts and wing nuts to attach the four legs and diagonal braces, just in case we needed to separate the layout from the leg assembly. The legs each use paired 2" carriage bolts to keep things from wobbling, as seen in **fig. 5**. The upper ends of the diagonal braces use 3" bolts to pass through an additional wood block that keeps the braces in alignment with the legs.

The door itself rests on two 80" long horizontal joists. We built these to reach the very ends of the 80" door, as shown in **fig. 3**. That way we could sink screws from below into the perimeter frame of the door for a better bite. Otherwise, we would be fastening screws into the thin veneer of the door with nothing but air behind the veneer.

On our layout, we ran a bead of wood glue between the top of the 80" girders

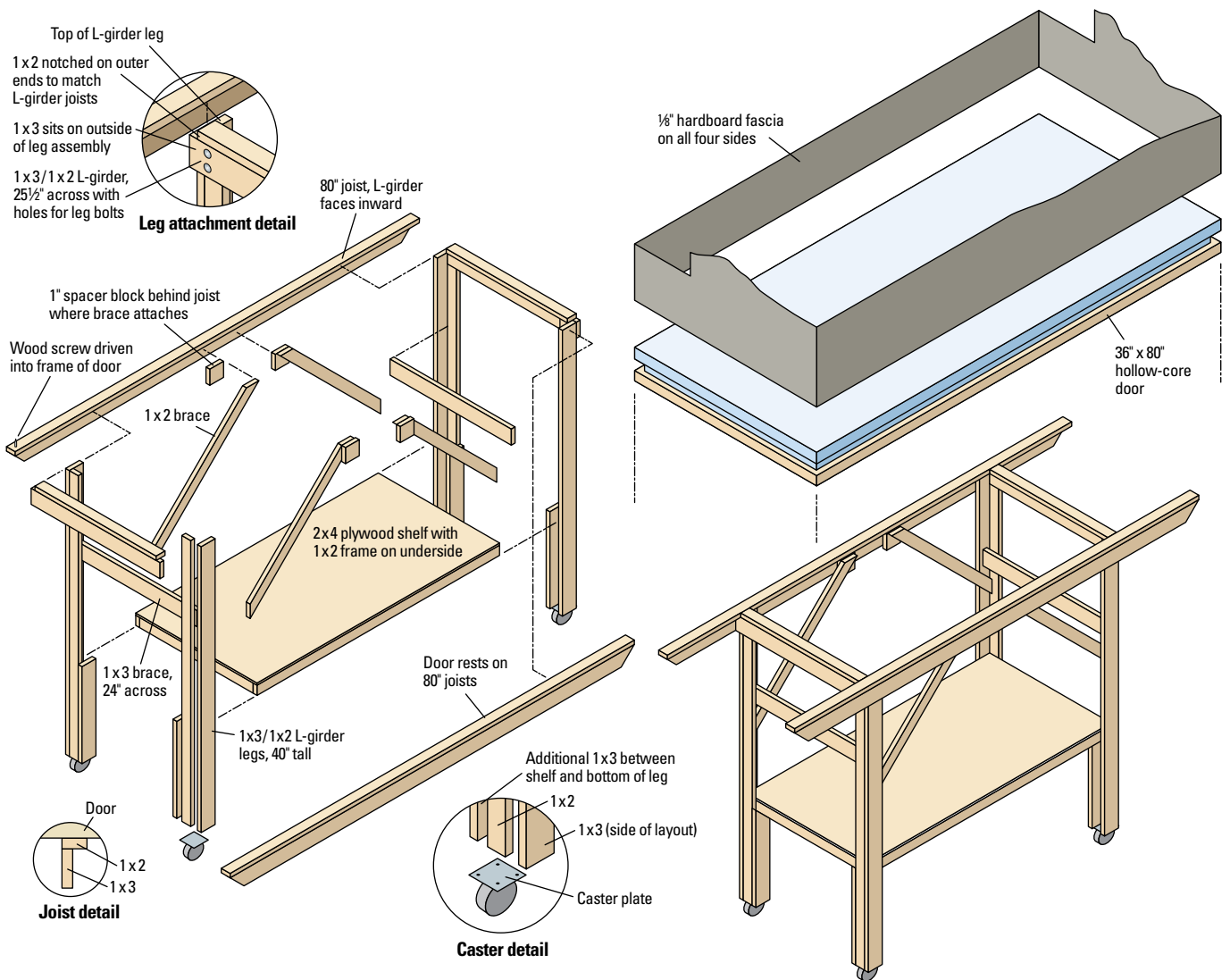


Fig. 6 Benchwork diagram. Here's how the different pieces of wood went together into the benchwork for our layout.

and the underside of the door as well as using the four screws.

Details and dimensions of the benchwork are shown in **fig. 6**, and the lumber and fasteners we used are listed in the bill of materials on pages 60 and 62.

Foam board surface

The surface of the layout is two sheets of 1-inch extruded-foam insulation board. Our foam was pink, but the blue stuff works just as well.

Why two pieces of foam board? First, it allows us to carve terrain that drops below track level and lets us cut a deep slot for the otherwise free-standing styrene backdrop. Second, by making the bottom piece an inch smaller than the dimensions of the door on all four sides, we created a trough for track wiring. See **figs. 7** and **8** on the next page. Once

the layout is complete, the trough is hidden by the layout's fascia. If access to the wiring is needed at later time, it's easy to unscrew a section of the fascia board.

Why the trough? Normally, we just would have drilled down through the layout surface to bus lines running underneath the layout. But it can be tricky to fish feeder wires through the open space in the middle of a hollow core door and out the bottom side. Also, should someone build this as a tabletop layout – without the leg assembly – sliding a layout with dangling wires along a tabletop isn't a great idea.

We cut one sheet of foam, the bottom one, 34" x 78" to allow for the previously mentioned wiring trough. We glued this to the surface of the door with foam-safe Liquid Nails for Projects (the solvent-based kind will dissolve the foam),

leaving a 1-inch gap all the way around the door.

We cut the second sheet of foam, our top sheet, the full size of the door – 36" x 80" – and temporarily placed it on top of the layout. We used a yardstick and some turnouts to determine where to draw the track centerlines, as show in **figs. 9** and **10** on page 62.

Then we marked out the sunken areas of the landscape, such as the crop field and adjacent farm in the front left, plus the highway that runs across the layout. We used a foam-cutting knife (which has a blade longer than a utility knife) to cut out these features. The result is shown in **fig. 11**.

Down the middle is a backdrop made of .060" styrene, 14" tall. It fits through a cut in both layers of the foam board, and that, plus a slight bow at each end, helps

EXTRUDED-FOAM INSULATION BOARD SURFACE



Fig. 7 Two sheets of foam. David Popp used two sheets of foam board for the surface of the layout, with the lower piece cut smaller to create a wiring trough.

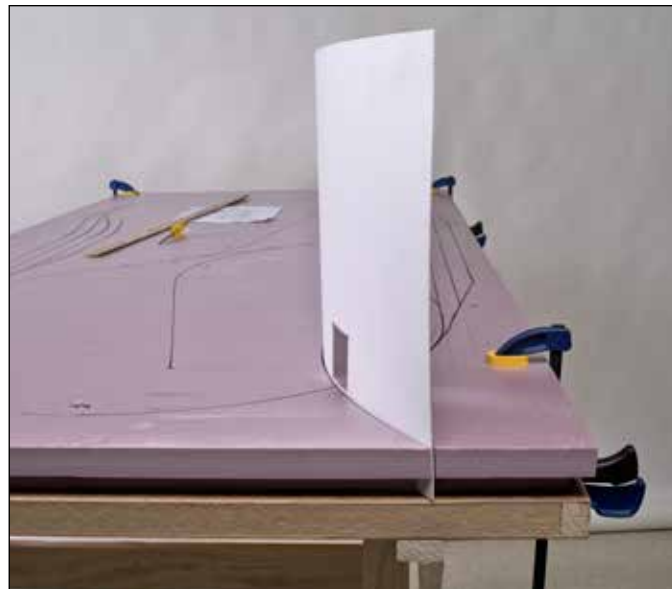


Fig. 8 Styrene backdrop. The gap between the top foam sheet and the door is for bus wires; the backdrop cuts through both sheets.

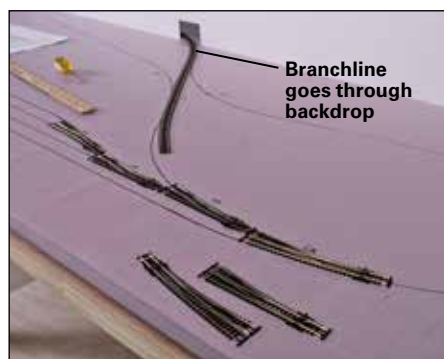


Fig. 9 Track centerlines. We used a straightedge, marker, and some track pieces to help transfer the track plan to the foam sheet.

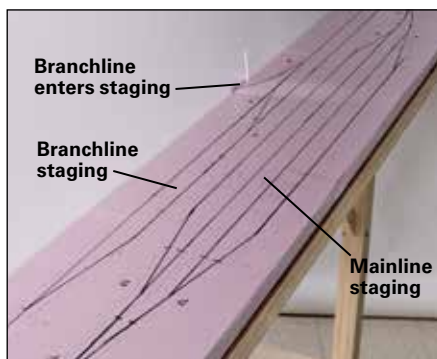


Fig. 10 Staging tracks. The space between tracks in the staging area on the back of the layout is tight, so we took extra care marking centerlines.

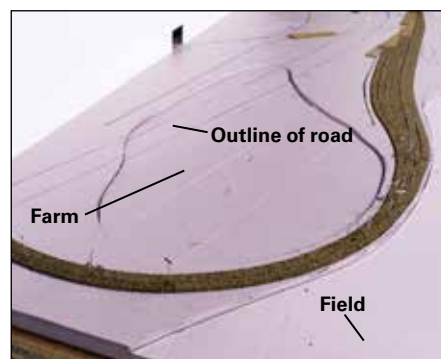


Fig. 11 Below grade scenery. We marked off and cut out areas of scenery that would be below track level, such as the farm and field.

▶▶ Besides foam, you'll need ...

Miscellaneous

- 1-inch extruded-foam insulation board (2 sheets)
- No. 10 x 1½" screws (16)
- No. 6 x ¾" screws (1 box)
- ¼" carriage bolt 2-inches (16)
- ¼" carriage bolt 3-inches (4)
- ¼" wingnuts (20)
- ¼" washers (20)
- casters (4)
- Liquid Nails for Projects (1 tube)
- gray latex adhesive caulk (1 tube)
- wood glue
- foam-cutting knife
- .060" sheet styrene 14" x 81½" inches (for backdrop)

it stand upright without any other support. The layout is 80" long, but the styrene sheet actually is 81½" long to accommodate the bow. We used the track centerlines to carefully cut out openings in the styrene with a utility knife where the tracks passed through the backdrop. **Fig. 8** gives a good view of the styrene backdrop in position.

If you prefer, ¾" tempered hardboard, sometimes sold under the brand name Masonite, would work just as well for the backdrop. It would be a little tougher to cut the three openings for the track, though.

We also began cutting and stacking pieces of scrap foam for elevated areas, such as along the backdrop where the track passes through. In trickier areas, we used a piece of newspaper as a

template, as shown in **fig. 12**. Once we were happy with the template, we transferred the shape to the foam.

For our layout, we made sure to cut a rectangular hole for the cattle yard (see **fig. 13**) that was built a few months earlier as part of a diorama on a 1" thick piece of extruded-foam insulation board (see Step by Step, page 22, May 2014). Associate editor Steven Otte built the cattle pen with its use on this layout in mind, so once we trimmed the edges off the diorama, the pen dropped right into our new hole, shown in **fig. 13**.

As we cut and shaped pieces of foam board, we glued them in place using Liquid Nails for Projects, which comes in a tube that fits into a caulk gun.

After letting the adhesive dry overnight, we glued the styrene backdrop



Fig. 12 Paper templates first. To get a good fit in elevated scenery areas, we made paper templates and then transferred them to foam pieces.

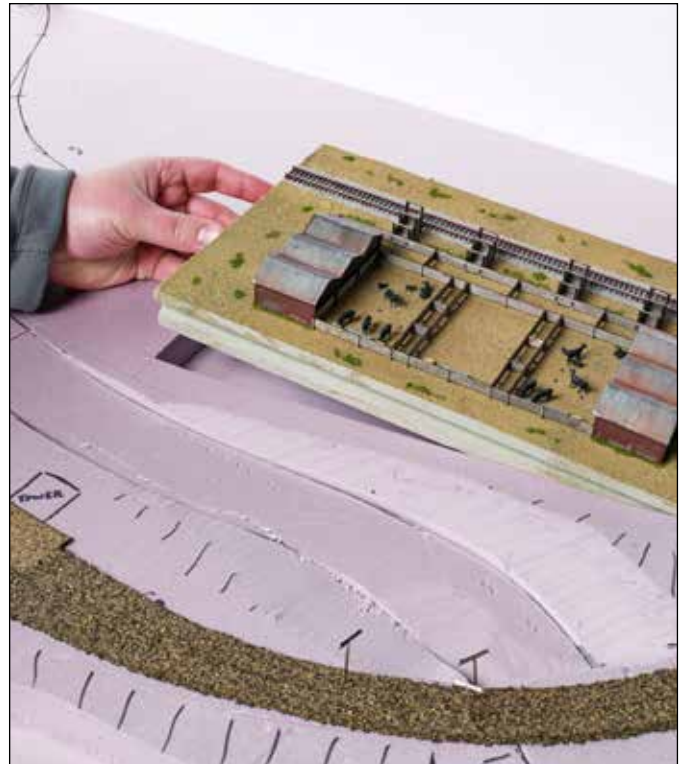


Fig. 13 Space for cattle pen. Our previously built cattle pen fit right into the hole we cut for it in the scenery. We glued it in place using Liquid Nails for Projects.

into its slot. We also added foam blocks to raise the landscape as it neared the backdrop, especially where the track passed through. This allowed us to better conceal the unrealistic openings once we started final scenery.

About this time we also started applying a base coat of Sculptamold, a papier-mache-like product, to fill in some of the seams in the foam.

Track and wiring

Our next step was to lay cork roadbed for the Peco flextrack and turnouts. We used Midwest Products N scale cork, separating the two halves (especially important on the layout's 13-inch radius curves) and laying the pieces down side by side, attached with carpenter's glue and pinned in place with T-pins overnight until the glue set, as shown in **figs. 14, 15, and 16.**

Under turnouts we used pre-cut sections of cork from Itty Bitty Lines, except for the five curved turnouts, which required a custom fit of strips of cork roadbed. See **fig. 17.** We used sheet cork cut to fit for the staging yard area.

The layout uses Peco code 55 N scale flextrack and Peco Electrofrog turnouts. There are two sizes of turnouts: Peco



Fig. 14 Splitting the roadbed. Using split roadbed allows the strips to conform to curves without buckling.



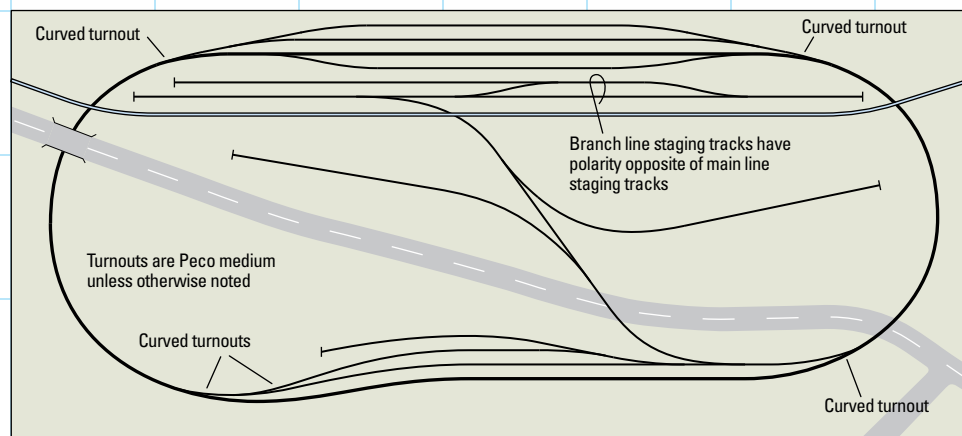
Fig. 15 Tacking down the roadbed. Although wood glue and foam seem like a mismatch, it works well.



Fig. 16 Holding cork in place. We used metal T-pins to keep the roadbed curves from moving as the glue dried.



Fig. 17 Cork strips and pads. We used pre-cut cork pads under turnouts, but in other places we cut and fit cork.



Red Oak

N scale (1:160)
 Layout size: 36" x 6'-8"
 Scale of plan: 3/4" = 1'-0", 12" grid
 Numbered arrows indicate photo locations
 Illustration by Rick Johnson
 Find more plans online in the
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Fig. 18 Curved turnout locations. This simplified version of the Red Oak track plan shows the locations for the Peco curved turnouts.

“medium” and Peco curved turnouts. Their positions are marked in **fig. 18**. On a small layout, the curved turnouts make a big difference. The staging tracks on the back side of the layout would have been roughly 8 inches shorter had we not used curved turnouts, and the passing siding on the front of the layout would have been noticeably shorter, too.

We used rail nippers and a flat mill file to cut and clean the flextrack rail ends as needed.

All metal rail joiners are soldered in place, and we used Peco plastic rail joiners to insulate the turnouts. We’ve

Track components

Peco (code 55 N scale)

- SL 300F Flex track (20 pieces)
- SL-E395F Electrofrog no. 6 medium radius right-hand turnout (5)
- SL-E396F Electrofrog no. 6 medium radius left-hand turnout (6)
- SL-E386F Electrofrog no. 8 curved right-hand turnout (2)
- SL-E387F Electrofrog no. 8 curved left-hand turnout (3)
- SL-311 insulated joiners
- SL-310 metal joiners

Midwest Industries

- 3019 N scale cork roadbed (1 box)
- 3020 N scale cork sheet roadbed (1 box)

Itty Bitty Lines

- 1340 right-hand turnout cork roadbed (5)
- 1341 left-hand turnout cork roadbed (6)

learned over years of project layout construction that it can be risky to build a model railroad without soldering the rail joiners, which always seem to loosen up with time, becoming poor conductors of electricity.

David Popp did most of the wiring on the layout. The layout is controlled by Digital Command Control (DCC). David soldered 22 gauge feeders to the track and before and after each turnout.

The feeders are soldered directly to the outer web of the rails, or in some cases where sections of track were put together on the workbench, to the underside of the rails. See **fig. 19**. We were careful to stay away from the plastic ties, and we removed a tie or two as needed to make room for the feeders. Later, before painting and ballasting, we came back and slid scrap ties, which we had sanded slightly thinner, into the voids.

To keep the underside of the layout smooth, we didn’t drill holes to run our wiring underneath. Instead, David used a hobby knife to cut narrow trenches in the foam from the rails to the edges of the layout, where the bus wires ran. Working carefully, David pushed the feeder wires into the trenches, which were easily concealed by ground cover. The feeders were attached to the 18 AWG bus lines with insulation displacement connectors, also called suitcase connectors because of their appearance, as shown in **fig. 20**.

The staging yard isn’t intended to be scenicked, so there was no need to hide its wiring. David partially built the staging tracks at a workbench, where it was more comfortable to solder the rail sections together. Taking advantage of the proximity of the yard tracks, David soldered a series of jumper wires across

sections of staging track instead of dropping feeders from each to the wiring bus. See **figs. 21** and **22**.

It’s important to note that the two staging tracks for the branch line, though right next to the back of the loop, actually branch off from the front. So the rails’ polarity is reversed compared to the adjacent mainline staging yard. You can’t continue a jumper wire pattern across the mainline staging tracks and into the branchline staging tracks without accounting for the change of polarity or you will create a short.

For a time the staging area, shown in **fig. 22**, was quite colorful: brown ties and pink foam with red and white feeders. We toned things down with brown and green paint, as you may recall in the photos of staging in January’s issue.

As the track was wired, we used adhesive caulk to attach it to the cork roadbed. We did this in stages, paying particular attention to alignment and using a sanding block on the roadbed to minimize any rises or dips, especially at track joints. To keep the flextrack in place as the caulk cured, we again used T-pins.

Where the road passes under a girder bridge, we intentionally left a “plug” of pink foam that would be removed later once we laid the roadbed and track, as shown in **fig. 23**. Keeping the plug in place at this stage made it easier to lay track without any unwanted bumps.

Now on ModelRailroader.com

We recorded a video blog of our progress building the Red Oak project layout. Magazine subscribers can watch the videos on our website, www.ModelRailroader.com.

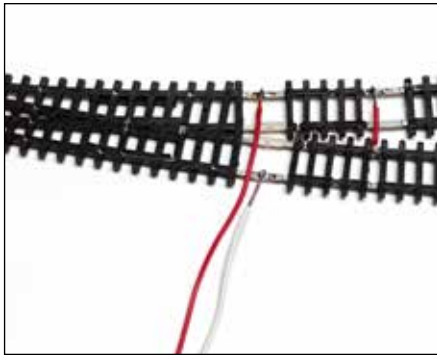


Fig. 19 Feeders at the workbench. We soldered some of the rail joiners and feeders at a workbench and then moved the assembly to the layout.



Fig. 20 Bus lines and suitcases. The feeders connect to the bus lines in the trough between the foam layers along the outside of the layout.

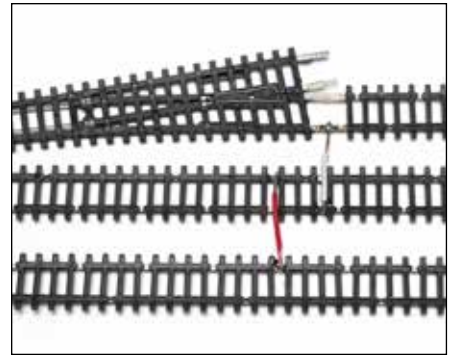


Fig. 21 Jumpers in staging yard. Since the staging yard is not scenicked, it was easier to use jumper wires than traditional feeder wires.



Fig. 22 Colorful trackwork. Jumpers connect the staging tracks; they were later painted to match the track and surrounding terrain.

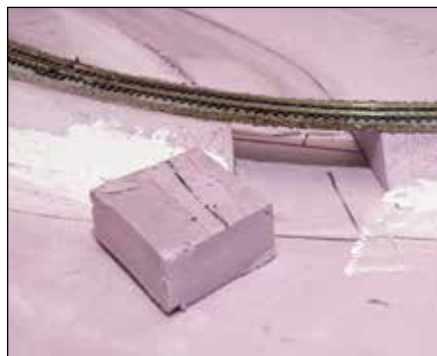


Fig. 23 Temporary plug. We used a temporary plug to smooth tracklaying where it will pass over a highway. Compare to the "after" photo below.



Fig. 24 Painting the track. Once laid, the track was airbrushed rail brown; turnouts were colored by hand with a paint marker.

Lastly, we drilled one set of holes through the door itself near the right-side set of legs to get the bus lines beneath the layout to a DCC command base, which we planned to install on a small shelf at the top of one set of legs. Your power supply location may vary depending on the type of equipment you are using.

Throughout the track-laying process we used a DC locomotive and a DC power pack to test our work. Attaching the power pack to the track or the feeders temporarily with a pair of alligator clips, we wanted to be sure that each section of track was properly powered before we kept going. Last winter, when we were building the HO scale Rice Harbor layout, we got lazy and presumed our wiring was perfect. When we finally ran a test locomotive, our bubble burst, and we had to backtrack to find the short.

We had one more task to complete for this stage of the layout. Cody Grivno used an airbrush and rail brown-colored acrylic hobby paint to finish the ties and rails. See **fig. 24**. He was careful to



The Silver Streak Zephyr crosses the girder bridge. Next month's article will cover the construction of that bridge, the highway, and other scenic features.

mask the switch points, since we didn't want any paint to gum up the mechanism or block the flow of electricity. Afterward, I came through with a paint pen to carefully cover the unpainted rails and tie tops on the turnouts.

At this point, except for a temporary power supply and cotton candy-pink scenery, we had a functioning layout. Next month, we'll build the highway and bridges, install a DCC system, and start covering that pink scenery. **MR**

Red Oak Route



Though the track on our N scale Red Oak project railroad is flat, the terrain surrounding it isn't. Layers of extruded-foam insulation board were stacked and carved to make low hills and gentle slopes, lending the layout visual interest and realism.

Build the 3 x 7 RED OAK LAYOUT

▶▶ The Red Oak series

January: Meet *Model Railroader's* N scale Red Oak layout

February: Benchwork, track, and rough scenery

March: Scenery plus roads and bridges

April: Structures, details, and rolling stock

Part 3: Terrain and scenery

By **Steven Otte** • Photos by Bill Zuback and Jim Forbes

Our Red Oak project railroad is set in the heart of Iowa farm country, which doesn't provide the same opportunity for dramatic vertical scenery as do the Appalachians or the Rockies. But central Iowa isn't as table-flat and treeless as you might think. Our online research found photos of low, rolling hills and plenty of dense forests. So even though the track on our project layout was flat, we decided

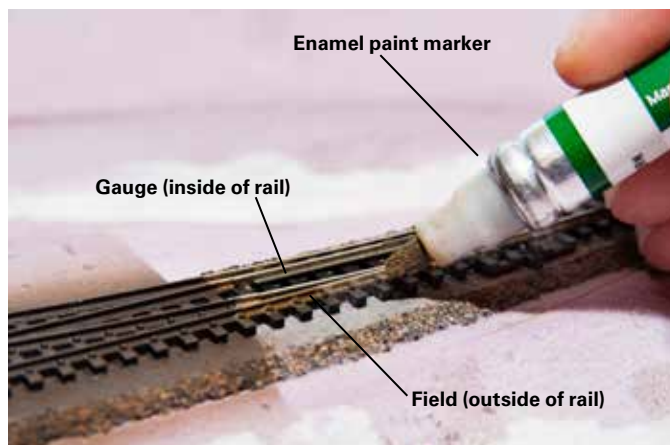
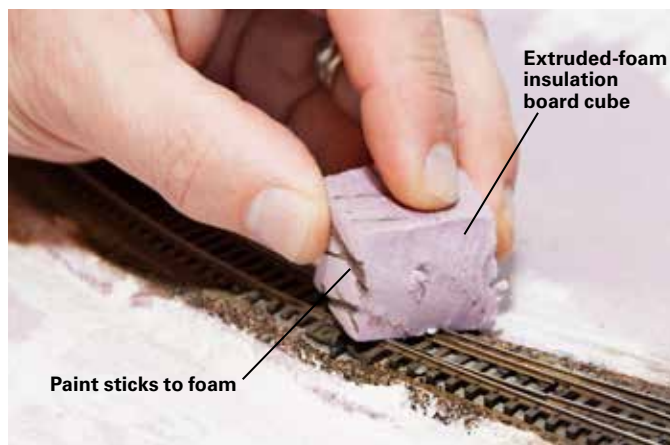
to depict elevation changes in the surrounding terrain by building up and carving away layers of extruded-foam insulation board.

Another scenic feature that adds vertical interest to a basically flat tabletop layout is High Street, which extends from one side of the layout to the other. This road passes under a through girder rail bridge on the right side of the layout, crosses the branch line at grade, and

passes over the railroad on a wood bridge on the left. You'll see how I built those two bridges starting on page 63 and how I paved High Street on page 65.

Before we could work on the scenery, though, we had to finish the track. In February's article we showed you how we laid and wired the track. We begin this month by weathering it with an airbrush and paint markers. Read on to see how we did it.

WEATHERING TRACK



With all of the track in place, Model Railroader associate editor Cody Grivno used an airbrush and Model Master Railroad Tie Brown (no. 4885) to paint the rails and ties.

However, before he could start the painting process, he needed to do a little prep work. First, Cody used a toothbrush and denatured alcohol to clean flux and other soldering residue from the areas where feeder wires were attached to the rails. Do a thorough job of cleaning, or the paint won't adhere well.

Second, Cody masked all of the turnouts with blue painter's tape. Even though the turnouts are Peco Electrofrog, he still masked the points and heels so paint wouldn't gum up the moving parts or cover any electrical contacts.

With the prep work complete, Cody airbrushed the track. Though no thinning is required for most Model Master acrylic paints, he slightly thinned the Railroad Tie Brown with 70 percent isopropyl alcohol (approximately 9 parts paint to 1 part alcohol). The layout was too big to fit in our spray booth, but he

had the exhaust fan running and wore a respirator and latex gloves for safety.

Shortly after Cody finished painting, editor Neil Besougloff came in with a scrap of extruded-foam insulation board to clean the still tacky paint from the rails. He used an abrasive track-cleaning block to remove any stubborn paint.

Finally, Neil touched up the turnouts using a Floquil Railroad Tie Brown enamel paint marker. [Testor's enamel paint markers are now part of the CreateFX line. Rail Tie Brown (new name) is in set no. 73801. – Ed.] He used a Microbrush with Model Master acrylic paint to cover hard-to-reach areas.

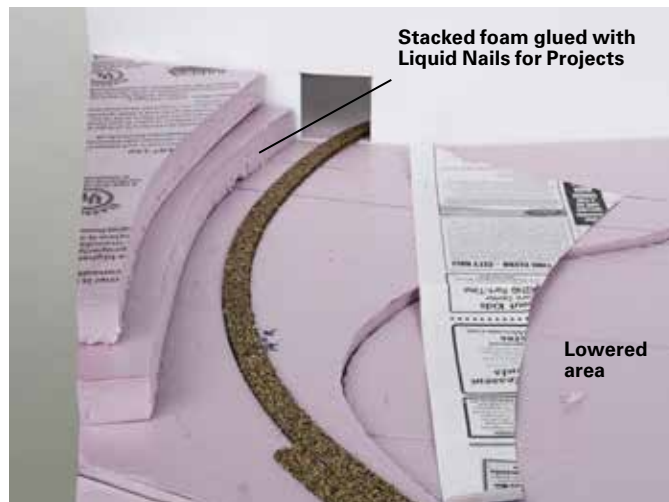
LAYERING FOAM SCENERY



Though the layout is essentially flat – there are no changes in track elevation – there are parts of the terrain that fall both above and below track level, giving the impression of Iowa’s rolling countryside. We accomplished this by both stacking and cutting away the layers of extruded-foam insulation board that formed our scenery base.

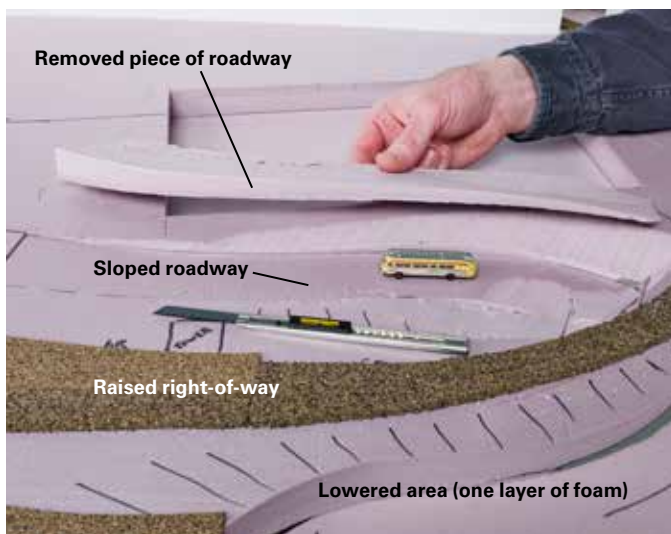
Model Railroader Video Plus producer David Popp used newspaper to trace the shapes needed to build up foam hills around the layout. After cutting them out with scissors, he transferred the patterns to pieces of foam board. He glued these in place with Liquid Nails for Projects adhesive.

The lowered front-right corner of the layout, where the track passes over High Street on a ballasted-deck girder bridge (see



the next page), was simple to create. We used only one layer of foam here, easily lowering the area 1" below track grade. Using utility knives and serrated kitchen knives, we sloped the surrounding terrain down to that level. There was no wiring in this area, so we didn't have to leave a channel in the foam here.

More subtle is the farm area, which is only slightly below grade. David lowered these areas by cutting out the top layer of foam, cutting it into strips, and thinning them about 1/2" with a serrated knife before gluing them back in place. While this technique would be perfect for creating complex slopes over large areas, David says in retrospect that a large, flat area like the ones on Red Oak would be easier to model by cutting a replacement piece out of 1/2" foam.



High Street, which slopes down from left to right across the layout, was made similarly. David used a utility knife to cut out a 2-foot-long section of the top layer of foam along the road’s gently curving path. He then cut away the bottom of the roadway section at an angle, creating a ramp, and glued it back in place. The surrounding foam was cut away at an angle to form sloping banks. We used coarse-grit foam rubber sanding blocks to smooth the slopes alongside the road and eliminate sharp edges.

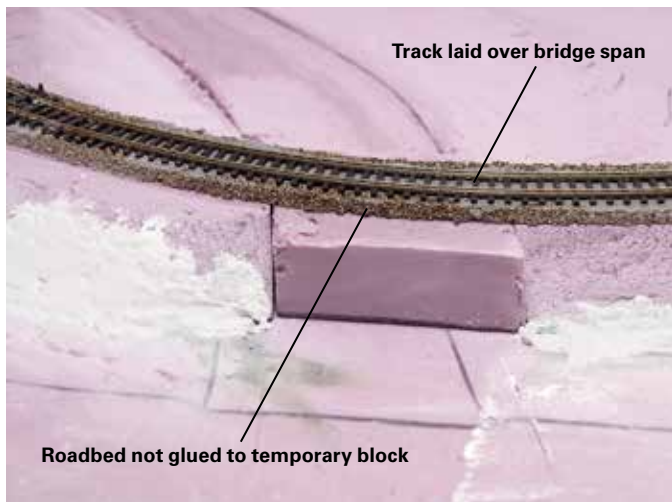
More hills were added toward the back of the layout, both to provide more support for the styrene backdrop and to disguise the openings where the track passes through it. There aren't a



lot of rail tunnels in Iowa, so having our terrain rise toward the backdrop gave us the ability to disguise those openings between hills and under bridges. [We'll cover how we disguised those backdrop openings in part 4 of this series, coming in our April issue. –Ed.]

Next, we mixed up a batch of Sculptamold. This is a light-weight material somewhere between plaster and papier-mache. It trowels on easily, dries to a bumpy texture, and can be carved, sanded, stained, and painted. We used it to fill in the gaps between foam pieces and introduce more natural variations and contours.

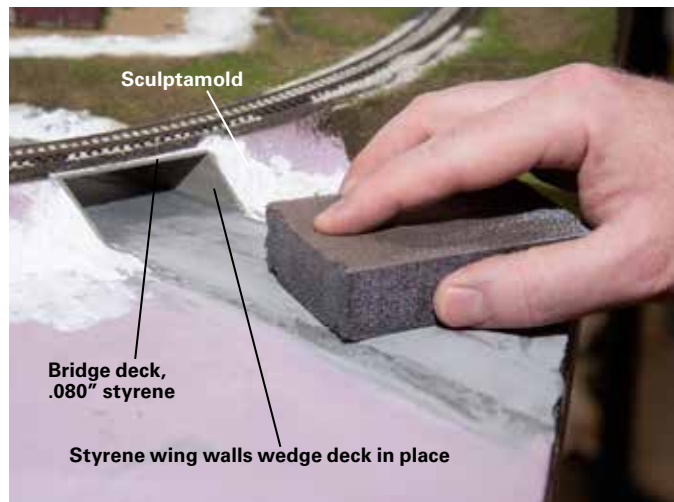
THE GIRDER BRIDGE



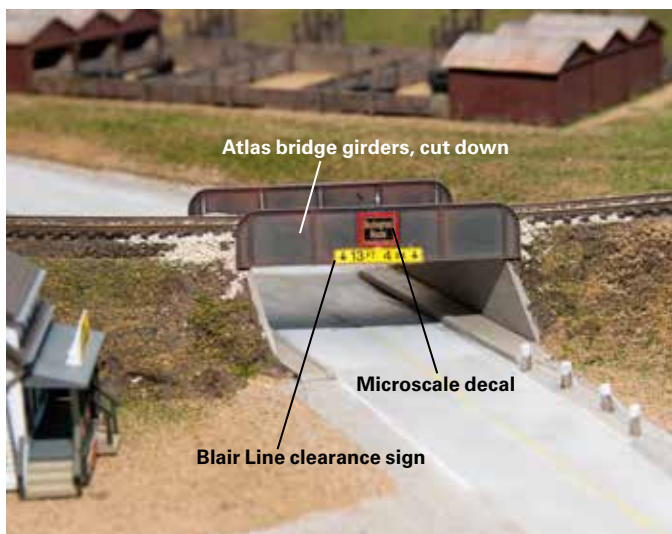
The through girder bridge on the right side of the layout carries the Burlington Route main line over High Street, which runs the length of the layout. It's typical of many small over-passes seen in rural areas even today.

After the general shape of the surrounding terrain was carved into the layers of extruded-foam insulation board, the roadbed and track were laid, including the segment that would become this bridge. A block of foam was used to support the track over the roadway, but the cork wasn't glued to this temporary support. After the adhesive cured, the foam block was removed to make room for the roadway.

I used .080" styrene sheet to make a deck under the roadbed, cutting and test-fitting it until I was satisfied. Next I cut

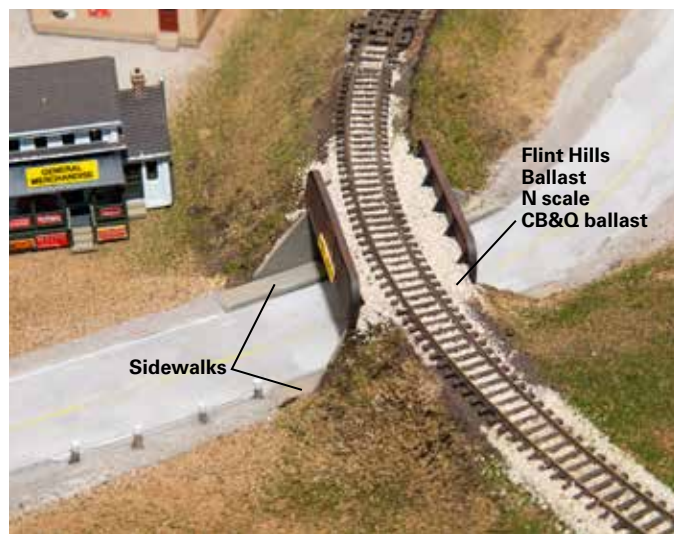


wing walls out of the same styrene, trimming them until they both matched the profile of the terrain on either side and held the deck wedged securely against the bottom of the cork roadbed. I then removed the pieces and painted them Concrete before replacing them and brushing Plastruc Plastic Weld liquid cement onto the joints. The gaps between the wing walls and the terrain were filled with Sculptamold.



I paved, sanded, and striped the road before returning to the bridge girders, which I got from an Atlas N scale bridge kit. Using a razor saw and a miter box, I cut four segments out of the middle of each girder, reducing them to four panels wide. After gluing the shortened girders together, I airbrushed them Tarnished Black. Panels of .020" styrene, bearing Burlington Route heralds from a Microscale diesel decal set, helped conceal and strengthen the splices. A set of Blair Line clearance warning signs finished the girders, which I then glued to both sides of the styrene deck.

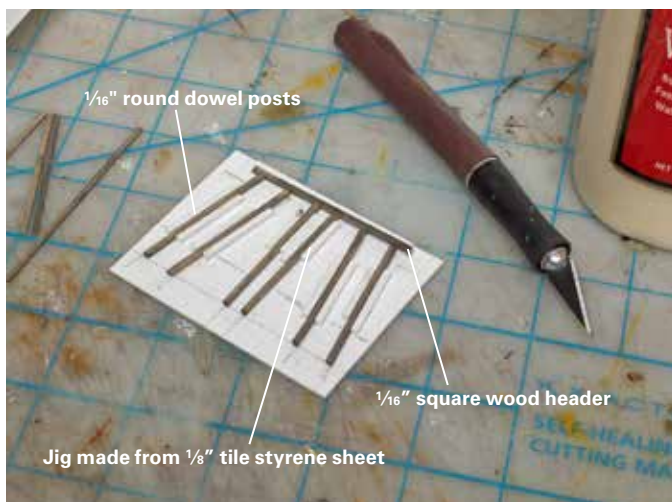
To provide safety for N scale pedestrians (and to conceal any gaps between the roadway and the bottom of the wing



walls), I added sidewalks on both sides of the underpass. I used .040" x .125" Evergreen styrene strip, which I scribed with expansion joints and equipped with curbs of .060" square strip. These were painted Concrete and glued to the roadway with Walther's Goo.

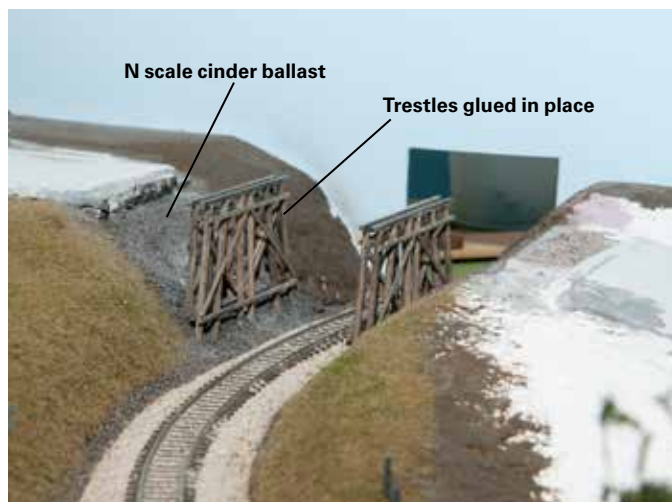
I also protected the approach with an old-fashioned type of guard wire, made of wood posts connected with steel cable. I drilled holes in 1/16" posts and threaded Fireline fishing line "wire" before gluing the posts into holes in the road shoulder, but did not glue the wire in place yet. After the posts' glue set, I pulled the wire taut and used cyanoacrylate adhesive (CA) to hold it that way, later trimming it with a hobby knife.

THE ROAD TRESTLE



A prototype photo of a steel-framed, wood-decked road bridge over a train track inspired my design for the scratch-built trestle on the left side of the layout. Kalmbach Books' *Model Railroad Bridges & Trestles* had diagrams that looked like the bents in the photo, so I adapted a design for my bridge.

Since I would need four identical bents, I made a plastic jig on a sheet of Evergreen styrene scribed in $\frac{1}{8}$ " squares. After transferring the design onto the grid, I glued on pieces of .080" square styrene strip to guide placement of the wood pieces.



Next, I cut and stained $\frac{1}{16}$ " square stripwood and $\frac{1}{16}$ " dowels, then glued them together on the jig to make four identical bents. I added cross bracing of stained .020" x .040" stripwood and glued the trestles back-to-back in pairs.

I used a hobby knife to cut slots into the foam terrain for the trestle piles, and glued them in place with white glue. When that glue had dried, there were still gaps around the piles. I covered them and the surrounding terrain with N scale cinder ballast and glued it down with Scenic Cement.



Gluing the trestles in place on the layout showed me that my bridge would be skewed. I cut two Evergreen styrene $\frac{3}{16}$ " I-beams long enough to span the bents and glued a .080" x .125" crossbearer at a 90-degree angle at the end of each one, forming two L shapes. Positioning them on the bents, I marked where the crossbearers would need to be glued to the opposite beams to form the skewed deck. I glued them together and added a diagonal brace.

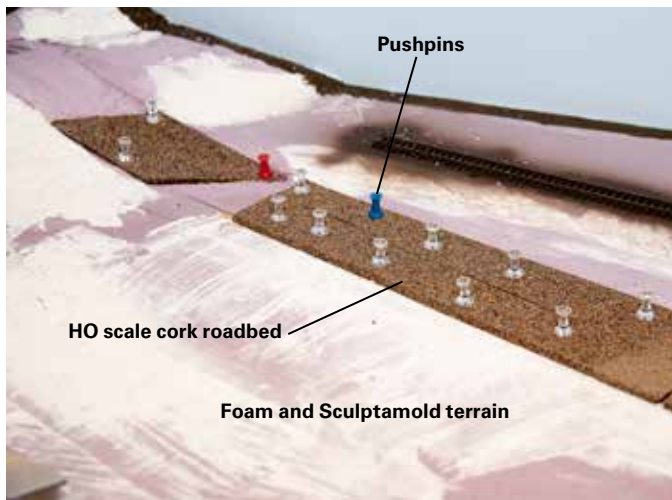
Next, I added the beams that angled down from the main deck to the roadways on either side. I strengthened the joints with splice plates on the back where they wouldn't be seen and added another set of crossbearers. Splice plates made of .010" styrene sheet embossed with rivets pushed in from the back

with a tack hid the joints on the outside of the beams. I painted the outer beam black.

I laid the beam assembly on a sheet of Midwest Products $\frac{1}{16}$ " scribed wood sheet and traced the angle before cutting it out. I stained the wood deck and glued it to the styrene framework with cyanoacrylate adhesive (CA). Next, I added $\frac{1}{16}$ " x $\frac{1}{8}$ " wood end rails, $\frac{1}{16}$ " square vertical posts, $\frac{1}{16}$ " styrene C-channel guardrails (painted silver), and $\frac{1}{16}$ " x $\frac{1}{32}$ " top railings.

I test-fit the completed bridge atop the bents. Though I'd put a wood filler piece in place to stand in for the bridge while paving the roadway, I found the bridge wasn't a perfect fit. Shaving some of the plaster away with a utility knife fixed that. I glued the bridge on top of the pilings with Walther's Goo.

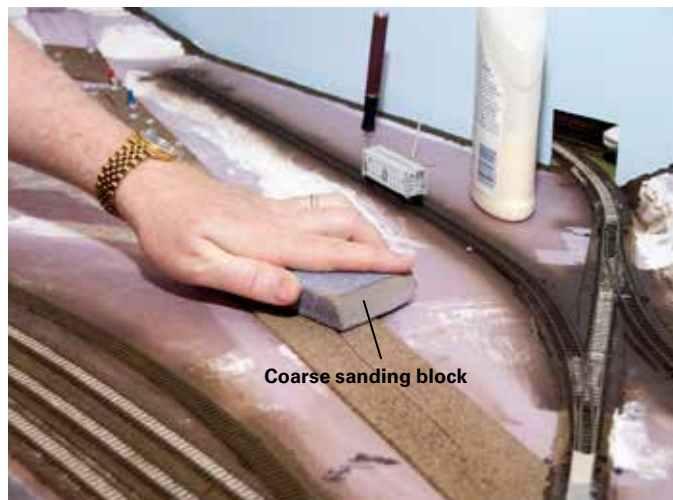
PAVING THE ROAD



To pave High Street, I used Smooth-It, a lightweight plaster-like product from Woodland Scenics. I like using it because it's easy to mix, spread, and sand, and tints well with liquid pigments. But first, I needed to shape a foundation for the road.

The first step was to smooth the terrain under the road. I used a coarse foam sanding block to remove sharp edges where the terrain transitioned from one thickness of extruded-foam insulation board to another. Doing so added some interesting and realistic variations to the road's height.

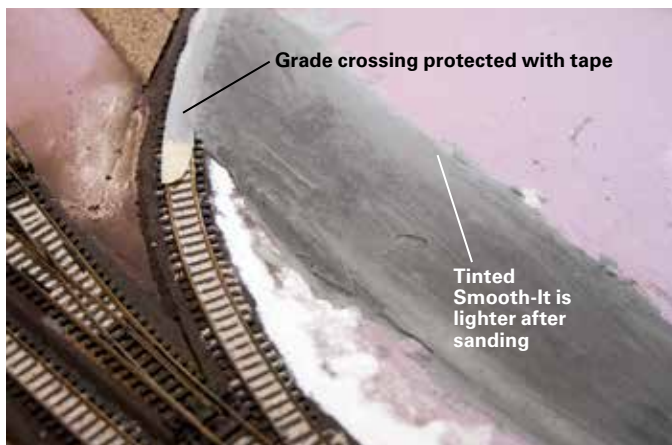
Next, I laid a foundation of HO scale cork roadbed. This elevated the road's surface, providing for drainage on either side. I used wood glue to affix it to the surface, tacking it down with pushpins while it dried. In some areas, I had to use two layers to even out a dip or raise the elevation on the bridge approach. Once the glue was dry, I pulled the pushpins and



sanded the surface to smooth the texture and remove rough edges on the shoulder. It was now ready for the Smooth-It.

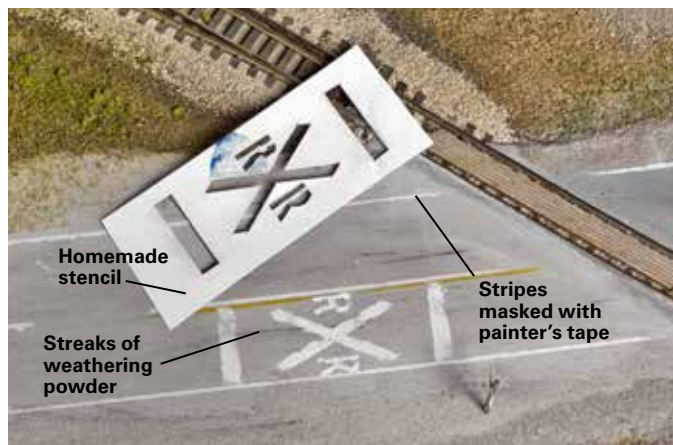
I mixed the Smooth-It a bit thicker than the box called for so it wouldn't slough down the slope of the hill before drying. I mixed it with a shot of black Woodland Scenics Earth Colors, a concentrated liquid pigment. This tinted the material gray so that I could sand and shape it after drying without exposing white plaster. I eyeballed the proportion, keeping in mind it would dry much lighter than it looked wet. I wasn't worried about matching colors between batches. If two parts of the road didn't match, it would look like it had been repaved.

Earlier, I'd glued a Blair Line wood grade crossing between the rails where the road would cross the branch line. I protected it, and the rails, with a piece of masking tape before troweling the tinted Smooth-It up to the level of the railhead.



After the Smooth-It dried overnight, I used medium- and fine-grit sanding blocks to smooth the surface. In some areas where the Smooth-It layer was thin, this exposed the cork roadbed. I covered them by brush-painting these areas with several shades of gray paint. Since there was no way to exactly match the shade of the tinted Smooth-It, I gave my painted areas square edges to represent pavement patches.

Next, I consulted a copy of the 1961 *Manual of Uniform Traffic Control Devices* to see how roads would have been striped in 1961. This United States Government publication is used by highway departments nationwide to govern the signaling and marking of roads, streets, and highways. The current version is available online at <http://mutcd.fhwa.dot.gov>; older

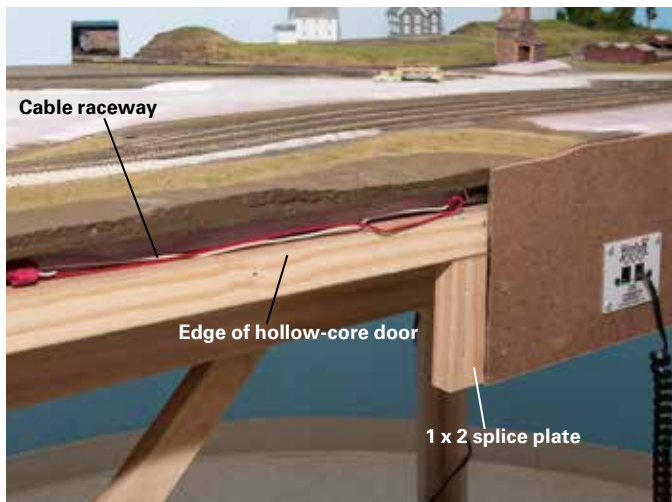


versions, like the 1961 manual I referred to, are archived on various websites and can be found with a quick Google search.

I used thin strips of blue painter's tape to mask off center and shoulder stripes along the road's width and filled them in a paint marker. For the railroad crossings, I created the graphic on my computer, printed it out to scale, reinforced the paper with painter's tape, and cut it out with a hobby knife to make a stencil. I then used a brush to paint the road markings white.

The next step was to brush full-strength white glue along the edges of the pavement and sprinkle on medium gray N scale ballast to simulate gravel shoulders. Finally, I weathered the road with medium gray and black weathering powders from AIM Products.

FASCIA AND DCC PANELS



The fascia on the Red Oak layout serves two purposes: It hides the wiring that runs through the foam trough at the edge of the scenery, and it finishes the edges of the model railroad. For this project, Model Railroader Video Plus producer David Popp used 3/16" tempered hardboard.

If you're building the layout to be supported on a table, you'll want the fascia to end flush with the bottom of the door – anything extending beyond that could be damaged when moving the layout. David used this method on his own N scale railroad, and reports it's worked quite well.

We built our Red Oak layout with the door permanently attached to its L-girder frame, however, so David extended the fascia 4" below the bottom surface of the door. Should we choose to take the layout off of its legs at some point, the layout will rest on its frame, protecting the thin hardboard fascia.

We used a deeper fascia on this layout for several reasons. First, it provides a larger surface for mounting Digital Command Control plug ports and throttle holders.

You can still install plug ports on a layout that has the fascia flush with the bottom of the door, but you'll need to cut holes into the foam scenery to make room for the back of the plug port. When David did this on his own model railroad, it was a bit fiddly. Instead, using deeper fascia allowed for easy installation of plug ports below the door.

Second, when the day comes that we set the layout up for operation, the deeper fascia provides more room to attach bill boxes, town maps, and other operating aids. The fascia also serves to protect these items when the layout is moved.



Finally, wider fascia frames a layout better. The larger neutral surface area makes it easier for your eye to be drawn into the finished scene. We painted the Red Oak's fascia semi-gloss black, much like a museum display. When viewing the layout, you immediately look past the black border into the bright world of our detailed Iowa landscape.

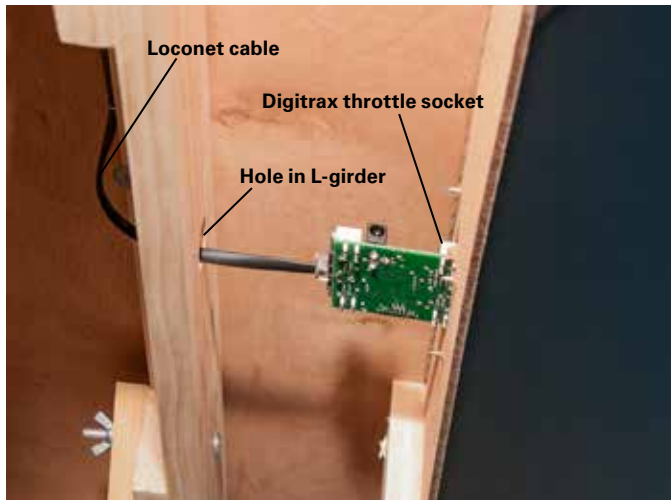
To make the fascia, David used pre-cut 2 x 4-foot "handy panels" and cut the sections with a reciprocating saw, following the scenery's contours. Where sections joined, he installed 1 x 2 splice blocks at the seams and corners to keep them together. He attached the fascia to the layout with no. 6 x 3/4" pan-head screws, making it easy to remove should we ever need to get to the wiring.



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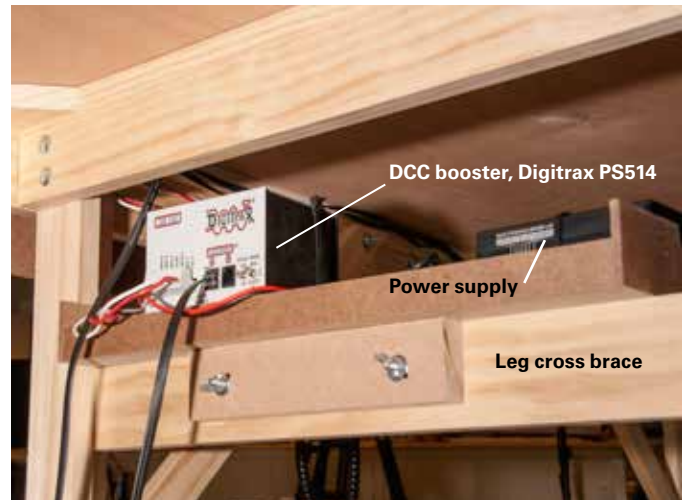
Model Railroader magazine subscribers can watch a series of video journals we recorded during construction. Find them under Online Extras at www.ModelRailroader.com

DCC SYSTEM INSTALLATION



For the Red Oak project, the MR staff selected a Digitrax Super Empire Builder Xtra starter set. It comes with nearly everything you will need to set up a layout the size of the Red Oak or larger, including a DB150 5 amp command station, DT402 master walk-around throttle, and a UP5 plug port. We chose a Digitrax PS514 4 amp power supply to run the system. We also added a second UP5 plug panel and a couple of Throttle Pockets from New Rail Models (item 40020) to hold the walkaround cab.

Installing the DCC system is easy. To begin, David built a 5 x 18-inch shelf on top of one of the leg supports for the command station and the power supply. Since the layout is small, he next installed one plug port and one throttle pocket in the



middle of the layout on both the front and on the back. Everything an operator will need to do on the layout is an easy reach from those positions.

With the command station, power supply, and plug ports in place, he then followed the instruction manual to make the final connections. This involved either connecting wires to screw terminals or plugging flat cables with RJ connectors into sockets. Digitrax requires you to follow a simple initialization procedure the first time you use the system – after that, it's ready for use.

David had the parts installed and the layout ready to run in less than an hour – considerably less time than it took to install the decoders in our locomotives. [MR](#)



Painted black, Red Oak's tempered hardboard fascia visually isolates the model railroad, helping to draw the eye into the scene.



Model Railroader Video Plus subscribers can watch a video showing the entire Digital Command Control installation process on the Red Oak layout at www.MRVideoPlus.com

Red Oak
Route



The branch line's Electro-Motive Division NW2 switcher works the elevator on our N scale Burlington Route Red Oak project layout. In this final installment, we tell you how we built the grain complex and the layout's other structures and scenes.

Build the 3 x 7 RED OAK LAYOUT

▶ The Red Oak series

January: Meet *Model Railroader's* N scale Red Oak layout

February: Benchwork, track, and rough scenery

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April: Structures, details, and rolling stock

Part 4: Scenery, structures, and rolling stock

By **Steven Otte** • Photos by Bill Zuback and Jim Forbes

The track is laid, wired, and running. The terrain is roughed in. We've added roads and bridges. Now comes the part that makes or breaks a model railroad, the final touches that can transform a layout into a work of art: the scenery, structures, and rolling stock.

When we plan our annual project layouts, we put great thought into the level of expertise a modeler would need to duplicate our work. This year, we decided the N scale Red Oak should target the beginner-to-intermediate model railroader. We wanted to make the project accessible to beginners, but still

produce results that would be up to the standards of more experienced modelers. By relying on tried-and-true scenery methods, building structures from unmodified kits, and populating the railroad with weathered ready-to-run cars and locomotives, we think we've achieved both goals.

For instance, a sticky dilemma facing many modelers is how to disguise track that needs to disappear through a hole in the backdrop. Depending on where your railroad is set, the obvious answer of a tunnel portal may not be appropriate. We show you the three approaches we used on the next page.

Model Railroader editor Neil Besougloff and Model Railroader Video Plus producer David Popp started off the ground cover and trees, setting the example that associate editor Eric White and I followed to finish the scenery. We then added structures that Eric and I had built and painted. Finally, Eric weathered the freight cars with powders, while David used an airbrush to do the same for the locomotives.

We had a lot of fun building this year's project layout. We hope that you enjoyed reading about it, and perhaps gleaned some ideas for your own model railroad along the way.

HIDING ENTRANCES TO STAGING



It's important to visually separate staging areas from the main layout to preserve the illusion that a model railroad connects to a greater rail network. On our less-than-3 x 7-foot tabletop, this requires a backdrop.

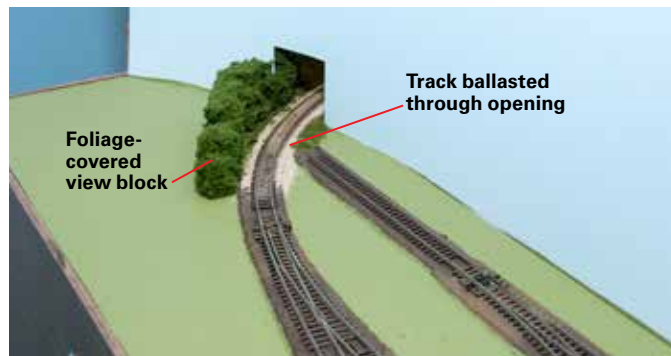
To keep our tracks from disappearing into an unrealistic hole in the sky, we needed to conceal these track openings somehow. While there are no mountains on our layout to justify disguising the entrances to staging with tunnel portals, Iowa does have hills, trees, and structures. We put our two mainline portals in terrain cuts and used structures to further shield the staging entrances from view.



On the right side, we used Woodland Scenics ground foam clump foliage and fine leaf foliage to make the tracks seem to disappear into the trees. We glued the clusters around the top of the backdrop opening to simulate branches arching up and over the tracks. The fine leaf foliage, which is a natural product enhanced with ground foam, was used to model shrubs around the base of the backdrop and random branches sticking out the top of the tree line. The occasional larger pieces with distinct stems became foreground trees. More trees planted on the hills flanking the curve further screen the staging entrance from view.

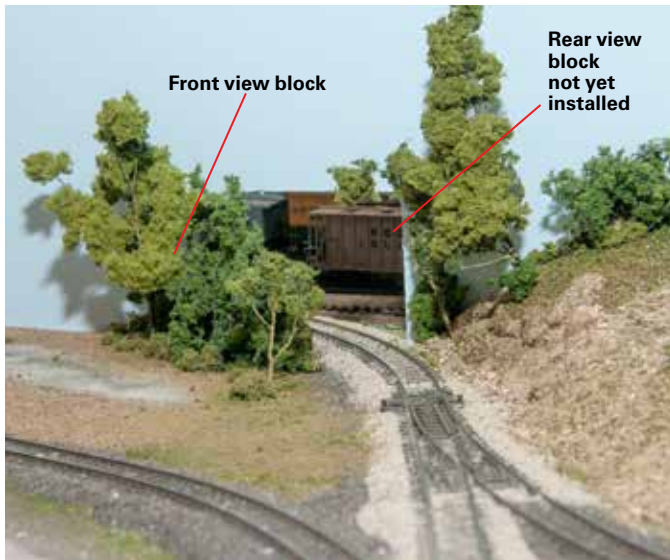


To disguise the portal on the left, which would have fewer trees to shield it, we made the surrounding hills higher and added a highway overpass above the track and in front of the opening. [Bridge construction was covered in our March 2015 issue. – Ed.] There's still foliage on the backdrop, representing a distant tree line, but the shadows under the bridge most effectively conceal the opening.



Behind all three openings, we added short view blocks covered with clump foliage. These visually continued the foliage from the front of the layout so the trains weren't seen disappearing into an unscenic void. We also continued the track ballast and ground cover through the opening.

HIDING ENTRANCES TO STAGING (CONT'D)



The branch line that cuts across the middle of the layout has its own staging tracks behind the backdrop. These staging tracks need their own entrance, because although they parallel the four-track mainline staging yard, they don't connect to it. The branch line passes through the backdrop at a sharp angle, so we screened it from the front with a thin wall of foliage and trees. It doesn't shield the opening completely, but it doesn't



have to, because we also placed a set of tall grain bins in front of the foliage view block. This leaves the backdrop opening still visible from certain angles, but not from the front or left. As with the other two openings, another foliage-covered wall behind the opening helps shield view of the staging area.

COMPLETING SCENERY



To make our pink-foam-and-white-Sculptamold terrain look more like dirt, we brush-painted it with a flat dark brown latex interior house paint left over from a previous project. We brushed the paint on in small sections so we could sprinkle ground cover onto it while it was still wet.

On most of the layout, we simulated wild grass with a mix of Woodland Scenics Fine Turf in green blend and earth blend colors. Bare dirt was covered with a sprinkle of finely sifted Real Dirt from Highball Products (item no. 510).

On some areas where the grass would be untended, such as along the right-of-way, we applied Burnt Grass Static Grass Flock by Woodland Scenics (no. 633) on top of the previous



scenery layers. In other areas, coarse ground foam and bits of Woodland Scenics Fine Leaf Foliage in several colors was sprinkled on to model weeds and shrubbery.

Where the branch line skirts a hill to reach the stock pen, I made the steep hillside look like an eroded cut by covering it with Real Dirt, then adding small rocks and talus sifted from a batch of leveling sand that came from our local hardware store. All scenery was secured by wetting the area with 70 percent isopropyl alcohol to break the surface tension, then applying Woodland Scenics Scenic Cement with a pipette.

COMPLETING SCENERY (CONT'D)

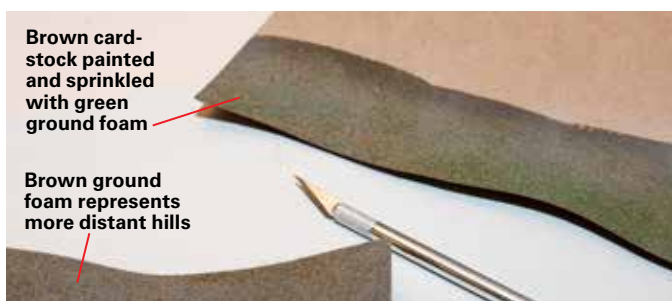


We used a few methods to model trees on the layout. To depict the treeline against the backdrop, we simply used yellow wood glue to stick Woodland Scenics Clump Foliage directly to the backdrop.

For low trees and shrubs, we used more Woodland Scenics fine leaf foliage. We generally used this as a transition between the backdrop treeline and the foreground, and to cover hills surrounding our tunnel entrances. But in several spots, we also broke out small branching clumps of the foliage to represent foreground bushes or taller branches sticking up out of the background treeline.



For most stand-alone trees, we used Wire Foliage Branches from JTT Trees. These armatures, twisted from four to eight wires, painted brown, and tipped with green ground foam clusters, can be used as tree branches in larger scales. But in N scale, they were just about right to represent trees on their own. We used single branches for saplings or combined several for larger trees. I used pliers to twist the wire trunks of two to four branches together, coated them with wood glue to disguise the twisted wire texture, and painted the trunks with earth-colored acrylic hobby paint. We also enhanced the foliage with various brands of ground foam and foliage netting.



Where the junction between the terrain and the backdrop wasn't concealed with foliage, we wanted to depict distant hills without drawing too much attention. Associate editor Eric White accomplished this with cardstock hills. By painting them the same brown as our terrain, he made sure the hills would tie in with the rest of our scenery. He then sprinkled fine ground green and brown foam into the still wet paint.



For the distant hills, he sprayed the foam and cardboard with a mist of gray primer to simulate atmospheric haze. He then cut low, scalloping silhouettes from both colors and layered them against the backdrop with wood glue. He further disguised the transition from backdrop and terrain with a line of white glue at the joint, into which he sprinkled fine green ground foam to match the turf.



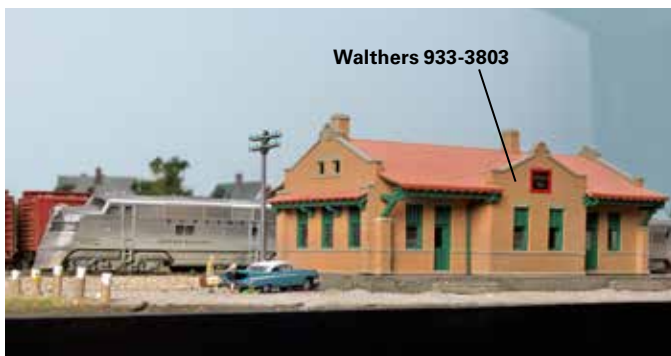
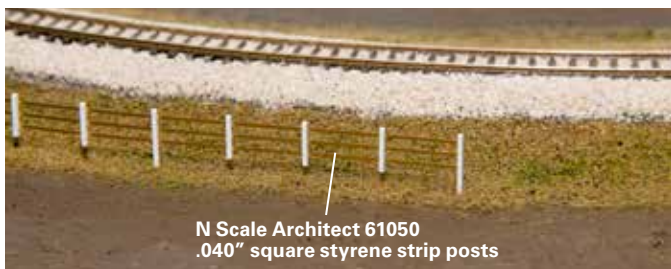
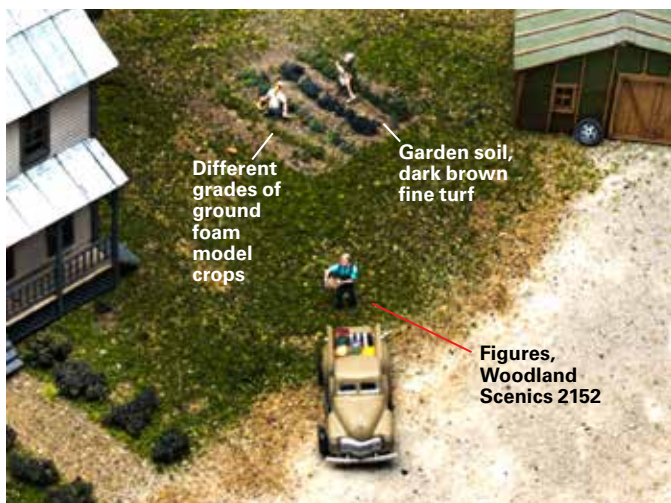
In addition to the highway down the middle of the layout [construction of which was covered in our March issue *-Ed.*], our layout needed a few driveways, dirt roads, and parking lots to serve its businesses and homes. I made these by adding a fine sprinkling of Highball Products N scale ballast in Light Gray or Limestone colors. I first soaked the area to be paved with isopropyl alcohol. Where a defined edge was needed, I used a piece of paper to keep the ballast off of adjacent ground cover. I then secured the roadways with Scenic Cement.



We added some details to make our rural highway more realistic. Plastic roadside signs on wood posts were made by Blair Line. We found the billboard in another Blair Line kit. I created a *Model Railroader* ad on my computer to decorate it.

Finally, we added vehicles from various manufacturers. One Volkswagen Beetle in an anachronistic shade of hot pink irked Eric White. He researched the paint colors in which Bugs were available in the 1960s and repainted the offending vehicle in an authentic (and custom-mixed) shade of Brunswick Blue.

STRUCTURES AND SCENES



The farm is the largest single scene on the layout. The eye-catching, bright yellow and green field in the front left corner was completed first. After David Popp scenicked the area around the track, he installed etched-brass three-rail fencing from The N Scale Architect between the field and right-of-way. To make the mostly flat fencing more realistic, he used cyanoacrylate adhesive (CA) to glue on posts of .040" square styrene. He then painted the fence with gray Rust-Oleum spray primer and stained it with Hunterline Creosote Black stain.

The main structures of the farm house, barn, silo, and shed came from an American Model Builders (AMB) LaserKit set. I assembled them and painted the house, barn, and silo traditional colors using Model Master acrylic paints. The shed came with self-adhesive paper siding representing a waterproof composite material. I weathered it slightly with a drybrush.

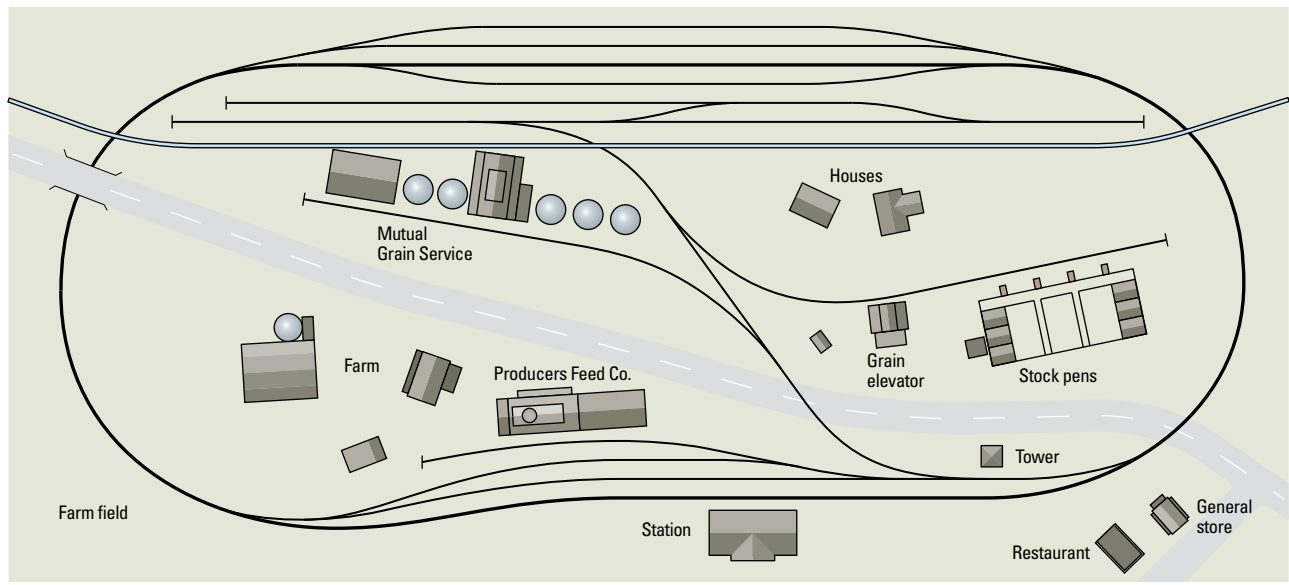
Eric White and I enclosed the cow pasture with etched-brass fencing from The N Scale Architect. I populated the pasture with livestock from Faller, then added a Woodland Scenics windmill and a 1954 farm tractor from a GHQ kit.

A set of Woodland Scenics figures and a pickup truck loaded with produce inspired another scene on the farm. After gluing down dark brown fine turf, I masked a section of the farmhouse's yard with a square of paper while applying the grass. Into this square of bare earth I glued four rows of ground foam in a variety of colors and grades, turning it into a garden. I set the farm figures to harvesting the crops and hauling them to the truck to take to market.

Though Walthers calls the station kit we used "Santa Fe-Style Brick Depot," it resembled prototype photos of some Midwestern CB&Q stations closely enough for us. All I did to customize it was to apply a placard with a Burlington Route herald decal from Microscale.

I scratchbuilt the platform by gluing .080" x .188" styrene strip around a piece of brick-patterned styrene. I painted this foundation Concrete, stained the entire platform with a thin black paint wash, and glued the station model to it.

I placed it on a gravel lot of N scale ballast and added life with a Woodland Scenics vehicle and figure set. More passenger figures and benches were added to the tracks platform.



The Mutual Grain Service complex was built from several kits to look like it had been expanded over the years to accommodate increased business, as many prototypes were. The core is an Alton Elevator from American Model Builders.

The modern steel grain bins, by Rix, are modular. I combined parts from two kits to make three tall and two short bins. I used .125" round styrene rod to connect the short bins to the wooden elevator structure, and linked the tall bins to the Rix elevator head. I scratchbuilt a downspout and a triangular support for it for the Rix elevator to create another loading spot at the grain complex.

The storage shed, which would be used for bagged grain, farm equipment, and other small lots, is from Walthers (the Co-Op Storage Shed, item no. 933-3230).

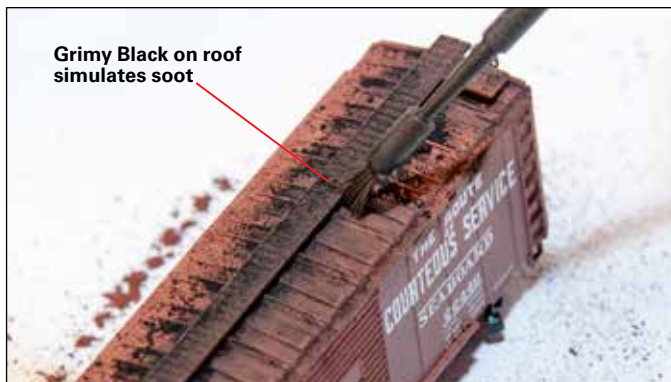
You've seen the stock pens before. I wrote about how I assembled, painted, weathered, and landscaped them in the May 2014 issue. Since the top layer of extruded-foam insulation board on the Red Oak layout was 1" thick, the same depth as I used for the base of the stock pens, it was a simple matter to cut a rectangular "swimming pool" in the terrain and drop the diorama in place. (We peeled off the diorama's track first, since we wanted to lay our spur track as one piece.)

Then, we used Sculptamold to fill in the seam and added ground cover and bushes to blend it into the surrounding scenery. The elevator's office, which wasn't part of the original diorama, is from a Blair Line Shack Pack.

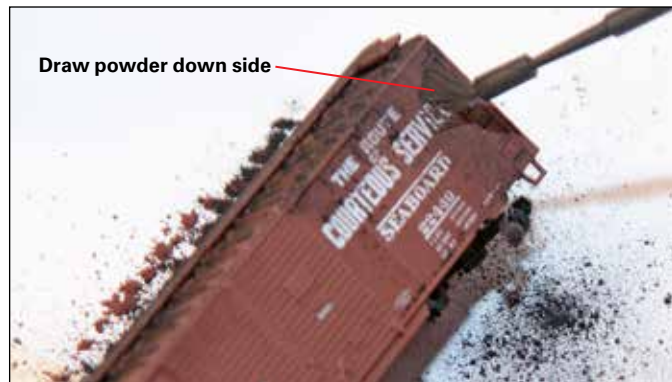
The Producers Feed Co. mill is the only other major industry on the layout. Associate editor Eric White assembled it from a Walthers Sunrise Feed Mill kit. Not wanting to make the popular kit too recognizable, we selected a different name for the business. Eric also personalized it with advertisements from a set of JL Innovative Designs paper signs left over from a previous project. He sanded the backs of the signs to thin the paper, then applied them with white glue, pressing them down into the texture of the structure's walls.



LOCOMOTIVES AND ROLLING STOCK



Steam-era cars got Grimy Black soot along their roofs.



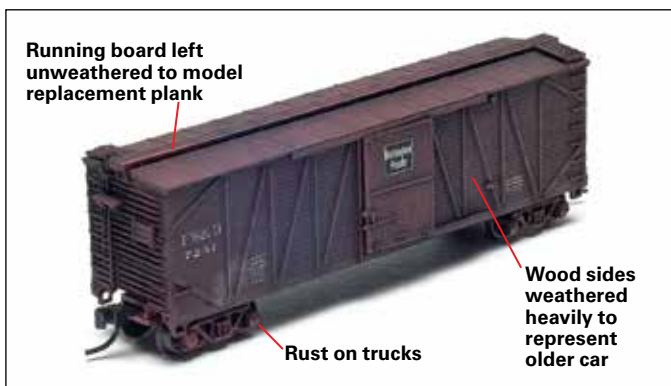
Eric drew powder down the sides to simulate rain streaks.



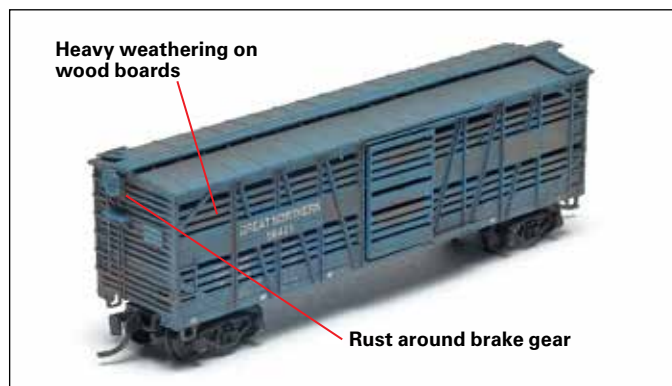
As the covered hopper was newer, it got lighter weathering.



Earth powders on the ends simulate wheel splatter.



An unweathered board simulates a repair to this wood car.



Older, wood-sided cars were more heavily weathered.

Eric White used an assortment of weathering powders from AIM Products to weather the cars for our Red Oak layout, favoring Grimy Black, Dark Rust, Medium Earth, White, and Medium Gray. He applied the powders with Microbrushes.

For the boxcars, he started at the top, either with Dark Rust or Grimy Black powder. Eric filled the brush and applied a generous dollop of powder along the cars' plastic running boards, which helped bring out the texture. Then he brushed the powder across the roof, following the ribs, and down the sides.

If he started with Grimy Black, intended to simulate soot from steam locomotives, he followed it with a layer of Dark Rust, using the same techniques. Sometimes he started with the Dark Rust, then followed with Grimy Black. On newer equipment that wouldn't have seen service in the steam era, Eric substituted Medium Gray as one of the heavy roof weathering colors, and went lighter with the Grimy Black.

Eric brushed Medium Earth along the side sills above the trucks to simulate dust thrown up by the wheels, then streaked this up and down to simulate rain washing loose dirt back down the sides of the car. The ends got a similar treatment, with Grimy Black drawn down from the roof and Medium Earth brushed up from the end sill.

On the covered hopper, Eric started with white powder around the hatches, then added a bit of Medium Earth to help the white contrast a bit more with the light gray paint scheme. This too, was dragged down the sides. Since this car is newer, he left off the Grimy Black.

On the ends of the cars, under the slope sheets, he applied a bit of Medium Earth powder to simulate the spray from the wheels. Again, Eric brushed the powder vertically, keeping in mind the direction water would wash down the car. Finally, the weathering was secured with Testors Dullcote.



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Registered users to our website can view Harold Russell's article "A tale of two shed" from *How to Build Realistic Layouts* at www.ModelRailroader.com.

David Popp used a fine-tipped double-action airbrush – one that controls both the air speed and the amount of paint dispensed – to lightly weather the locomotives for the layout. He thinned Testors Model Master acrylics with isopropyl alcohol to make the paint go on in lighter layers so he could more easily control the amount of weathering.

The pair of Kato F units assigned to freight service were the oldest on the layout, so they got the heaviest treatment. David started with a streak of Engine Black along the top, surrounding the exhaust stack and radiator fans. He thinned this paint about one part paint to three parts alcohol so he could build up the weathering in light layers. The side intake grills also got the Engine Black treatment.

He next sprayed the freight engines' trucks, fuel tanks, and undercarriage with Reefer Gray. This brought out the details of the molded black parts, giving the effect of faded black paint as

well as accumulated road dust. He used a fine-pointed brush to touch up the journal boxes and fuel filler with Engine Black to simulate spilled grease and fuel. He also added a bit of Rust to the couplers and the trucks' leaf springs.

The other locomotives got a lighter touch. We figured that as the crack passenger train on our layout, Kato's *Silver Streak Zephyr* would have been well maintained. So the EMD E5 that leads the train got only a light misting of Engine Black on the roof, Reefer Gray on the trucks, and Rust on the coupler.

The Chinese Red on the Walther's EMD GP20s was a fairly new paint scheme in 1960, so they were also lightly weathered. The Kato NW2 switcher got the same treatment. With our rolling stock and motive power set to go, the N scale Red Oak is now complete. [MR](#)