

BUILD A SMALL MODEL RAILROAD

WINTER 2018

8 clever railroads designed for compact spaces!

Including the 4 x 8-foot Virginian - step-by-step!



**This HO scale
layout fits
neatly along
an apartment
wall. See p. 38**

**An H0 Midwest
main line meets
a freelanced
short line** p.24

**Track plan for
a Santa Fe
rail-marine
operation** p.32

**How to build
small & light
benchwork
sections** p.42

CABOOSE™

Sharing Our Passion for Trains Since 1938

Widest selection anywhere – everything you need to build your model railroad.

The ultimate full-service train enthusiast's store.

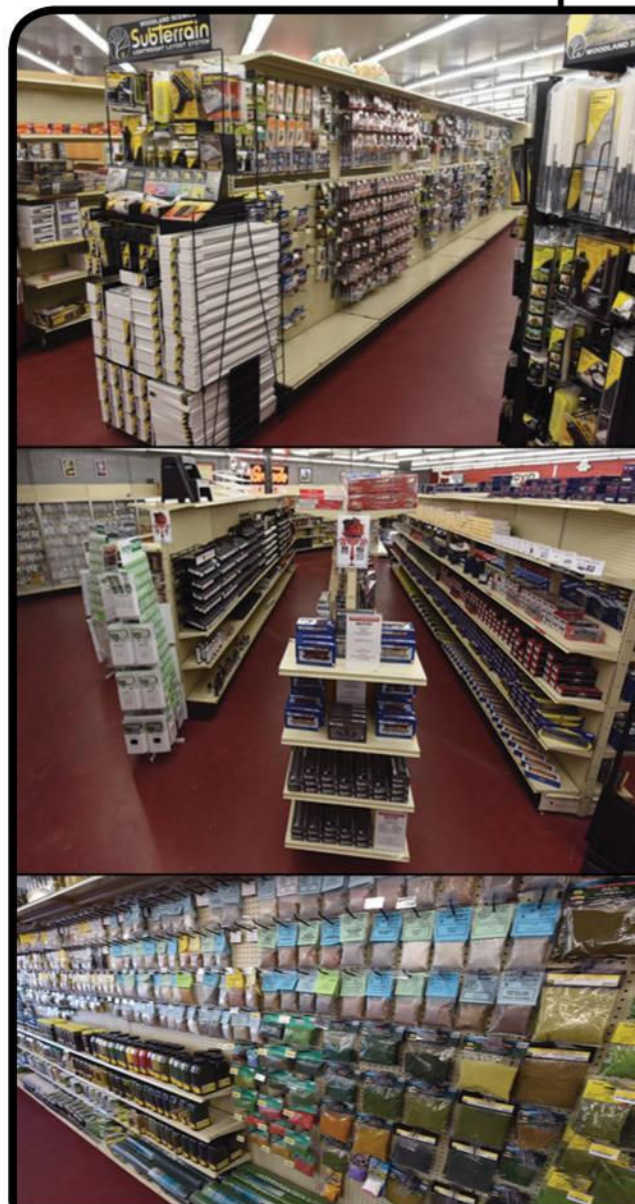
We have all the supplies, tools
and knowledge to help you
build **any** size model railroad.

Everything from G to Z –
more than 170,000 items,
over 512 manufacturers,
most at a discount from
retail and all at a fair price.

***As always, in-stock orders
over \$100.00 ship free
within the Continental U.S.!****

**surcharges may apply for oversized items.*

**10800 West Alameda Ave.
Lakewood, CO 80226
(303) 777-6766
Open 7 days a week!**



MYCABOOSE.COM

BUILD A SMALL MODEL RAILROAD

4 NOT JUST A PLACE TO START

Introduction/by Hal Miller

5 NARROW GAUGE LOGGING IN LESS THAN 4 X 7 FEET

This compact layout has a lot to offer
/by Dave Jacobs

10 SANTA FE AND SOUTHERN PACIFIC IN A SPARE ROOM

Tehachapi in the 1960s inspired the freelanced HO scale Oak Valley RR/by Hans Wolfram Nikolaus

16 BIG TIME RAILROADING ON A DOOR OR TWO

The N scale Pennsylvania RR Juniata Division is built for mobility/by Dave Vollmer

24 VERSATILE ROOM-SIZE LAYOUT

Two upper-Midwest railroads cross in a typical town
/by Iain Rice

28 LOTS OF SWITCHING IN A SMALL SPACE

A module that serves as a complete layout or part of a larger system/by Frank DiFalco

32 ALICE STREET IN 4 X 8 FEET

A highly prototypical N scale track plan for a Santa Fe rail-marine operation in Oakland, Calif.
/by Andy Sperandeo

38 RAILROADING ON AN APARTMENT SHELF

An HO short line that fits neatly along a living-room wall/by Russ Rettig

42 HOW TO BUILD LIGHTWEIGHT SECTIONAL BENCHWORK

Combine commercially available kits with two types of foam for a sturdy foundation/by Lou Sassi

44 BUILD THE VIRGINIAN: PLAN AND OPERATION

Pt. 1: Hauling coal on the HO scale Virginian Ry.
/by David Popp

54 BUILD THE VIRGINIAN: BENCHWORK

Pt. 2: Building solid benchwork that's easy to expand for our HO layout/by David Popp

60 BUILD THE VIRGINIAN: TRACK LAYING AND WIRING

Pt. 3: Getting trains up and running on our 4 x 8-foot layout/by David Popp

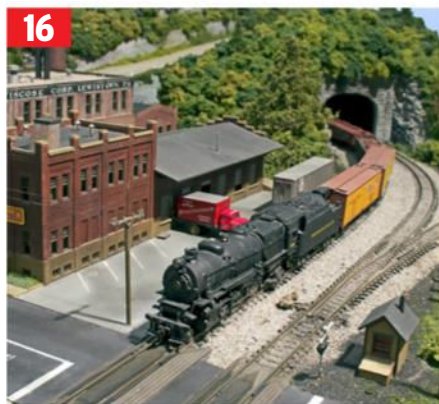
68 BUILD THE VIRGINIAN: SCENERY

Pt. 4: Our HO scale layout gets some mountain scenery/by David Popp

76 BUILD THE VIRGINIAN: STRUCTURES

Pt. 5: Coal mines, company houses, and more complete our project railroad/by David Popp

ON THE COVER: There are lots of ways to put big-time model railroading in compact spaces. Russ Rettig captured the look and feel of the Midwest on his 2 x 16 Grand Trunk & Indiana RR. See page 38. Photo by Russ Rettig



IT'S NOT JUST A PLACE TO START

THERE'S SOMETHING about the term "small layout" that has, over the years, come to infer "your first layout" or "starter layout." After all, isn't the goal to start modestly and move up to something larger?

Well, maybe. Like so many things today, it depends. You have to ask yourself a few questions, and answer them fairly honestly. The first is, "How much room do I have?" Another is, "What do I want to do with my model railroad?"

The initial question is usually pretty easy to answer. The second might require some thought. Do you want to watch your trains go around through highly detailed scenes? Do you want to switch

cars between various industries? Do you want a layout you can run by yourself, or do you want to be able to host a group operating session?

Maybe the biggest question, though, is how much time do you want to put in building it, troubleshooting it, and cleaning it vs. running it?

These questions apply to the beginner, and increasingly, also to seasoned model railroaders as they are looking to downsize. Many of them want to continue in the hobby, even though they no longer need the living space their families once required. I can't tell you how many modelers I've met who have had large railroads and are looking forward to explor-

ing a different scale, era, or railroad in less space in their next dwelling.

In this publication you'll find plans for several types of layouts, all designed to fit in small to medium spaces. You'll get tips and tricks on how to construct your layout for maximum realism and enjoyment. And you'll learn how to make your layout expandable, should you choose to go bigger.

No matter which end of the experience spectrum you're on, there are ideas in here for you.



FOR MORE INFORMATION

LOOKING FOR MORE TIPS & TRICKS?

Visit the Kalmbach Hobby Store, www.kalmbachhobbystore.com.

PDF packages are available for download covering design and construction of other compact model railroads.

Also available is Tony Koester's book, *Modeling the Transition Era*.



Founder	A.C. Kalmbach 1910-1981
Editor	Hal Miller
Art Director	Thomas G. Danneman
Editorial Staff	Jeff Reich Dana Kawala Cody Grivno Steven Otte Eric White
Senior Graphic Designers	Drew Halverson Scott Krall
Illustrators	Rick Johnson Roan Kelly Kellie Jaeger
Photography Supervisor	William Zuback
Production Coordinator	Cindy Barder

Kalmbach Publishing Co.

CEO	Dan Hickey
Senior VP, Sales & Marketing	Daniel R. Lance
VP, Content/Editorial Director	Stephen C. George
VP, Consumer Marketing	Nicole McGuire
Corporate Advertising Director	Ann E. Smith
General Manager	Brian J. Schmidt
Art and Production Manager	Michael Soliday
Group Advertising Manager	Scott Redmond
Advertising Sales Representative	Martha Stanczak Mike Ferguson
Advertising Services Representative	Daryl Pagel
Circulation Director	Liz Runyon
New Business Manager	Catherine Daniels
Retention Manager	Kathy Steele
Single Copy Specialist	Kim Redmond

Editorial offices

Phone:	262-796-8776
E-mail:	mrmag@mrmag.com
Website:	www.ModelRailroader.com

Advertising

Advertising inquiries:	888-558-1544, ex. 643
Advertising e-mail:	adsales@mrmag.com

Selling Model Railroader

magazine or products in your store:

Phone:	800-558-1544
Outside U.S. and Canada:	262-796-8776, ex. 818
E-mail:	tss@kalmbach.com
Website:	www.Retailers.Kalmbach.com

Customer Sales and Service

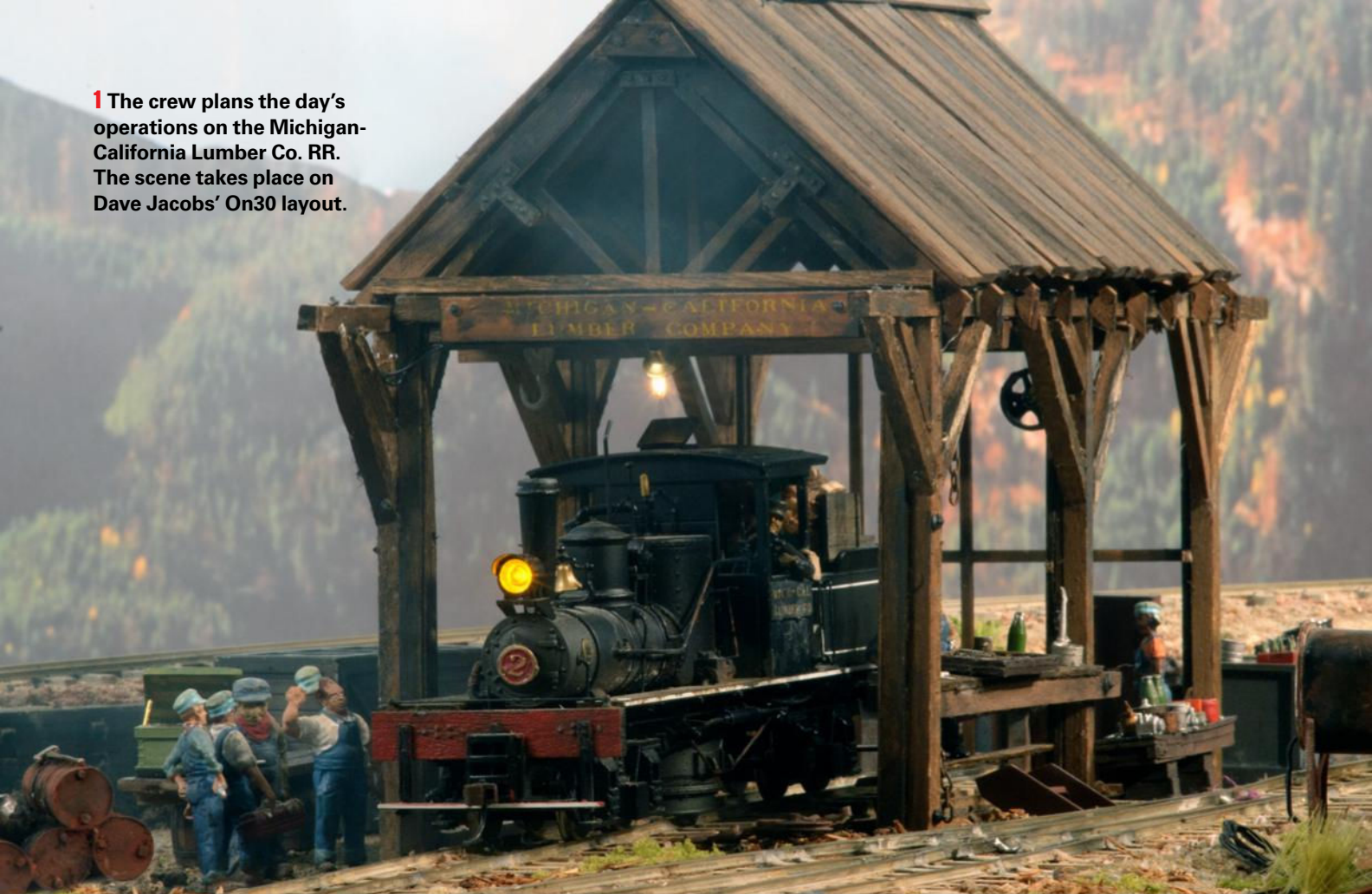
Phone:	877-246-4879
(Weekdays 8:30 a.m. to 4:30 p.m. CT)	
Outside U.S. and Canada:	813-910-3616
E-mail:	ModelRailroader@customersvc.com

HOW TO MODEL TODAY'S RAILROADS (ISBN 978-1-62700-310-0) is published by Kalmbach Publishing Co., 21027 Crossroads Circle, P.O. Box 1612, Waukesha, WI 53187-1612. Single copy price: \$8.99 U.S. and International, \$9.99 Canadian, payable in U.S. funds drawn on a U.S. bank. (Canadian price includes GST.) BN 12271 3209 RT. Expedited delivery available for additional \$2.50 domestic and Canadian, \$6 foreign.

©2017, Kalmbach Publishing Co. Title registered as trademark. All rights reserved. Printed in U.S.A.



1 The crew plans the day's operations on the Michigan-California Lumber Co. RR. The scene takes place on Dave Jacobs' On30 layout.



NARROW GAUGE LOGGING IN LESS THAN 4 X 7 FEET

This compact layout has a lot to offer

BY DAVE JACOBS
PHOTOS BY DENNIS BRENNAN

THE BACHMANN SHAY and Climax were what first attracted me. At the time, the Shay model had recently had excellent reviews, and I started researching the prototypes of the diminutive On30 [also called On2½ – Ed.] locomotives.

The locomotives, combined with an interest in Western logging railroads, led me to build my small layout, which I call “The Deuce,” after the name given to the Michigan-California (Mich-Cal) Logging Co.’s Shay no. 2.

The operational purpose of the Mich-Cal Lumber Co. was logging. Sugar pine was the most profitable, but Douglas fir was available in California as well. The latter wood was used for railroad ties and trestles.

Layout goals

I designed a logging camp and its environs after studying a number of model railroading publications. Modeling a logging camp requires a variety of structures, trackwork, scenery, figures, and activities. The camp includes not only loggers involved in different pursuits, but also woodchoppers, a laundress, checkers players, engineers and mechanics, stable hands and horses, bears, garbage



2 A logger guides the Hayrack boom system on the spar pole over a pile of logs as a donkey doctor, right foreground, works on the stationary donkey engine.

cans, railroad materials, and more, surrounded by a forest.

The Mich-Cal had at least 16 logging camps, but I focused on one camp and spent time on the details of my compact layout. I enjoy scenery construction because it provides an enormous canvas of opportunities to express whatever creativity I may possess. I truly enjoy beholding the beautiful Earth about me,

and I try to construct a little portion of it in miniature.

Building the layout

My friend Miles Hale built the oval table for the layout using our combined specifications. Miles and his wife, Fran Hale, greatly enhanced the track plan, and often consulted with considerable kindness to resolve problems.



3 The Deuce rolls up to a water tank as log cars roll by below. The hills were created with extruded-foam insulation board covered with tinted Sculptamold.

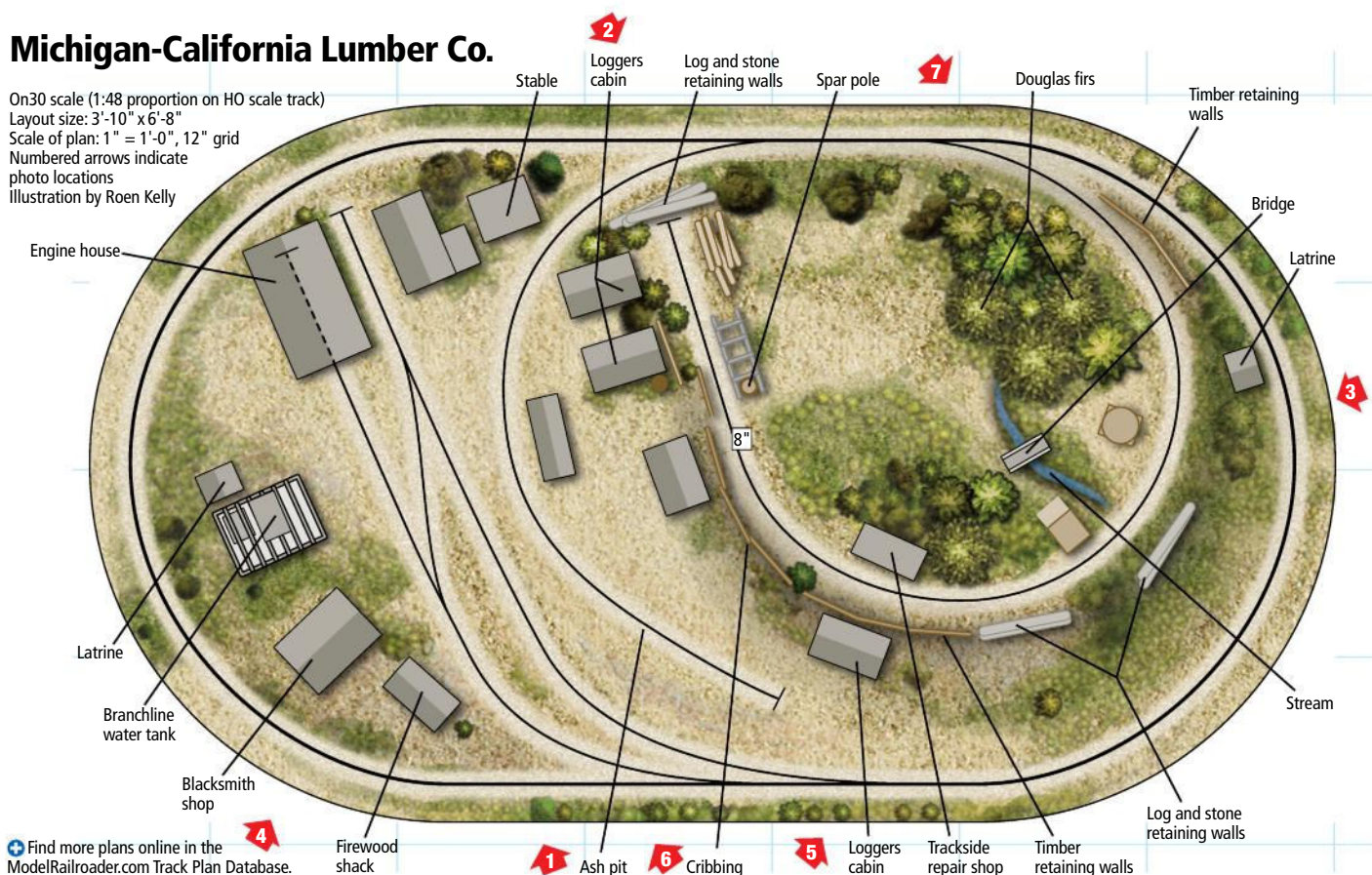
I used Fast Tracks templates and materials for five of the turnouts and some of the trackwork, and bought flex-track for other portions of the layout. Of six turnouts, only one is commercially made. Tortoise by Circuitron switch motors power the turnouts. I used Woodland Scenics SubTerrain inclines to create grades and change elevations.

Landforms were created using layered extruded-foam insulation board covered irregularly with Sculptamold, a papier-mache product; the latter had small quantities of tan acrylic paint mixed in. Cliffs were modeled with products from Bragdon Enterprises. I used several layers of various ground covers, including sand, and foliage from a number of sources, including Woodland Scenics and Brennan's Natural Ground Cover (www.brennansmodelrr.com).

I built Douglas firs from wood trunks dyed with Higgins russet drawing ink and painted a grimy black color. I drilled holes for caspia branches, which were dyed with Moss Green Design Master spray paint no. 721. I then used Woodland Scenics Green Blend fine ground foam applied with a spray

Michigan-California Lumber Co.

On30 scale (1:48 proportion on HO scale track)
Layout size: 3'-10" x 6'-8"
Scale of plan: 1" = 1'-0", 12" grid
Numbered arrows indicate photo locations
Illustration by Roen Kelly



Find more plans online in the ModelRailroader.com Track Plan Database.



4 This little logging camp took Dave about two years to build. Structures were scratchbuilt, kitbashed, and assembled from kits.

adhesive. The towering trees on the hill on the layout are the first things one sees when entering the train room.

The water was modeled with Enviro-Tex two-part resin. A trickle of water seeps between hills in the forest, where a wrecked steam donkey lies rusting after falling down the hill. A sound system, employing two old automotive speakers, reproduces the sound of the stream and

a thunderstorm. Johnny Cash is also available to sing *Lumberjack*.

I applied photographers' blue background paper to a wall in my room for sky. I drew clouds with white and gray chalks. Modified dry-mounted photo-mural pictures of hills and mountains were placed on the background paper.

Overhead, I had halogen lights installed, which are directed at scenes.

LAYOUT AT A GLANCE

Name: Michigan-California Logging Co.

Scale: On30 (1:48 proportion on HO scale track)

Size: 3'-10" x 6'-8"

Prototype: Michigan-California Lumber Co.

Locale: El Dorado County, Calif.

Style: Tabletop oval

Era: 1918

Mainline run: 19'-4"

Minimum radius: 18"

Minimum turnout: no. 6

Maximum grade: 4 percent

Height: 41" to 47"

Roadbed: Homasote

Track: handlaid Fast Tracks and Micro Engineering code 70 flextrack

Scenery: Sculptamold on extruded-foam insulation board

Backdrop: photomurals on blue background paper

Control: Bachmann E-Z Command Digital Command Control



5 The Climax moves needed supplies up past a loggers' cabin to a switchback. The cabin is a Foothill Model Works kit with a scratchbuilt roof and modified door. Dave built several retaining walls on the layout using various materials.



6 A trainman crosses the tracks toward a wooden caboose. A stable in the background houses the Mich-Cal's horses, which haven't yet been replaced by steam donkeys.

Structures and rolling stock

I scratchbuilt two of three loggers' cabins, a blacksmith shop, a firewood shack, log and stone retaining walls, and an outhouse, mostly from published photographs. A number of structures were kitbashed from SierraWest Scale Models, Berkshire Valley Models, and others' kits. An ash pit was kitbashed.

The enginehouse was scratchbuilt, based on published photographs of one housing a Shay in El Dorado County, Calif., owned by the Diamond & Caldor

Ry. This county was also the home of the Mich-Cal.

One of the pieces of logging equipment I wanted to model was a spar pole, or spar tree. A spar pole was used like a crane to move logs onto log cars. Some sources show only a stick in the ground, stabilized by cables. I'd thought that building one would be a piece of cake, but I was quickly disillusioned.

I desperately faced the fact that all of those cables had to go somewhere and do something! These include guy lines

and yarding lines, which are used to move the logs. I was on a steep learning curve. Each piece of hardware had a purpose, and I wanted to try to get it right. Following a small disaster, I bought fishing line to replace sewing thread for the guy lines.

My spar pole is a Hayrack type, and two steam donkey engines were needed. I bought one and modified it, and built another from a kit.

I enjoy kitbashing or scratchbuilding from wood. I color with Rembrandt pastels mixed with rubbing alcohol or mineral spirits. I use Bragdon pastels, Prismacolor pens, India inks, conventional paints, and chemical techniques such as A-West Blacken-It for metal. To detail structures as much as possible, I added as many high-quality figures as possible, and extensively scattered tools, junk, debris,

MORE ON THE WEB

Find "Modeling logging railroads," a downloadable story package, at www.kalmbachhobbystore.com.

rocks, forest twigs, and other landscaping items.

Rolling stock includes a scratchbuilt gondola loaded with leftover hardware from construction of the spar pole. One scratchbuilt flatcar carries a couple loggers enjoying lunch, their saws tossed about with other loads. Another flatcar carries some cant hooks (log rollers). A scratchbuilt water car is built on a modified flatcar.

A growth experience

My layout, called “The Deuce” after Shay no. 2, has led me into tracklaying, turnout construction, logging scholarship, construction of landforms, a wooded hill, buildings and other structures, and a lot of fun. I think all of these things have been reasonably successful, and I’ve established friendships that I value.

It’s challenging to study the background of a prototype and try to learn to model its features. Digging into the literature was a bit of work, but rewarding. Many of the best sources are out of print and not readily available, but my local library was wonderful. It borrowed books for me from around the country. I needed all the help I could get; there isn’t a lot of narrow gauge railroad logging presently going on in my home state of Kansas.

I didn’t find it possible to re-create a precise model of all 16 logging camps of the Mich-Cal. Elements have been condensed to create scenes as closely as possible, and as historically accurate as possible of logging in those bygone days in the American West. 



7 Mich-Cal Climax no. 4 is about to pass cliffs made with Bragdon Enterprises products. The track is a combination of handlaid and flextrack.

MICH-CAL ROSTER

IN RESEARCHING THE PROTOTYPE for Bachmann’s Shay locomotive before building my model railroad, I looked into classic books, including Michael Koch’s *Steam and Thunder in the Timber: Saga of the Forest Railroads* (World Press, 1979) and *The Shay Locomotive – Titan of the Timber* (World Press, 1971). R. Stephen Polkinghorn’s book, *Pino Grande – Logging Railroads of the Michigan-California Lumber Co.* (Howell-North, 1966), is also superb. Although all out of print, they can still be found at used booksellers.

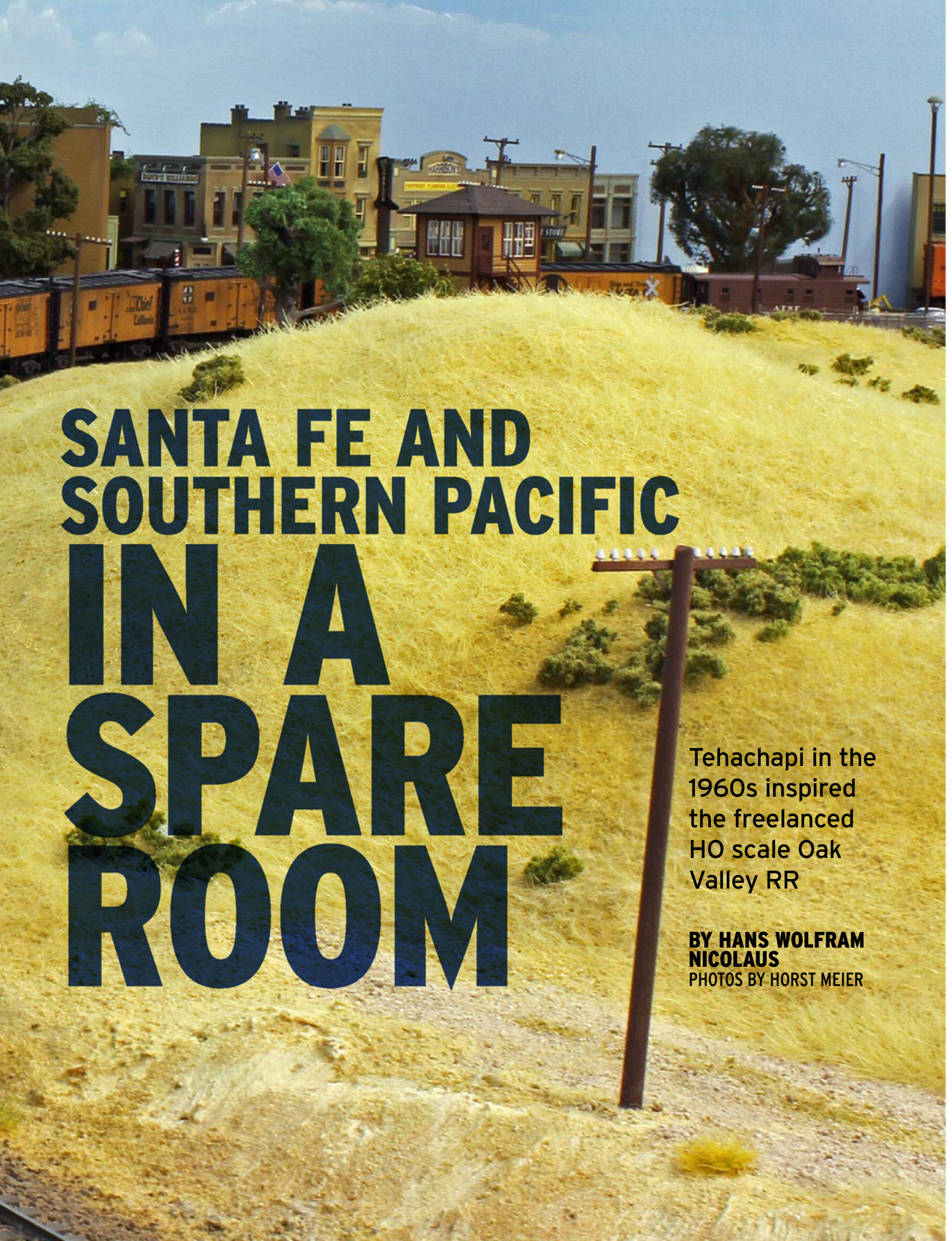
Reading these books, I learned something about logging, but nothing about mining. Thus I looked at narrow gauge logging railroads using the T-boiler Shay (the so-called “boot boiler Shay”). Possible choices for prototypes narrowed considerably. My penchant for modeling backwoods hills, valleys, and mountains led me to discover the Michigan-California Lumber Co. (the Mich-Cal) and its Deuce, Shay no. 2, the two-spot.

This 3-foot-gauge locomotive was built by Lima in 1884, it’s builder no. 122. Originally a wood-burner in Michigan, it was brought to California by the El Dorado Lumber Co. in 1901, which became the Mich-Cal Lumber Co. in 1918. Its Shay no. 2 worked for a total of 50 years and is presently the oldest known Shay in existence. I think this no. 2 bears a remarkable resemblance to the Bachmann product.

The Mich-Cal roster included a Class B Climax and a Stearns-Heisler locomotive, both narrow gauge locomotives and each, at least in my eyes, beautiful. The Climax was Mich-Cal no. 4, built in 1902, and shop no. 339. The Stearns-Heisler, Mich-Cal no. 1, was the third type of geared locomotive on the railroad. Heislars were known for power, durability, and (compared to Shays and Climaxes) speed, but only 625 were built. My three Bachmann geared locomotives are all appropriate for the Michigan-California Lumber Co. – *Dave Jacobs*

1 A pair of F units leads a Santa Fe reefer train out of Oak Valley. Hans Wolfram Nicolaus based the scenery of his freelanced HO scale layout on the rolling hills and high-desert landscape around Tehachapi, Calif.





SANTA FE AND SOUTHERN PACIFIC IN A SPARE ROOM

Tehachapi in the
1960s inspired
the freelanced
HO scale Oak
Valley RR

**BY HANS WOLFRAM
NICOLAUS**
PHOTOS BY HORST MEIER



2 The Tehachapi-inspired peninsula started with open-grid benchwork and 1/2" plywood subroadbed. Once the track was laid, Hans made the hills from extruded-foam insulation board. He used sand and sparse vegetation to finish the scene.

ALTHOUGH I LIVE IN GERMANY and am surrounded by many interesting European prototype railroads, I model the North American West. Perhaps because it's so different from where I live, the arid scenes of the California high desert have always fascinated me. With some careful planning, I fit a freelanced HO scale version of this rolling landscape in a modest 11'-6" x 13'-10" room.

In my Oak Valley RR's (OVR) fictional history, the Southern Pacific RR bought the line in the early 1900s. By the 1960s the SP and the Atchison, Topeka & Santa Fe Ry. jointly operated the branch line through south central California.

The point-to-point track plan fits a lot of action into a compact space. Both ends of the line, Valley Junction and Lakeview Siding, provide space for staging trains. Starting at Valley Junction, the line climbs around a broad horseshoe curve and rolling desert scenery. This stretch of track takes up a third of my layout space, but adds a lot of depth to the layout. It's reminiscent of parts of the famed Tehachapi Loop.

A passing siding in Oak Valley provides a location for train meets. Along with trackside industries, Oak Valley also features a small town.

Second time around

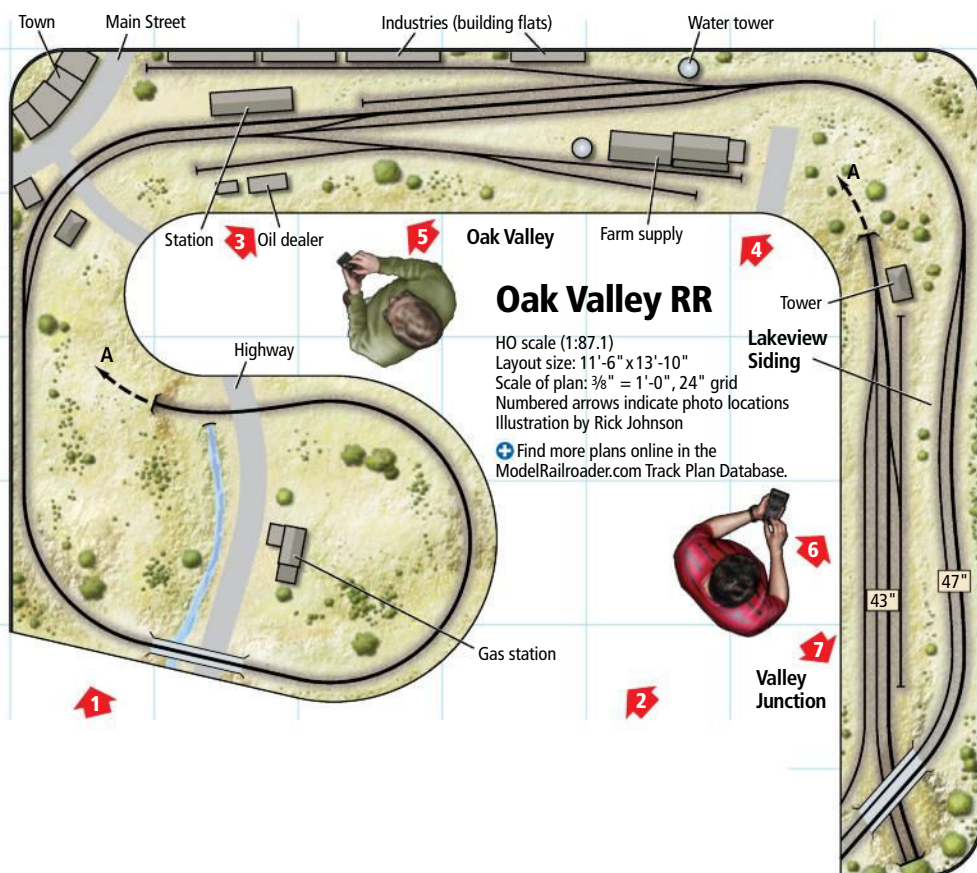
The Oak Valley RR is my second layout set in the American West. I've been a model railroader ever since my dad bought me my first Märklin HO scale train set in the mid-1950s. I've built several layouts based on German prototypes. Then about 20 years ago my modeling interest shifted toward the United States, and I built my first California-themed layout.

After building and operating that layout, I realized several things I would've done differently. Eventually I dismantled the layout and started over.

I planned the new OVR to be easier to operate and maintain. My new layout would include aisles at least 30" wide, a layout height suitable for sitting or standing operation, no duckunders, and no turnouts or storage tracks in tunnels. Armed with these requirements, as well as better skills, I set to work on my new model railroad.

Building the layout

I found it a lot easier to build my layout's backdrop, which runs all the way to the ceiling, before building benchwork. The backdrop consists of 1/8" hardboard screwed into 1/2" studs placed 24" apart along the layout room wall. I coved the



LAYOUT AT A GLANCE

Name: Oak Valley RR

Scale: HO (1:87.1)

Size: 11'-6" x 13'-10"

Theme: freelanced branch line operated jointly by the Atchison, Topeka & Santa Fe Ry. and the Southern Pacific RR

Locale: California

Era: 1960s

Style: around the walls with peninsula

Mainline run: 66 feet

Minimum radius: 26"

Minimum turnout: no. 6

Maximum grade: 2.5 percent

Benchwork: open grid

Height: 43" to 47"

Roadbed: cork on 1/2" plywood

Track: code 70 and 83 flextrack

Scenery: extruded-foam insulation board and plaster over chicken wire

Backdrop: painted hardboard

Control: Digitrax Digital Command Control

backdrop by bending the hardboard to a 12" radius around the room's corners. This technique adds depth to a backdrop by avoiding the harsh shadows caused by two flat panels meeting at a right angle.

After filling in the joints and screw heads with drywall compound, I painted the hardboard with white primer followed by two shades of blue. I wanted the sky to be darkest at the ceiling and gradually transition to white near the horizon. I also painted clouds and hills following methods in Mike Danneman's book *Painting Backdrops For Your Model Railroad* (Kalmbach Books, 2008).

I wanted the layout to be easily dismantled in case I ever move, so I built the benchwork in five open-grids made of 1 x 4s. Each section rests on 1 1/2" square legs. The tabletop is 1/2" plywood.

I laid Peco code 83 flextrack in Valley Junction and Shinohara code 70 track everywhere else. Tortoise by Circuitron switch motors control the turnouts.

I wired the layout for Digitrax Digital Command Control (DCC). Each benchwork section is wired independently and connects to the other sections via terminal strips and jumpers. For the more complicated track arrangements, such as the Valley Junction yard, I found it easier to wire that section upside down on sawhorses. When that section was wired, I simply turned the section right-side-up and screwed it onto the benchwork.



3 Two Santa Fe SD24s, one in "zebra stripes" and the other in the "bookend" scheme, bring a local freight into Oak Valley. A single siding along the backdrop serves Pacific Machine Repair and three other industries.

Scenery

I installed tunnels, bridges, and bridge abutments before starting scenery work. The scenery base around these structures is made of plaster cloth over chicken wire.

I made the large hill in the middle of the horseshoe curve using layers of extruded-foam insulation board. After I laminated the boards to get the proper height, I shaped the hills using a hot-wire tool and coarse files. I then covered the hills with a layer of plaster.

For most of the rock faces, I used rubber molds to make plaster castings. After they dried I glued the castings to the scenery base. I then painted the castings using a Woodland Scenics Mini-Scene set. I also used real rocks that I found in a store that sells terrarium supplies.

The ground cover is sand from Arizona Rock & Mineral that's secured with diluted white glue. To model the sparse desert vegetation, I used coarse turf and static grass from Woodland Scenics and Scenic Express. The trees on



4 Farmers Union supply company is another rail-served industry in Oak Valley. Wearing the Southern Pacific's gray and red "bloody nose" livery, Alco RS-11 no. 2909 is on the main line toward Lakeview Siding.



5 The morning local passenger train makes a stop at the Oak Valley Station. Since there's only one station on the layout with a relatively short platform, Hans uses an HO scale Budd rail diesel car to model this service.

the layout are all ready-to-install models from several manufacturers.

Although I'd painted the rails prior to starting on the scenery, I didn't ballast the track until all the ground cover was in place. That way I didn't have to worry about static grass fibers or turf getting stuck in the ballast, unless I was deliberately modeling a little-used siding.

Structures and streets

Four of the houses on Main Street in Oak Valley are off-the-shelf models. Other structures are kitbuilt or kit-bashed from plastic and laser-cut wood kits. I weathered all the buildings with paint washes and weathering powders.

I used .060" styrene sheet to model the streets in town and the highway out in the desert. The sidewalks in town are .100"

styrene sheet cut to fit. After installing the styrene, I made several passes over the surface with a sanding block. This gave the surface a rougher texture that looks more like real concrete when painted. I also used a mini drill to engrave the sidewalk joints, as well as potholes and cracks in some of the streets.

I painted the streets with a mix of dark asphalt and concrete gray acrylic paint. For the sidewalks I used only concrete gray. I applied brown and black weathering powders to both surfaces.

Figures and vehicles finish off the scenes. I did a lot of research to make sure the cars and other details matched my layout's era.



Operation

I usually operate the OVR by myself, but I enjoy running trains with friends. The layout can keep as many as three operators busy.

Trains run point-to-point between Valley Junction and Lakeview Siding, and before each session I stage trains at each location. I also use Valley Junction as a fiddle yard where I place cars destined for the industries in Oak Valley. I'll then make up a switch list for the Oak Valley local freight.

In addition to the once-daily local freight, there's a morning and evening local passenger train that runs between Valley Junction and Oak Valley. Because the layout's mainline run is so short and there's only one passenger station with a short platform, I model local



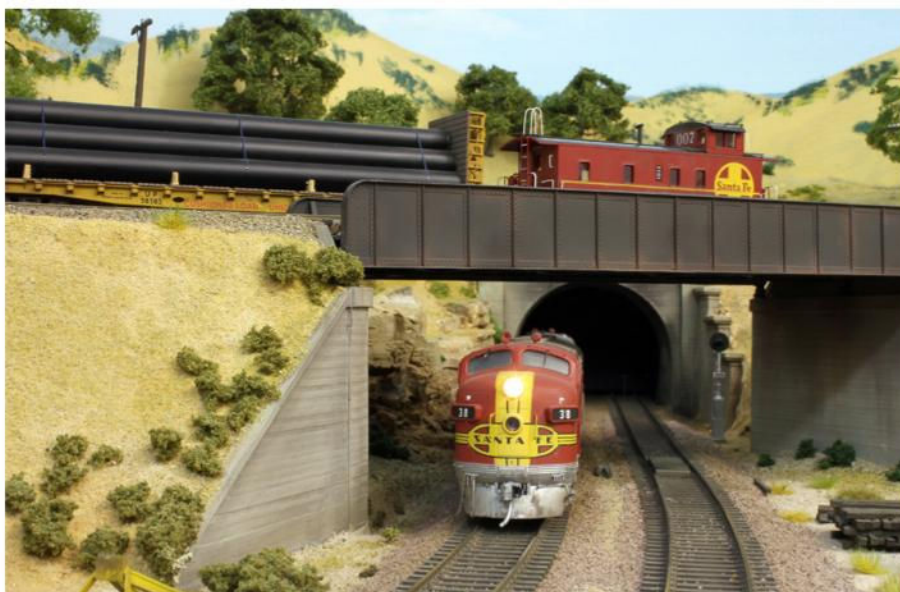


6 Atchison, Topeka & Santa Fe GP7 no. 2879 works Valley Junction, while Southern Pacific "Black Widow" F units haul a train into Lakeview Siding. Both railroads inspired Hans' compact HO scale layout.

passenger service using a single Budd rail diesel car (RDC).

During a typical session I also run two or three through passenger and freight trains that originate in either Lakeview Siding or Valley Junction. Most of the through freight traffic is unit trains made up of grain hoppers, refrigerated produce cars, or manifest freight. All meets take place at the passing siding in Oak Valley.

When I run trains on the Oak Valley RR, I feel transported to another time and place. That's part of the magic of model railroading. For a few hours I'm no longer in Germany in the 21st century, I'm trackside at Tehachapi in the 1960s. **MR**

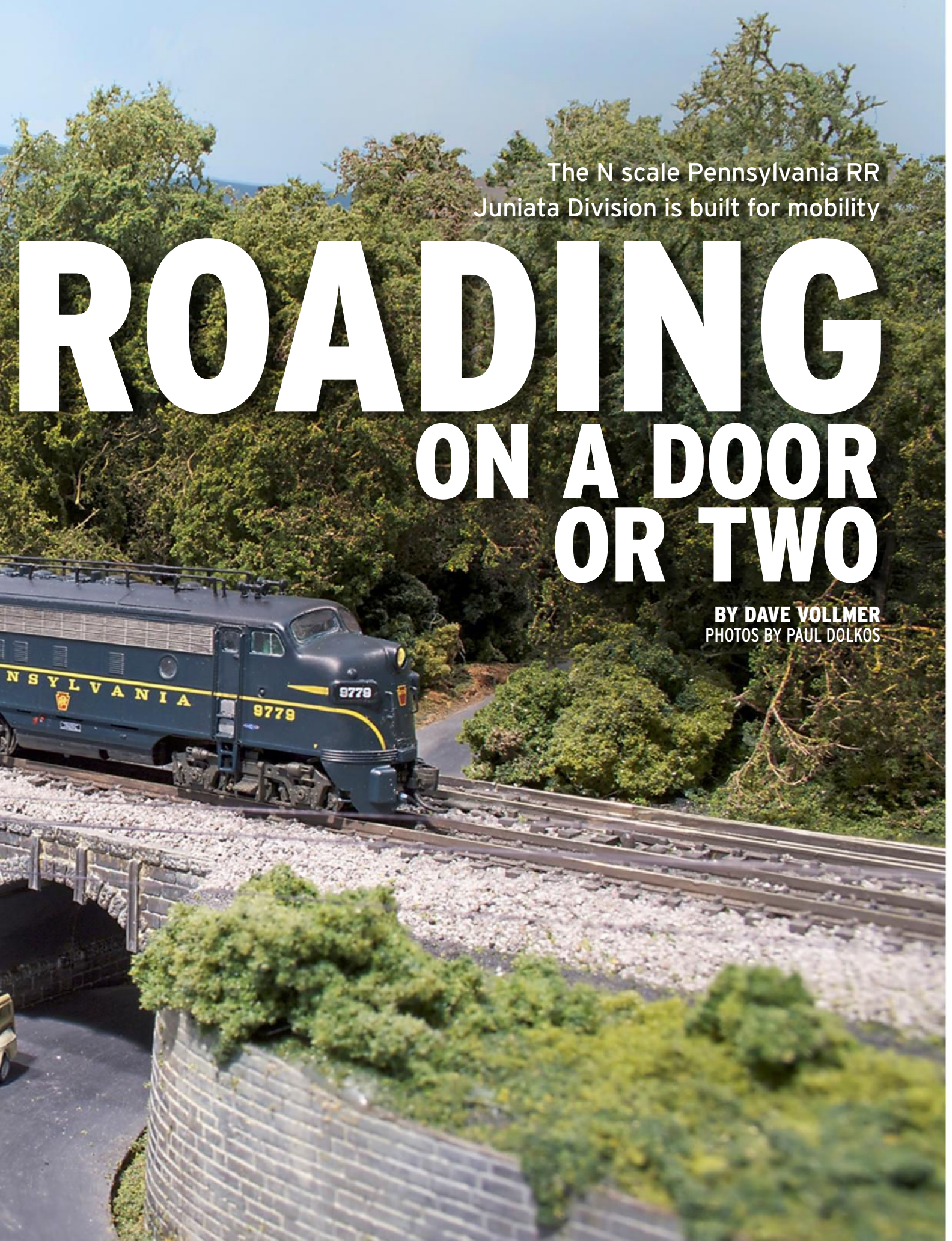


7 A class CE-1 caboose brings up the rear of a Santa Fe freight as it passes over a "warbonnet" F7 leading a train through Valley Junction. Hans installed all bridges and tunnel portals before starting the scenery.

BIG TIME RAIL

1 An eastbound coal drag exits Spruce Creek Tunnel and crosses the Juniata River and State Route 45 on a classic Pennsylvania RR stone arch bridge made from a pair of Atlas viaduct kits. Dave Vollmer's N scale Juniata Division captures PRR mainline railroading atmosphere on a layout built to move.





The N scale Pennsylvania RR
Juniata Division is built for mobility

ROADING ON A DOOR OR TWO

BY DAVE VOLLMER
PHOTOS BY PAUL DOLKOS

LAYOUT AT A GLANCE

Name: Pennsylvania RR Juniata Division

Scale: N (1:160)

Size: 6'-8" x 8'-8"

Prototype: Pennsylvania RR Middle Division

Locale: central Pennsylvania

Period: 1956

Style: island

Mainline run: 15.4 feet

Minimum radius: 13.5"

Minimum turnout: no. 5

Maximum grade: none

Benchwork: hollow-core doors

Height: 42"

Roadbed: Woodland Scenics Track-Bed

Track: codes 80 and 55 flextrack

Scenery: extruded Styrofoam covered with Sculptamold

Backdrop: 1/8" tempered hardboard

Control: Digitrax Digital Command Control

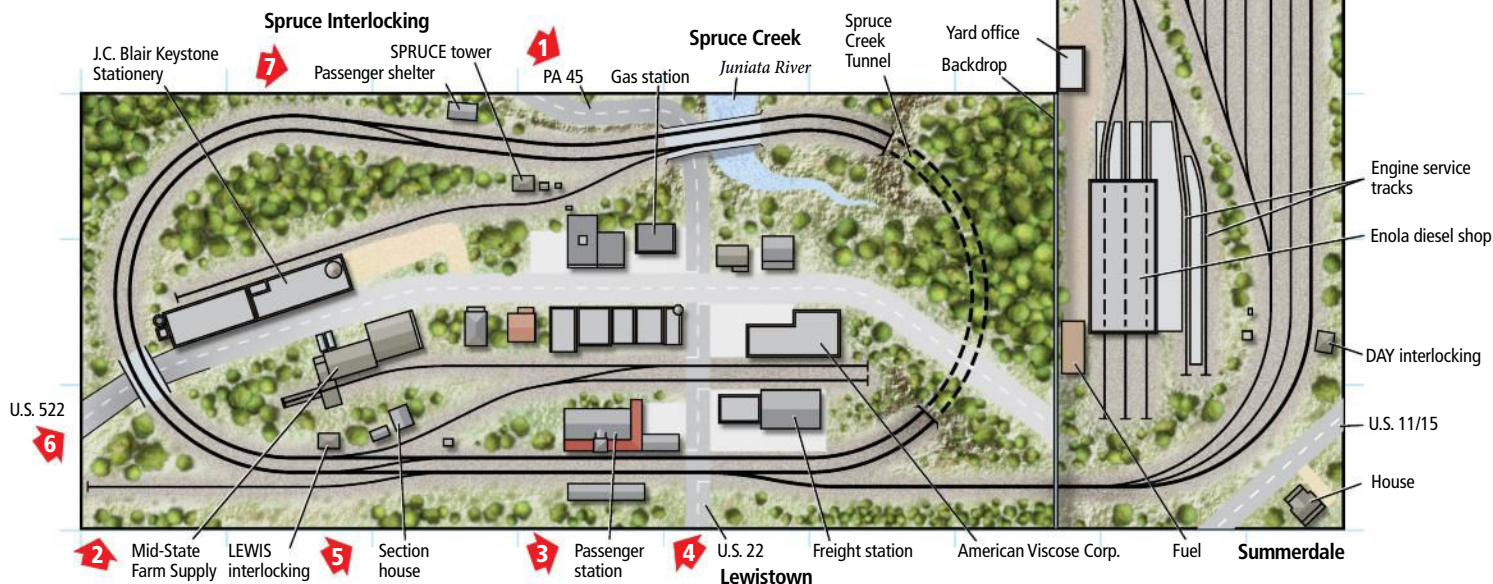
Pennsylvania RR Juniata Division

N scale (1:160)

Layout size: 6'-8" x 8'-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
ModelRailroader.com Track Plan Database.



2 Dave gave his Juniata Division ridgelines to divide its scenes, and added the engine terminal and staging yard in 2009.

I MODEL PENNSYLVANIA RR mainline railroading circa 1956, and I'm an Air Force officer who has to move every few years, sometimes to places where basements are uncommon. Pursuing my hobby concurrently with my career meant I needed a portable model railroad that could still suggest the scale and intensity of a gigantic prototype in an impossibly small space.

I found what I needed in a track plan with a scenic, double-track main line that could be made to look somewhat like the PRR Middle Division as it followed the Juniata River through central Pennsylvania. Astute fans of *Model Railroader* may recognize my track plan as an N scale project railroad from the December 1993 issue, and also appearing in the second edition of *Small Railroads You Can Build* (Kalmbach Books). It was called the Mohawk Division, and was built by Lou Sassi.

After several less-than-fulfilling starts in HO, my requirement for mobility led me to model in N scale. The advantages of the smaller scale were immediately apparent for my purposes. I could run 20-car trains without overwhelming the layout and still take advantage of a healthy scenery-to-trains ratio. I could run two trains at once on the mains while switching with a third. Most importantly, I could take the layout with me when I received orders to move.

As a side benefit, I really enjoy taking the layout to train shows and sharing it directly with the public. It all fits neatly in a rental trailer, and can be handled easily by two people.

As an island design, the layout can fit most spaces, whether bedroom or basement. The real Middle Division was four tracks wide, but even in N scale, a 36"-wide hollow-core door has its limits. I named my pared-down version the Juniata Division in deference to the liberties I took with the prototype.

Although I've tried to develop operating schemes in the past, I'm still just a railfan at heart, and Lou's plan allowed for some great scenic running and photo opportunities. So, plan in hand, I set about making Lou's layout into my own slice of the late, great Pennsylvania RR.

Toward a Pennsy theme

Getting the most out of a small layout is something near and dear to my heart. Over time I've built enough layouts and made enough mistakes that I've learned through experience what works for me. I usually relate most easily to layouts that communicate one central theme.



3 A fast freight led by one of the Pennsylvania RR's many class L1 2-8-2s rolls past the Lewistown freight station and across U.S. Route 22. The crossing shanty is still in place after the recent installation of automatic signals. The locomotive is a kitbash of a Kato United States Railroad Administration Mikado with a GHQ Models conversion boiler (www.ghqmodels.com).

On the Juniata Division, my theme is the PRR's central Pennsylvania main line in 1956, so everything I do is tied to that theme, from architecture to locomotives and rolling stock to scenery. This requires some research to carry off, but prototype research is one of the things I enjoy most about the hobby.

Absent a central theme, a layout's plausibility suffers. This becomes especially true for a small layout where so

much is visible in a single field of view. A secondary benefit of setting boundaries based on plausibility is that you can focus your hobby budget on those things that will contribute to the theme.

It's worth noting that plausibility doesn't necessarily imply prototype modeling. Some of the most believable layouts I've seen have been freelanced. Two HO scale layouts come to mind: Tony Koester's Allegheny Midland and



4 The Lewistown Local, with its usual class H10sb 2-8-0, pulls a pair of boxcars from Mid-State Farm Supply. Behind it looms the J. C. Blair Keystone Stationery plant, a sight familiar to many PRR fans.

Allen McClelland's Virginian & Ohio, both part of the Appalachian Lines.

I knew I wouldn't be able to execute an exact replica of any portion of the PRR Middle Division in my limited space. Instead I've built a prototype-inspired vignette. Over time I've tried to refine the layout's scenes to more closely resemble real locations on the Pennsy.

Pennsy from the track up

To establish my layout as clearly PRR, I set about building a Pennsy-specific railroad infrastructure. The older, 2006 portion of the layout uses code 80 track, which is too heavy even for PRR, but the Enola portion (2009) uses the somewhat more correct code 55 track.

The main lines are ballasted, weathered, and superelevated (banked) to convey the sense of heavy-duty PRR track structure. The ballasted shoulder is deep cinder, a product of thousands of steam locomotives passing by.

The double-track stone arch bridge over Spruce Creek might look out of place on a western-themed layout, but it's almost identical to the dozens of stone arches over the Juniata River on the real

Middle Division, right down to the steel reinforcements the Pennsy added after World War II.

Company buildings receive the two-tone brown with red window sash per P-Company plans, and all wear appropriate keystone signs. Yet another obvious clue that this is Pennsy country are the unique, operating PRR position-light signals. (See "Signaling like the Pennsy" on page 23.)

To those railroad features I added tree-covered ridges, a small town of obvious Pennsylvania architecture, and characteristic signs, including an Eisenhower re-election poster on the drugstore wall. I hope the layout lets visitors see themselves in central Pennsylvania in the summer of 1956.

Trains tell the story, too

When it comes to the trains, I continue the theme by staying consistent with what would have been found on the Pennsy in 1956. I have a collection of Kato GG1 electric locomotives, and though they're correct for the era, the lack of catenary on the Pennsy's Middle Division (and on my layout) means

I usually keep them stored, pantographs down, at Enola.

The last full year of steam operations on the PRR was 1956, and to that end I have amassed a collection of kitbashed and brass Pennsy steam locomotives. In that year, the PRR train-phone induction phone systems were still in use on locomotives and cabin cars (caboosees), so I've added those where appropriate.

Although I will occasionally flex the era to include late 1940s and very early 1960s equipment, most of my freight cars have a reweigh or paint date earlier than July 1956. Recently N scale has seen a boom in highly specific prototype models, and I've been slowly replacing some of my generic cars for more accurate models.

I've found that prototype research in books and with online photos is a tremendous help. In fact, since a small layout requires a smaller roster, it provides an opportunity to focus on individual car and locomotive models. Over time I've come to appreciate subtle differences in prototype cars, and to understand that not all 40-foot boxcars are alike. Although I never had the opportunity to



5 A limited pulls up to the Lewistown depot. David K. Smith kitbashed the structure using two Walthers freight station kits. The full-size station now houses the Pennsylvania RR Historical & Technical Society archives.

A FRIEND COMES THROUGH

THE AMTRAK PASSENGER DEPOT at Lewistown, Pa., is easily recognizable to PRR fans and modern railfans alike, thanks to its recent restoration by the PRR Technical & Historical Society. While I was discussing on the internet about how I might scratchbuild a model of this landmark, friend David K. Smith (owner of NZT Products and *Great Model Railroads 2000* author) offered to kitbash the model for me. Usually I'm a lone wolf modeler, but being a big fan of David's work, I was honored and excited at the prospect of having one of his masterpieces on the Juniata Division. I shared all of the photographs I had from various stages in the depot's life, and Jeff Faulkner of the PRR N Scale Yahoo Group took additional photos for us.

To my surprise, David found the perfect material for the depot from the same Walthers Water Street freight

depot kit that sits across the road from the depot on my layout. To David's great credit, the common origin of the two structures is not at all apparent, and the model is instantly recognizable as an accurate portrayal of the real Lewistown depot. He added the signature filigree ornamentation on the tower and wrapped the main platform in a canopy roof like the prototype's.

The model arrived in the mail less than 48 hours before the photo shoot, so I worked feverishly to integrate it into the layout, adding covered platforms, benches, and passengers. Because David had taken such care to coordinate with me during construction, it fit perfectly and looks as if it had always been there. The bonus, of course, is that this was a gift from a friend that will always have a treasured place on the Juniata Division. — *Dave Vollmer*

see the real PRR during its heyday, I hope I've been able to re-create the feel of its unique equipment and operations.

Maximizing a small space

It's obviously very difficult to convey on a hollow-core door the sheer magnitude of America's "Broad Way of

Commerce," as Pennsy called its main line. It would be tempting to stuff the space with track, which might be effective for the more urban parts of the PRR, but would not convey the rural, scenic Middle Division very well.

What I could do, however, is employ a few tricks to increase the apparent size of

the layout. Lou Sassi's plan already included some interesting over/under interplay between the tracks and the roads, which I preserved in my version.

Additionally, I used a tall, narrow ridge line and Scenic Express SuperTrees to separate the two sides of the main layout and increase the sense of distance.



6 The cabin car on a westbound merchandise freight sails over U.S. 522 outside of Lewistown on the way to Altoona. Dave appreciated the way the Lou Sassi track plan included elevation changes without grades on the main line, and made that part of his Juniata Division scenes. The car is a Bowser PRR class N5 with Gold Medal Models train-phone antennas added.

One sharp turnback curve is hidden in a tunnel while the other is in a deep cut, like the one east of Huntingdon, Pa., on the prototype. I was fortunate that the real Middle Division has a tunnel at Spruce Creek, a good excuse for mine.

I've kept most structures on the small side so as to be dominated by the scenery, with the exceptions being rail-served industries and the signature Lewistown passenger station. (See "A friend comes

through" on page 21.) Also, tree size tapers down toward the ridge tops in order to force the perspective. All these elements combine to make the main layout seem slightly larger than it is.

Time for expansion

By 2009 I'd reached the limit of what I could do on a single 36"-wide door, and a small 3-track staging yard I'd built on the one end didn't come close to meeting

my needs. I decided to expand cautiously, cognizant that I might someday not have room for that extension, depending on where I ended up next.

Starting with an otherwise unused siding, I wrapped the track around into a combination staging yard and engine terminal. As I built and scenicked the yard, it began more and more to remind me of the real Enola Yard at Harrisburg, Pa. This inspired me to abandon my original freelanced place names and try to move the layout toward a more prototypical depiction.

Meantime, the yard provided the room I needed for my growing roster of rolling stock, as well as additional operating interest, from an investment of just over 13 more square feet. A removable sky board enforces the separation between Enola and its river valley setting and the rest of the model railroad's mountainous environment.

With a mainline run of just over 15 feet, the Juniata Division doesn't convey to an operator the same sense of distance the scenery does. Fortunately, there are enough industries on the layout to keep a local freight busy while dodging the many mainline trains racing along the Juniata River. I'm also considering other track changes more conducive to realistic operations in this small space, such as adding another crossover and a passing siding in Lewistown, which I hope won't overcrowd the scene.

Keeping it interesting

Since I enjoy building more than prototype operation, one would imagine that I'd be bored with my railroad by now. The good news is there are plenty of ways to keep a small layout interesting. As my skills evolve and my knowledge of the prototype increases, I've revisited previously completed projects.

For example, the Juniata Division originally included a kitbashed coal mine that really wasn't appropriate for the Middle Division. I replaced it with the J. C. Blair Keystone Stationery factory, based on a well-known trackside landmark in Huntingdon, Pa.

Another recent addition to the layout is a replica of the Penny's iconic station at Lewistown, Pa., built by David K. Smith. This is actually the third depot on that site on my layout.

The most exciting change for me has been developing a full roster of Conrail locomotives and rolling stock circa 1980. I can change eras by swapping out all railroad equipment and vehicles. Then I can enjoy Big Blue in its early years,



7 Guarded by characteristic position-light signals, a string of hoppers carrying bituminous coal rolls eastward through Spruce Interlocking behind a brace of Intermountain F7s equipped with brass train-phone antennas.

SIGNALING LIKE THE PENNSY

THE PRR POSITION-LIGHT SIGNALS were an important feature in carrying out my Pennsy theme. An early innovator in many things, the PRR developed signals that used rows of three amber lights to mimic the arm of a semaphore signal. Some of these signals are still in use. Mine are built from brass kits by Alkem Scale Models (www.alkemscalemodels.com). I wired the true-to-scale signal heads with surface-mount LEDs on brass masts.

I didn't think my small layout justified wiring for multiple electrical blocks, but I still wanted my signals to

indicate track conditions like the real thing. Logic Rail Technologies (www.logicrailtech.com) provided a solution called a Signal Animator. When a train covers an optical sensor mounted between the rails, the signal displays a stop indication. A timing chip starts after the train has cleared the sensor and cycles through approach and clear indications after specified time intervals, which I've set for 10 seconds each. The effect is one of operating automatic signals and helps establish a PRR mainline feel. — *Dave Vollmer*

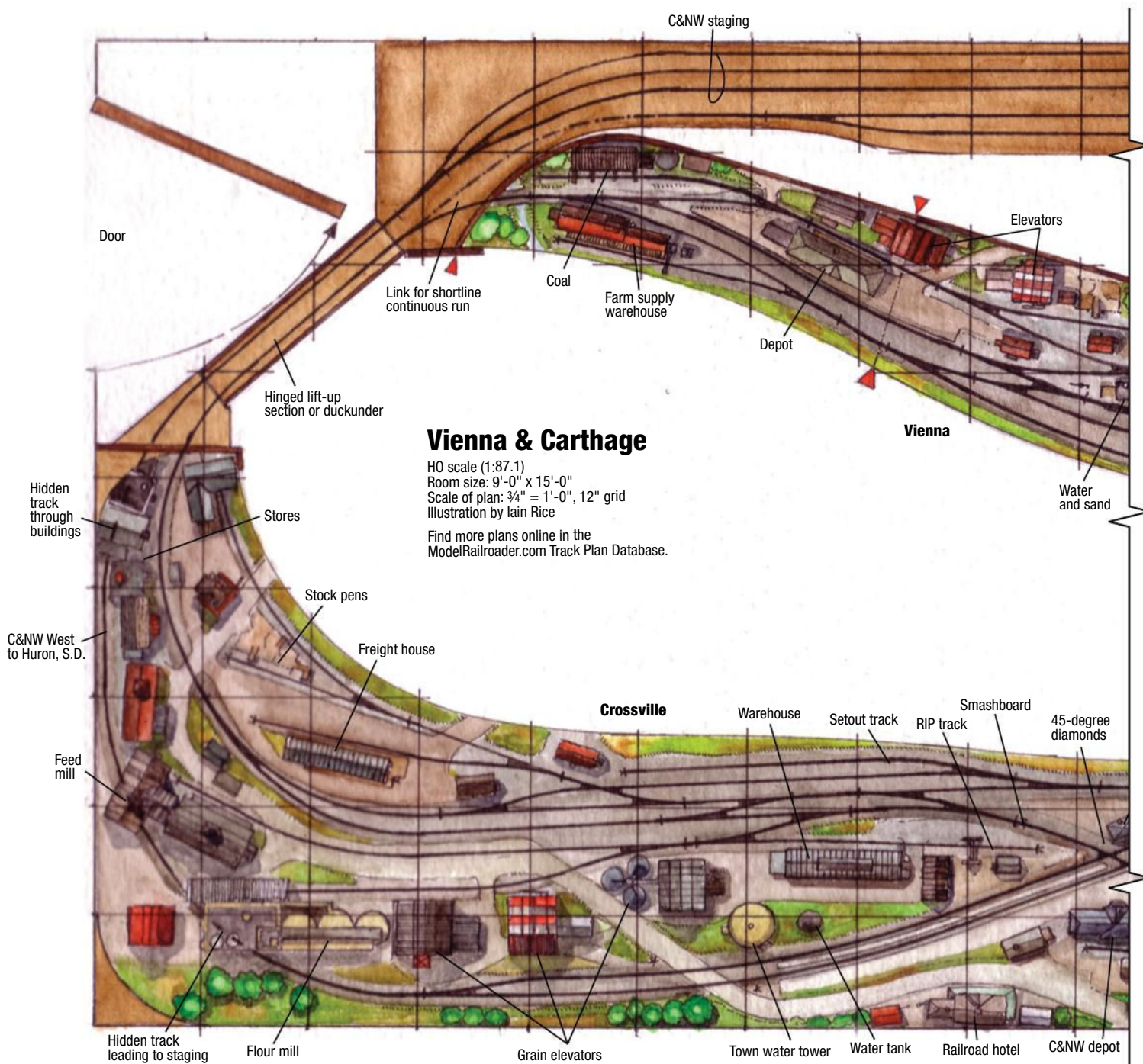
complete with Penn Central patch-outs, piggyback trains, and long coal drags of "fallen-flag" hoppers (from merged or otherwise defunct railroads).

Changing eras has been so enjoyable that now I'm eyeing pure Penn Central as a third potential roster. The history of the PRR's merger with the New York Central, Penn Central's bankruptcy, and the eventual formation of Conrail are at once tragic and triumphant, and also make for some interesting modeling.

I'm not sure what the future holds

for the N scale Juniata Division. I suspect that as long as I remain on active duty, the layout will exist in its current form. However, some day I would like to have a larger, around-the-walls version based on the same section of the Pennsylvania RR that I currently model, although perhaps including some of the electrified territory around Harrisburg so I have room to run those GGIs. In the meantime, I'm grateful to have a layout compatible with my military career.

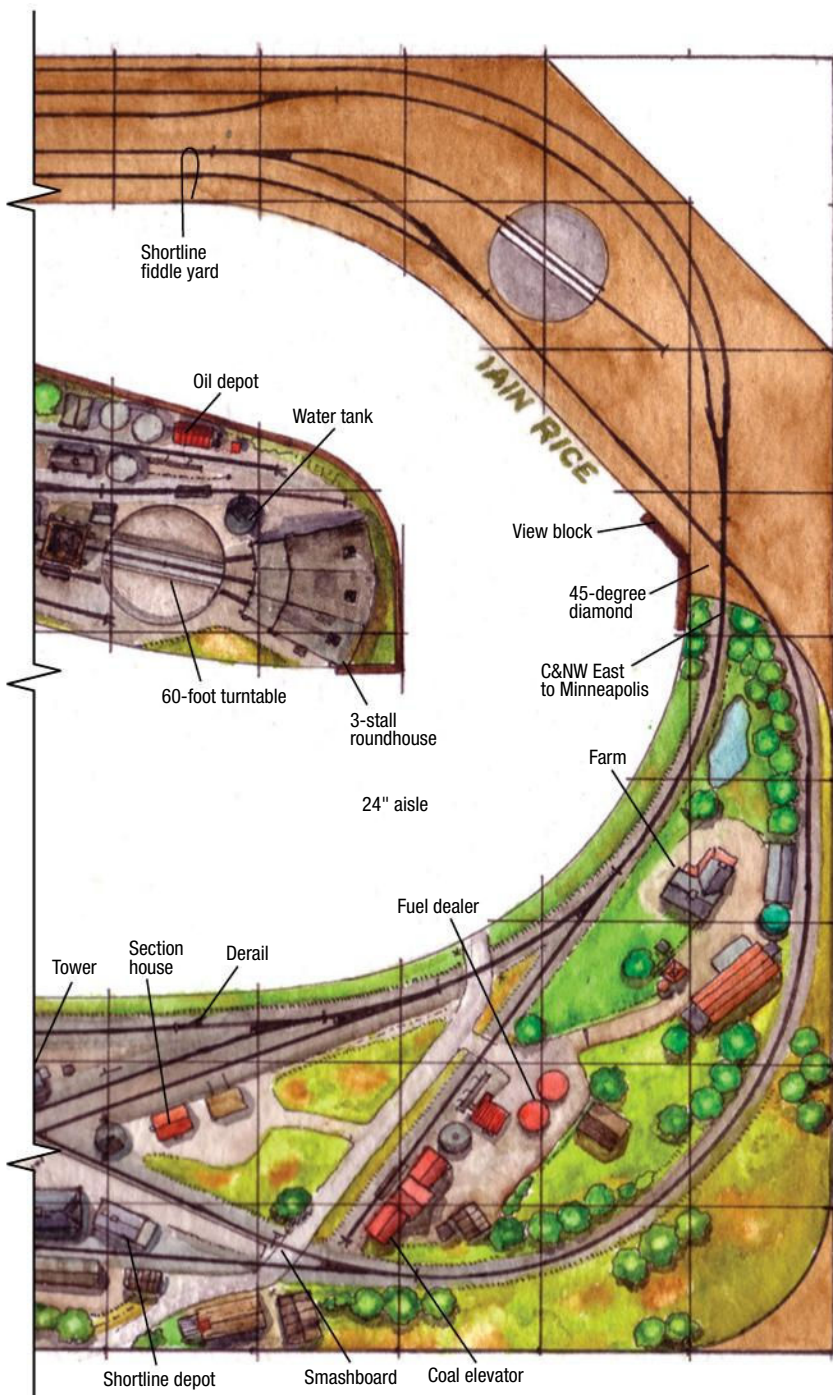
The two sections of the Juniata Division are self-contained, including folding, telescoping legs and handles for lifting, making it ideal for a mobile lifestyle such as mine. It's a comforting thing to be able to run a train through finished scenery within days of moving into a new house. On my layout, that train is likely to be a class K4 4-6-2 with a consist of head-end cars and Pullman sleepers dressed in Tuscan Red and lettered for the Standard Railroad of the World, the mighty Pennsylvania. **MR**



VERSATILE ROOM-SIZE LAYOUT

Two upper-Midwest railroads
cross in a typical town

BY IAIN RICE



LAYOUT AT A GLANCE

Name: Chicago & North Western and Vienna & Carthage RRs

Scale: HO (1:87.1)

Size: 9'-0" x 15'-0"

Prototype: C&NW plus freelanced short line

Locale: South Dakota-Minnesota border

Era: late 1940s to early 1950s

Style: single deck

Mainline run: C&NW 39 feet, V&C 42 feet end-to-end, 37 feet continuous

Minimum radius: 30" (main), 27" (short line)

Minimum turnout: no. 6 (main), no. 5 (short line, yards)

Maximum grade: none

Track: codes 70 and 83 flextrack

Train length: 6 to 10 feet

Such trains are the bread and butter of a room-sized model railroad.

And that's what this is – a modest layout designed to represent a "typical American railroad" (if there is such a thing) for my friend Andrew to fit in a 9 x 15-foot spare room. That 135 square feet could also be found in a compact one-car or half of a two-car garage, an attic, or a smaller basement.

A mainline radius of 30" is no problem, either practically or visually, and the train lengths in the range 6 to 10 feet that can be accommodated are long enough for realistic consists in HO. Also on the plus side, a mid-sized compact layout like this makes for an achievable one-person project.

So what sort of a model railroad can you pack in this space, and what sort of operation will it offer?

A versatile layout

In the normal course of operations on a full-size railroad, a train will be doing one of three things: highballing, switching, or waiting on a siding (for a scheduled departure time, a connection, or a meet with an opposing train on a single track line). In the real world, waiting is a big part of the railroading game.

All other operational functions of a full-size railroad are geared to enabling trains to do these three things. Locomotives will visit engine terminals for servicing and repairs, passenger cars will be cleaned and restocked, reefers will be iced, and defective cars will be repaired often on a RIP (repair-in-place) track or set out on a siding. Maintenance-of-way

I'VE ALWAYS HELD that designing a smaller layout is more demanding than planning a big one, as every inch counts. This is particularly true where the layout has to cover all the bases of prototype operation from long-distance and local passenger trains, through freights as well as peddlers serving local industries, general merchandise less-than-carload-lot (LCL) traffic, mail and express, and special ladings like milk or livestock. And don't overlook the servicing of the locomotives hauling all this traffic. Each of these functions demands the provision of suitable facilities on the railroad, which is difficult to arrange on a small site without unrealistic crowding.

Full-size railroads, as opposed to models, are rarely short of real estate, and many facilities sprawl over large areas. And it seems that the more recent the time frame, the more things spread out – not surprising in these days of mile-long blocks of double-stacks, grain hoppers, or unit coal trains. Go back 60 years when freights were shorter and locals roamed the rails, and things become a lot more manageable.

Similarly, many passenger trains consisted of two or three head-end cars trailed by one or two often-empty coaches. In this transitional era, power could be either surviving steam or modest consists of compact first-generation diesels.



crews and their equipment will be deployed to keep the line in good order. And, on those hopefully rare occasions when it all goes pear-shaped, the wrecking gang will be called out and given a priority path to the scene of the mishap.

To replicate the basic three states of train operation on our model railroads, we need to provide four types of track: a main line for highballing, yards and/or industry spurs for switching, sidings where trains can sit and wait, and off-scene staging or fiddle yards from which trains enter or leave the modeled area.

Organizing such varied track arrangements on a large basement model railroad isn't usually too much of a problem. On a small layout in a spare room, however, it's more of a challenge if things aren't to get unrealistically crowded.

Achieving maximum operational variety combined with realism in a small space is all about making an apt choice of prototype and location and selecting Layout Design Elements (LDEs, visually and operationally recognizable models of prototype locations) that live convincingly together while ticking all the operational boxes.

A designer's best friend

When it comes to LDEs that pack a lot of operational bang for the prototypical buck, that characteristic Midwestern scenario where two railroads cross at grade and interchange cars has a lot to offer. A diamond implies two through routes, so you're going to have at least

some track on which to highball, with the added drama of being able to watch trains hammer across the diamond, plus the scenic and operational bonus of an interlocking plant of some sort.

Add on to that an interchange track and you have a switching area that can handle pretty much any type and quantity of car and lading. Prototypically spice the mix with a small interchange yard, and you've got yourself a classification area as well as a place for trains to wait, ticking another basic operational box. Locate your interchange on the edge of a town and you can mix in a freight house, team track, and industry spurs.

Moreover, the crossing doubles your choice of prototype to model, as you'll usually be modeling the trains of at least two railroads. This offers not just variety in equipment and paint schemes, but also the chance to model two very different styles of railroad: a major carrier and some lesser railroad, or a main line crossed by a branch, a mining or logging railroad, or even an interurban.

The other bonus a crossing introduces is that of conflicting train movements. This is something the prototype strives hard to eliminate, but it's bread-and-butter to model railroaders. Where would we be without opposing trains, switching moves that tie up main lines, and peddlers and drag freights trying to keep out of the way of passenger trains or symbol freights?

Of all the operating conflicts on a full-size railroad, a crossing with another

railroad is the most intransigent, as it's a place where the other guy can hold you up without you being able to do a thing about it. Having a crossing on the layout can also introduce another job – tower operator – while serving as a linchpin around which to build the whole operating scheme of the layout.

Selecting the location

Contrasting trains are one of the potential benefits of these railroad meeting-places. Given an equipment druthers list running from turn-of-the-century steam well into its twilight phase to gleaming E or F units fresh out of Electro-Motive Division's LaGrange, Ill., factory, then planning the layout around equally contrasted railroads is an obvious ploy, with a minor branch or short line tiptoeing across the high iron of a busy Class 1 main line.

In the Midwest, there are lots of branch lines to choose from, including those worked by the C&NW or Chicago, Burlington & Quincy, but fewer independent short lines. Those smaller roads that I did find in the pages of Lucius Beebe and Charles Clegg's classic *Mixed Train Daily* (Dutton, 1947) and Don Ball's *America's Railroads* (Norton, 1980) included appealing prototypes, such as Iowa's Manchester & Oneida; Indiana's Louisville, New Albany & Corydon; and Minnesota's Duluth & Northeastern, which used steam well into the 1960s.

These lines struggled on into the post-World War II era with classic Americans



One of the C&NW's high-drivered class D Atlantics (4-4-2s) pauses briefly at Wittenberg, Wis. This is the sort of compact but glamorous motive power Iain had in mind when designing this track plan. Photo courtesy Chicago & North Western Historical Society

(4-4-0s), Ten-Wheelers (4-6-0s), or Consolidations (2-8-0s) powering short freight or mixed trains featuring wood passenger cars and sway-backed cabooses. Mind you, it wasn't only the one-horse short lines that featured elderly equipment picking its way through the weeds. Many of branch lines of the Midwestern Class 1 roads looked much the same!

So, in search of a setting for the widest possible variety of equipment in the context of a believable Midwestern setting, I based my layout plan on the edge-of-town crossing of a freelance independent steam-worked short line with a single-tracked main line of the C&NW. That ruled out the double-track Chicago-Omaha trunk route, so I looked farther north and selected the looping arm of the Dakota main around the Minnesota-South Dakota state boundary.

The crack train in those parts was the very modelable six-car Chicago-Huron, S.D., *Dakota 400*, introduced in 1950 complete with E units and streamlined cars. By contrast, at this time the *Dakota's* main also saw several steam-hauled long-distance passenger trains, including train 515/516, the *Minnesota and Black Hills Express*. It took two not-very-express-like days to pick its way from



The Chicago & North Western and subsidiary Chicago, St. Paul, Minneapolis & Omaha both served Wyeville, Wis., shown here circa 1917 looking northwest up the Omaha toward the Twin Cities. The joint depot inspired the crossing on Iain Rice's HO track plan. Photo courtesy Chicago & North Western Historical Society

Chicago to Rapid City, S.D., but it offers a good excuse to run a Pacific and heavy-weight cars.

To complete the contrast between the two railroad elements of my room-sized slab of South Dakota, I've given them two very different formats. The fictional short line is essentially end-to-end, although a continuous connection is possible, as shown dashed on the plan. I've christened it the Vienna & Carthage, which links two real places and has a grandiose ring to it. The line runs from its terminus out on the remote prairie at Vienna via the railroad town of Crossville, S.D. (fictional, but located somewhere west of Arlington), where, after crossing the C&NW, it theoretically continues southwards toward Carthage but actually runs into an active fiddle yard.

The C&NW, by contrast, is an oval continuous-run track served by an off-scene ladder. The two routes cross twice: once visibly in Crossville and once discreetly in the offstage area, which brings the Carthage fiddle yard to the front of the mainline staging tracks for better accessibility. Vienna, the short line's northern terminal, is fully modeled on a narrow peninsula in the center of the room. Being designed in a British context, the Vienna scene is contrived as two portable layout sections to take to the many exhibitions that form such an important part of the model railway hobby in England where I live.

A very ordinary railroad

This is a straightforward exercise in transition-era model railroading. Track on the short line could be laid with Micro Engineering code 55 and 70 flextrack with plenty of weeds in the ballast, with much-more-substantial-looking code 83 on the main line. The C&NW has a

passing track here for east- and west-bound trains to meet or pass; the resulting pair of 45-degree crossings would all be laid in the heavier rail.

The depot serving both lines was inspired by the C&NW prototype at Wyeville, Wis. I show train-order signals and semaphores on the main line and smash boards for the freelanced V&C short line. The interlocking tower would be a C&NW structure, as would be the section house and water tank.

The V&C's Crossville terminal is ordinary enough: a three-track yard with a setout spur, a RIP track, a small freight house, some stock pens, and a shack for the agent. Local industries include a fuel depot, a storage warehouse, a feed mill, and a row of four grain elevators, the end-but-one in the row straddling the hidden-return section of the C&NW. This track also sneaks through several town structures on its way to staging.

Also ordinary is the simple stub-end shortline terminal at Vienna, although the small timber coal dock and three-stall roundhouse might call for some scratchbuilding or kitbashing. The turntable is a 60-footer, just big enough to handle the V&C's projected roster of a Bachmann 4-4-0, a 4-6-0, and a 2-8-0. The track running behind the depot to serve yet more grain elevators depicts a classic prairie-railroad arrangement.

All in all, this is a very ordinary slice of history, the essence of the traditional common-carrier railroads that served the America heartland for more than a century. In that respect, I suppose this plan can lay claim to being the "truly typical" piece of railroad that the friend I conceived it for was looking for. All I have to do now is get him busy building – and negotiate running rights for my old brass C&NW Atlantic! **MR**



1 As soon as its door is closed and a seal is applied, the CSX (ex-Chessie System) boxcar will be pulled from Harlin Supply on Paul Newton's HO module. Paul scratchbuilt the fence using corrugated siding from Campbell Scale Models.

LOTS OF SWITCHING IN A SMALL SPACE



2 Photographed outdoors, it's hard to believe this eye-level photo was shot on a 2 x 6-foot HO switching module. Its compact size allowed plenty of time for detailing.



3 Paul added a light-color wood fascia and tan upholstery fabric to the layout's frame to give it a finished appearance. It serves as both a stand-alone switching layout and as one of more than 25 modules comprising the Northeast Florida Model Railroaders layout.

A module that serves as a complete layout or part of a larger system

BY PAUL NEWTON

PHOTOS BY FRANK DIFALCO

IN TODAY'S WORLD OF LONG TRAINS, big 6-axle locomotives, and flashing red lights replacing cabooses, it's comforting to know that spotting a single boxcar at a warehouse is still an integral part of railroading. As a railfan, I enjoy watching a local freight switch, and it can be equally entertaining to re-create that scene on a layout.

Despite covering only 12 square feet, my HO scale CSX Ridgecrest module serves as my home layout and as part of the 70-foot-long club layout of the Northeast Florida Model Railroaders.

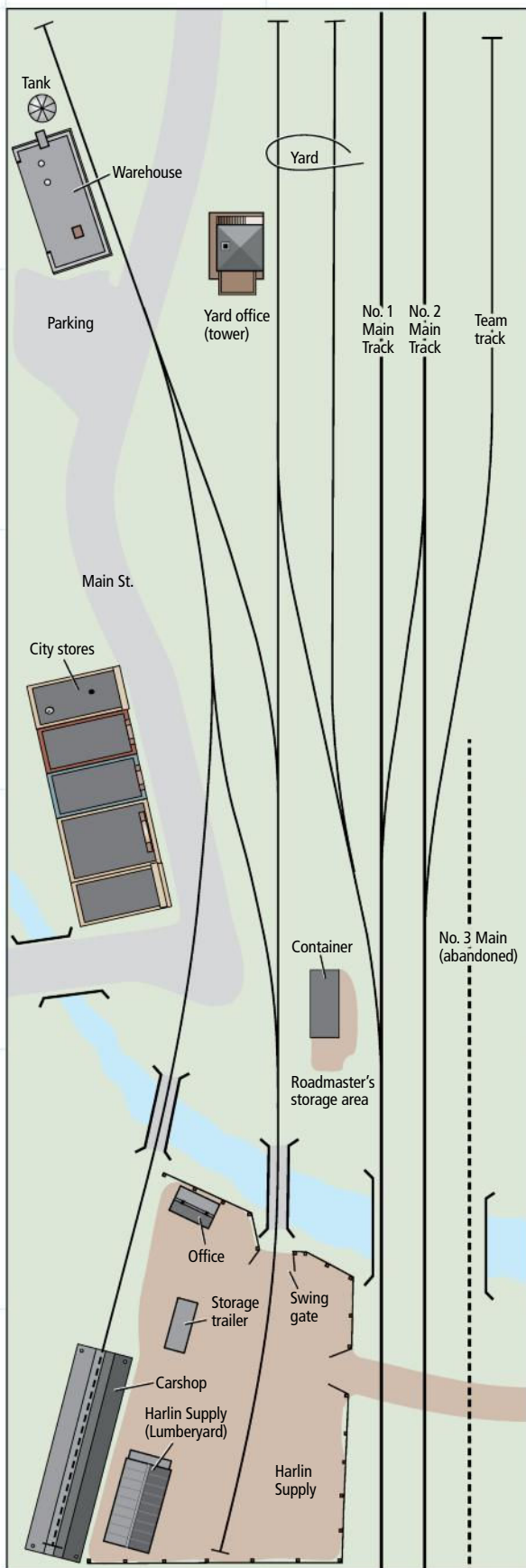
Designing the module

As I designed my layout, I had to work within space constraints. I was adamant about including a small yard and at least three industrial customers, yet I didn't want so much track that the track itself became the focal point. I wanted the track to blend into the scene around the rail customers. The club's two standard main lines are Atlas code 100 track and turnouts, and the rest of the module uses code 83 track. All of the module's trackwork is laid on cork roadbed.

The powered mainline crossover is activated by a toggle switch wired into the interlocking signals. This helps create the effect of a CSX double-track main line with Centralized Traffic Control (CTC). The turnouts off the main lines have tall manual switch stands from Caboose Industries. The other switches use ground throws.

To spot cars in the stub-end tracks facing both ends of the layout, I had to include a runaround track that could comfortably hold a 60-foot car. I also added the crossover on the main line so both tracks could be used for switching. In fact, the outside main becomes a third yard track or storage track as needed.

To me, street running is an intriguing aspect of railroading, so I wanted to re-create a small piece of that. It occurs right



CSX Ridgecrest

HO scale (1:87)
Scale of plan: 1½" = 1'-0" (12" grid)
Illustration by Jay Smith

Find more plans online in the
ModelRailroader.com Track Plan Database.



4 EMD MP15DC no. 1145 pauses in the yard on Paul Newton's CSX Ridgecrest layout. The former interlocking tower now serves as the yard office.

outside the front doors of the layout's business district on the track that leads to the carshop. The street running certainly gives me a reason to embrace locomotives with sound, as the locomotive bell gets plenty of use.

Finally, I added a team track up front to create even more switching versatility. Like many team tracks, it's covered with weeds and adds a lot of detail and character to the foreground.

Freight cars and buildings

Collecting and operating freight cars is an important part of the hobby for most model railroaders, and I'm no different. That's why it was important for me to create customers that could logically receive a variety of car types.

Harlin Supply, the lumber and building-supply company on the left side of the layout, receives freight from boxcars and center-beam or bulkhead flatcars. The small brick warehouse on the back right side can receive many different types of boxcars. The narrow car shop at the back left can receive virtually any type of car as long as the car doesn't exceed the Association of American Railroads standard Plate C clearances [10'-6" wide and 15'-6" tall – *Ed.*]. The team track can handle a variety of cars as well.

Harlin Supply is kitbashed from the popular Atlas lumberyard kit. The carshop consists of two United Trucking Terminal kits from Walthers, kitbashed to extend the length of the building. I added a large opening at one end to allow railcars to

LAYOUT AT A GLANCE

Name: CSX Ridgecrest
Scale: HO (1:87)
Size: 2'-0" x 6'-0"
Prototype: CSX
Locale: no specific area
Era: varies
Style: module
Mainline run: 6 feet
Minimum radius: 18" on sidings
Minimum turnout: no. 4
Maximum grade: none

Benchwork: tabletop
Height: 40"
Roadbed: cork
Track: codes 83 and 100
Scenery: ground foam
Backdrop: Instant Horizons scenes glued onto hardboard
Control: NCE Digital Command Control (DCC) or MRC Tech II power pack (DC)



5 The switch engine heads into the street-running track in the business district. This photo shows how much scenery depth can be achieved in 24".

enter the structure. It's not tall enough, however, for many of today's common excess-height cars.

The brick warehouse is the main building from Walthers' O.L. King & Sons Coal Co. kit with a roll-up warehouse side door added. The tower that serves as a yard office is the familiar interlocking tower kit from Atlas. The layout's business district is Walthers' Merchant's Row I.

For better or worse, the era that I model seems to keep widening. I'm a big fan of new, modern railcars, yet some of my earliest rolling stock representing a vanishing era is still fun to operate. I've tried to resolve this time-warp dilemma to my advantage by selecting buildings for the layout that span the years from the 1950s through today. Then, simply by replacing the modern vehicles with earlier-era counterparts, I can move the railroad back in time.

Scenery and weathering

Most of the layout's scenery is made from Woodland Scenics materials. The rolling hills are shaped layers of foam insulation board. For grass, I tend to use dark-green ground foam, as I've found that over time, dust and sunlight lightens the scenery. I also blend the colors of ground foam for variety.

The trees came from many manufacturers. I made the water in the creek using Enviro-Tex Lite, a two-part resin material.

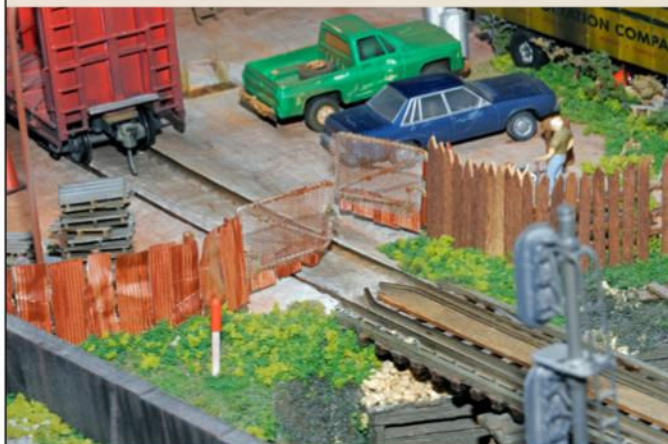
Everything on the layout is weathered to some degree. My rule is nothing goes on the layout until it's weathered. Rub your finger along even brand-new prototype cars or locomotives, and you'll discover they're already slightly grimy. Even the new red SUV rolling down Main Street has a light dusting of dirt on the underframe and sides as well as on the wheels.

I prefer powdered pastels, but I'm also a big believer in airbrushing, so nearly everything also receives some weathering with my airbrush and Floquil paints. I believe an airbrush applies the smoothest, most realistic coats of weathering and dulls unrealistically glossy items. But I also always keep a spray can of Testor's Dullcote handy.

Module operations

I can operate the layout either with Digital Command Control (DCC) or a DC power pack. Switching cars is enjoyable, but that enjoyment is enhanced when my layout is connected to other modules. Setting out cars from a long freight train into the small yard is fun. And moving a car from the team track across the main lines to the yard can be challenging while long trains are rolling past in either direction.

OPEN THE GATE TO REALISM



6 Paul made working hinges so the gate in the fence surrounding Harlin Supply has to be opened, adding another step to the switching moves.

IT'S THE SMALL DETAILS that add realism and fun to a small layout. Take, for example, the security gate across the track entering Harlin Supply. Many railroad customers, including lumber companies and others that store materials outside, will fence their property with a gate across the tracks for access. When the local arrives to pick up or set out cars, a crewman unlocks the gate and swings it open. Later, they'll close and lock the gate after the engine leaves.

I built the gateposts from Northeastern Scale Lumber Co. 6 x 6 lumber. The frames of the gates are made from brass rod bent to the general outline of a gate. The two tubes that the frame fits into are made from metal tubing, available from K&S Engineering, that's sized to accommodate the gate's brass rod. I then glued on panels of Scale Structures Ltd. chain link fence to complete the gate. — Paul Newtonson

For modelers who are new to the task of switching cars into facing-point spurs, consider this scenario: An empty car at Harlin Supply has to be picked up and returned to the yard. Meanwhile, a manifest freight just dropped off a load at the yard to be placed at Harlin. You'll need to use the runaround track to swap these two cars around.

When running around a car, I try to spot the freight car on the front side of the runaround, so that only the locomotive has to negotiate the diverging legs of the two no. 4 turnouts at the rear of the runaround.

A second module

I'm planning to construct a second module soon, as opposed to a permanent layout. The portability of modular railroading allows the layout to easily move with me. Moreover, I can incorporate my module into a permanent layout someday.

Meanwhile, this has been a fun switching layout to build and now to operate, whether or not it's connected to a larger layout. I can set up switching scenarios that take only a few minutes to complete, or may take quite a while to figure out. So while moving a long freight or high-speed passenger train around a layout is definitely a thrill, firing up the local switcher and serving nearby customers can be just as compelling. **MR**

ALICE STREET

A highly prototypical N scale track plan for a Santa Fe rail-marine operation in Oakland, Calif.

BY ANDY SPERANDEO

PHOTOS USED BY PERMISSION OF THE
SANTA FE RY. HISTORICAL & MODELING SOCIETY



THE SANTA FE'S FIRST & ALICE STREET YARD

was a compact industrial area along the waterfront in Oakland, Calif. It had no direct rail connection with the rest of the far-flung Atchison, Topeka & Santa Fe Ry. The yard did have a little-used interchange track connecting with the Southern Pacific, but most of its traffic came and went by way of the "Santa Fe Navy," railroad-owned carfloat barges and tugboats that plied San Francisco Bay and connected with five other rail-marine terminals.

I first became aware of Alice Street when I operated an HO scale shelf layout based on this prototype built by my friend Bill Childers in Fort Worth, Texas. It featured industrial switching concentrated in a small area along a narrow shelf, and it used the car floats both to move a variety of cars on and off the layout and to store them as if in staging. I'd seen other model railroad designs and

actual layouts featuring this kind of operation, but hadn't associated this concept with the AT&SF. (Yet I should have, having seen photos of Santa Fe tugs, one even painted in a variation of the famous "warbonnet" passenger diesel color scheme.)

I learned more about Alice Street from Bill's article in the 3rd Quarter 2001 issue of the Santa Fe Ry. Historical & Modeling Society's *Warbonnet* magazine. That issue also showed his Alice Street layout. More recently, an article by *Warbonnet* editor John R. Signor in the 1st Quarter 2011 issue covered the Santa Fe's San Francisco Bay rail-marine operations more generally. (You can find back issues of the *Warbonnet* at www.atsfry.net. You don't have to be a society member to buy them.)

All of this prototype information contributed to the N scale track plan

shown here, which first appeared in the February 2011 *Model Railroader*.

I had only a few paragraphs there to explain my layout design, although I had more to say. This article allows me to go into a little more detail and share more information on the subject.

So why is it a 4 x 8?

Before I retired from the magazine's staff, former MR editor Neil Besouglloff wanted to offer readers a variety of track plans for the common 4 x 8-foot layout size that so many hobbyists begin with. He asked each of us on the staff to design a layout of that size, guaranteeing that they'd all be different.

We were all aware of the advice offered by layout-design gurus to cut the 4 x 8

IN 4x8 FEET



sheet of whatever material into narrow strips and build shelf layouts. But Neil was aware of that too, and he told us that he wanted plans for 4 x 8-foot table layouts, not shelf railroads.

To make the assignment more interesting, I decided to try to come up with a prototype-based track plan. And when I think of prototypes, I naturally start with my own favorite, the Santa Fe. Reviewing familiar AT&SF station and yard layouts to find a suitable modeling subject, the First & Alice Street Yard quickly came to the fore. It had several appealing features:

- Shape: OK, it wasn't a rectangle, but it seemed close enough to the 1:2

proportions of the 4 x 8 to allow a reasonably true-to-life N scale track plan. I like following a prototype track layout because it tends to impose realistic operating patterns on us hobby railroaders.

- Marine connection: Staging can be a challenge on the smallest layouts, but car floats allow rolling stock to readily move to and from the rest of the Santa Fe system and the national rail network. As I'd seen on Bill Childers' layout, car floats can also serve a storage function just like the cassettes used in British-style fiddle yards.

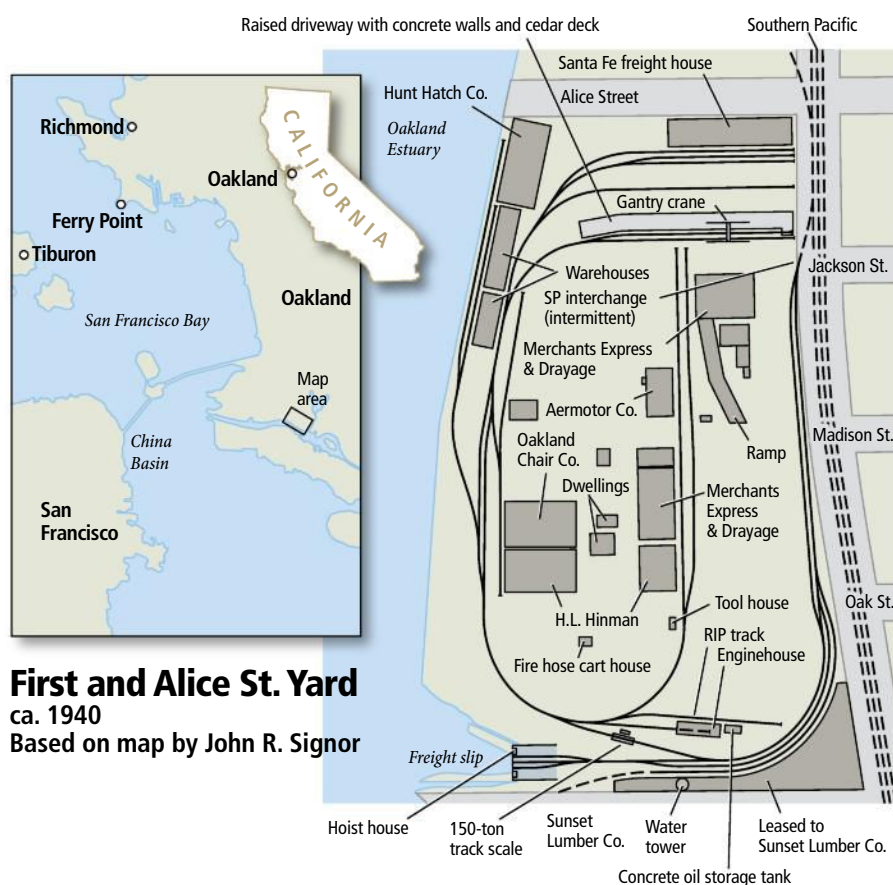
- History: Although the First & Alice Street Yard was eventually ripped out in

The Santa Fe's First & Alice Street Yard was an isolated industrial district in Oakland, Calif., connected to the rest of the system by car floats. In this 1952 view, a General Electric 44-tonner switches reefers on the team tracks. The building at right is Monahan Paper on the Southern Pacific. John R. Signor collection photo



In this aerial view of the Alice Street complex from 1921, the freight slip is at the lower left on the Oakland Estuary, First Street runs up the right side with Southern Pacific tracks in

the street, and Alice Street crosses First at the fifth intersection up from the bottom. The AT&SF freight house goes left from First and Alice. John R. Signor collection photo



First and Alice St. Yard ca. 1940

Based on map by John R. Signor

favor of expanded parking for Oakland's Jack London Square, it was a functioning terminal operation from 1904 through the 1950s. (The freight agency closed in 1958, and the freight house was razed in 1966.) That gives modelers a choice of periods, including Alice Street's own

steam-diesel transition in 1952, when 0-6-0s gave way to 44-ton General Electric steeple-cab units.

• Point-to-point schematic: At first glance the real Alice Street layout might look like a typical oval model railroad, but look closer. There was no continuous

running at Alice Street, and the crews didn't take the engine from one end to the other unless there was work to do when they got there.

The same is true of this track plan. I'm sure many of you will think of joining the layout's SP connection and one of the team tracks to make an ordinary oval, but I hope you won't. As it stands, Alice Street is small, but it's really a railroad.

Track plan details

I chose a minimum radius of 12", a little larger than the "N scale minimum" of 9³/₄". This will make the equipment look better and make it easier to shove long cuts of cars reliably. I'd still advise keeping most of the rolling stock to less than 50 scale feet in length. I'd also suggest body-mounting all the couplers for reliability in switching. You don't need so many cars on this layout that this should be a great burden, although with car-float cassettes you can expand your roster as much as you'd like.

The plan shows the center locations for the major curves. Use these to assist in accurately drawing out the track layout on whatever tabletop material you choose. I drew the plan using the specifications of Atlas code 55 turnouts, and the matching code 55 flextrack would look good in Alice Street's industrial setting.

Experienced N scalers know that Atlas code 55 track hasn't always been readily available, and if you really want to get your Alice Street layout started quickly, you can look at handlaying the

TRACK PLAN AT A GLANCE

Name: First & Alice Street Yard

Scale: N (1:160)

Size: 4 x 8 feet

Prototype: Atchison, Topeka & Santa Fe industrial terminal

Locale: Oakland, Calif.

Era: 1904-1958 (plan based on drawing representing the 1940s)

Style: tabletop

Mainline run: no main line

Minimum radius: 12"

Minimum turnout: no. 5

Maximum grade: none

Train length: switching operations only

track. This is a small enough model railroad that tracklaying from scratch wouldn't be an endless chore, and you'd learn a lot too. When you know how to build your own turnouts, the commercial products pretty much lose whatever mysteries they once held.

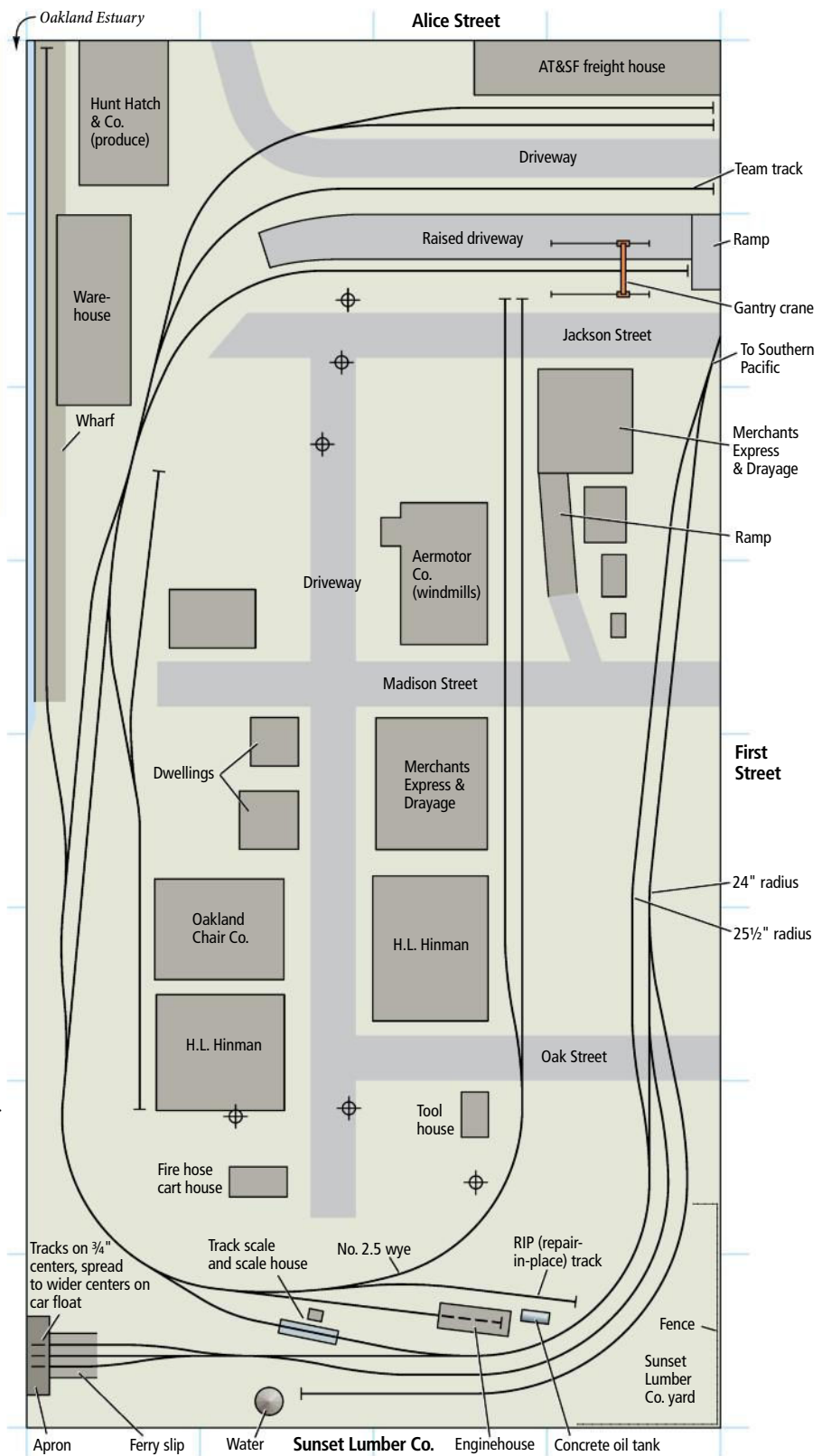
I've labeled each edge of the plan for the boundary features that defined the Alice Street property. The left edge on the page is the Oakland Estuary, the waterfront at Alice Street. The top edge is Alice Street itself, and the right edge is First Street, where the Southern Pacific's main line ran right down the middle of the roadway. The lower boundary is the property line of an industry, the Sunset Lumber Co. The yard space along the spur there can be detailed with stacks of lumber being loaded into freight cars.

I've also included the road grid for this area on the plan. Such a grid is one of the most characteristic features of urban districts, and here it helps to put Alice Street in its City of Oakland setting.

Where do the car floats go?

On the plan I've indicated only the apron that connects to the car floats and the hoist house that raises and lowers the apron to match the freeboard of the barge. The three tracks on the apron are tightly spaced as on the prototype and don't allow clearance on more than one track at a time. This reduced the width and weight of the apron, with the tracks spreading out again on the barge to allow loading on three parallel tracks.

An extension shelf, perhaps a temporary clamp-on in the manner of David Popp's extensions for the MR Beer Line project layout, shown in the January 2009 issue, could be added to the Alice Street 4 x 8 to support a car float and even a tug. This would allow you to use



First & Alice Street Yard Atchison, Topeka & Santa Fe Ry.

N scale (1:160)
Layout size: 4 x 8 feet
Scale of plan: 1" = 1'-0", 12" grid

All turnouts no. 5 unless marked
Minimum radius 12"
Illustration by Rick Johnson
Find more plans online in the
ModelRailroader.com Track Plan Database.



Looking south along the Oakland waterfront, car float No. 3 is tied up at the Alice Street slip along with the Santa Fe tug *Richmond*. The tall structure to the left is the hoist house that adjusted the ferry apron's height. Vernon Sappers collection photo



Although taken at Ferry Point in 1962, this photo shows the same kind of apron hoist used at Alice Street, and the three tracks on the car float squeezing together to meet the closely spaced tracks on the apron. Jack Whitmeyer photo

car float barges – if not detailed models, at least wooden planks with lengths of track – as staging cassettes to move cars on and off the layout. See “The Santa Fe Navy” on the opposite page for information on the prototype vessels.

Industries

The wharf and the freight station/team track complex were probably the busiest “industries” in Alice Street’s heyday. The wharf is rather compressed on the layout due to space constraints, but the freight station can boast a near-prototypical complement of tracks – a bit foreshortened, of course. The good news is that as trans-shipment points rather than actual producing or consuming industries, these can use many types of cars.

The Merchants Express & Drayage buildings serve a similar function to the

freight station as terminals for a local trucking operation. Both Merchants Express and the freight station can load merchandise and LCL (less-than-carload lot) cars for scheduled car float (and ultimately freight train) connections. Both can also load and unload cars on parallel tracks: Spot the cars so their doors line up to allow placing bridge plates to connect the outer car to the loading dock through the inner car.

The Sunset Lumber Co. was a sawmill operation and a major shipper, so several cars at a time can be spotted for loading on its long spur. Remember that for most of Alice Street’s operating life, finished lumber mainly moved in boxcars, with flatcars and gondolas used for rough-cut lumber and larger timbers. Bulkhead flats carrying packaged lumber and wall-board didn’t come on the scene until the

LEARNING POINTS

- It’s possible to accurately model a carefully selected part of a prototype railroad on the classic 4 x 8-foot table.
- The car floats that connected the railroad to the rail network can serve as portable staging yards or fixed fiddle yards.
- Despite the railroad’s small footprint, it served several major industries.
- Unloading or loading a barge isn’t as simple as it may seem.
- Either steam or diesel operation is appropriate.
- This plan offers the opportunity to do some marine modeling.

middle 1950s. One source says Sunset Lumber closed in 1945, but keeping it in business for a few years more would be a reasonable compromise.

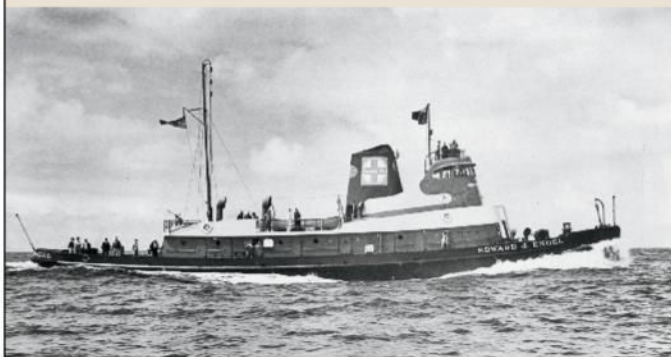
The other industries are labeled on the track plan. Hunt Hatch received produce by boat from the Sacramento River Delta and packed it for shipping. The Aermotor Windmill Co. is a branch of that large manufacturer specializing in windmills and other machinery for ships. This is a business most of us might not think to include on a model railroad, and that’s one of the pleasures of following a specific prototype.

There can be challenges too: The H.L. Hinman Co. is identified, but I haven’t been able to learn what kind of a business it was. [A reader wrote that it was an LCL business. – *Ed.*]

Operation

I’d begin a shift at Alice Street by pulling outbound cars from their spots

THE SANTA FE NAVY



The last tugboat built new for the Santa Fe, in 1945, was dressed with a streamlined superstructure and a red and silver "warbonnet"-inspired paint scheme. A yellow oval-cross Santa Fe emblem decorated the front of the *Edward J. Engel's* wheelhouse. Kansas State Historical Society collection photo

THE SANTA FE'S EARLY CAR FLOATS were wooden barges with steel chafing surfaces. Numbered 1 through 3, they were 261 feet long and had a beam (width) of 41'-6". The 3rd Quarter 2001 *Warbonnet* includes a scale drawing. Two all-steel barges were added later.

The newest steel floats, Nos. 6 through 9, were 260 feet long with a 38-foot beam. All of the steel barges had rudders to assist in maneuvering and were steered from an elevated wheelhouse at the stern. For scale drawings, see the 1st Quarter 2011 *Warbonnet*. The barges held 8 to 13 cars.

Santa Fe tugboats moved the unpowered barges around the bay. There were eight of these over the years, but usually only three or four in service at one time. The *Edward J. Engle* of 1945 was built with a streamlined superstructure dressed in warbonnet-style red and silver.



Car float No. 4 is taken west through the Oakland Estuary by an unidentified Santa Fe tugboat in 1923. Alice Street was one of six terminals connected by water to the Ferry Point slips near the railroad's Richmond Yard. Richmond was the northern terminus of the Valley Division main line from Bakersfield. Vernon Sappers collection photo

The last two boats, the *John P. Hayden* and the *Paul P. Hastings*, were seagoing tugs built for the U.S. Army in 1945. They began their Santa Fe service in 1948, after which the remaining older tugs were retired or sold.

The Santa Fe navy was based at Ferry Point, near the railroad's Richmond freight yard, terminal of the Valley Division main line from Bakersfield. From Ferry Point, car floats served six other terminals around San Francisco Bay. Besides Alice Street, these included Alameda, China Basin, Fremont Street and Powell Street in San Francisco, and the North Western Pacific terminal in Tiburon.

For modeling information, I recommend Richard Dietrichson's article, "Modeling the Santa Fe Navy in N scale," in the 2nd Quarter 2011 *Warbonnet*. It includes scale drawings of the tugs *Hastings* and *Hayden*.

— Andy Sperandio

and lining them up for loading on the next car float, giving priority to loaded merchandise and LCL cars and other outbound loads. When the barge comes in, the activity shifts to pulling inbound cars off and shoving outbound cars on.

There's a convention among model railroaders to unload cars alternately from either side of a barge, and to load by reversing that procedure, but that's not necessarily how it was done. It all depended on where the loaded and empty cars were and how their weight was distributed on the barge. The exact order of moving cars on and off was up to the captain of the vessel, and you can make out switch lists requiring varied loading procedures based on those factors. The 1st Quarter 2011 *Warbonnet* includes a selection of Santa Fe "Rules Concerning Barge Loading."

The engine switching the barge used idler flatcars, called "boat flats," to reach across the apron and onto the barge.

Engines could run on and off barges – as they regularly did to get to and from maintenance shops – but in normal switching it was just simpler and safer to keep the engine's weight onshore.

When the inbound cars are landed and the barge "sails" with the outbounds aboard, I'd write out a switch list showing how the inbound cars stand on the track and give some thought to the most convenient order of spotting. That would probably be to start with the freight house and team track cars and work back around the rest of the layout. Before that, however, I'd line up cars that need to be on the other end of the engine and spot them in a runaround track, ideally one we'll pass on the way to the freight house.

A couple of the prototype features of Alice Street can add variety to the switching. You can have car inspectors go over outbound cars and tag any with defects – as determined by a random

card drawing – to be spotted on the RIP (repair-in-place) track for at least one operating shift. The RIP can also be used as a clean-out spot to clean a car before loading.

Other cars can be designated for weighing on the track scale, either before or after loading, sometimes both, depending on the commodity being shipped. Remember not to weigh tank cars, though. Their billing is determined by volume in gallons rather than by weight.

When all the cars are spotted, take the engine to the house and put her away until the next "day," which can start whenever you'd like. Before that, put on your freight agent hat and check the waybills of the cars spotted on the layout. Write up a switch list of outbound cars for the next Alice Street engine foreman to pull, and line up a new set of inbound cars on the next barge to arrive. With just a little housekeeping, the fun at Alice Street can go on and on. **MR**



RAILROADING ON AN APARTMENT SHELF

An HO short line
that fits neatly along
a living-room wall

BY RUSS RETTIG

PHOTOS BY THE AUTHOR UNLESS NOTED

THE GRAND TRUNK & INDIANA RR

is a freelanced HO railroad representing what's left of an 11.3-mile short line originally named the New Jersey, Indiana & Illinois RR. The NJI&I was built by the Singer Sewing Machine Co., which named it for the three states in which it had factories. It was never intended to serve those three states, though. Its primary purpose was to link Singer's plant in South Bend, Ind., with the Wabash RR at Pine, Ind.

The railroad was owned in succession by the Wabash, Norfolk & Western, Conrail, and finally Norfolk Southern. Today, Norfolk Southern operates only a short portion of the original line, serving the *South Bend Tribune* newspaper. [For another track plan based on the prototype NJI&I, see the August 2011 *Model Railroader*. – Ed.]

My HO edition of the Grand Trunk & Indiana is 16 feet long, representing about two miles of the prototype. Half of the layout is Olivers Yard; the other half represents South Bend.

Construction

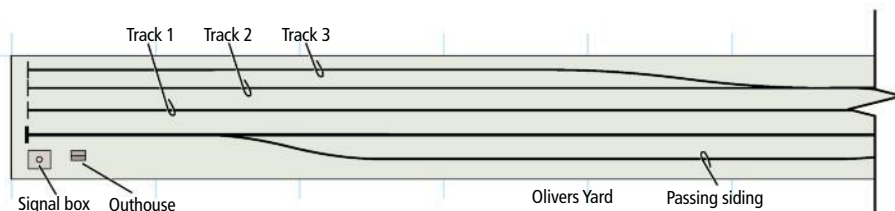
I built the original GT&I, described in the December 1986 MR, in a spare bedroom measuring about 11 x 15 feet. This area allowed a reasonable representation of an 11-mile short line.

My current layout is much smaller, built as two narrow 8-foot-long sections. South Bend is a sandwich of $\frac{1}{2}$ " Homasote glued to $\frac{1}{8}$ " plywood, 2 feet wide. Olivers Yard is $\frac{1}{8}$ " cork glued to a 1 x 10 wood plank. Both sections are framed by 1 x 3 lumber and supported by shelf brackets along one wall of my apartment's living room.

This layout was originally designed for block control with a walkaround throttle. A little over a year ago, though, I became fascinated with on-board locomotive sound systems and decided to go with a Digital Command Control system. Once I saw how easy NCE PowerCabs were to install, and how nicely their Power Pro throttles fit in my hand, I jumped right in.

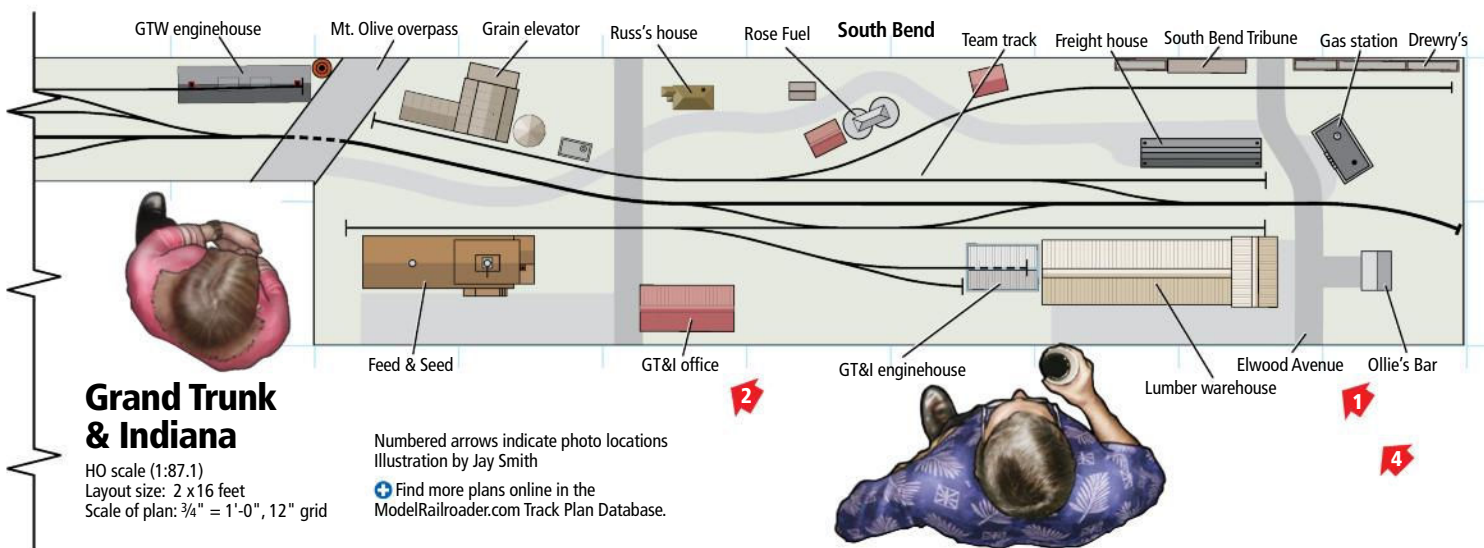
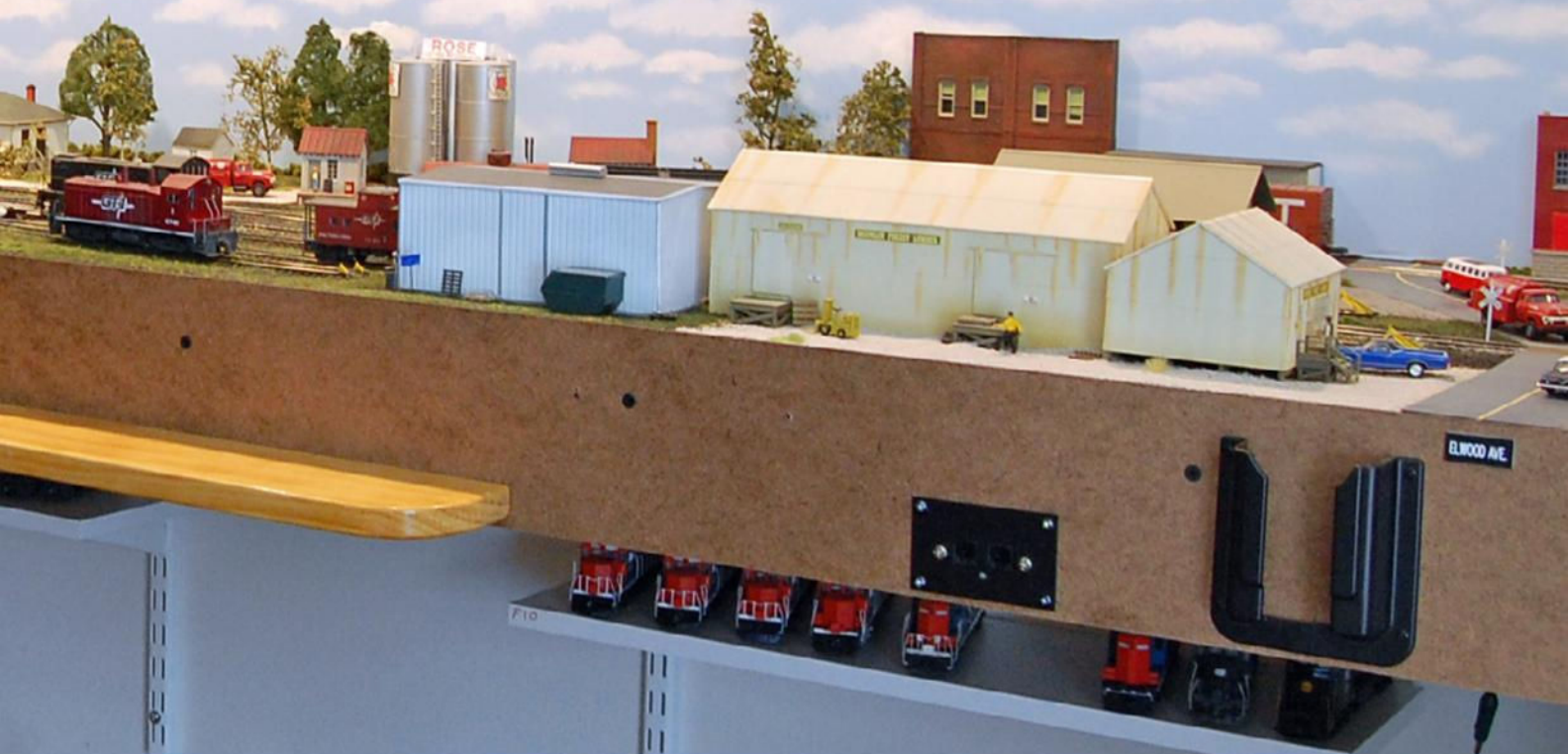
I used Atlas code 83 flextrack and no. 4 turnouts on the entire railroad, with one exception. "Mike's Switch," which leads into the GT&I enginehouse in South Bend, is a no. 6 that Mike Papp gave me when I discovered I was one turnout short. If I were to do it all over again, I'd use only no. 6 turnouts.

What little scenery I needed I fashioned from various Woodland Scenics products that I had on hand. I also had a



3

1 This overview shows the entire Grand Trunk & Indiana layout, based on the prototype New Jersey, Indiana & Illinois. The city of South Bend is modeled at the right end; Olivers Yard, at left, represents the rest of the world.



box of trees from Scenic Express that John Cernak built for me and planted around on the layout.

There's no raised roadbed anywhere, as this is all that's left after the line was neglected and abandoned by other railroads. To reflect this lack of maintenance, the ballast is a mixture of leftovers from previous projects.

I had to build the layout to fit the restricted space that was available to me. Since this location was above my couch and a bookcase, I had to make sure the layout was high enough to be out of the

LAYOUT AT A GLANCE

Name: Grand Trunk & Indiana
Scale: HO (1:87)
Size: 2 x 16 feet
Prototype: New Jersey, Indiana & Illinois RR
Locale: north-central Indiana
Era: late 1970s
Style: single deck
Mainline run: 16 feet
Minimum radius: 18"
Minimum turnout: no. 4

Maximum grade: none
Train length: 8 to 10 cars
Benchwork: 1/8" plywood plus 1/2" Homasote with 1 x 3 frame
Height: 53"
Roadbed: none
Track: Atlas code 83
Scenery: flat terrain
Backdrop: painted hardboard
Control: NCE Digital Command Control



2 Grand Trunk Western GP38 no. 5808 ventures into South Bend while working the interchange on Russ Rettig's HO scale Grand Trunk & Indiana. The layout is 2 x 16 feet and occupies one wall of his apartment living room.

way of other activities. Yet it had to be a "workable" height for both construction and operation. I chose 53" as a good compromise height.

Track plan and operation

My track plan is simple, starting with the three-track Olivers Yard. The main line extends down to the end of the yard. The passing siding alongside can also be used as a runaround or engine escape track. The Grand Trunk Western has a

one-stall enginehouse at the north end of the yard. I separated the yard from South Bend with an overpass, which provides a nice view block between the two scenes.

South Bend, Ind., sees fewer rail shipments today than it did in its glory years, but the *South Bend Tribune* still receives rolls of paper in 50-foot boxcars, as it has for as long as I can remember. There are a total of six industries on the layout, as well as a team track and a freight house

for less-than-carload-lot (LCL) cargos. The GT&I makes a living bringing cars from the yard and spotting them at industries. Once they're loaded or emptied, they are returned to the yard. These cars go to the back of the yard and cycle through until they are needed again. These classification duties are the job of the GTW.

I like to use compact motive power, as it seems to operate better through my layout's no. 4 turnouts and around sharp curves. That's why I use EMD and Alco end-cab switchers and EMD GP9s, GP38s, and GP40s. Since this is a small railroad, I try to use short rolling stock as well. I can put a lot more 40-foot boxcars on a 6-foot yard track than 86-foot auto racks or high cubes.

Kadee scale "whisker" couplers are mounted on all of my rolling stock. I trim off the metal trip pin, as I don't use uncoupling magnets. Instead, I uncouple using a small tapestry needle with a handle made of radio-control aircraft control-line tubing. (See "A manual uncoupling tool" below.) All of my turnouts are lined using Caboose Industries ground throws, which I have used for more than 25 years.

This layout is designed for operation by one person, but, thanks to DCC, one operator can now work the GTW yard job while the GT&I switches South Bend. Since the entire railroad is run under "yard limits" rules, which require crews to be able to stop within half of their

A MANUAL UNCOUPLING TOOL

I MADE AN UNCOUPLING TOOL for my GT&I switching layout from three components: a no. 18 tapestry needle that's cemented into a 3" piece of plastic tubing from radio-control aircraft control cable using cyanoacrylate adhesive, and a cap sold as a plastic handle for a mini toggle switch.

I use Kadee "scale" whisker couplers, usually no. 153. To uncouple, I create slack by slowly reversing the engine. As soon as the couplers start to open, I insert the needle between the knuckles. I then move the needle back and forth a tad as the engine slowly starts to move forward, and the couplers separate.

If I'm backing a cut of cars into a yard track, I stop on the yard lead, insert the tool, and pull forward a tiny bit until I can swing one of the couplers to the side. I then slowly back up while holding the coupler slightly to the side, which delays the uncoupling.

I keep several of these tools handy at Olivers Yard and in South Bend, so there's always one nearby. It costs only about \$3 to make a half dozen of these handy little uncoupling tools. — Russ Rettig



Russ removes the trip pins from his Kadee knuckle couplers, since he doesn't use magnets. Instead he uncouples cars with this tool, made from a tapestry needle inserted into a grip made from a length of plastic tubing. Tony Koester photo



sight distance, both have to look out for each other. Normal speeds are less than 15 mph.

The new dimension of sound has slowed everything down considerably. For example, when changing direction, the engineer now comes to a complete stop, lets the engine rpm drop down to idle, reverses direction, and then slowly starts the train again.

Fun then, fun now

This switching layout has been fun to build and continues to be fun to operate. If it weren't for great friends, my first Grand Trunk & Indiana would never have been built 25 years ago, and the same holds true today. Jim Brenock, John Cernak, Tom Johnson, Mike Papp, and Quintin Schini have all been fantastic in helping me build the 2011 version of the GT&I. 

Russ Rettig, who worked for the Penn Central, Conrail, Santa Fe, and the Grand Trunk Western as a block operator and train dispatcher, is now semi-retired and works in the security industry. He started with a Lionel set on a 4 x 8 sheet of plywood but switched to HO. A GTW timetable that featured the then-new Detroit, Toledo & Ironton herald led him to create the GT&I.

3 Russ built his Grand Trunk & Indiana to share living room space with his family. Olivers Yard, which functions as open staging, is only 10" deep, in order to clear the heads of people using the couch below.



4 The South Bend portion of the railroad features six industries plus a freight house and team track, providing plenty of switching. The overpass at far left serves to separate the downtown area from the interchange yard.



After having to abandon his West Hoosic Division layout in a move, Lou Sassi decided his next layout would be built with more portable, lightweight benchwork. While building a diorama for a book project, he found his solution.

HOW TO BUILD LIGHTWEIGHT SECTIONAL BENCHWORK

Combine commercially available kits with two types of foam for a sturdy foundation

BY LOU SASSI // PHOTOS BY THE AUTHOR

WHEN MY WIFE, Cheryl, and I moved to North Carolina in 2007, my West Hoosic Division layout, built using Linn Westcott's L-girder construction, didn't make the trip. L-girder is a very strong and simple construction technique, but it doesn't necessarily lend itself to portability.

My new layout depicts Maine's narrow gauge Sandy River & Rangeley Lakes RR in O scale. I decided, before starting benchwork, to make the layout light and portable.

Inspiration came when I was writing my fourth publication for Kalmbach Books, *How to Build and Detail Model Railroad Scenes, Vol. II*. I built a diorama for the book using Woodland Scenics Mod-U-Rail module kits, capped with a sandwich of foam boards. It became the basis of my benchwork.

My layout room is 16 x 22 feet, but the slope of the walls influenced me to make a 7 x 17-foot, free-standing layout in the center of the room with a 2 x 11-foot opening in its center, surrounding a double-sided photo backdrop. The



No. 16 pulls into the station at Strong, Maine, on Lou Sassi's Sandy River & Rangeley Lakes model railroad.

diorama built for the book, a scene set in Strong, Maine, has been incorporated into the layout.

The Woodland Scenics diorama kits I used for the 2 x 6-foot scene consist of 18 x 36-inch open-grid-style frames made of 1 x 4 medium-density fiberboard supported by 2 x 2 pine legs. Since the module kits are 18" wide and the width of the diorama needed to be 24", I used additional 2 x 2 stock to extend the diorama base (see **fig. 1**).

On top I used 2" thick Woodland Scenics white foam sheets over 2" thick blue extruded-foam insulation board. I attached this sandwich to the wood with white glue. I used the blue foam because it's more dense, and therefore more rigid, and the white foam is softer and easier to shape.

Since I'd salvaged a lot of 1 x 4 lumber from the old railroad, I opted to use it, rather than additional Woodland Scenics modules, for the remainder of the layout. I assembled this in the same manner as the modules, as shown in **fig. 2**. I then attached the new sections to the originals using lag bolts and added the double layer of foam to them.

The original Woodland Scenics modules on the right are mated to the scratchbuilt ones on the left in the photo above left. You can also see the foam sandwich that makes up the scenery and track base along with the new track.

In the photo, you can see the track from Strong station on the original diorama that will eventually swing to the left and enter Kingfield.

Although my layout is O scale narrow gauge, this technique would certainly work in other scales. Not only will the layout be easier to dismantle and move, this method eliminates the need to handle unwieldy 4 x 8 sheets of plywood.

Perhaps this idea will be what you need to get started on your own model railroad. **MR**

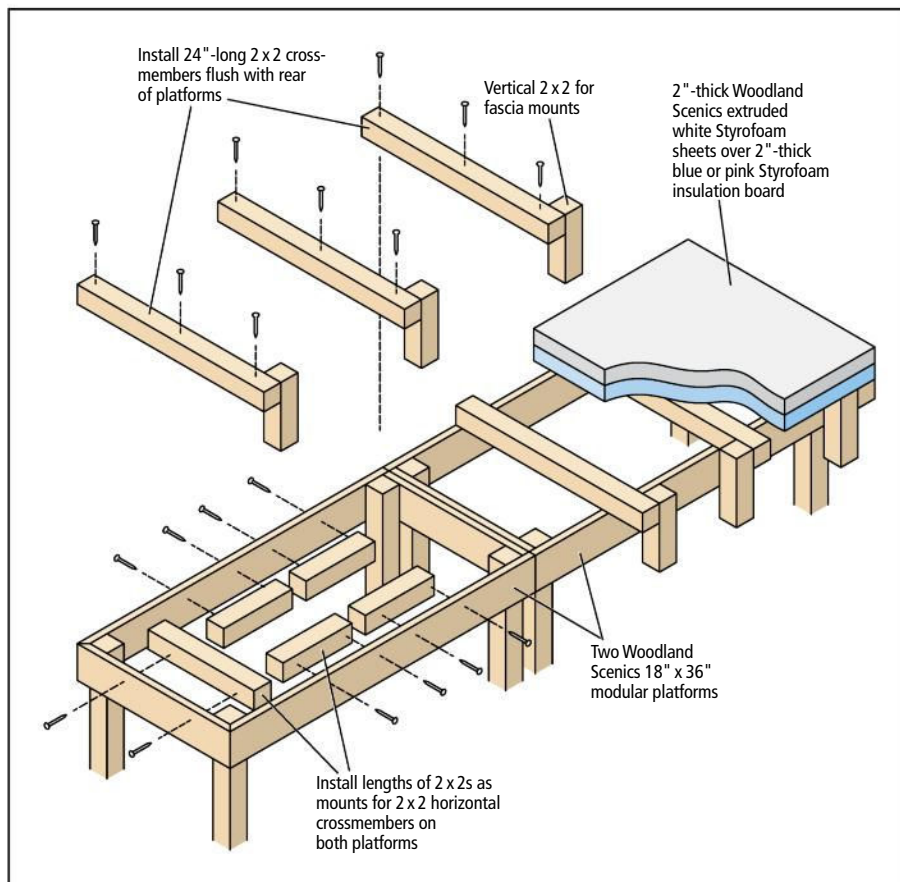


Fig. 1 Modifying the Woodland Scenics module kits. Horizontal crossmembers made of 2-foot-long, 2 x 2 pine were added to the modules to widen them from 18" to 24". The modules were assembled, then foam was glued on top.

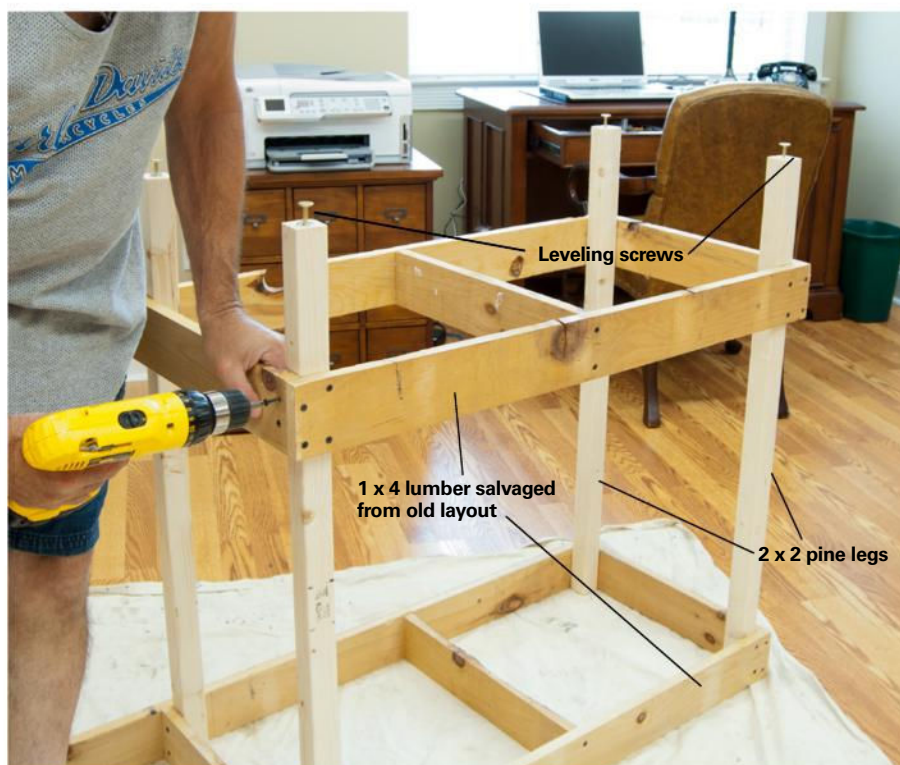


Fig. 2 Constructing new modules. Lou built additional modules from lumber salvaged from his old West Hoosic Division layout. The parts match the construction of the Woodland Scenics module kits he used to build his original scene. Lou is building the layout in the room above his garage in his new home.

PLAN AND OPERATION



Part 1: Hauling coal
on the HO scale
Virginian Ry.

BY DAVID POPP
PHOTOS BY JIM FORBES
AND BILL ZUBACK

OUR 4 X 8 FOOT HO SCALE Virginian project layout got its start thanks to a book in the David P. Morgan Library here at *Model Railroader's* offices. *The Virginian Railway* was penned by H. Reid and published by Kalmbach in 1961 (out of print). The book provides a colorful history of the railroad through stories told by the people who worked for or lived along the Virginian.

I wasn't too many pages into the book before I decided someone had to model this stuff, so I drew up an initial sketch for a small Virginian-themed railroad,

which was published in the February 2011 MR. Soon after, MR's former editor Neil Besougloff and I decided that the Virginian could make a good starting point for an HO scale project railroad, so I revised the plan for that purpose.

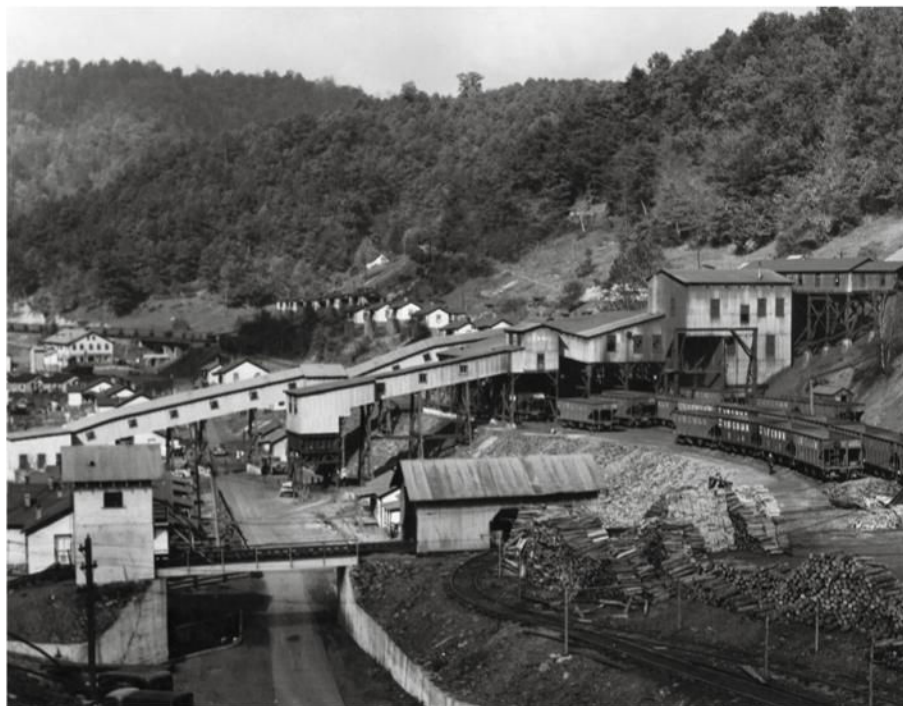
The Virginian Ry. was one of the best-kept secrets of Class 1 railroads in the first half of the 20th century. Started by millionaire Henry Huttleston Rogers and planned by Col. William Page in January 1903, the Virginian Ry. was a modern railroad built with a single purpose – move coal from the mines of



1 Moving coal on the Virginian is what *Model Railroader's* 4 x 8 project railroad is all about. The HO layout was inspired by H. Reid's 1961 book, *The Virginian Railway*.

West Virginia to ships in Chesapeake Bay and make a lot of money in the process. Big articulated steam locomotives, giant electric engines, and rivers of black coal hoppers with white VIRGINIAN block lettering were icons of the railroad.

The 591-mile line was deeply tied to coal mining and remained financially strong most of its life. On Dec. 1, 1959,



This photo, taken at Slab Fork, W. Va., shows many key modeling features, including white company houses, wooded hills, and a river of black Virginian hoppers. More than 85 percent of the traffic on the Virginian came from mines in the West Virginia coal districts. Virginian Ry. photo



2 The crew of the morning Sweeper picks up coal hoppers at the Bigger Mine. The mine was built by former senior editor Jim Hediger, and it's made from kitbashing a Walther's New River Mine kit.



2 X 6 FOOT TURTLE CREEK BRANCH

We expanded our layout using this project from the January 2005 MR.

LAYOUT AT A GLANCE

Name: The Virginian

Scale: HO (1:87.1)

Size: 4 x 8 feet, plus extensions

Prototype: Virginian Ry.

Locale: West Virginia

Era: spring 1955

Style: island, portable

Mainline run: 18 feet

Minimum radius: 22" (main),
18" (branch)

Minimum turnout: Atlas
Snap-Switch

Maximum grade: 3 percent

Benchwork: cookie-cutter

Height: 38" to 42"

Roadbed: cork

Track: code 83 sectional track
and flextrack

Scenery: extruded-foam insula-
tion board

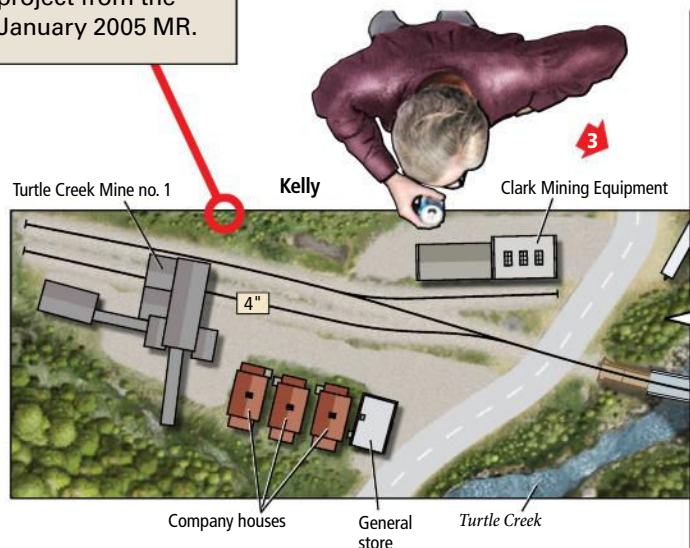
Control: NCE Corp. Digital
Command Control

The Virginian

HO scale (1:87.1)

Layout size: 4x8 feet plus optional
2x6 foot Turtle Creek Branch,
8" x 32" fold-up station section,
and 7" x 78" staging yard
Scale of plan: $\frac{3}{4}" = 1'-0"$, 12" grid
Illustration by Rick Johnson

Find more plans online in the
ModelRailroader.com
Track Plan Database



FASCIA INDUSTRY

We built the
cabinet company
as a flat attached
to a fascia section,
adding depth to
the yard scene.



3 Kalmbach senior graphic designer Drew Halverson and Model Railroader Video Plus producer David Popp run trains on the completed layout. By adding the small staging yard (behind David), the layout can keep two or three operators busy for an evening of switching fun.

the Virginian merged with the Norfolk & Western. Although the railroad lost its identity, it was a move made for survival as the coal industry faded.

Hauling coal on a 4 x 8

If you've been paying attention, by now you should be scratching your head. "You planned to build a 4 x 8 foot HO scale layout for a railroad that ran big articulated steam locomotives?" That's an excellent question, and the short answer is that, as much as I like them, I never planned to run articulated locomotives on this layout. In fact, even our 0-8-0 yard switcher doesn't really enjoy the 18" radius curves on the branch line.

In truth, the backbone of the plan for the layout was the 55-ton two-bay hoppers that were everywhere on the Virginian. More than 85 percent of the traffic on the railroad was coal mined in West Virginia. And because the VGN moved much of that coal straight from the mines to its coal docks at Sewalls Point,



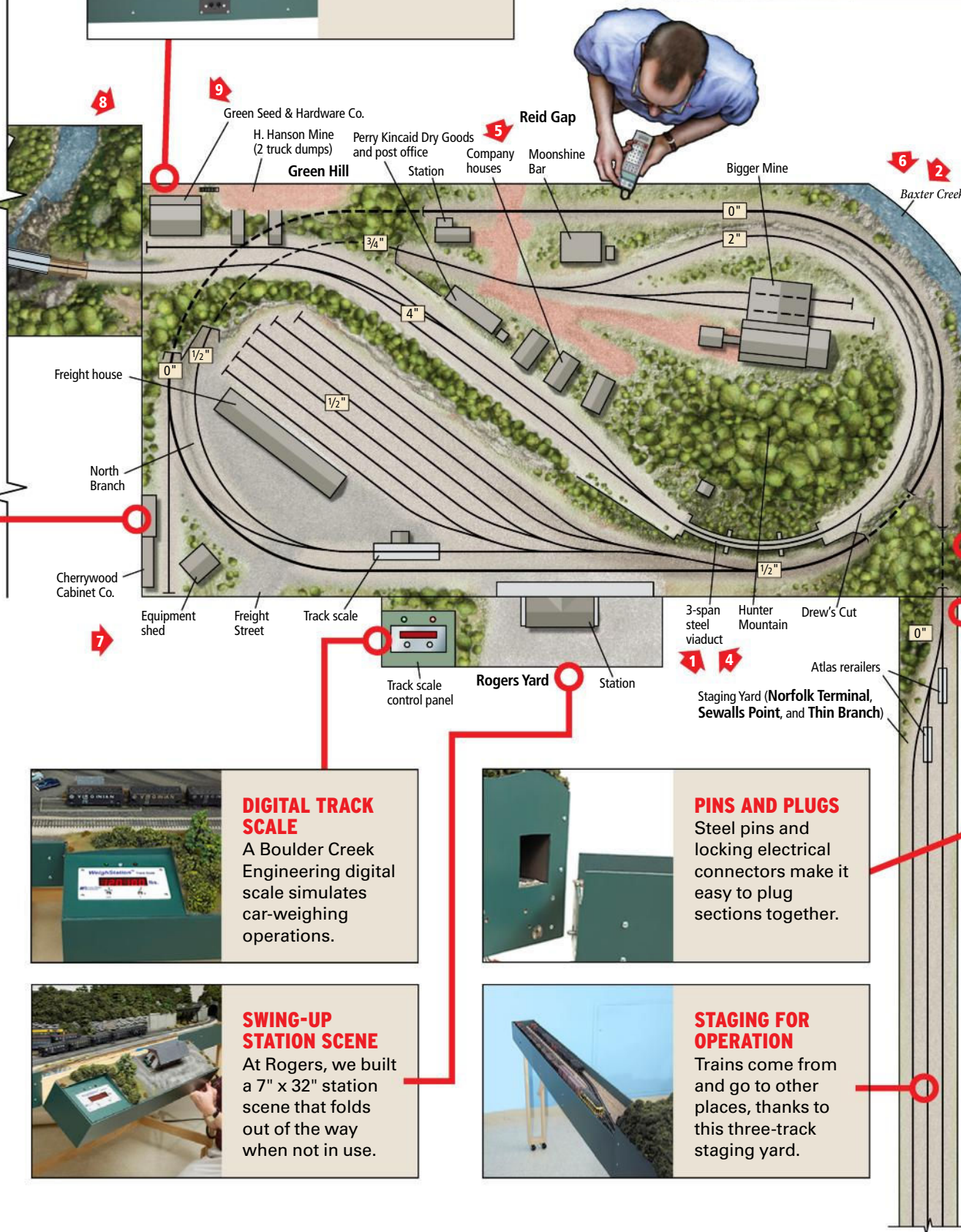
TUNNEL ACCESS DOOR

This door is cut into the fascia for easy access to hidden track.



REMOVABLE HILLTOPS

Tall hilltops plug into the layout using PVC pipe and dowels, so the layout can travel.



DIGITAL TRACK SCALE

A Boulder Creek Engineering digital scale simulates car-weighting operations.



PINS AND PLUGS

Steel pins and locking electrical connectors make it easy to plug sections together.



SWING-UP STATION SCENE

At Rogers, we built a 7" x 32" station scene that folds out of the way when not in use.



STAGING FOR OPERATION

Trains come from and go to other places, thanks to this three-track staging yard.



most of the hoppers on the railroad at any given time were home-road cars, something very rare for a Class 1 railroad, then or now. As shown in the prototype photo on page 45, hoppers with the white VIRGINIAN lettering were everywhere you looked, making for a unique modeling opportunity.

The other great thing about all those relatively short hoppers is that you can run strings of 10 or 12 of them on a 4 x 8 layout and have an impressive train. And because the hoppers are small, you can build a compact classification yard, like

the one I've included at Rogers, and operate it well.

Motive power, however, was the reason for setting the layout in the mid-1950s. Although the Virginian held onto steam longer than most other railroads, by 1955 the VGN was using four-axle Fairbanks-Morse (FM) diesel road-switchers for power on a lot of its trains, particularly on branch lines. The engines were painted in a striking yellow and black scheme, another Virginian icon, and thanks to Bachmann, models of the FM H-16-44s decorated for the VGN

were easily obtainable in HO scale. The FM diesels and the 55-ton hoppers are right at home on a compact layout with 18" radius curves and are a big reason this is a workable 4 x 8 plan.

A 4 x 8 and more

The nucleus for the Virginian is the 4 x 8 section of the layout, but there are a number of places where it can be easily expanded.

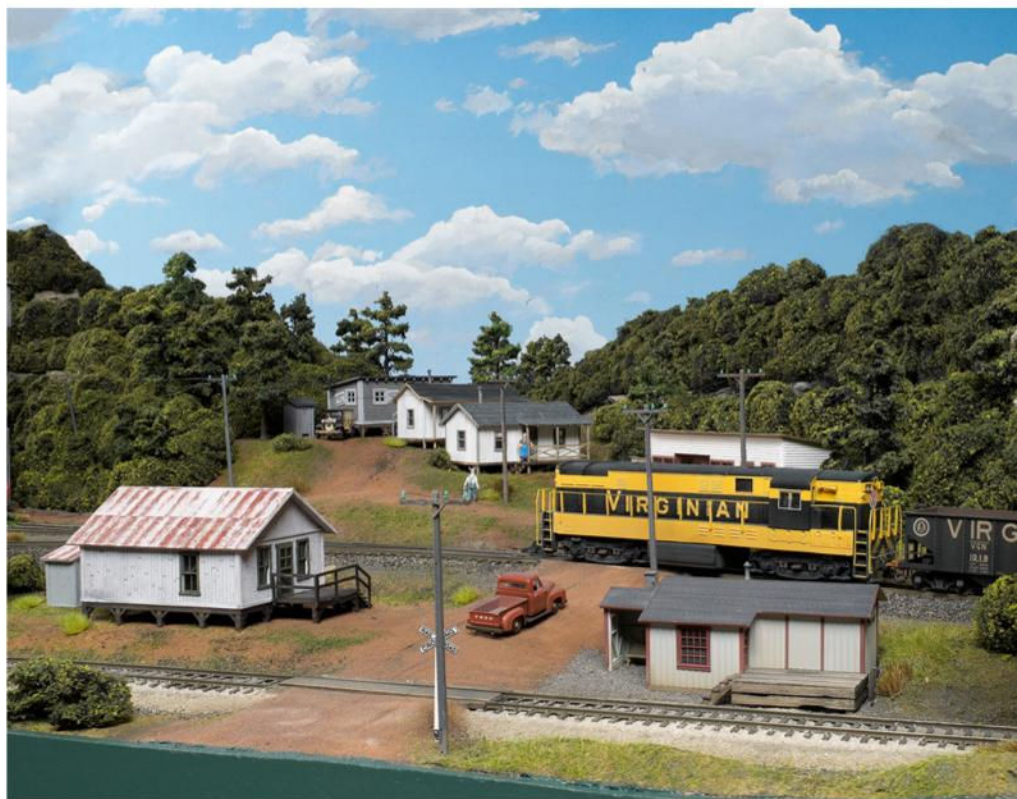
For starters, as shown on the plan on page 47, I've included a simple 78" long three-track staging yard. The yard has a



4 Rogers Yard is the connection point for the North Branch with the rest of the Virginian.

fold-up leg and is designed to plug into the layout at Baxter Creek Junction when in use. When it isn't needed, the leg folds up and the yard rests under the 4 x 8 section on the main leg supports. When the time comes for more expansion, you could easily add new layout sections starting at Baxter Creek Junction, and then place the staging yard after that.

The branch line to Green Hill on the other end of the layout is also a great



5 The North Branch train, lead by an FM H-16-44, passes Reid Gap station on its way to fill orders for empty hoppers. The depot was scratchbuilt by associate editor Cody Grivno from Virginian plans.

PAPERWORK FOR COAL

FOR MANY OF MR'S project railroads I've used the car card and waybill sets from Micro-Mark. While those work well for moving regular freight cars around the layout, I needed something a little more specific for moving blocks of coal hoppers. Using Microsoft Word, I made simple forms for mine blocks and mine orders, and you can download PDFs of them by going to www.ModelRailroader.com.

The mine block forms are used by crews picking up strings of loaded coal hoppers from the various mines on the layout. Information on the form includes the number of cars in the block, shipper and receiver data, and the reporting marks of the cars. There is also a space for gross weight, which is filled in when the cars are weighed at Rogers Yard. I installed a Boulder Creek Engineering digital scale at Rogers for this purpose, and the yardmaster writes in the weights as the cars are pulled through the scale.

The second piece of paperwork I made is the mine order form. This



form tells the yardmaster how many empty hoppers are needed on the branch. The train crews then use the form when spotting the hoppers at the mines.

Both forms are simplified versions of those used by prototype railroads, but they make operating our layout more fun. — David Popp



6 The “Light train” leaves staging and enters the layout through the tunnel at Baxter Creek. This train’s empty hoppers will be used to fill mine orders.

CAR CAPACITIES

FOLLOWING ARE THE CAR SPOTS available for the layout.

The North Branch industries include those on the Turtle Creek extension. One or two tracks in the staging yard represent the Thin Branch.

Rogers Yard

Yard – 27 cars (55-ton hoppers)
Cherrywood Cabinet Co. – 2 cars
Freight house – 3 cars

North Branch

Bigger Mine – 5 cars
H. Hanson Mine – 3 cars
Green Seed & Hardware – 1 car
Turtle Creek Mine – 4 cars
Clark Equipment Co. – 1 car

Thin Branch (staging)

Holly Mine No. 4 – 3 cars
G. C. Albert Mine – 3 cars
Pulpwood terminal – 2 cars
Company Store – 2 cars



7 Using a Boulder Creek Engineering digital scale, Drew records the weights of loaded hoppers on a mine-block sheet. See “Paperwork for coal” on page 49.

candidate for expansion to other mines and towns. We just happened to still have the Turtle Creek Branch (built by former MR staffer and current N scale columnist Jim Kelly and featured in the January 2005 issue), and we reused it here as one example of how you can extend the line. The Turtle Creek Branch had sat in storage for several years, so Neil and I gave it a complete overhaul.

As shown on page 46, the branch is now called the town of Kelly, and it plugs into the Virginian at Green Hill. Because it wasn’t built specifically for this layout, the 2 x 6 foot addition overhangs the 4 x 8 section by 8". Since we operate the layout in an open room, this isn’t a problem, but if you plan to include the Turtle Creek, I’d suggest reworking the track at the creek end to make a flush fit.

Another spot you could expand the layout is the spur at Rogers that serves the Cherrywood Cabinet Co. My thought is to eventually add a 20" x 36" plug-in section here that will include a compact engine terminal and a power plant. I’d also keep the cabinet company, which is a simple fascia flat, by moving it to the end of the plug-in.

The final add-on is a swing-up section that holds the Rogers depot and the digital scale controls. This is an 8" x 32" box, mounted to the layout with a piano hinge. Since the Virginian is made to



travel, the piece folds under the layout when not in use. As shown in the photo of Rogers on page 48, the swing-up section adds a lot to the scene and protects cars parked on the main line in front of the yard.

Taking an operating tour

From the start, I designed the Virginian to be an operating model railroad. The prototype had a number of branch lines that wound their way from the main line through adjacent valleys. Although I loosely modeled the layout on the Virginian's White Oak Branch, it's a freelanced design, so I could include all the things that were needed to make the layout operate well.

The heart of the model railroad is the small coal-marshaling yard at Rogers. The five-track stub-ended yard is nestled into a valley, and features a freight house

and scale track. While passenger service on the prototype Virginian ended in 1951, I included a depot. The Virginian's passenger trains were hauled by steam right up to the end, should you choose to include them.

During an operating session, the yard crew at Rogers spends its day making and breaking up trains, weighing loaded coal hoppers, and switching the few local industries, including the freight house. For a complete look at the daily operating scheme, see "Operating sequence for the Virginian" on the next page.

I've also included a digital scale at Rogers, adding to the duties of the yard crew. Boulder Creek Engineering (www.bouldercreekengineering.com) makes the scale. It gives random weights within a specified range as the cars roll over an optic sensor. As blocks of loaded coal hoppers enter the yard, the yard

8 The H. Hanson Mine is represented by two truck dump platforms. Using the platforms, built by associate editor Steven Otte from Blair Line kits, was an easy way to add more car loading spots. We assume the mine itself is higher up the hill.

crew uses the scale to weigh the cars, then fills out the weights on the mine block sheets.

The line leaves Rogers through the tunnel under Green Hill, passes the little mining town of Reid Gap, and then connects to the Virginian main line at Baxter Creek Junction. Essentially, the junction is just a single switch that diverts trains from the mainline loop to staging.

The staging yard's three tracks are used to represent the coal docks at Sewalls Point, Va., the Virginian's yards at Norfolk, and a second branch line called the Thin Branch. At the beginning

OPERATING SEQUENCE FOR THE VIRGINIAN

A TYPICAL FULL-DAY operating session on the HO scale Virginian Ry. includes the following sequence of trains and activities. This operating sequence can be easily modified for those building the layout without the Turtle Creek Branch – simply use fewer cars.

1. The Rogers Yard crew is called and assembles the Sweeper, filling any early mine orders for empty cars.
2. The Sweeper runs from Rogers to Kelly (or Green Hill without the Turtle Creek), picking up outbound coal loads.
3. The Light train (empty hoppers and assorted freight) runs from Sewalls Point (staging) to Rogers.
4. The Rogers Yard crew breaks up the Light train and assembles the North and Thin Branch trains, filling mine orders for empty cars.
5. The Thin Branch train runs from Rogers to staging, swaps cars
- there, and waits to return later in the session.
6. The Sweeper returns to Rogers and weighs coal loads with the help of the yard crew.
7. The yard crew assembles the North Branch train.
8. The North Branch train runs from Rogers to Kelly, working all industries.
9. The yard crew switches cars at local industries.
10. The Thin Branch train returns to Rogers and weighs coal loads with the help of the yard crew.
11. The yard crew assembles the outbound coal train.
12. The coal train runs Rogers to Sewalls Point (staging).
13. The North train returns to Rogers and weighs coal loads with the help of the yard crew.
14. The yard crew organizes the yard for the next day, then marks off duty. – *David Popp*

of an operating session, the staging tracks hold the “Light train” (empty hoppers and the few other freight cars destined for Rogers Yard) and the loads and empties from mines and industries on the Thin Branch.

Trains from the Thin Branch leave Rogers through the yard lead tunnel and then back through Baxter Junction into staging. Once there, the Thin Branch train swaps its empty hoppers for the loaded cars parked on one of the staging tracks and then waits until it’s time to return to Rogers later in the session.

The North Branch starts at Rogers Yard and winds its way through Reid Gap and Green Hill, terminating at Kelly (the old Turtle Creek Branch). This branch has three mines on it, including Bigger Mine, H. Hanson Mine, and Turtle Creek Mine no. 1. (The car capacities for the mines and all the industries on the layout and in staging are given on page 50.) The H. Hanson Mine is represented by two timber truck dumps. This was a space-saving trick, as I didn’t have a lot of room to build a complete second mine on the layout at Green Hill.

We can imagine that the Hanson Mine is just higher up the hill, out of sight.

The branch is served by two trains each day, the morning “Sweeper” and the North Branch local. The Sweeper collects loaded coal hoppers at the mines and also spots any cars from early mine orders. Later in the day, the local delivers empty hoppers to the mines as well as occasional local freight cars and picks up any late coal loads.

A lot in a small package

Working on small layouts has become one of my favorite ways to enjoy model railroading; it’s easy to get started, as well as to see some progress. And don’t think you need to have everything finished to run trains. I was switching cuts of cars in the yard long before we had anywhere for those cars to go.

Whether a basement size empire or a 4 x 8, building a model railroad is a rewarding adventure. **MR**

9 The 2 x 6 foot Turtle Creek Mine Branch, built for the January 2005 MR, is a great addition to the Virginian.





BUILD THE VIRGINIAN

BENCHWORK

Building solid benchwork that's easy to expand for our HO layout

BY DAVID POPP
PHOTOS BY JIM FORBES
AND BILL ZUBACK

BUILDING A GREAT LAYOUT starts with solid benchwork. However, that doesn't necessarily mean it needs to be constructed like a house using heavy materials such as 2 x 4s and $\frac{3}{4}$ " plywood. With the correct fasteners, framing, and bracing, you can build sturdy layout benchwork using much lighter construction materials.

Peeling away the track and scenery layer reveals the cookie-cutter benchwork used on our HO scale project railroad.





ELEVATION CHANGES FOR MORE THAN TRACK.

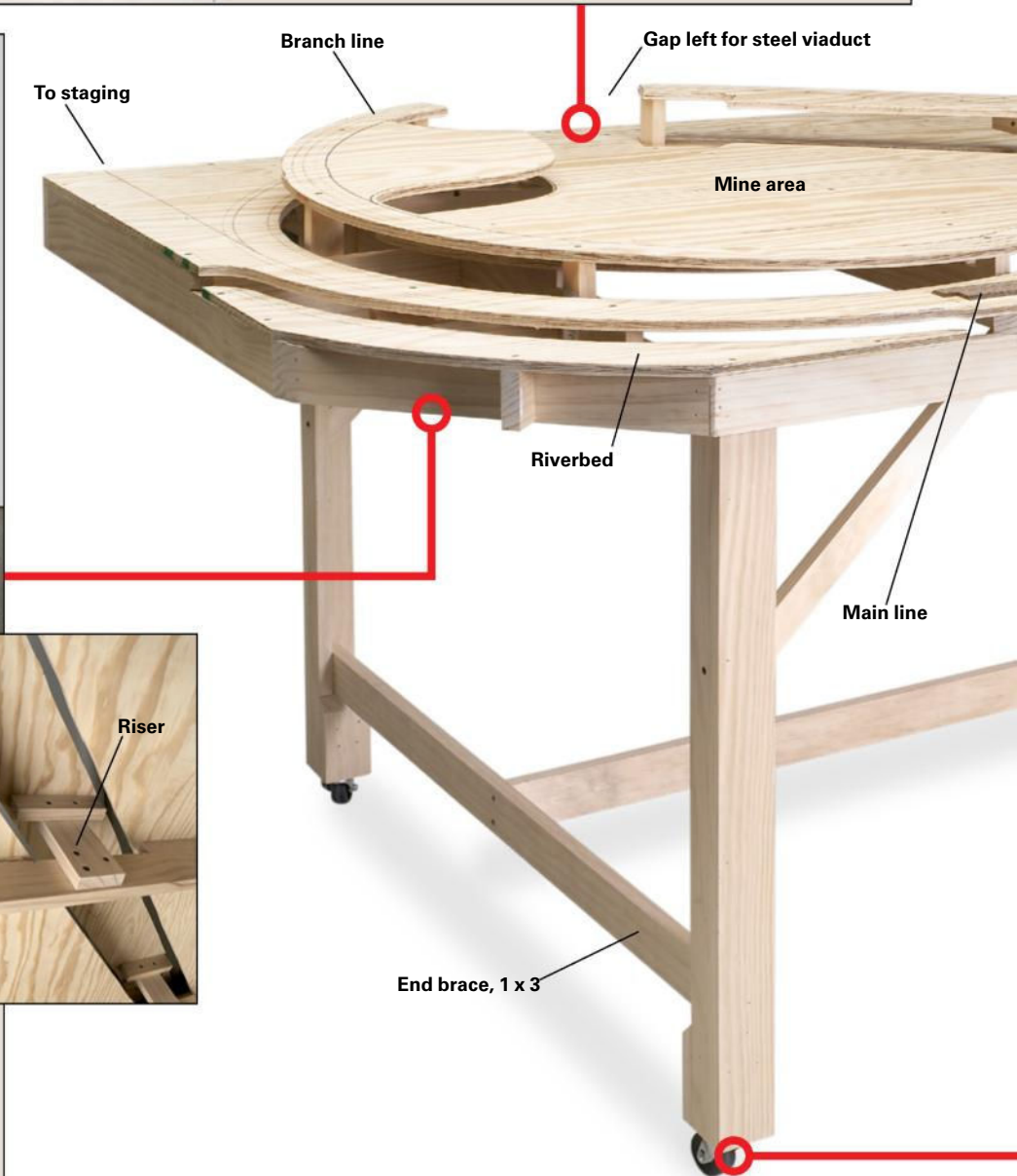
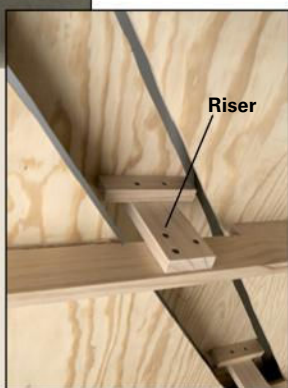
In addition to raising the railroad right-of-way, the cookie-cutter benchwork method is also great for scenery. As shown here, the floor of the valley sits at the same level as the yard lead, while the mid-height section behind it will be used for one of the layout's mines. The higher bump on the right will eventually support part of Hunter Mountain. Use the plywood cutting diagram on page 55 as a guide. As shown below, I cut a 1" deep notch into the frame on one end for the riverbed.



COOKIE-CUTTER WORK.

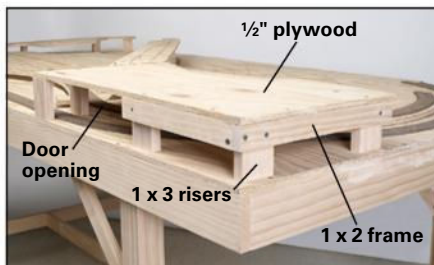
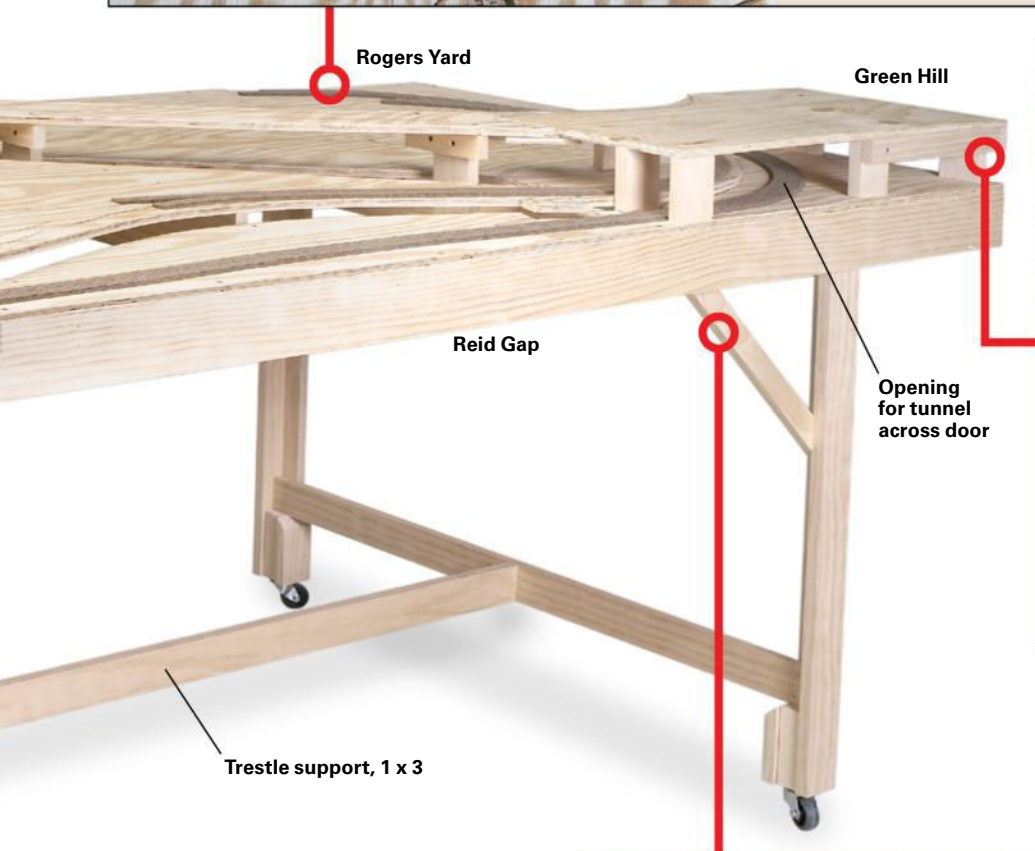
After cutting the plywood top around the right-of-way and various scenic elements, I used pieces of scrap lumber to make risers, forming the elevations. As shown above, I glued some of the risers, such as those under the mine area at Reid Gap and Rogers Yard, directly to the tops of frame members. This works well for supporting large expanses of plywood in level areas.

In other places, I attached the risers to the sides of the frame members with screws as shown in the inset photo. This allows the riser to be easily adjusted, which is important when modeling grades. Keeping as much of the plywood top in one piece as you can when you cut it makes it easier to achieve smooth transitions between risers.

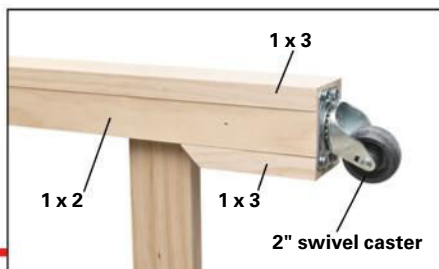




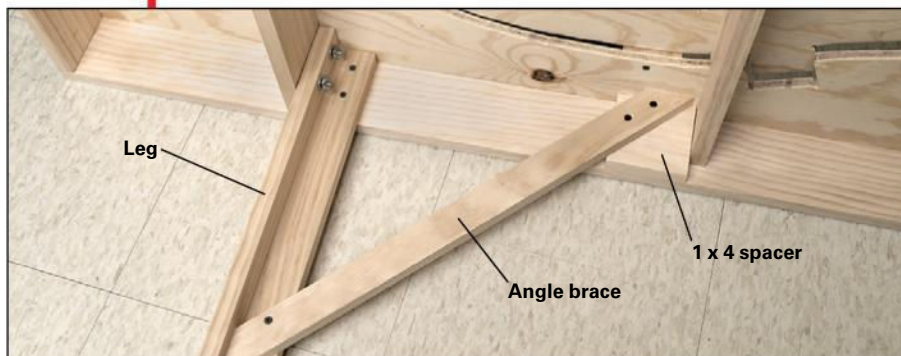
DRAWING GOOD CURVES. Transferring the curves from the track plan to the plywood top is actually easier than you might think. First, I drew a grid of 24" squares on the plywood. I then used the grid (and the one on the track plan) to position the center points for the curves. Next, as shown in the photo, I made a trammel from a yardstick. I used a screw to attach one end of stick to the plywood at a curve center point, and then used the stick to guide my pencil in a clean arc. It helps to drill a hole in the yardstick at the point of your curve radii, in this case 18".



THE SECOND LEVEL. Green Hill on the layout is actually built over the top of the mainline and branchline tracks. To do this, I built a mini section of benchwork from 1 x 2s and covered it with 1/2" plywood. I attached the new section to the layout with glue and screws. The notch in the frame is where the tunnel access door will be.



MADE TO ROLL. I don't build many layouts anymore that I can't move myself, and casters are a great aid. On this layout, I used 2" swivel casters, attached to the legs with no. 10 x 2" screws. Since the casters are bigger than the legs, I made mounting pads from a 5" section of 2 x 2 and a scrap piece of 1 x 3.



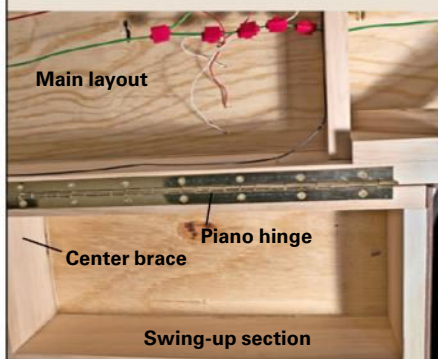
ATTACHING THE LEGS. A big part of building solid benchwork centers on where the legs attach to the frame and how they are braced. I built the layout so that it travels in one piece. As shown in the photo above, each leg is held to the benchwork with two 1/4" x 2" carriage bolts with wing nuts and washers. Each leg also has its own 1 x 2 angled brace. For the brace to properly line up with the leg, I installed 1 x 4 spacer blocks inside the table frame and attached with screws. (By replacing the bracing screws with bolts, you can make the legs easily removable.)

As shown in the center image, the legs are paired with 1 x 3 end braces. I used an additional 1 x 3 as a trestle table support to lock the legs together.

BUILD A SWING-UP SCENE FOR YOUR LAYOUT

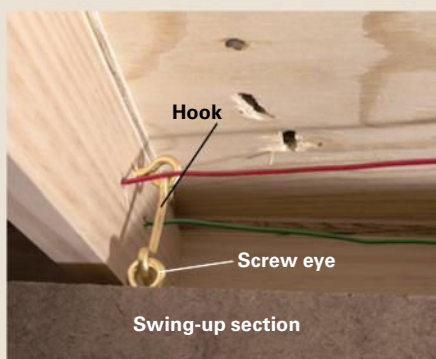


The 7" x 32" station scene swings into place when needed.



David used a 30" piano hinge on the swing-up section, providing a good fit.

I DESIGNED OUR LAYOUT TO TRAVEL, and it could be no more than 46" wide to fit into Kalmbach Publishing Co.'s elevator. After laying out the track at Rogers for the main line and yard, there wasn't any room left for a station scene, which was something I wanted to add. In addition, losing 2" on the width of the layout would place the main line and the trains rolling over it dangerously close to the edge for a layout that would need to be used for display at train shows.



Two ordinary hooks and screw eyebolts secure the hinged section under the layout.

To get around both problems, I built a 7" x 32" swing-up station scene. The framework is a simple box made of 1 x 4s glued and nailed together. As shown in the drawings on page 55, the box also has one center brace. To match the 1/2" elevation of Rogers yard, I rimmed the top of the 1 x 4 frame with a 3/4" strip of 1/2" plywood. I then surfaced the top of the frame with a piece of 1/2" plywood, glued and nailed in place. The scenery and station were all cemented in place later.

When not in use, the scene folds under the layout, completely out of the way.

I used the 30" piano hinge shown at left to attach the frame to the layout. The piano hinge provides a solid anchor, keeping the moving section perfectly in line with the rest of the benchwork. After completing the scenery, it's difficult to find the seam where the swing-up meets the yard.

I used two 1/4" x 2" carriage bolts with wing nuts and washers to hold the section in the open position. When closed, the section locks under the layout with a pair of hooks and screw eyes (above). The bolts and washers are stored inside the frame.

You can use a swing-up scene like this on just about any layout. Instead of a station, it could hold houses, a town, or an industry, and even have track that connects to the rest of your layout. When it's not in use, just remove the loose items, such as vehicles and trains, and then lock the section under the layout, clearing the aisle for foot traffic. — David Popp



This view shows the finished layout, complete with its fascia boards. Using the cookie-cutter method, David cut the plywood bases for the riverbed, main line, branch line, and mine scene from the same sheet of material.

Even if you're not an expert carpenter, it's not difficult to build benchwork. All of the materials you'll need can be found at any home center, and you don't have to have a workshop full of power tools to get the job done – a variable-speed drill with a few standard-sized drill and screwdriver bits and a small reciprocating saw (saber saw) can handle nearly every construction task.

If you have a lot of benchwork to build, you may also want to invest in a power miter saw, because it's a more convenient way to cut the dimensional lumber used for frames and legs.

Getting started

Our 4 x 8 Virginian benchwork uses standard dimensional lumber (1 x 2s, 1 x 3s, and 1 x 4s) for the legs and frame, and 1/2" plywood for the top. The illustration on page 55 shows the important dimensions for building the frame and legs as well as how to construct the fold-up station scene section and the removable staging yard.

Making tight joints is a key ingredient to building good benchwork. You can achieve this using carpenter's glue and 2" screws or nails for all of the connecting points on the frame. If you use screws, be sure to drill pilot holes first, as driving screws into the wood without them

tends to split the lumber. Also, as you build the framework, be sure to check your work periodically with a carpenter's square. It's easier to make adjustments before the glue sets.

Cookie-cutter top

To create the elevations on the layout, I used the tried and true cookie-cutter construction method. After drawing the track plan on the sheet of plywood, I used a reciprocating saw to cut around the right-of-way and structures in all the places that would be on different levels. While I was at it, I cut out the riverbed and the floor for the small valley where the steel viaduct would stand.

Next, I laid the plywood on top of the frame and then cut various spacer blocks to elevate the different sections. The natural place to start this process was the yard at Rogers, which sits 1/2" above the frame. To raise this section, I cut 3/4" strips of 1/2" plywood and glued them to the top of the frame members. I then attached the yard's plywood top to the frame with 1 1/4" drywall screws. After that, I attached all the 0" elevation plywood for the main line to the frame before elevating the climb up the branch.

To elevate the branch, I used scraps of 1 x 2 and 1 x 3, attaching those to the frame and plywood with screws. Though

MATERIALS LIST

Table frame

1 x 2 (1)
1 x 3 (2)
1 x 4 (5)
1/2" plywood, 4 x 8 foot (1)
1/2" plywood, 2 x 4 foot handy panel (1)

Legs

1 x 2 (3)
1 x 3 (4)
2 x 2 (1)
2" swivel casters (4)
No. 10 x 2" roundhead screws (16)

Staging

1 x 2 (1)
1 x 3 (1)
1 x 4 (2)
1/2" plywood, 2 x 4 foot handy panel (1)
2" swivel casters (2)
No. 10 x 2" roundhead screws (24)

Fold-up section

1 x 4 (1)
1/2" plywood, 2 x 4 foot handy panel (1) (can use leftover plywood from table or staging yard instead)
30" piano hinge (1)

Fascia

1/8" Masonite, 4 x 8 foot (1)
No. 6 x 3/4" roundhead screws (1 box)

Miscellaneous

Carpenter's glue
1 5/8" drywall screws
2" finishing nails
1" panel nails
1/4" x 2 1/2" carriage bolts (13)
1/4" x 3" carriage bolts (3)
1/4" washers (16)
1/4" wingnuts (16)

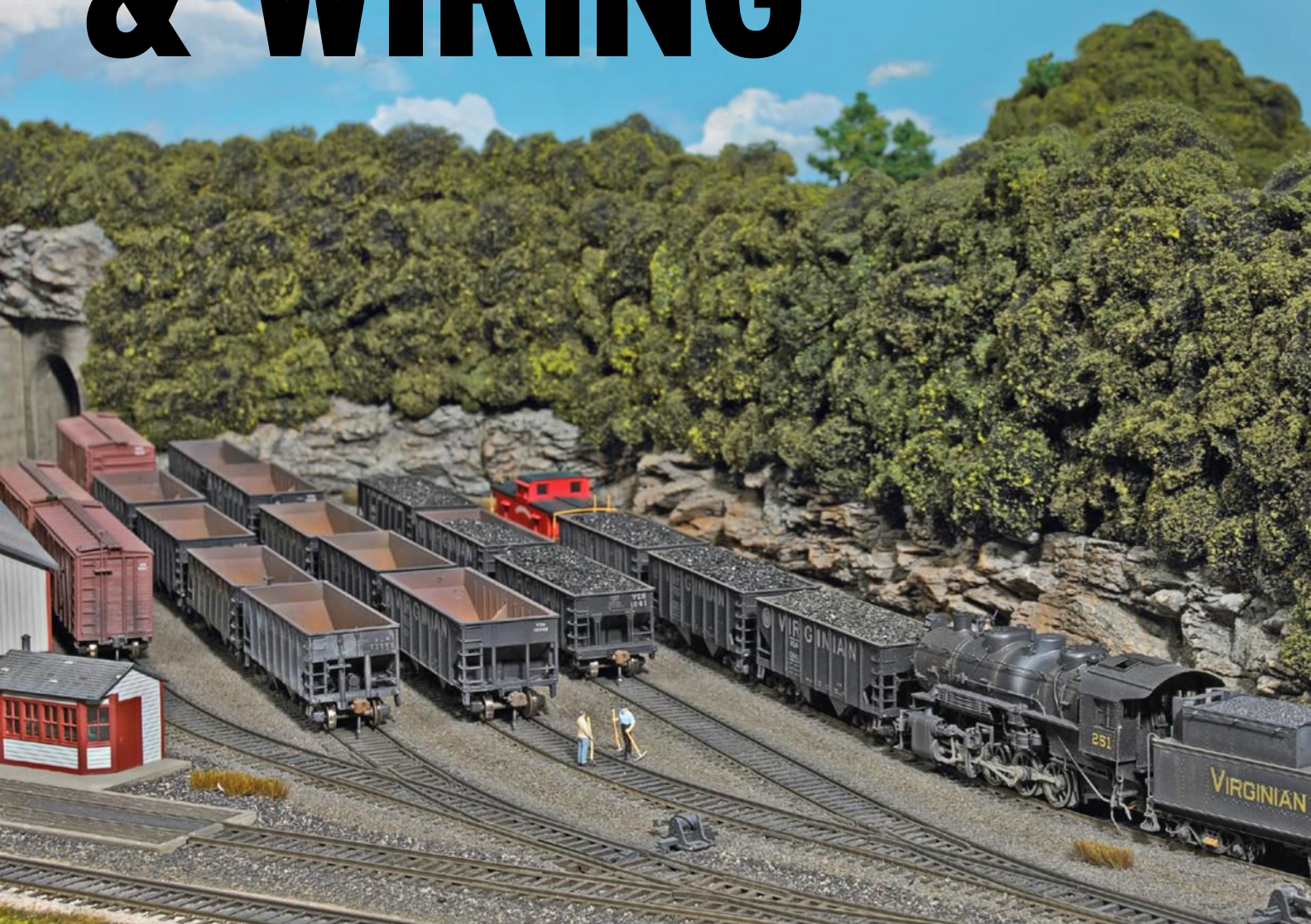
the elevations are marked on the track plan, they are merely suggested heights. Before attaching anything, I clamped the risers to the frame and made eyeball adjustments until I was happy with how it looked. I then attached it all with screws.

I made the Green Hill section, which sits over the top of the tunnel, from a separate piece of plywood, framed on one end by 1 x 2s and supported by 1 x 3s.

Pages 56 and 57 provide many other tips regarding the Virginian's benchwork, but for those actually planning on building the layout, I'd suggest watching the videos at www.ModelRailroader.com. 

BUILD THE VIRGINIAN

TRACK LAYING & WIRING



Part 3: Getting trains
up and running on our
4 x 8-foot layout

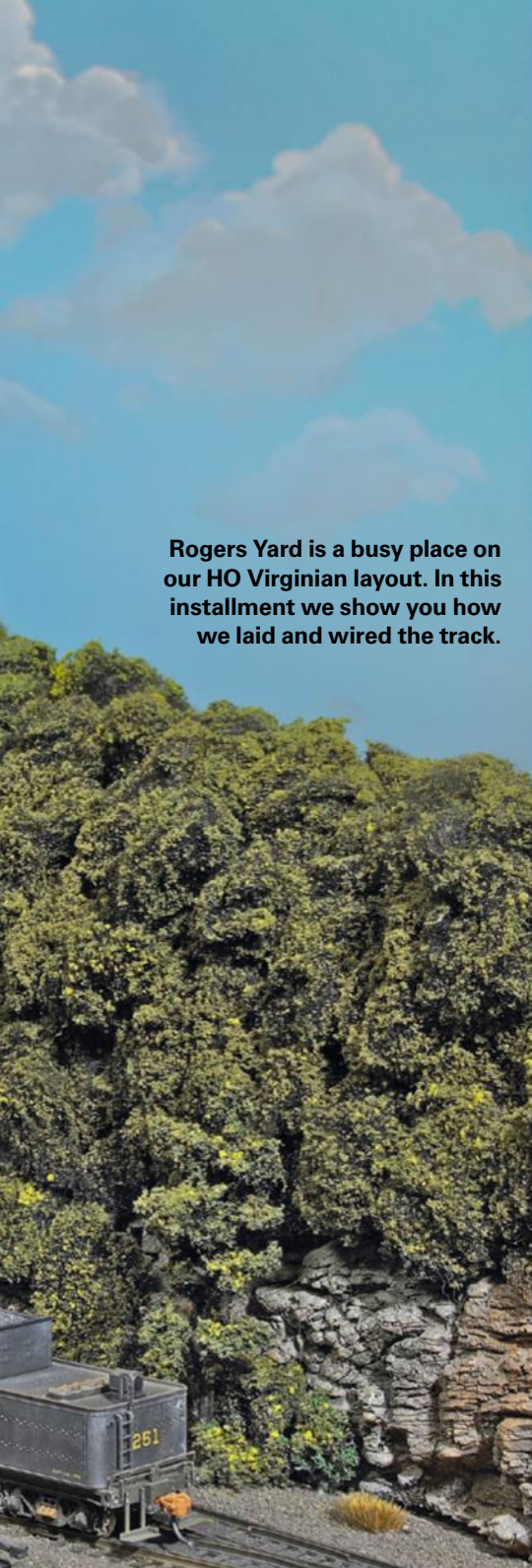
BY DAVID POPP
PHOTOS BY JIM FORBES
AND BILL ZUBACK

THE SOONER YOU get some track laid, the sooner you can start running trains, which is usually the reason you build a model railroad to begin with. However, that being said, you want to make sure that you don't rush the track-laying step and take shortcuts. Much like on a prototype railroad, your trains run well only if the track is carefully laid.

In this installment of our HO scale Virginian project layout series, we'll take a look at the steps I used to lay the roadbed

and track, as well as how to wire the layout for Digital Command Control. Even if you're interested in running the layout with a DC power pack instead of DCC, most of the steps shown here will be the same. In fact, to test my initial track and wiring work, I connected a DC power pack to the layout to run the first trains.

Patience is the name of the game at this step. Taking your time to make sure the roadbed surface is smooth, the track fits correctly, and the wiring is properly



Rogers Yard is a busy place on our HO Virginian layout. In this installment we show you how we laid and wired the track.

installed will reward you with a model railroad that operates reliably for years to come. So, let's get started!

Establishing the right-of-way

The roadbed is the layer directly beneath the track on a model railroad. On a prototype railroad, this includes a layer of earth, followed by layers of tamped rock. The track is then laid on top of this and covered with a dressing layer consisting of more rock (ballast),

Continued on page 64



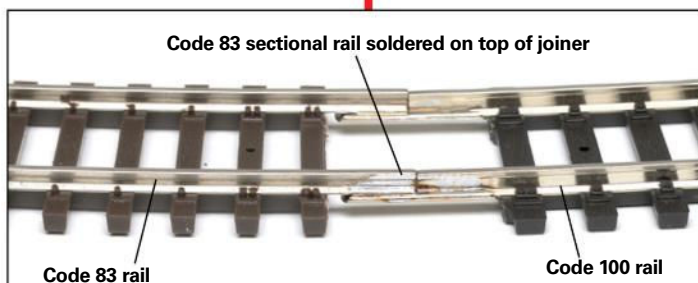
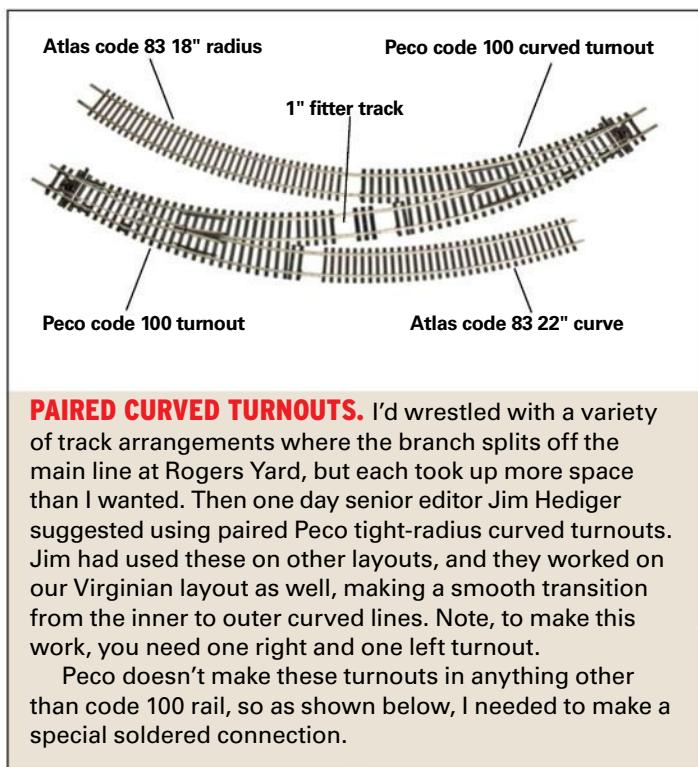
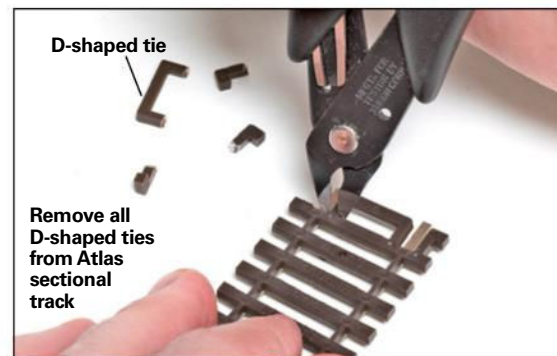
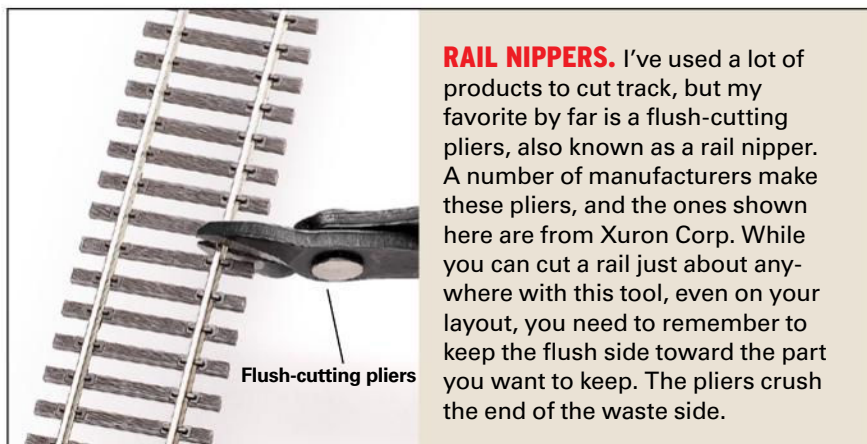
Fig. 1 Laying cork strips. Midwest cork is split down the middle (inset photo). Separating the cork into two pieces makes it easy to lay it on curves (above).



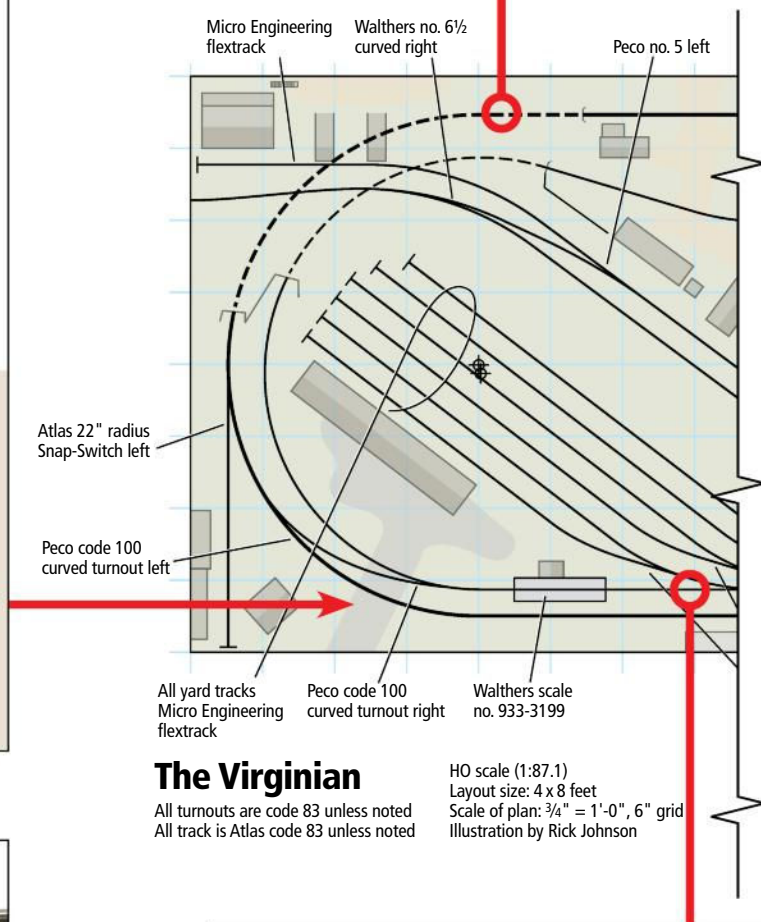
Fig. 2 Smooth on all sides. With the cork set in the glue, David smoothed it with a wallpaper roller (inset). After the glue dried, he sanded the cut edges.



Fig. 3 Wide open track spaces. In the yard and under the Bigger Mine, David used sheets of N scale cork under the track, cemented in place with wood glue.

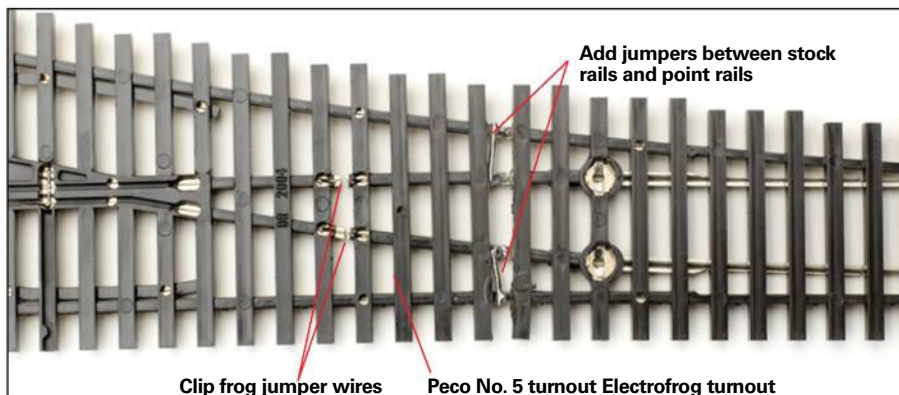


JOINING MISMATCHED RAILS. To connect the Peco code 100 turnouts to the rest of the code 83 track on the layout, I used soldered joints. This is actually pretty easy. First, solder the rail joiners to the code 100 section of track. Next, set the code 83 rails on top of the joiners (not in) and solder those in place. This isn't the strongest joint, so handle it carefully as you position it on the layout.

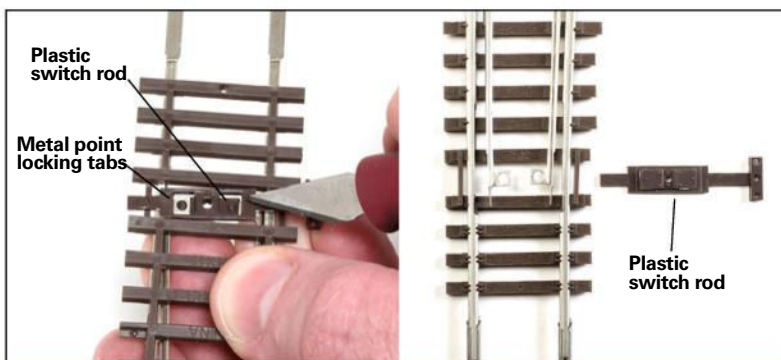
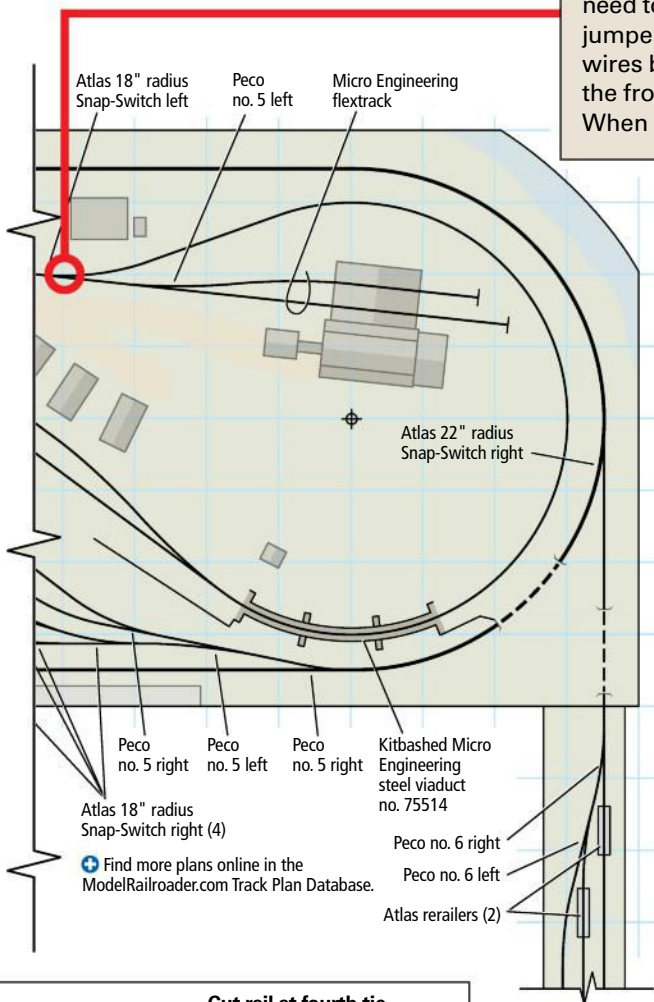


SNAP-SWITCH MODIFICATION 1. Atlas Snap-Switches are designed to work with Atlas sectional track, replacing one standard curve or straight. Since I needed them to fit in tight places, such as Rogers Yard, I cut them down to size a bit. On all of the Snap-Switches, I removed part of the rails leading into the points, counting four ties up. I did the same for most of the Snap-Switches at the top. While I was at it, I removed the last two ties (not the rails) from the diverging route. The modifications are shown at right.

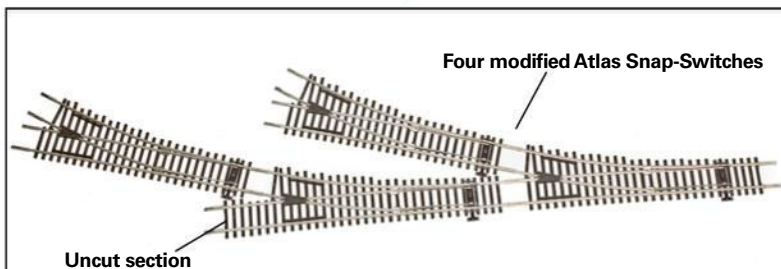
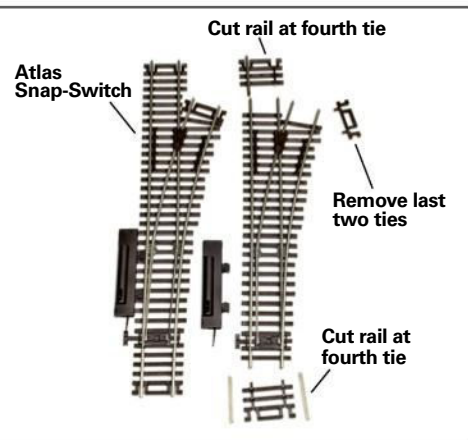
CUT THE D-SHAPED TIES. The Atlas curved sectional track we used on the layout comes with D-shaped ties molded into the ends. While these ties make it easy to put on rail joiners, they don't look realistic on the layout. Trim all the D-shaped ties before installing the track and replace them with standard ties later.



PECO ELECTROFROG MODIFICATIONS. To power a Peco turnout's frog, you need to make a few small modifications, as shown above. First, clip the jumper wires between the point rails and the frog rails. Next, solder new wires between each stock rail and its corresponding point rail. The wire from the frog will be connected to the Hex Frog Juicer, as shown on page 66. When installing the turnout, insulate the two rails leading from the frog.



SNAP-SWITCH MODIFICATION 2. Because of tight clearances, some of the Atlas Snap-Switches on the Virginian layout had to have their switch rods reversed, which turned out to be an easy modification. The rod is made of plastic and is attached to the switch points by metal locking tabs. Working from the bottom, I used a sharp knife and gently pried the tabs out of their seats and then slipped them out of the rod. Once the switch rod was free, I turned it around and slipped the locking tabs back into place.



MAKING THE YARD LADDER A SNAP. The only way I was going to fit a six-track yard onto the layout was if I could nest several small turnouts together. After some modification, four Atlas Snap-Switches proved to be the answer, as shown above. All have been cut to fit (modification 1), but the upper two still need to have their switch rods reversed (modification 2, above).



Fig. 4 Caulk. David used gray DAP caulk to attach the track to the roadbed. After laying a bead of caulk on the cork, he smoothed it with a putty knife.



Fig. 5 Track nails. Once a section of track was positioned, David tacked it with track nails so it wouldn't move while he worked on the next section.

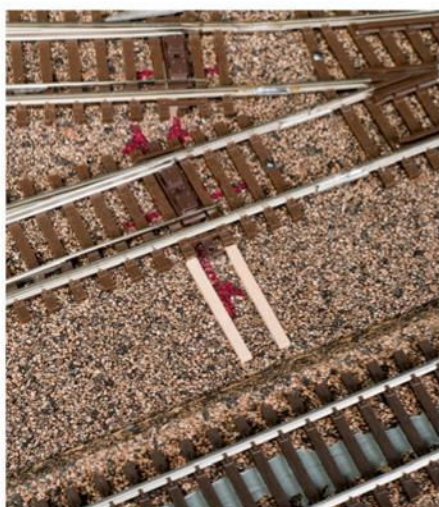


Fig. 6 Switch ties. We would later add ground throws to operate the turnouts, so David installed wood ties to extend the switch's head blocks. They were painted with the track.

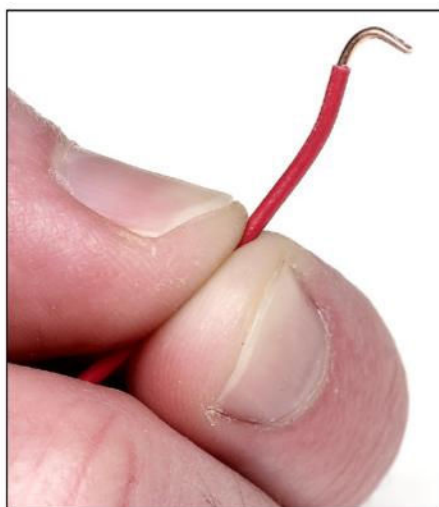


Fig. 7 Feeder wire. To run power to the rails, we used 22AWG solid wire. Before installing the wire on the layout, strip approximately 1/4" of the insulation and bend the tip 90 degrees.

Continued from page 61

which provides drainage and serves to lock everything together. This combination of earth, rock, track, and even bridges and trestles, is all called a right-of-way. It's graded in an angled profile to provide support and a way to shed water away from the track.

As described in part 2, we used plywood for the subroadbed on our project railroad, marking all of the track centerlines in pencil before we cut out the elevations. On top of that, as shown here, I then laid cork to form the roadbed for our right-of-way.

Working with cork

For this layout I used Midwest Products HO cork roadbed strips for the main line and branch line. As shown in **fig. 1** on page 61, the cork roadbed comes as a 3-foot long flat strip that has been cut most of the way through at an angle down the center. Simply pull the cork apart to separate the two pieces. (Cutting it with a sharp knife will make a cleaner edge.) Then, by turning one strip over and placing the square edges back to back, the cork strips form the roadbed, complete with angled profile.

With the strips separated, it makes them easy to form into curves. To lay the curve shown in **fig. 1**, I first laid a bead of yellow wood glue along the outside of the curve's center line. I then pressed the cork into the glue, aligning its inner edge along the centerline, and used a wallpaper roller to smooth it out, as shown in **fig. 2**. I then used a few pins to hold the strip in place until the glue set.

Next, I laid a second bead of glue, this time along the inside of the centerline, and then pressed the second strip of cork into it, tacking it as needed with pins, as shown in **fig. 1**. Once the glue dried,



Fig. 8 Soldered feeder. The small diameter feeder wires solder easily to model railroad track. Once this section is painted and ballasted, the feeder will be hard to notice.



Fig. 9 Power bus. David used 16AWG wire for the power bus under the layout, connecting the smaller feeder wires to insulation displacement connectors (suitcase connectors).

MAKE YOUR TRACK REALISTIC WITH PAINT AND BALLAST

MAKING YOUR TRACK look realistic is a two-step process: painting and ballasting. David generously cleaned the solder joints for the feeder wires with denatured alcohol. Flux and other soldering residue may affect paint adhesion.

Next, I masked the points on the Peco power-routing turnouts so the paint wouldn't foul the electrical contacts. Then I used an airbrush to paint the rails with Polly Scale Railroad Tie Brown. After the paint dried, I removed the masking tape and carefully touched up the turnouts with a Microbrush.

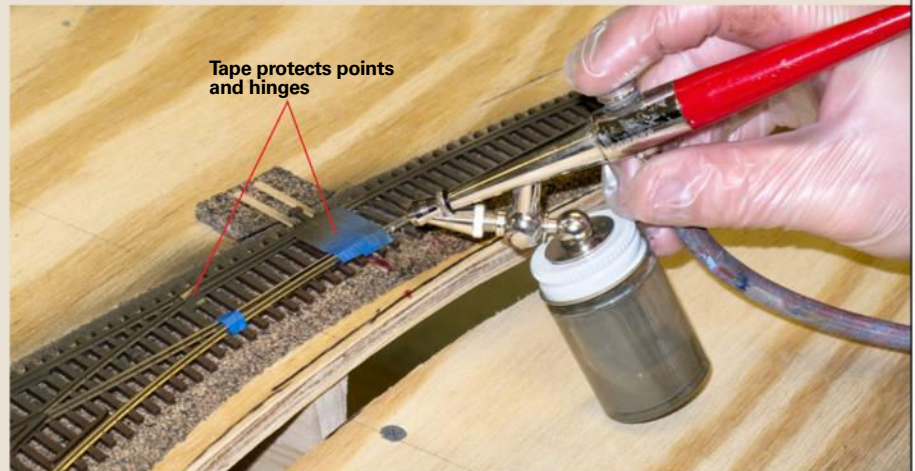
I let the paint dry for a full day before I started ballasting. I used Highball Products limestone ballast for the main line and cinders for the branch line and Rogers Yard.

Though many people think I'm crazy, I find ballasting very enjoyable. Why? Because I break it into manageable steps. I started by applying the ballast between the rails. This is a quick way to cover a lot of ground in a short amount of time. I used a 1/2"-wide paintbrush to evenly distribute the ballast, keeping the granules off the tie tops and out of the web of the rail.

Next, I used a pipette to soak the ballast with 70 percent isopropyl alcohol. After the alcohol had soaked in for two minutes, I applied Woodland Scenics Scenic Cement with a second pipette. To minimize the risk of washing out the ballast, I applied the glue from the outside and let it wick in toward the center.

Then I worked on the shoulders. I started by applying diluted white glue (thinned 20 percent with water) with a second 1/2" paintbrush. With the glue wet, I sprinkled on a thin layer of ballast. Once the glue dried, I used a shop vacuum to clean up the loose granules.

I applied a second, heavier layer of ballast, as shown at bottom left. I used a 1" foam paintbrush to shape the ballast (the brush's profile is close to that of the roadbed). I turned to the same wetting and gluing techniques as before. Once I could see glue between the granules, I knew the ballast would be secure. — *Cody Grivno, associate editor*



The first step in making track look realistic is to paint the rails and ties. Here, Cody is using an airbrush to apply Polly Scale Railroad Tie Brown.



Cody's multi-step ballasting technique starts between the rails. He uses a 1/2"-wide paintbrush to spread the ballast between the ties.



Next, Cody works on the shoulders of the roadbed. With the thinned white glue still wet, he sprinkles on a thin layer of ballast.



After vacuuming up the loose granules, Cody applies a second layer of ballast. He uses a 1" foam paintbrush to shape the right-of-way's beveled edge.



Finally, Cody applies the Woodland Scenics Scenic Cement with a pipette. As shown here, he let the glue wick up from bottom to top.



Fig. 10 DCC system. The Virginian uses an NCE Corp. Digital Command Control starter system with four plug ports and a second cab for two operators.

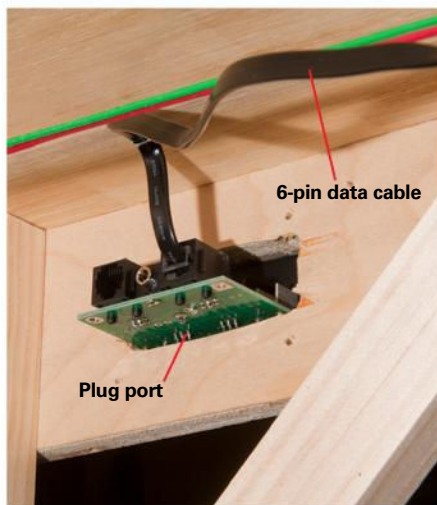


Fig. 11 Plug and play. The NCE system is easy to use. After the extra cab plugs are installed on the layout, they connect to each other under the layout using 6-pin data cables.



Fig. 12 PowerCab connection. The PowerCab is the brains of the system and must remain plugged into the left socket of the main cab bus port (the one with the red LED) at all times.



Fig. 13 An extra hand. To keep people from setting the DCC cabs on the layout, we installed several of these plastic pockets, made by New Rail Models, to the layout's legs.

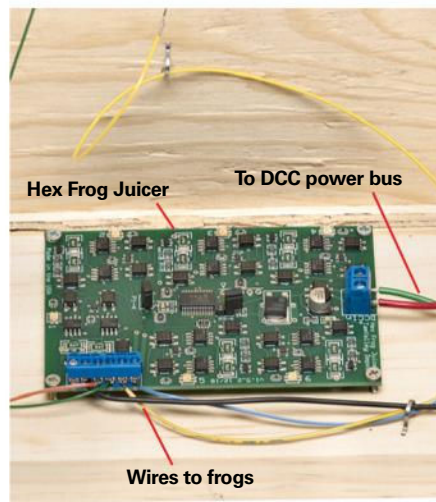


Fig. 14 Live frogs. The powered frogs on the Peco turnouts are connected to a Tam Valley Depot Hex Frog Juicer. This unit automatically reverses a frog's polarity on DCC layouts.

I removed the pins and used a sanding block to smooth the edges (see **fig. 2** on page 61), which is an important step to complete before you ballast your track.

Because the roadbed is split, you can curve it under turnouts just as easily. In this case, follow the outside edge of both routes leading from a turnout, and then cut pieces to fill the middle.

For the flat places under the Rogers Yard tracks and at Bigger Mine, I used N scale sheet cork, as shown in **fig. 3**. The N scale cork has a thinner profile, so it sits lower than the HO cork used on the main line, providing the yard and industry tracks a subtle, realistic elevation change. I glued the sheet cork to the layout with wood glue. It's important to lay weights on top of the sheet cork while the glue dries (books or bricks will do) to prevent the sheet from curling.

Trackwork

Because the layout required a variety of turnouts to make the plan work, we used track from four different manufacturers, which is easy to do since the components all work well together. For track component placement on the layout and other tracklaying tips, see pages 62 and 63.

The bulk of the track on our railroad is Atlas code 83. The code indicates the height of the rail's profile, so code 83 rail is actually .083" tall. I used Atlas code 83 flextrack on the main line and branch line. However, on the tight end curves I used Atlas code 83 sectional track in 18" and 22" radius. The sectional curves are very accurate and don't change shape. I soldered all of the rail joints.

As shown in **fig. 4** on page 64, I cemented the track to the layout using DAP gray latex caulk. I placed a bead of caulk on the roadbed, and then smoothed it with a putty knife. After pressing the track into the caulk, I tacked each section in place with a few track nails. See **fig. 5**. Though the caulk will hold the track by itself once it sets, I needed to keep working, so the nails kept the track secure while I added the next sections to it.

To operate the turnouts we used Caboose Industries ground throws. To support the ground throws, I added wood ties, used as the switch's head blocks, as shown in **fig. 6**.

Feeders and buses

I wired the layout as one big electrical block and used 22AWG wire (**fig. 7**) for feeders from the rails to a 16AWG power bus under the layout. The bus terminates in two wires.



Fairbanks-Morse H-16-44 no. 12 pulls loaded hoppers from the Bigger Mine. The four-axle road unit and short hoppers are ideal for the 4 x 8-foot layout.

While I didn't install feeders on every section of track, there are plenty, and they are soldered to the base of the rails, as shown in **fig. 8**. Soldering the correct color feeder to the proper rail can be a problem, even on a small layout. I used red and white wire, so my motto became "white out" as I worked, meaning that the white feeder went to the outside rail on the layout everywhere – everywhere, that is, except Green Hill, where the track doubles back on itself.

As seen in **fig. 9**, the feeders connect to the 16AWG bus using 3M brand insulation-displacement (suitcase) connectors. These are easy to use, and the best part is that they require no soldering, which is a great thing when you're working under a layout.

DCC control

At this point, the track and wiring was complete, and the layout could be run on DC by connecting the two bus wires

to a power pack. However, I wanted to run the Virginian with more than one operator, so I installed an NCE Corp. PowerCab DCC starter system. As shown in **fig. 10**, the system includes a power supply, a PowerCab, and a plug port, and it can be set up in minutes.

I also bought a Cab 04 (**fig. 10**) and four no. 207 cab bus plug ports so we could have two operators. The extra ports are easy to install and connect together with 6-pin data cables (also available from NCE). See **fig. 11**. I used the supplied template to cut holes in the layout's fascia and installed the ports.

Unlike other DCC systems, the PowerCab is the brains for the layout and must be kept plugged into the left jack of the PowerCab panel, as shown in **fig. 12**. You also need to use the 6-pin flat cable with it. If you unplug it, everything will stop, so we use this cab to run Rogers Yard and the Cab 04 to run the other trains. To hold the PowerCab when it's not in use, I installed a New Rail Models Throttle Pocket to each of the four legs. See **fig. 13**.

Because we are using DCC, I took advantage of the powered frogs on our

MATERIALS LIST

* Track listed is for both the 4 x 8 layout and the staging yard

Atlas HO scale code 83 track

170 rail joiners (2)
500 flextrack (16)
532 18" radius (14)
535 22" radius curves (12)
540 18" Snap-Switch right (1)
541 18" Snap-Switch left (4)
546 22" Snap-Switch right (1)
547 22" Snap-Switch left (1)
2540 track nails

Caboose Industries

202 sprung ground throw (10)

Micro Engineering Co.

10104 HO code 83 flextrack (7)

Midwest Products

3013 HO scale cork roadbed (1 box)
3020 N scale cork sheet (1 box)
3030 HO scale cork sheet (2)

Peco code 83 unless noted

SLE8351 no. 5 turnout right (3)
SLE8352 no. 5 turnout left (3)
SLE8361 no. 6 turnout right
SLE8362 no. 6 turnout left
SL8311 insulated rail joiners
244 Code 100 curved turnout right
245 Code 100 curved turnout left

Wm. K. Walther's Inc.

8827 6½ curved turnout right

Miscellaneous

Carpenter's glue
DAP latex caulk

Peco no. 5 turnouts and connected them to a Hex Frog Juicer, made by Tam Valley Depot (www.tamvalleydepot.com). This is a reversing module that automatically changes polarity of a turnout's frog. This means that the turnout has no dead spots, making it more reliable. I modified the Peco turnouts before installing them, as shown on page 62, and then connected the Hex Frog Juicer, shown in **fig. 14**, following the manufacturer's instructions. This is a DCC-only product.

It took the better part of three weeks, working here and there, to get the track and wiring done, but when it was finished, it was great fun to finally get to run some trains. **MR**





Model Railroader staff members share how they added rocks, trees, and other scenery to the Virginian layout.

BUILD THE VIRGINIAN

SCENERY

Part 4: Our HO scale layout gets some mountain scenery

BY DAVID POPP
PHOTOS BY JIM FORBES
AND BILL ZUBACK

PUFF BALL BOOT CAMP

PUFF-BALL TREES AREN'T NEW,

but they sure are effective and are among the least expensive ways to fill a landscape with trees.

We wanted to model the rich, dense deciduous forests of Appalachia, so we started with black poly fiber from Micro-Mark. (We made a few trees with green poly fiber and found that black fiber makes a big visual difference.) To break up the sameness of the puff balls, we planted a few Scenic Express trees, as shown in the town photo below. We coated those trees with the same colors of ground foam for consistency. – Neil Besouglouff



First, Neil took a 4" tuft of poly fiber and teased it into a rough shape about the size of a golf ball. Then he dipped it into a 50/50 mix of white glue and water and squeezed out the excess so the poly fiber was wet, but not soaked.



Next, Neil rolled the wet poly fiber ball into two colors of ground foam – first Woodland Scenics blended green, and then burnt grass. Don't worry if the foam doesn't stick to all of the fibers.



He then gave each puff ball a quick roll in Scenic Express light green foam to simulate new leaves. By sticking to the pattern – blended green, burnt grass, and light green – all of the trees were consistent.



Neil put the damp puff balls into a plastic paint tray. These disposable tray liners worked great for the entire puff-ball process. At this stage the trees looked like moldy meatballs, but on the layout they'll look like a forest.



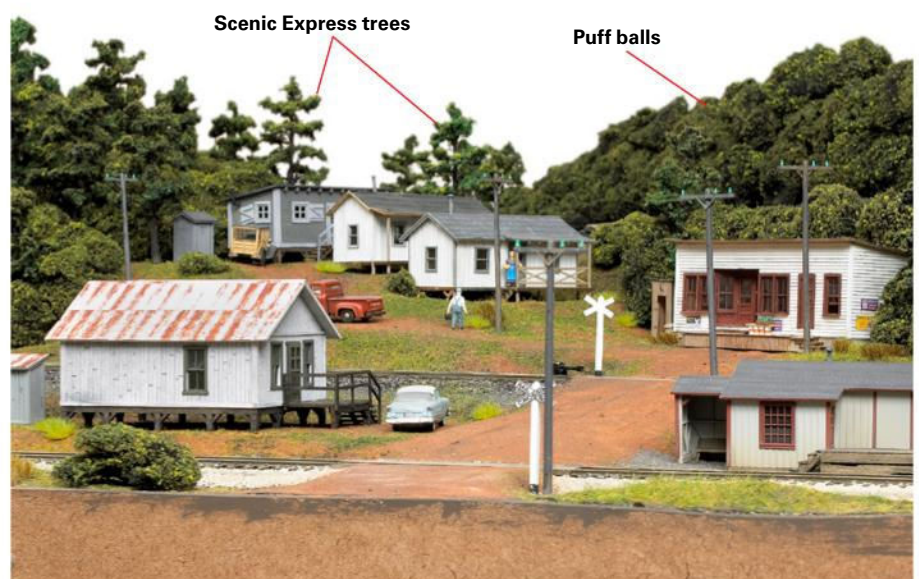
Neil started "planting" with full-strength white glue. The still-damp trees can be teased out and nestled together far more easily than when dry. This photo shows how far Neil got with three trays of trees.

SCENERY IS ONE OF THE MOST distinctive features of any model railroad. While the trains you choose to run say a lot about the prototype you're modeling and the era you've chosen to represent, it's the scenery that really tells the viewer the region of the country you've selected.

One of the appealing things about modeling the Virginian was that we got to build some tall scenery, which helped make the 4 x 8 foot layout seem much bigger than it really is, and that's where we'll begin this installment.

Hills and trees

Our Virginian project railroad is set in the Appalachian Mountains of West Virginia, and that meant we were going to need rounded hills covered with trees. For the hills we used stacks of extruded-foam insulation board glued together with latex caulk, as shown on pages 72



While much of the layout's hills are covered with puff-ball trees, as explained above, Neil also added some Scenic Express trees, shown behind the houses.

DIRT ROADS

FROM ALL OF THE VIRGINIAN PHOTOS we looked at, we knew we'd need to model dirt roads. To make the roads, I started by cutting the roadway into the foam scenery using a coarse sanding sponge. I then added the grade crossings, shown on page 75, and protected them and the track with masking tape. As shown in the photos, I used Woodland Scenics' Smooth-It, a plaster product, to form the roadway. The material is easy to work with a putty knife. The top surface is painted with Polly Scale Mud and then coated with white glue and Arizona Rock & Mineral Sedona Red Powder, making for a realistic dirt road. – David Popp



Tape protects grade crossing

David used a putty knife to form the roads with Smooth-It, a plaster material from Woodland Scenics. Tape protects grade crossings

and 73. The foam is a great choice for scenery work because it's lightweight, easy to cut, and holds its shape well.

From the photos of the Virginian, we could see that we were going to need to model a tight-packed deciduous forest, which translates to a huge number of trees. We figured we could speed things up by using the old practice of making puff-ball trees, which models just the treetops without the trunks and branches. Former editor Neil Besougloff headed up that department, and his technique for making puff-ball trees is shown on the previous page.

When we started the project, most of us had no real idea of just how many puff-ball trees it would take to cover the layout, but we didn't think we'd need that many – after all, it's just a 4 x 8-foot model rail-road, right? And at least half of that area is covered by track and structures.

Neil and our former editorial associate, Eric Stelpflug, started making puff-ball trees and used plastic paint tray liners to hold the finished trees waiting to be planted. Although a paint tray seems to hold a lot of puff balls, the reality was that the tall hills on the layout have a lot of vertical surface area, so the Virginian had a ferocious appetite for trees. In the end, even then-executive editor Andy Sperandio was called upon to make a few batches of puff balls.

We learned several things in the process, but the most helpful was that puff balls are best planted while they are still damp. It makes them easy to position in groups, and when the glue dries, it locks the puff balls together.

Flexible rocks

Flexible foam rock castings, such as those from I.S.L.E. Laboratories, have been around for quite a while, but I'd never used them before until the Virginian project. The rocks have good detail and are wonderful to work with. As seen on page 73, they bend around curves, and the foam is dense enough that it doesn't need to be backed with any other material when filling gaps up to 6".

The foam rocks are easy to cut with a sharp knife. I had great success using a retractable knife made for wallpaper work. I cemented the rocks to the layout and the foam hills using latex caulk. To fill in the gaps and blend the edges of the castings into the rest of the scenery, I used Sculptamold.

The rocks come in a pleasing tan color but can also be painted with acrylic paints. Associate editor Cody Grivno airbrushed all of the rocks on the layout



Vehicle used to make tire tracks

While the Smooth-It was still wet, David used a model truck to make wheel ruts in the road's surface.



When the plaster had dried, he painted the roads with Polly Scale Mud, then full-strength white glue.



Sedona Red Powder

To add the dirt to the road, David sifted Arizona Rock & Mineral Sedona Red Powder into the wet glue. The finished dirt road is shown here.

THE THIN BRANCH



Once the Virginian layout was finished, David revisited the region with the Thin Branch in the August and September 2013 issues of *Model Railroader*.



Extruded-foam insulation board was again the basis of the scenery. David added an access hatch to the tunnel.



Cast Hydrocal rocks on the Thin Branch were blended with more Hydrocal, carved while it was damp.

with Polly Scale E/L Gray. [Any light to medium gray would work – Ed.] After the paint dried, I applied an India ink wash (1 part ink to 9 parts 70 percent isopropyl alcohol), and then drybrushed the rocks with various Polly Scale colors to add highlights.

And more scenery

In addition to the rocks, hills, and trees, we added several dirt roads, a muddy creek, and a variety of ground cover, including ground foam, static grass, and grass tufts. These layers of

scenery are easy to apply and provide a realistic finished texture that makes the layout seem to be a lot more detailed than it really is. You can see many of these techniques on pages 74 and 75, and we demonstrate all of them, including how we painted the rocks, in the video journal series at www.ModelRailroader.com.

Structures are the last piece we needed to complete our Virginian project railroad, and former senior editor Jim Hediger and associate editor Steven Otte will dive right into that topic in the next installment. 

MATERIALS LIST

Amaco

41819M Sculptamold

Arizona Rock & Mineral

1040 Sedona Red Powder

1113 thin flagstone

Blair Line

126 18" radius grade crossing

127 22" radius grade crossing

165 two-lane grade crossing

Busch

1304 late summer grass pad

Chooch Enterprises

8320 concrete tunnel portal (3)

8421 concrete abutments

Highball products

224 cinders

I.S.L.E. Laboratories

501 Flexrock canyon wall (2)

502 Flexrock embankment (1)

503 Flexrock gorge (1)

Micro-Mark

84907 black poly fiber (4)

Model Master paint

4876 Concrete

4805 Railroad Tie Brown

Monroe Models

124 concrete abutment

Noch

7072 summer-blend static grass

Pre-Size Model Specialties

113 concrete tunnel portal (3)

Scenic Express

801B light green fine turf

1203 3" deciduous trees (7)

Woodland Scenics

191 Scenic Cement (3)

1252 concrete tunnel portal

1258 concrete retaining walls (3)

1344 burnt grass turf

1349 green blend turf (2)

1350 earth blend turf

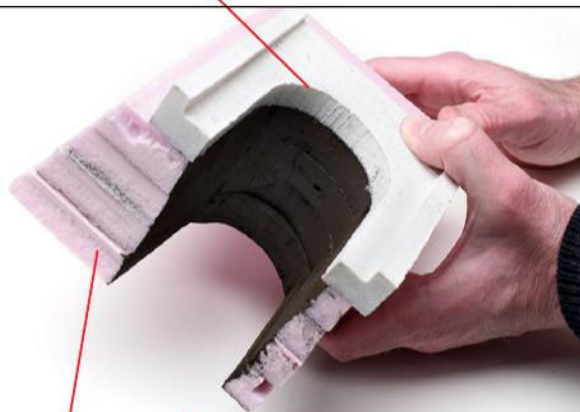
1452 Smooth-It

Miscellaneous

DAP gray latex caulk (3)

SHORT AND CURVED TUNNELS. The layout has four tunnels, three containing curved track. Neil built the curved tunnels by stacking together horseshoe-shaped pieces of scrap foam board. He used a tunnel portal as a template to cut each foam piece with an old steak knife. Each piece is offset by approximately $\frac{1}{4}$ " to follow the track curve. Neil test-fit each piece and then glued the sections together with latex caulk. Once the caulk was dry, he cleaned up the section seams with a knife but left the tunnel interior rough to simulate blasted rock. He painted the tunnels dark brown.

Pre-Size resin portal



Foam layers offset for curve

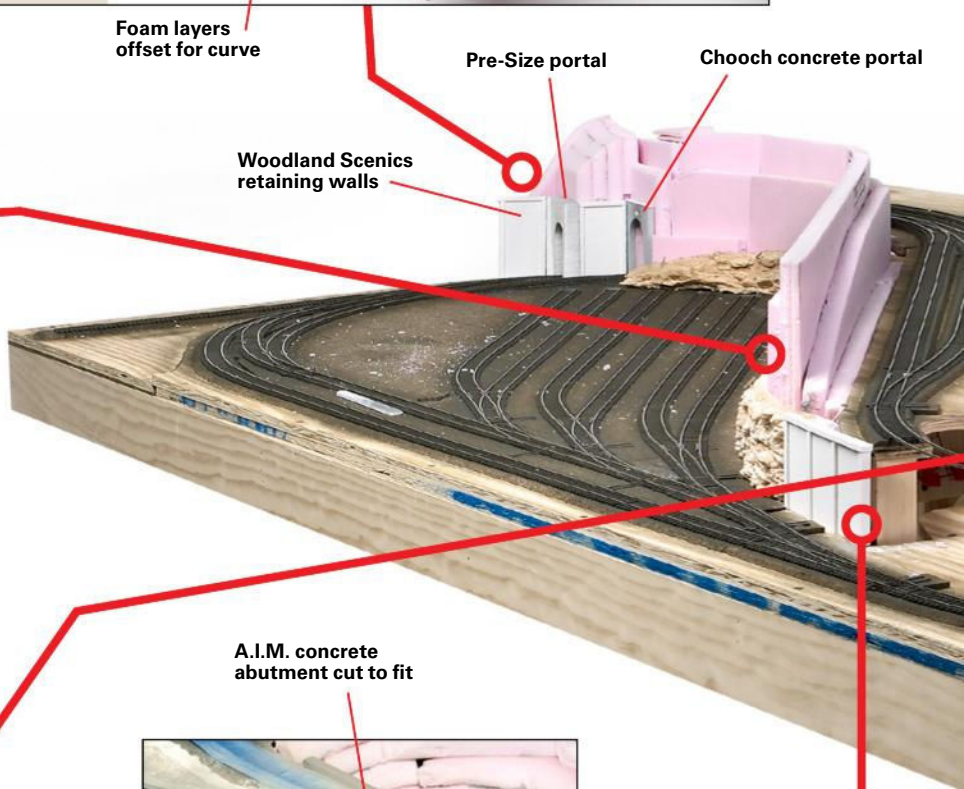
Pre-Size portal

Chooch concrete portal

Woodland Scenics retaining walls

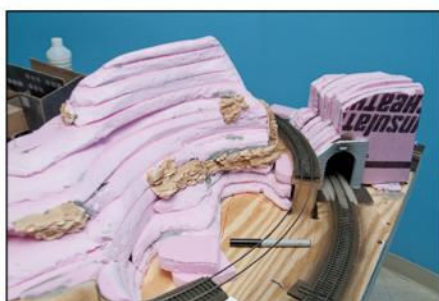


DIVIDING THE LAYOUT. Neil used four vertical strips of foam board to build the 9-foot ridge running diagonally across the layout. He used a knife to trim the edges and give the ridge a few undulations. The bare ridge looks far too thin, but after it was scenicked it looks like a much larger land mass.

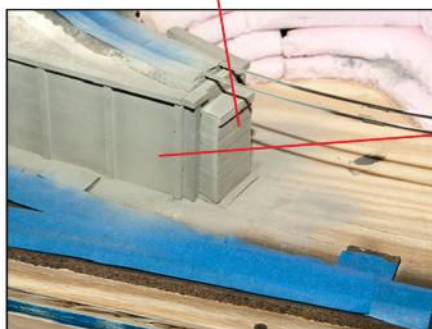


A.I.M. concrete abutment cut to fit

Woodland Scenics retaining walls



HORIZONTAL AND VERTICAL. Neil stacked layers of foam board horizontally and vertically to build the scenery. He used vertical pieces for steep or narrow slopes and horizontal pieces for wide areas. Neil used a caulk gun and DAP latex caulk to glue the foam together. Once the caulk cured, he shaped the scenery with a knife and a sanding sponge. Large seams and openings were filled with Sculptamold, but numerous smaller seams were left alone, since the puff-ball trees would hide the cracks.



RETAINING WALLS. David used plaster castings for the tunnel retaining walls and for the approach to the girder bridge. David prefers using plaster castings because they are much easier to cut than resin. Later, Cody airbrushed the walls Polly Scale Concrete [Model Master Concrete is similar. – Ed.], then David stained them with a wash of India ink and isopropyl alcohol to make them look weathered.

Chooch retaining wall



Pre-Size portal

TIGHT PORTALS. Two of the tunnel entrances on the layout were too close together to build with horseshoe-shaped pieces of foam board. Here Neil built boxes from scraps of foam board, glued them to the layout with adhesive caulk, and painted the inside surfaces a dark brown color.

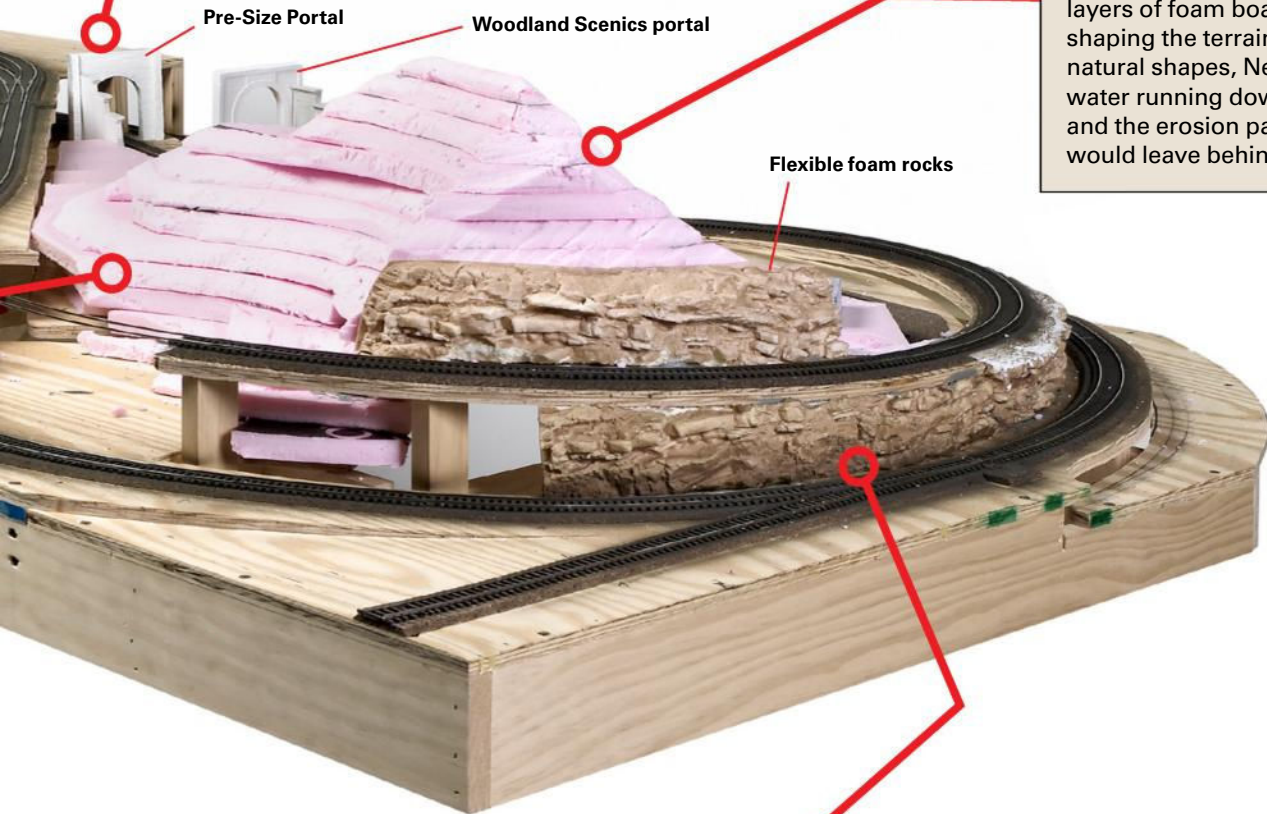


CARVING FOAM. Neil used an old steak knife and a sanding sponge to shape the layers of foam board. To disguise the layers, he made deep slashes through multiple layers of foam board while shaping the terrain. To create natural shapes, Neil visualized water running down the slopes and the erosion patterns the water would leave behind.

Pre-Size Portal

Woodland Scenics portal

Flexible foam rocks



FLEXIBLE FOAM ROCKS. Our Virginian layout has a lot of tight curves and elevation changes. As shown in the photos, a good way to cover those areas on a layout is to



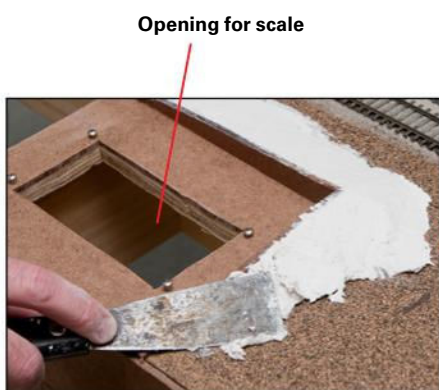
use exposed rock faces. For all of the rocks on the layout, we used flexible foam rock castings from I.S.L.E. Laboratories. These come in large sheets that can be easily cut with a



sharp knife. We used DAP latex caulk to attach the rocks to the layout. We used Sculptamold to blend the castings into the scenery. The rocks were painted with acrylics.

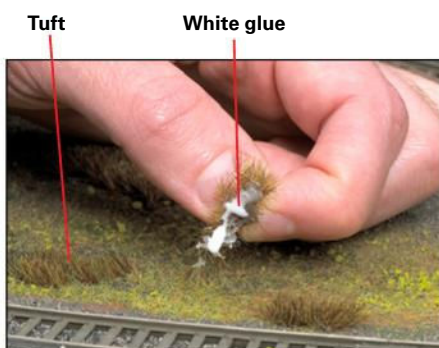


FASCIA. After we had the scenery well underway, we installed the fascia. We made the fascia boards with $\frac{3}{16}$ " tempered hardboard. One 4 x 8-foot sheet is all you'll need for this layout. We cut the boards with a saber saw to match the contours of the scenery. We then painted the fascia green and attached it to the layout with $\frac{1}{2}$ " panhead screws. We cut a tunnel-access door into the fascia under Green Hill. The door has two small brass hinges attached with no. 8 machine screws and nuts.



Opening for scale

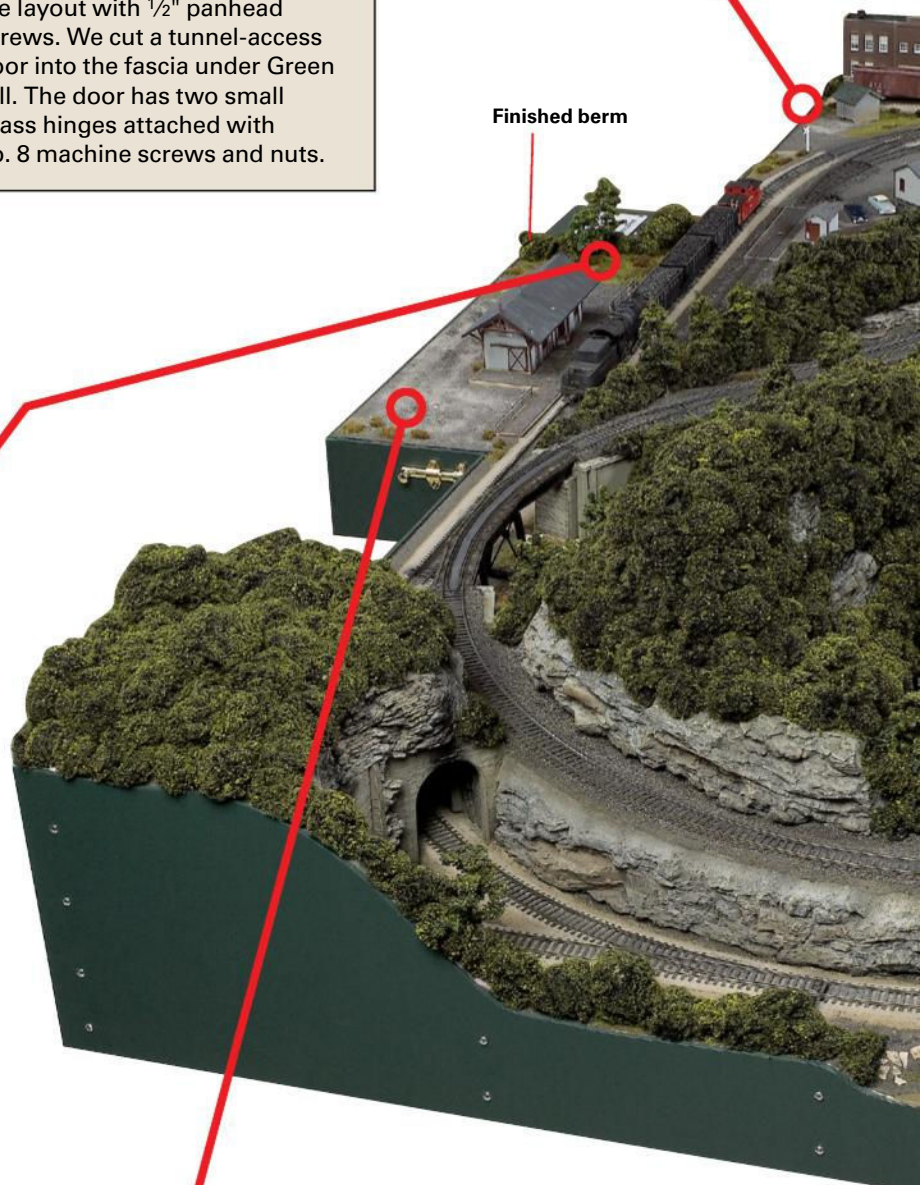
FILLING THE GAPS. Although foam makes up much of the scenery on the layout, we also used some Sculptamold, a papier mache-type product from Amaco, to fill in the gaps and make small contours. As shown here, we used Sculptamold to build up the berm around the scale control panel.



Tuft

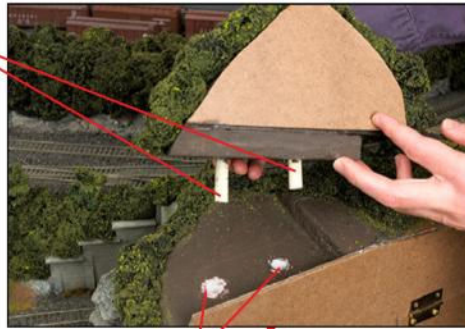
White glue

GRASS TUFTS. Tufts are one of the best scenery products to come along. Tufts are offered by many manufacturers. (Late Summer Grass by Busch is shown in the photo.) Tufts are clumps of static grass that can be peeled off a sheet and affixed to the layout with white glue.



Finished berm

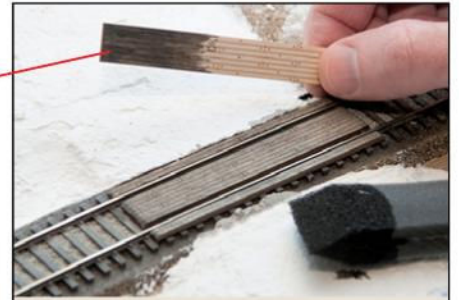
7/16" dowels



REMOVABLE TOPS. We built the layout to fit into a van, so the two tallest peaks are removable. Neil glued two pieces of 7/16" dowel into each lift-off section. They fit into two 5/8" pipe pieces glued into the scenery. The pipes and dowels keep the peaks aligned, and puff-ball trees hide the seams.

5/8" PVC pipe

India ink stain



GRADE CROSSINGS. We used Blair Line wood grade crossing kits for all of the road crossings on the Virginian, cementing them in place with cyanoacrylate adhesive (CA). As shown above, we stained the wood parts with an India ink wash (1 part India ink to 9 parts isopropyl rubbing alcohol).

Puff balls cut in half



EASY RIVER. David took a simple approach for modeling the river. First, as shown above, he applied a thin coat of Smooth-It plaster from Woodland Scenics on top of the plywood riverbed. After the plaster dried, he sanded it smooth and then finished the scenery along the bank.

Following prototype photos, David covered the bank with Highball Products cinders and Arizona Rock & Mineral thin flagstone chips to simulate the cinders and large, flat stones used as fill. He then added a few tufts of static grass and some of Neil's ubiquitous puff-ball trees.

To model the water, David mixed 2 parts Polly Scale Railroad Tie Brown and 1 part Mud [Model Master offers similar colors. *Ed.*]. He then added an equal part of gloss medium. David stippled the mixture onto the surface to create a small wave pattern. Since the water is supposed to be muddy, the glossy painted surface is all that was needed to simulate dirty river water.



Flagstone chips

Plaster river coated with paint and gloss medium

BUILD THE VIRGINIAN

STRUCTURES

Coal mines, company houses, and more complete our project railroad

BY DAVID POPP // PHOTOS BY JIM FORBES AND BILL ZUBACK

To conclude our HO scale Virginian project railroad, staff members share how they built many of the structures for the layout, including this kitbashed coal mine.



ALTHOUGH THE SCENERY made the biggest difference in how our HO scale Virginian layout looked as we built it, the addition of the structures was the finishing touch to our railroad.

For our Virginian project, we needed an assortment of buildings to create the feel of coal railroading in the hills of West Virginia in the 1950s. After

digging through a number of photos in books, Cody Grivno and I turned to the Walthers catalog to look for suitable kits. We selected a number of plastic and wood models (see the key below) and divided them among the staff.

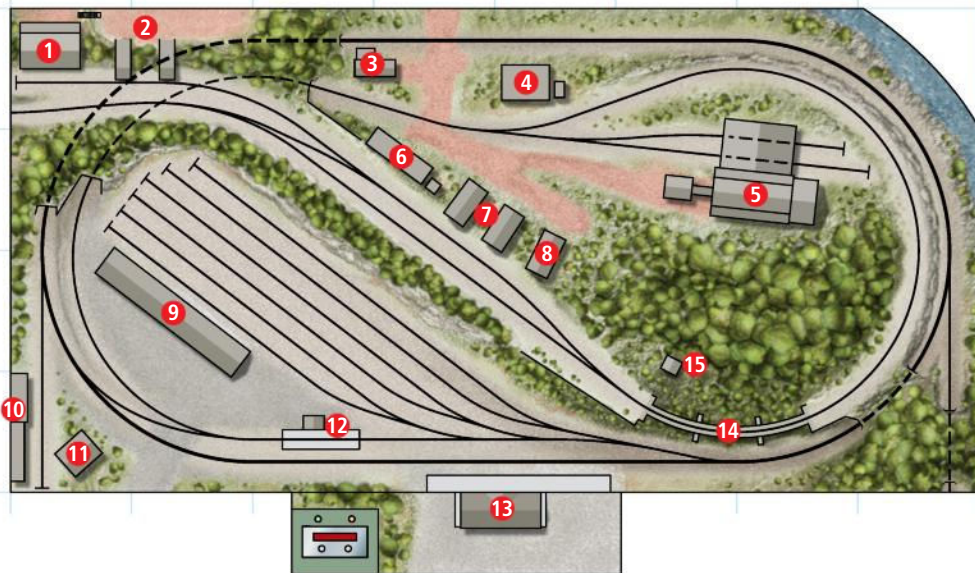
A few of the kits could be built as is. These structures made it to the layout fairly quickly.

Others needed small modifications to be used for our layout. The Walthers flat shown below was intended to be used as a background building. However, by moving it to the front edge of the layout and protecting it with a fascia panel made of tempered hardboard, we were able to suggest a factory in just a few square inches.

Continued on page 82

Virginian structure key

- 1 Green Seed & Hardware: Grandt Line no. 5098 Corrugated Iron Warehouse
- 2 H. Hanson Mine: two Blair Line no. 177 truck dumps (kitbashed)
- 3 Reid Gap Depot: scratchbuilt from styrene (see Step by Step on page 26). Now available as a wood kit from American Model Builders no. 180 Cullen Station
- 4 Moonshine Bar: Blair Line no. 2003 Sam's Roadhouse
- 5 Bigger Mine: Walthers no. 933-3017 New River Mine and no. 933-2935 Surge Bin (see page 38)
- 6 Perry Kincaid Dry Goods: King Mill Nella Country Store
- 7 Company houses: two Blair Line no. 176 kits (see page 40)
- 8 Company house: Blair Line no. 2000 Joe's Cabin
- 9 Rogers freight house: Scratchbuilt from styrene using prototype photos for inspiration
- 10 Cherrywood Cabinet Co.: Walthers no. 933-3193 Arrowhead Ale (see this page)
- 11 Tool shed: found model. Use State Tool & Die no. CMA-1222 Virginian tool shed
- 12 Track scale: Walthers no. 933-3199 heavy scale kit
- 13 Rogers depot: Atlas no. 720 Maywood Station (see page 42)
- 14 Steel viaduct: Micro Engineering no. 75513 viaduct and Walthers no. 948-886 bridge track (see page 42)
- 15 Hunter's shack: left over part from King Mill Nella Country Store kit



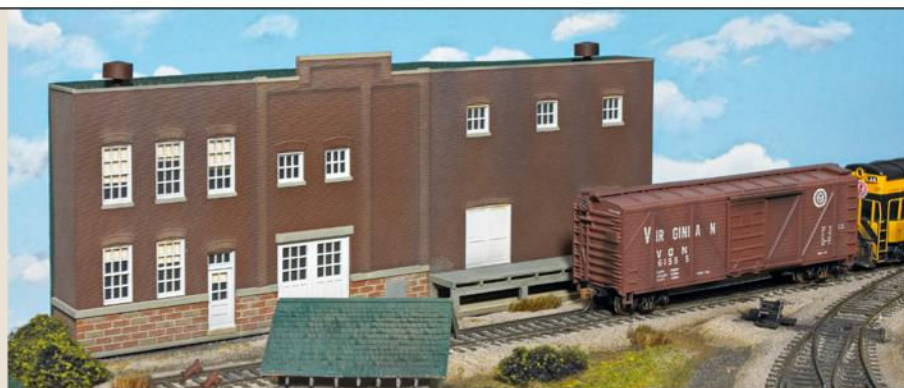
FASCIA FLATS

THE TRICK OF MODELING large industries as though they are just off the layout in the aisle has been around for a long time. Typically a track or two running along the front edge of the layout, and a sign or some vehicles are all that's needed to show that there is a factory or warehouse just out of view.

Similar techniques have been employed using layout backdrops. In this case, one or more tracks run along the back edge of the railroad and are accompanied by a structure flat or a picture of the industry they serve mounted to the backdrop.

More recently, however, modelers have begun combining the two ideas to make fascia flats. These are narrow structures that run along the front edge of a layout and are supported and protected by raised areas of the fascia.

I built the Cherrywood Cabinet Co. at Rogers on our Virginian



The small factory at Rogers started as a Walthers building flat. David modified it so that he could mount it to a raised part of the layout's hardboard fascia.

layout as a fascia flat, and it proved to be an easy project that added a lot of depth to the finished scene. I used a Walthers Arrowhead Ale kit for the cabinet company. After building and painting the model, I installed a wood 1 x 3 mounting block inside it, as shown at right. I then cut the fascia panel for that side of the layout so that it included the outline of the building. Two screws hold the flat to the fascia. — David Popp

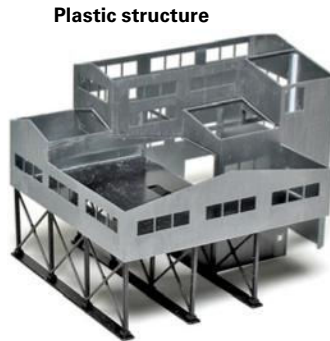


To secure the plastic structure kit to the fascia, David installed a block of wood inside the model. It's attached to the building's roof with screws.

RESIZING A COAL MINE



Cardboard mock-up



Plastic structure

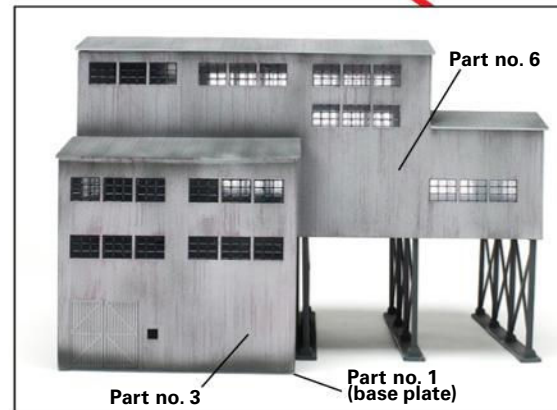
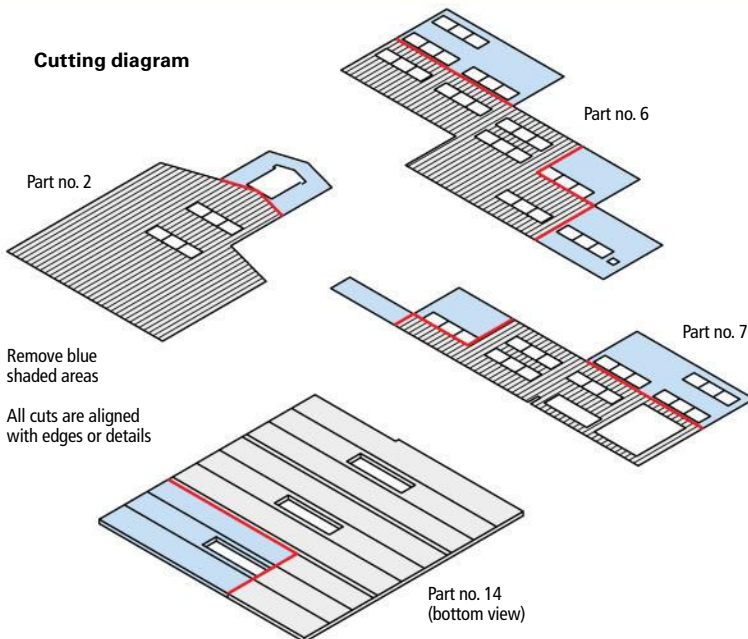
THE VIRGINIAN RY. made its living hauling coal, so we needed a fair-sized mine to provide traffic on our branch line. Walther's New River Mine kit seemed like the perfect solution, but it turned out to be too large for our 4 x 8-foot layout. After comparing the interesting lines of the New River kit to prototype photos, I decided to reduce its size to bring the mine into proportion.

I've used the Walther's kit's part numbers in the following references. I used the kit base (1) as a foundation for the main tippie. Then I could use the

outside wall (2), the lower back wall (3), the lower front wall (4), and the inside wall (5) to make a solid core for the structure.

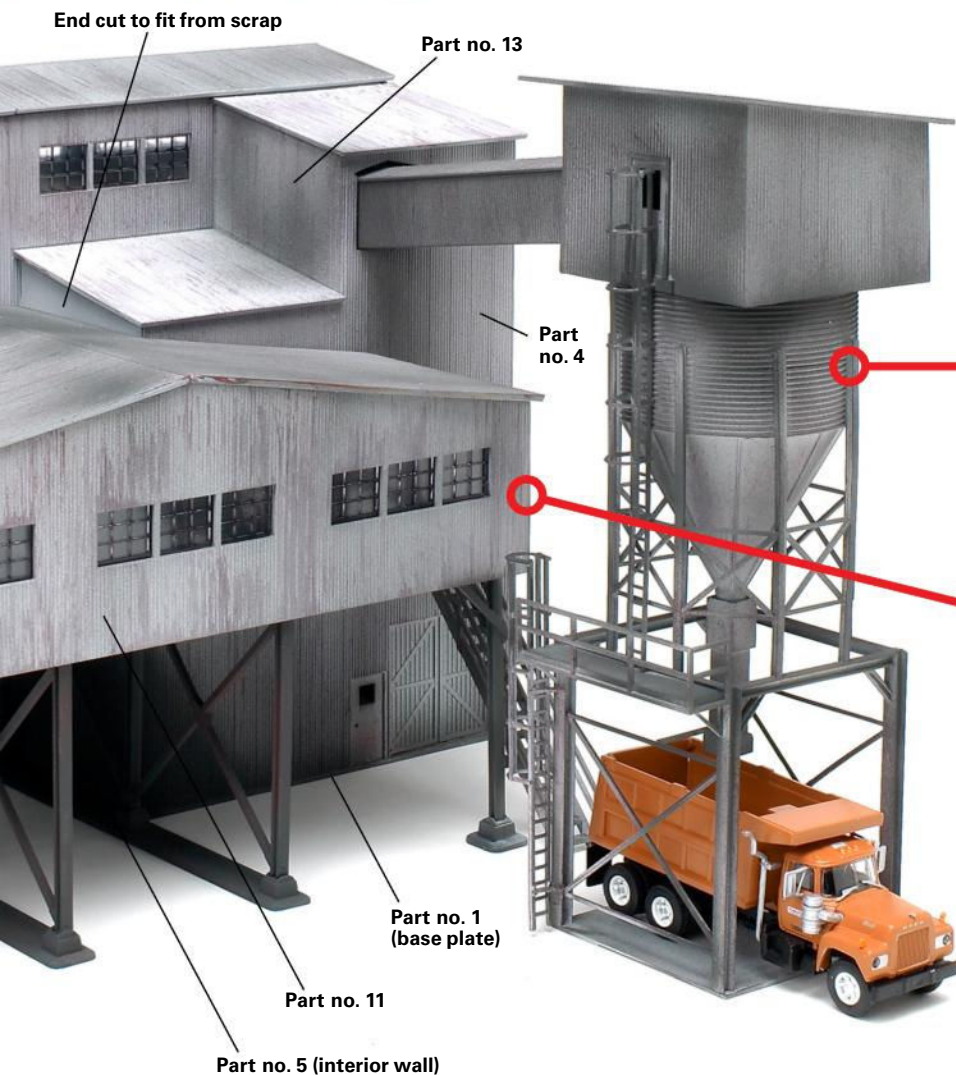
Before I began cutting any plastic, I photocopied the walls and cut them out of the copies with scissors. Once I figured out how to alter them, I cut the copies as shown in the drawing below, taped them onto pieces of cardboard, and assembled the mock-up (above left). Using details molded underneath the main floor (14) as guides, I cut a notch to eliminate one track under the tippie and leave a square corner for the office.

Cutting diagram





PAINTING AND WEATHERING. I used an airbrush to spray paint the model with Floquil Gray Primer. Then I drybrushed the roof panels and walls with Boxcar Red to simulate rust. Finally, I sprayed the model with more of the Gray Primer to tone down and blend the rust color and finished with a dusting of Grimy Black “coal dust.”



Conveyor opening

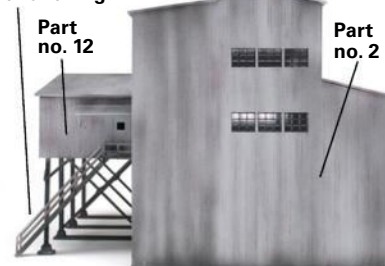


THE WASTE bin included in the kit was too large, so I replaced it with a cylindrical bin to break up all the rectangular shapes in the mine. I built this structure from a Walthers no. 2935 grain series surge bin using the kit “steelwork” and only two rings and the funnel bottom for the cylindrical bin.

A small scratchbuilt square machinery housing sits on top to power the conveyor. To complete this interesting addition, I installed the kit’s great-looking ladders and safety cages to provide access to the machinery.

My last step was to spray paint the waste bin using the same gray paint and rusty dry-brushed weathering that I applied on the mine. A light spray of Grimy Black simulates a layer of coal dust all around the bin.

Plastruct stairs and railing



CHECK TWICE, cut once. Building the mine proved to be fairly easy once I had the cuts figured out. All of my cuts are extensions of the part edges or the molded window openings. I used a sharp no. 11 hobby knife and a steel square to guide my cuts. In each case, I made a number of light cuts along the same line and either filed the edges smooth and square or beveled them to match adjoining walls.

I trimmed off the top of the outside wall (2), using the upper end wall (8) as a pattern for the short, angled cuts. Then I assembled the tippie walls on the base (1).

I trimmed the main floor (14) to fit against the tippie so the adjacent trestle (15) and its base (16) would fit against the foundation. Then I cemented the trestle assemblies in place, clamped them squarely in position, and let the joints harden.

I TRIMMED OFF the top of the rear wall (2) and cemented it in place against the outside wall, inside wall, and the base (1). I then added the low walls (10, 11, and 12) around the main floor (14), and added .125" square styrene to reinforce the joints. Finally, I cut and fit the remaining walls to complete the structure. I made the office entrance from styrene with a Plastruct stairway and railings. The rest was a matter of following the instructions. – *Jim Hediger*

KITBASHING A COMPANY HOUSE

WHAT'S A WEST VIRGINIA coal-mining railroad without a row of company houses? The town of Reid Gap, on the mine side of the layout, called for three of them. Associate editor Cody Grivno built the one in the back from a Blair Line Joe's Cabin kit, and I used two of the same firm's Company House kits for the others. I built one as directed, and the other one I kitbashed slightly.

I modified the house's corners to recover from a mistake in assembly. But I changed the front porch on purpose to make the house look different from its neighbor. You can use these simple ideas to improve the look of your wood kits, even if you build them right the first time.



Associate editor Steve Otte built two Blair Line Company House kits for the town of Reid Gap. He modified the first house to give it a unique look.

1. PREPARING THE PARTS

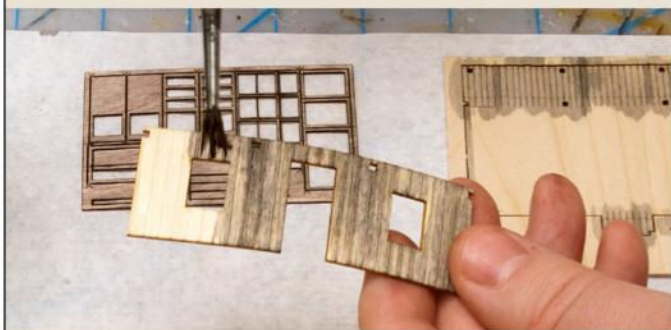
AFTER EXAMINING and identifying all the parts, the first step I always take with a wood kit is to stain the wood. I used a homemade mixture of 70 percent isopropyl alcohol mixed with about a tablespoon of black acrylic hobby paint per bottle. I applied the stain with a soft brush. I then sandwiched the parts between two paper towels and set weights on top so they would dry flat.

Once the stain dried, I painted the small parts while they were still attached to the carrier sheets. I chose Polly

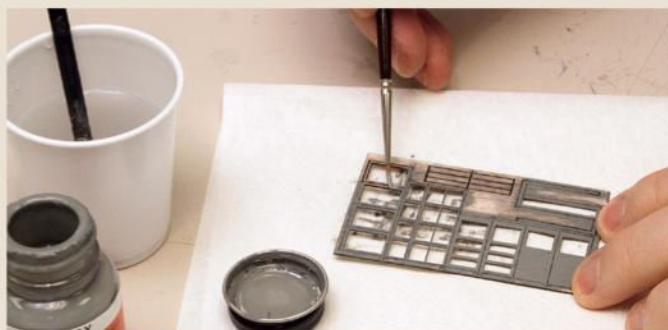
Scale Reefer White for the walls and Erie Lackawanna Gray for doors, windows, and trim.

I gave the walls a heavy drybrushing with the Reefer White, dragging the brush vertically. I kept adding more paint in light layers until just slivers of wood showed.

The kit comes with peel-and-stick windows and doors. After painting these parts, I peeled off the liner protecting the self-stick adhesive and assembled them. I applied the glazing, then installed the windows, doors, and trim.



Steve stained the wood parts with an alcohol and acrylic paint mixture. This gave the bare wood an aged look.



Painting the fine parts before removing them from the carrier sheet makes them easier to handle.

2. BRACING AND MODIFICATION

WHEN I ASSEMBLE a wood kit like the Blair Line company house, I add plenty of stripwood bracing to the interior walls. This is always a good idea, since stain, paint, and moisture from the air can warp a wood structure's thin walls. Since our Virginian project railroad is designed to travel to shows, extra bracing would also reinforce the houses against accidental bumps. But this is where I goofed.

I glued $\frac{1}{8}$ " square strip to the edges of the end walls before test-fitting them together, and my assumption of which edge formed the outside of the corner turned out to be wrong. So I compensated by filling the notch at the corner with $\frac{1}{16}$ " square stripwood, painted my trim color.

I like this technique, which I also tend to use when scratchbuilding. But it ended up making my house $\frac{1}{8}$ " too wide for the foundation and roof. Since the back of the

2. BRACING AND MODIFICATION (CONTINUED)

house would butt up against a slope in the terrain, I cut off the small back porch and extended the foundation in back with a strip of wood cut from the carrier sheet. I reinforced the butt joint with a wood strip I positioned to also strengthen the wall-to-floor joint.

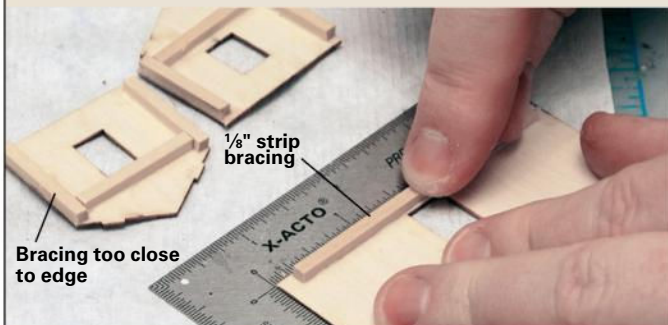
The kit roof comes in three parts: a rear piece cut long enough to slightly overhang the back wall, a front piece with no overhang, and a porch roof that joins the front where it meets the wall. My wider building left both main roof pieces slightly too short.

I likewise lengthened these with scraps from the carrier sheet. So my reinforcement strips wouldn't interfere with the wall joints, I added the splice to the

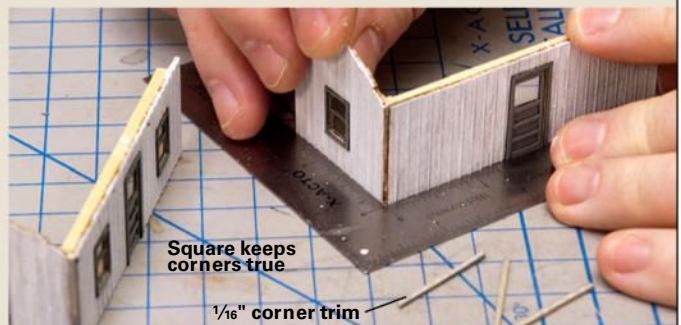
peak of the roof, meaning I had to trim the attachment tabs off the wall tops and fill the slots with stripwood.

Just as the back of the house sits against a slope, the terrain slopes down away from the front. So I modified the porch to make the steps exit to the side. This simple modification gives the house a distinct look from the stock kit.

Starting at one of the notches for the porch roof supports, I cut off the left one-third of the porch floor. I then trimmed the porch roof to a length so it would slightly overhang that left edge, then cut the same length notch in the lengthened front roof piece. The front roof would then overhang the exposed third of the front wall.



Bracing wood kit walls with stripwood is always a good idea. So is test-fitting your parts before doing so.



Steve fixed the corners by adding $\frac{1}{16}$ " square trim strips. This made the house deeper than it should be.

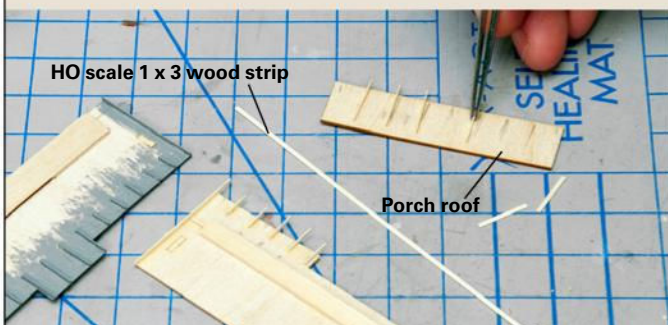
3. ADDING DETAILS

BEFORE APPLYING either roof piece, I marked the undersides with a pencil at regular intervals of approximately $\frac{1}{4}$ ". After marking where the walls would fall against the underside of the roof pieces, I glued short segments of HO scale 1 x 3 stripwood along these marks to make rafter tails. To make these tiny pieces easier to handle, I cut them long, trimming them off at the roof's edge only after the glue had dried. I also added full-length rafters at the gable ends of the roofs. I painted the rafters, the roof edges, and the visible part of the undersides gray before gluing them in place.

To add some more interest (and to keep the residents from accidentally tumbling down the hill), I made a decorative railing for the front porch. I glued pieces of

scale 1 x 3 into two shallow X shapes, then trimmed the ends to make them about $\frac{1}{4}$ " deep. I then glued them between two scale 2 x 4 beams to make a railing. I cut it into two pieces and trimmed them to fit between the porch posts, and then glued them in place. I left these unpainted, preferring the weathered wood look of the rest of the porch.

The final step to complete the house was to finish the roof. I applied the included self-stick rolled roofing, cutting some pieces short to fit the shortened porch. I then brush-painted it Polly Scale Tarnished Black and weathered it with a drybrushing of E-L Gray. Finally, I glued the smokejack in place, added a guy wire of .012" brass, and painted both Tarnished Black. – *Steven Otte*



Steve marked the underside of the roof pieces at even intervals and glued on rafter tails of 1 x 3 stripwood.



A shortened porch and a section of scratchbuilt decorative railing gives the kit house a distinctive look.

ROGERS DEPOT



After removing the dock, Cody lowered the freight door to ground level. This left an opening in the wall above the newly positioned door.

THOUGH THE ATLAS Maywood Station kit is based on a New Jersey Midland RR prototype, with the right paint it's a plausible stand-in for a Virginian structure.

I first removed the dock on the freight end of the depot. Then I



Cody Grivno used the Atlas Maywood Station kit for the Rogers depot. He painted the building in Virginian colors to match other rail-owned structures.

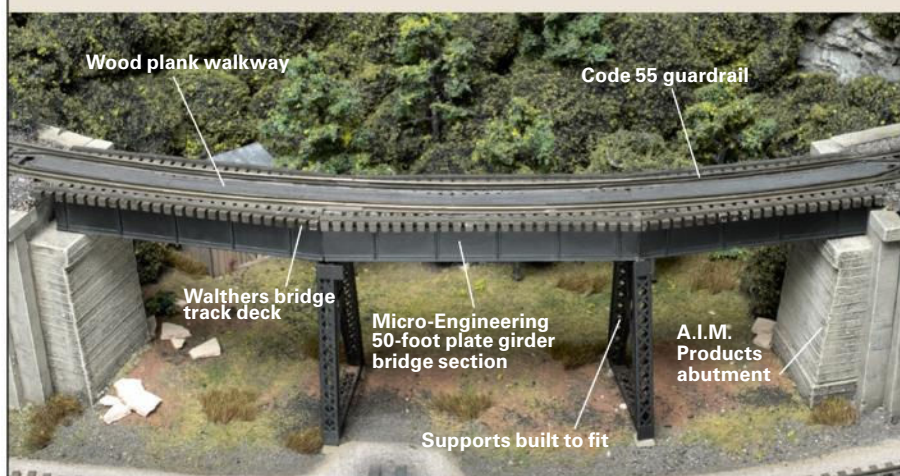
lowered the door to ground level, as shown at left. Moving the door down left an opening in the wall. I used the trim from the dock (which matches the walls) to fill the gap.

Next, I painted the depot Polly Scale Undercoat Light Gray and

Oxide to match the other Virginian structures on the layout. To give the station some character, I used a sanding stick to remove some of the oxide paint from the trim.

I finished the building by applying an India ink wash. – Cody Grivno

STEEL VIADUCT



The Virginian had many steel viaducts, so the layout wouldn't be complete without one. David and Cody built this one using a Micro Engineering kit.

THE STEEL VIADUCT started life as Micro Engineering kit no. 75513. The trick was to make the straight model fit our 18" radius curve.

To start, I built the three 50-foot girder bridge sections from the kit. Next, I laid the sections on top of the Atlas 18" radius track spanning the gap in the layout for the bridge and marked the angles needed for the viaduct to follow the curve. I cut the ends of the girders with a razor saw, then cemented the pieces together.

I used a section of Walther's 948-886 bridge track to make the deck. First, I removed the rails from

the plastic ties and used a hobby knife with a chisel blade to remove the spike and plate details. Next, I cut the Walther's deck into three sections to match the bridge. I cemented the decks to the girders with cyanoacrylate adhesive (CA). The guard rails are code 55 rail.

Once the bridge was in place I cut the A.I.M. Products no. 124 plaster abutments to fit and glued them to the retaining walls with latex caulk.

Later, Cody finished the work by building the legs, painting the bridge Engine Black, and adding a strip-wood plank walkway. – David Popp

Some buildings needed more extensive modifications to fit a given location. When you take one or more kits and rework the pieces to make something different, it's called kitbashing, and we did our share of that on the Virginian.

The Bigger Mine on the layout was built by Jim Hediger, who kitbashed pieces from two different Walther's kits to make it. As he explains on page 78, Jim photocopied the kit parts and built a mock-up out of paper before cutting a single plastic wall. This technique is a great way to experiment with ideas and makes kitbashing a lot easier.

We also did a few things to give our structures some character. Sometimes all you need is paint, as shown above on the Rogers depot. The depot started life as a common Atlas Maywood Station kit. More than one visitor has commented on how much it looks like a prototype Virginian station, simply because we painted it in Virginian Ry. colors.

Sometimes just a few tweaks to a building can make a big difference as well. Steven Otte built a pair of Blair Line company houses for the Reid Gap side of the layout, but he made a few changes to the second one and added extra details to make it unique. His handiwork is explained on page 80.

While we've come to the close of our Virginian series, the layout still has a lot of potential. In fact, we've already built several additions, which brings up a good point: Even a small model railroad like the Virginian can be the beginning of a much larger enterprise. **MR**



MR VIDEO PLUS
SHOWS
YOU
HOW



“

Awe-inspiring.
Started my first layout
about a year ago and
this video and others
keep me driven for
the greatness that
can be achieved.

— FRANK HORAN

”

Looking for a Little Inspiration?

Join the MR Video Plus crew as they showcase some of the finest model railroad scenery and layouts you'll ever see in any size or scale in our Layout Visits series. From Lance Mindheim's CSX Miami downtown spur in HO scale to Bernard Kempinski's O scale USMRR Aquia Line, we show you how these modelers created stunning layouts and inspire you to do the same!



1-Month Subscription to MR Video Plus =
LESS THAN 1% of the cost of the Winston-Salem benchwork.
Subscribe now and let MR Video Plus show you how!

MRVideoPlus.com/intro

WHAT IS ATHEARN ROUNDHOUSE?



FUN

Classic model trains inspired by real railroading. Setting a foundation for excitement and enjoyment.

ROBUST

Designed to pass the test of time. Tried and true products that last a lifetime.

VARIETY

Colorful equipment for everyone – from vintage to modern. Perfect for beginning and experienced enthusiasts.



These points are the basis for the new Athearn Roundhouse®. This collection is home to the hobby's best-loved classic models. A wide variety of eras and railroads are available with an emphasis on fun, creating a product line for both beginning modelers and experienced hobbyists.

A rich history is not exclusive to real railroading alone. The year 2017 will see Athearn Trains celebrating our 70th year of offering model railroaders fun, exciting and accurate models. Athearn – the biggest little railroad in America™ since 1947.



HORIZON
H O B B Y

VISIT
Your Local Retailer

CLICK
Athearn.com

CALL
1.800.338.4639

SERIOUS FUN™

©2017 Horizon Hobby, LLC. Athearn, Genesis, Ready To Roll, Trains in Miniature, Serious Fun and the Horizon Hobby logo are trademarks or registered trademarks of Horizon Hobby, LLC. The Union Pacific mark and other marks owned by Union Pacific are made under trademark license from Union Pacific Railroad Company. All other trademarks, service marks and logos are property of their respective owners. Final models may vary slightly from photos shown. 558501