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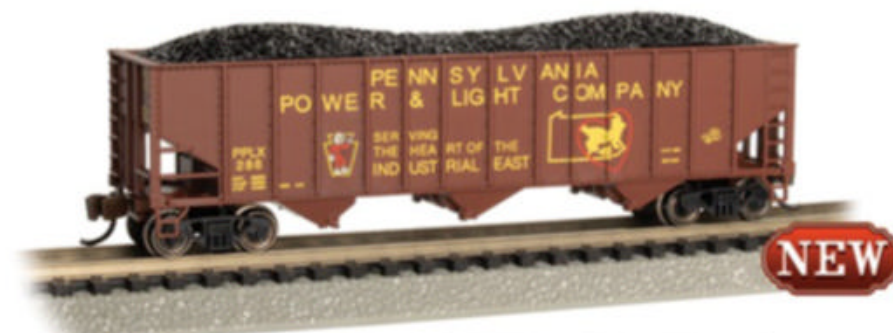
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▲ **Kato New York Central train set in N scale** p.48

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Compact railroads in HO and N scale p.26, p.34

Model hard-working ballast cars

p.31

Layout lighting surprises, good and bad p.66

Dramatic bridge and tunnel scenes on Scott Lamoureux's N scale layout. See page 34.

PLUS

Add sound to an HO Walthers' E9A p.44

On Operation: Reading a train register p.54



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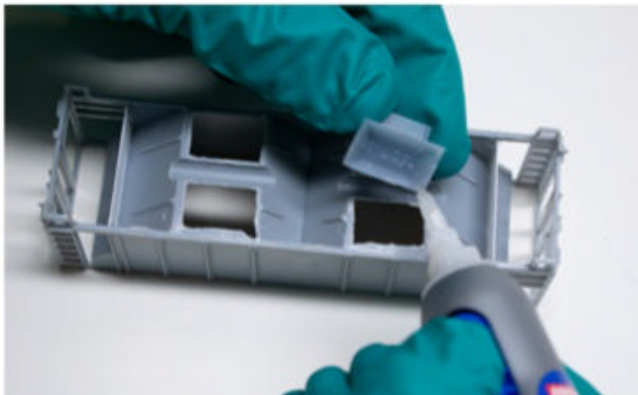
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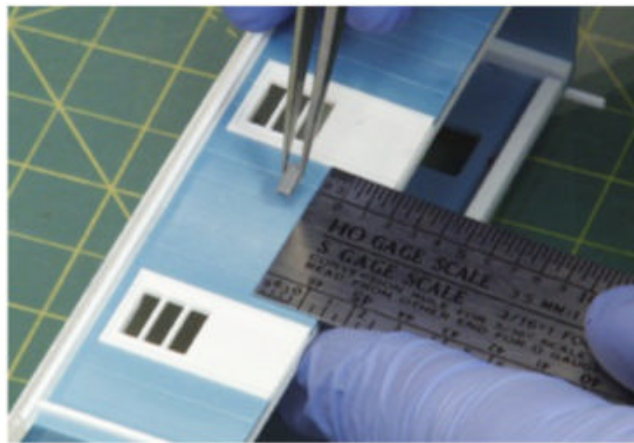
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On the cover: A set of CN diesels steps out onto Cisco Bridge on Scott Lamoureux's N scale Ashcroft Subdivision layout. Scott Lamoureux photo

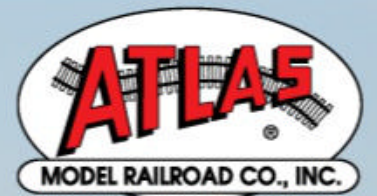


Next issue

In June, visit a narrow gauge mining line set in Michigan's Upper Peninsula. Plus, learn to use staging yards more efficiently, model a switch heater, and more!

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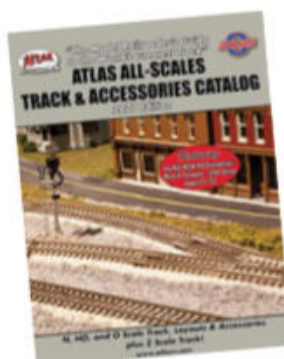
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Big results from modest-sized layouts

For many of us, there's the model railroad we have now and there's the one we would like to have.

That future layout has as many forms as there are modelers to dream of it but each falls under the category of "It will be better." Better looking, better running, more rewarding – a layout to showcase our love of the hobby.

So what's holding you back? Perhaps you're contemplating a move. Perhaps finances will be less of an issue down the road. Fair enough.

I'm embarrassed my own oft-repeated lament, "I don't have enough room for a nice layout," turns out to be a fairly hollow excuse.

In this issue, we showcase two layouts, both compact in

size but both making the most of the space available.

Scott Lamoureux, a long-time modeler in both HO and N scales, built his Canadian National Ashcroft Subdivision in just 7 x 10 feet. The N scale layout, shown below, is compact yet allows Scott to run long, modern trains through dramatic scenery. Scott shares his story starting on page 34.

Frequent contributor Bill Neale had just finished a clinic when he was approached by Ed and Vicki Adler, who asked if he knew of anyone who could help them build a layout.

After some conversation, Bill offered his assistance and also secured the help of a team of fellow modelers.

The 12 x 17-foot area the Adlers had available is not much room, given that the couple also wished for wide curves to accommodate long HO scale passenger cars.



In his article starting on page 26 Bill notes, "To solve the radius issue, we decided that the railroad would go around the outside of the area, with the people in the middle."

The design is simple, and the results are exceptional.

Both layouts show the value of thinking big – in a small way!



Scott Lamoureux's N scale Canadian National Ashcroft Subdivision layout achieves a lot in a small area. Scott Lamoureux photo

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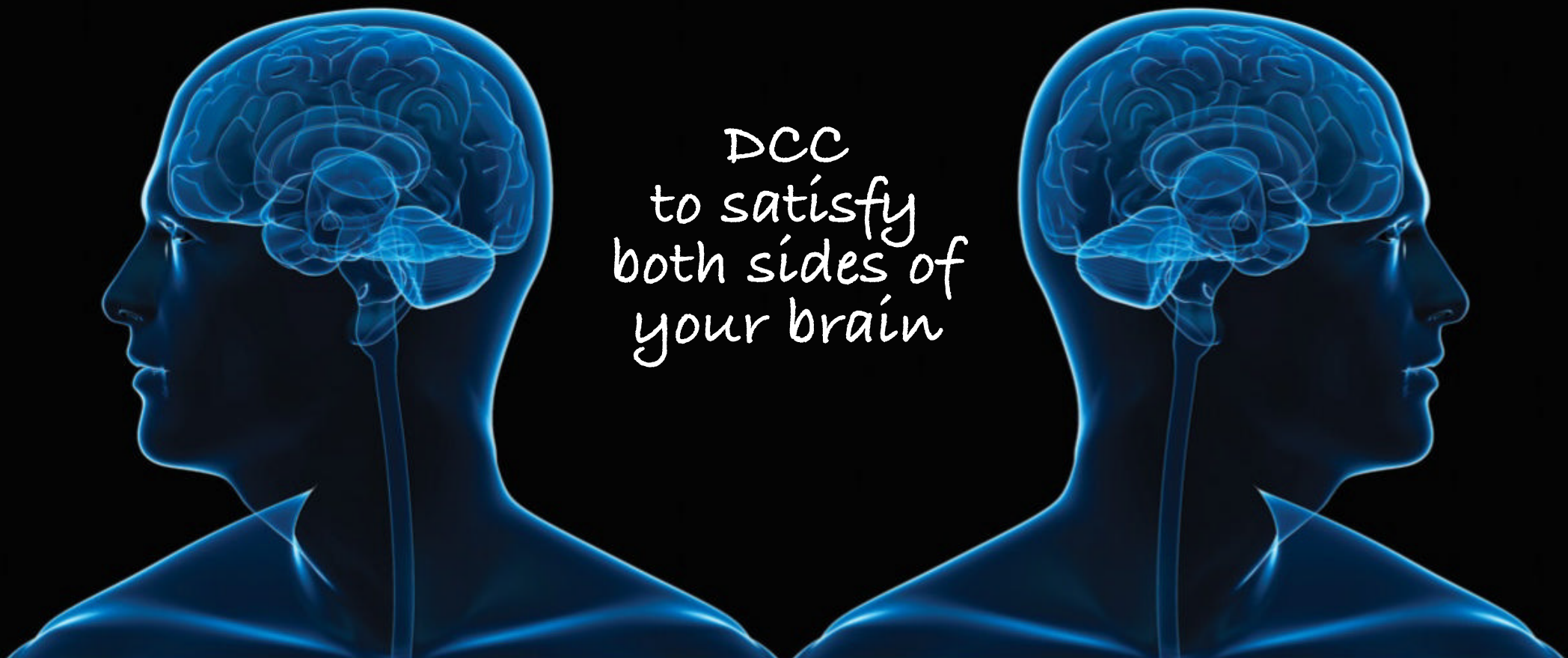
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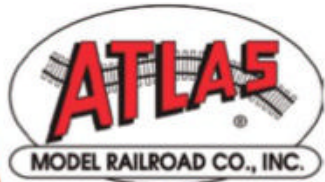
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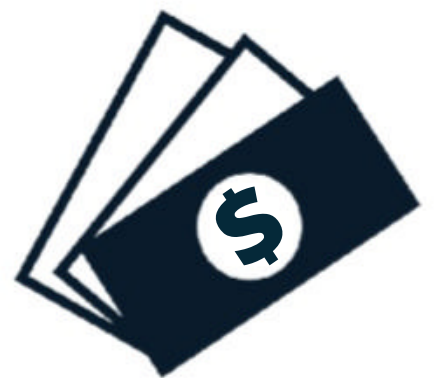
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Our proposed method of grouping products based on prototypes across nearly 200 years of railroads in the United States!



Era	Date	Name	Steam	EMD	Alco	GE	Passenger
1	1827-1880	Old Time	American 4-4-0s				Open vestibule wood cars <60ft
2	1880-1915	Turn of the Century	Atlantics, Moguls, Consolidations, Camelbacks				Closed vestibule wood cars 80ft
3	1915-1928	Golden Age	USRA to Superpower and Modern Steam				Steel Clerestory/Early streamliners
4	1929-1934	Superpower	4-6-4s, 2-8-4s, 4-8-4s, 2-10-4s and 2-6-6-4s		Small switchers HH series		
5	1935-1945	Modern	Streamlined steam	NW Series/Streamline Trainsets/Early E Series	S Series DL Series		
6	1946-1960	Steam/Diesel Transition	Steam Decline	E/F/SW Series Early GP/ SD Series	FA/PA/S Series Early RS Series	U Series launched	Rise of the post-war streamliner
7	1960-1972	1st Gen	End of steam	SW1000/1500, GP20 to SD45	RS27-36/Century Series	U Series	Decline of the post-war streamliner
8	1972-1985	2nd Gen		GP/MP15, GP/SD50, GP/SD60, Dash 2 Series		Dash 7	Amtrak Heritage/Amfleet
9	1985-1995	3rd Gen		GP50/60 SD50/60		Dash 8	Amtrak Superliners/Amfleet II
10	1995-2015	4th Gen		SD70 Early AC traction		Dash 9, Early AC	Amtrak Viewliner/Superliner 2
11	2015 to Present	Current		SD70 ACe		AC Series, GEVO	Avelia Liberty (Amtrak Acela II)

Thank you to Mr H. Fuller and others for helping to progress the eras we proposed in our previous advertisement. Visit www.HattonsModelMoney.com/US-Eras to take part!

We welcome assistance in developing this resource - please contact our proprietor Richard Davies on richard@hattons.co.uk if you are interested in participating with this project.

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HO scale



General Electric ES44AH diesel locomotives. These HO scale Rivet Counter line models from ScaleTrains.com are decorated in the CSX Pride in Service schemes (Spirit of our Armed Forces, Spirit of our Law Enforcement [with red-and-blue or clear ditch lights], and Spirit of our First Responders). Direct-current models with a 21-pin connector sell for **\$209.99**. Versions with a dual-mode ESU LokSound 5 sound decoder with Full

Throttle, dual cube-type speakers, and two PowerPack super capacitors are priced at **\$299.99**. A portion of the proceeds from the sale of these six-axle road locomotives will benefit Blue Star Families, First Responders Children's Foundation, Operation Homefront, Operation Gratitude, and Wounded Warrior Project. ScaleTrains.com, 423-299-3689, scaletrains.com

ScaleTrains.com acquires MTH HO, S tooling

ScaleTrains.com, a Benton, Tenn., based manufacturer of N and HO scale trains, announced that it has acquired MTH Electric Trains' line of HO and S scale tooling. The acquisition includes steam and diesel locomotives, freight cars, and track in both scales. The HO tooling also includes turbine and electric locomotives, subway sets, passenger cars, and more. Engineering schematics for several all-new steam era HO projects were also acquired as part of the agreement.

"MTH is recognized as a leading manufacturer of HO scale steam locomotives," said Shane Wilson, president of ScaleTrains.com, in a statement posted

on the manufacturer's website. "The purchase of MTH's HO products also allows us to broaden our product line into passenger cars, track, and more. We believe there is an opportunity to grow the S market as well."

Retiring MTH president Mike Wolf added, "ScaleTrains.com has a great reputation in the industry, and the MTH HO tooling will make a great addition to [its] already impressive HO lineup. S gauge fans will find the ScaleTrains.com team loaded with talent and model railroading experience."

Products from both scales will be merged into the ScaleTrains.com

umbrella of brands. Several molds have been transferred to the ScaleTrains.com factory. The models will be modified to accept the ScaleTrains.com motor and ESU LokSound electronics. The first models are planned for release in 2022.

MTH Electric Trains will fulfill all outstanding customer HO and S Scale preorders. In addition, service and support for products sold by MTH Electric Trains will be serviced by the current MTH Authorized Service Center network. This includes part sales.

Products manufactured by ScaleTrains.com will be serviced by Product Support in Benton, Tenn.

Walthers 2021 National Model Railroad Build-Off

Wm. K. Walthers Inc. announced the 2021 National Model Railroad Build-Off. Winners will be judged on 2 x 2, 2 x 4, or 2 x 6-foot HO scale scenes built with materials in themed kits available for purchase from Walthers. There's also an open class for N, HO, and O scales.

The contest is open to youth, adults, and adult teams with separate classes for each. Cash prizes will be awarded. For more information, and to see pictures of last year's winning entries, visit the Wm. K. Walthers Inc. website at walthers.com.

HO scale locomotives



- **Siemens SC-44 Charger diesel locomotive.** New paint schemes: Altamont Corridor Express and North County Transit District Coaster. One road

number per scheme. Dual-mode Train Control Systems WOWSound sound decoder with Audio Assist, Keep-Alive capacitor, 10 decoder-controlled lighting functions, factory-applied detail parts, interior corridor work lights, and die-cast metal frame. \$469. Fall 2021. Bachmann Trains, 215-533-1600, bachmanntrains.com

HO scale freight cars

- **Assorted freight cars.** Boston & Albany and Delaware & Hudson 36-foot double-sheathed boxcars, \$19.98 each. CSX American Car & Foundry 2,970-cubic-foot-capacity two-bay Center Flow covered hopper with Chesapeake & Ohio reporting marks (single car, \$20.98;



three-pack, \$61.98). Minneapolis & St. Louis Association of American Railroads 40-foot boxcar, \$19.98. Pittsburgh & Lake Erie 50-foot welded-side boxcar with Superior doors, \$19.98. Rock Island 50-foot welded-side plug-door boxcar, \$19.98. Injection-molded plastic kits with plastic wheelsets, Accumate couplers, and steel weight(s). Accurail, 630-365-1173, accurail.com

- **Bethlehem Steel Co. 52'-6" 70-ton riveted-side drop-end gondola.** Baltimore & Ohio (March and April 1940 class O-59A in as-delivered Capitol

Dome scheme in six new road numbers [three each for March and April] and 1957 class O-59 repaint in six numbers); Central RR of Pennsylvania (original 1944 scheme, six new numbers); Central RR of New Jersey (1952 restencil in six new numbers); Lehigh Valley (1970 United States Railroad Equipment Green and May 1973 gray in six numbers each); Wellsville, Addison & Galetton (1961 paint in two numbers); and Western Maryland (1980 Chessie System scheme in four numbers). Prototype-specific details, wire grab irons and uncoupling

levers, and Kadee scale couplers. \$40.95. Tangent Scale Models, 828-279-6106, tangentscalemodels.com

N scale locomotives



- **Alco RS-2 diesel locomotive.** New paint schemes: Chicago & North Western (green and yellow), Canadian Pacific (maroon and gray), Maine

Union Pacific Railroad (UP) class 4000

The Union Pacific Railroad rolled out the biggest restoration of 2019, the complete overhaul of the largest steam locomotive in the world – **the Big Boy, road number 4014.**

TRIX



To commemorate this event, Trix has reissued an accurately redesigned model in HO scale (Item No. 22163). This model was made specifically for the HO US market.

- RP 25 Wheels
- Kadee® Couplers

This metal model has a total of 14 design changes to accurately represent the prototype, including changing to an oil firing tender, "Big Boy" written on the smoke box door, applying the UP 4014 logo onto cab floor and more!

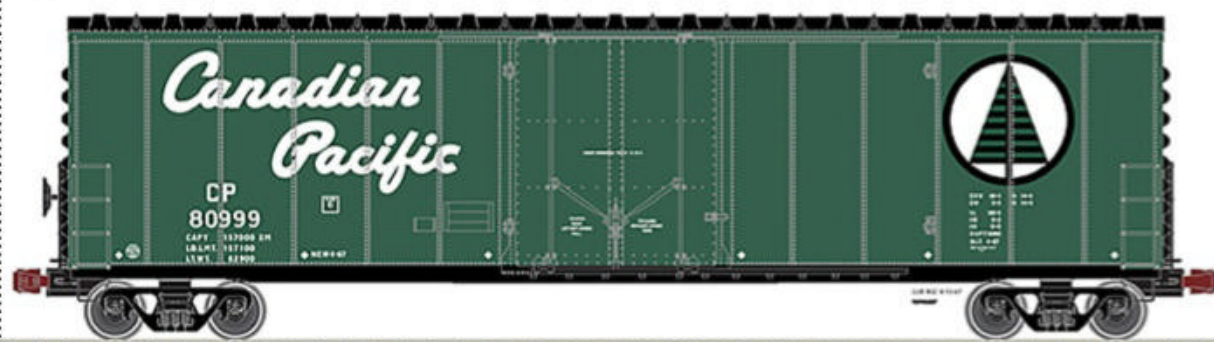
Also available in a Märklin H0 version (37997) and standard Trix HO version (22014).

Trix products are available from authorized Trix and Märklin dealers. See our complete line of products at marklin.com and trix.de/en. Contact customerservice@marklin.com for more information or to request a free New Items catalog.

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HO scale



National Steel Car 50-foot newsprint boxcar. Atlas Model Railroad Co. is offering this former True Line Trains car in its Master Line. The HO scale newsprint car, scheduled for release in the fourth quarter, will be decorated for Canadian Pacific; British Columbia Ry.; Central Vermont; and Minnesota, Dakota & Western in three road numbers per scheme. The boxcar (\$36.95; undecorated, \$26.95) will have separate, factory-applied detail parts; prototype-specific doors; and Symington roller-bearing trucks. Atlas Model Railroad Co., 908-687-0880, atlasrr.com

Central (Harvest Gold and green), Lehigh Valley (red, yellow, and black), Southern Ry. (black, Imitation Aluminum, and gold), and Union Pacific (Armour Yellow and Harbor Mist Gray).

Two road numbers per paint scheme; also available undecorated. Directional, golden-white light-emitting-diode headlights; dual brass flywheels; and Accumate couplers. Direct-current

model, \$129.95 (undecorated, \$119.95); with dual-mode motor and light decoder, \$169.95 (undecorated, \$159.95). Fourth quarter 2021. Master Line. Atlas Model Railroad Co., 908-687-0880, atlasrr.com



• **Steeple cab electric locomotive.** Direct-current model with coreless motor, detailed and adjustable metal pantograph, and Kato knuckle couplers. \$45. July 2021. Pocket Line. Kato USA Inc., 847-781-9500, katousa.com

N scale freight cars

• **36-foot old-time boxcar.** Atchison, Topeka & Santa Fe; Chesapeake & Ohio; Missouri-Kansas-Texas; New York, Ontario & Western; Nickel Plate Road;

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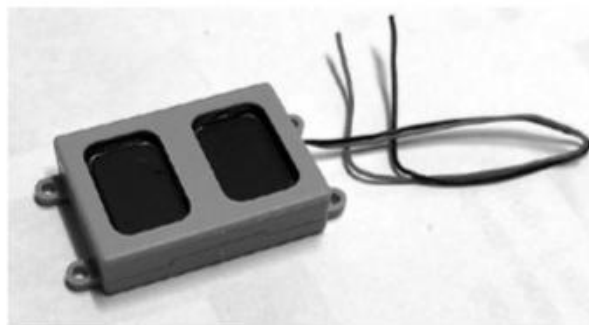
and St. Louis Southwestern (Cotton Belt). Three road numbers per scheme. Molded truss rods with turnbuckles, screw-mounted trucks, and body-mounted couplers. \$34.99. January 2022. AthearnN. Athearn Trains, 800-338-4639, athearn.com

Z scale locomotives



- **Alco RS-3 diesel locomotive.** St. Louis Southwestern (Cotton Belt). Two road numbers. Phase I body; Alco Association of American Railroads trucks; three-chime airhorn; 1,400-gallon fuel tank; 7.5mm coreless motor with dual flywheels; traction tires; built-in pilot; directional light-emitting-diode headlights; and body-mounted couplers. American Z Line, 614-764-1703, americanzline.com

Electronics/controls



- **Sugar cube speaker.** Pre-installed in sealed speaker box. 8 ohms. Measures 17.5mm x 25.5mm x 6.7mm. \$17.95. Bowser Manufacturing Co. Inc., 800-327-5126, bowser-trains.com
- **Switch Machine Interface.** Permits easier connections to a Tortoise by Circuitron switch motor that separates motor terminals and each single-pole double-throw (SPDT) set of contacts from each other. Reversible without the need to rewire connections. Two options for one SPDT contact: three-pin header plug for easier connection to a signaling system and three-position terminal block. Header version: ready-to-use, \$8.05; kit, \$5.63. Terminal block version:

ready-to-use, \$9.05; kit, \$6.63. Quantity discounts start with three units. Price may vary based on exchange rate. Circuits4Tracks, 905-787-1203, circuits4tracks.daxack.ca

- **The Motorman.** Automatic reversing train shuttle controller. Includes control unit with liquid-crystal display and buttons, faceplate and hardware (pre-installed), 12V/3A power supply, and two TrainSpotter infrared detectors with 8-foot cables. Stores settings for up to 15 locomotives. Adjustable acceleration and deceleration rates and built-in track short circuit protection. Supports intermediate stops (with additional sensors). Compatible with direct current and Digital Command Control. Measures 4½" x 4" x 1⅛". \$99. Iowa Scaled Engineering, iascaled.com

Decals

- **Washington & Old Dominion diesel locomotive decals.** HO scale set covers post-1948 Whitcomb 65- and 75-ton diesel locomotives and General Electric

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Showcase



1



6

2



5



3



4



1 General Electric Dash 9-44CW. This HO scale Operator Line model from ScaleTrains.com is decorated for BNSF Ry., BC Rail, and General Electric demonstrator in one to four numbers per scheme. Direct-current models with a 21-pin connector are **\$104.99**. Versions with a dual-mode ESU LokSound Essential sound decoder sell for **\$159.99**. ScaleTrains.com, scaletrains.com

2 Denver & Rio Grande Western *Ski Train*. Rapido Trains offers three-car sets (cafe, coach, and club car)

and single coaches and snack coaches for this name train in HO scale. The cars (single, **\$109.95**; three-pack, **\$319.95**) have a multi-color interior with individually installed seats. Rapido Trains, rapidotrains.com

3 National Model Railroad Association standards gauge. The Mark V version of this sheet metal gauge allows users to check track gauge; wing rail, guard rail, and frog spacing; turnout points; wheel gauge; clearance; and coupler height. The gauge (**\$16.95**) is produced by NMRA and

available online from the Kalmbach Hobby Store, KalmbachHobbyStore.com

4 Lightweight coach. New from RailSmith Models is this N scale model painted in Great Northern's Big Sky Blue scheme. The coach has painted molded grab irons on the sides and a plastic interior. The car is offered in two road numbers and is priced at **\$46** (single) and **\$84** (two-pack). RailSmith Models, lowellsmith.net/railsmith/

5 Trinity 5,660-cubic-foot-capacity four-bay covered hopper. General American is

one of six new schemes on this HO scale Master Line Plus model. The covered hopper (**\$57.95**) has factory-applied wire grab irons and uncoupling levers and etched-metal brake wheel platforms. Atlas Model Railroad Co., atlasrr.com

6 50-foot gondola. This Roundhouse line model is decorated for Toronto, Hamilton & Buffalo and in nine other schemes. The HO scale car (**\$27.98**) has 33" machined metal wheelsets and body-mounted McHenry scale couplers. Athearn Trains, athearn.com

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N scale



Lancaster farmhouse. This plastic kit from Wm. K. Walthers Inc. has separate doors, windows, and details; detailed porch trim with spindle railing; and a cellar entry door. The Cornerstone Series structure (\$34.98) measures 2½" x 3¼" x 2⅝". Wm. K. Walthers Inc., 414-527-0770, walthers.com

44- and 70-ton diesel locomotives. Dulux Gold artwork, updated by Robert Wingo, includes road names, revised heralds, and full set of road numbers. \$4.39 postpaid. Virginia residents add sales tax. Bill Mosteller, Great Decals, 3306 Parkside Terrace, Fairfax, VA 22031; greatdecals.com

Weathering supplies

- **Vetero Solutions stain.** Aged Barn Wood, Burnt Sienna, Medium Cherry Brown, Light Amber, Murky Brown, and Raw Umber. 6.7 oz. bottle. \$14.95; six-pack (one each), \$74.75. Bollinger Edgerly Scale Trains, veterosolutions.com **MR**

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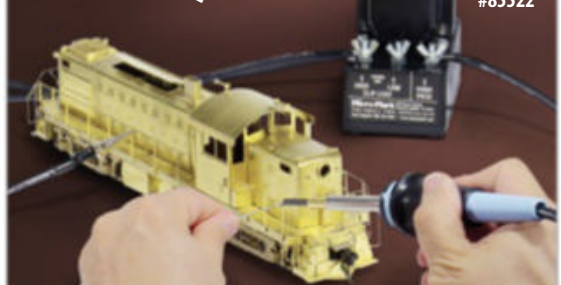
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A Tropicana refrigerator car is seen on the Juice Train northbound on the CSX RF&P subdivision, passing through Doswell, Va., in February 2010. Reefers like this are used for cargos that must be kept cold; insulated boxcars are for shelf-stable but temperature-sensitive freight. Alex Mayes photo

What kind of food goes in what kind of car?

Q What criteria would the food industry use to choose between refrigerator cars, insulated boxcars, and regular boxcars for shipping processed food products (canned food, bakery goods, chocolate) and beverages like beer and spirits? Would it vary between seasons? My layout is set in Southern Quebec in June 1960; it serves a brewery and a biscuits factory.

Philippe Blain, Saint-Lambert, QC

A Refrigerated cars are for products that would spoil at room temperature, like produce, meat, and dairy. Insulated boxcars are for cargos that are stable at room temperature but could be damaged by the high heat that could be produced in an uninsulated boxcar in the sun, like bottled beverages and canned goods. Regular, uninsulated boxcars would be used for temperature-stable food products like baked goods, cereal, dried beans, and coffee in 100-pound sacks. Before the widespread use of covered hoppers, regular boxcars were also used to ship grain in bulk.

Covered hoppers and tank cars would be used for bulk ingredients like grain, flour, sugar, corn syrup, and milk. Once a foodstuff is processed, it would have to be protected from temperature extremes, so refrigerator cars or insulated boxcars would be the choice if it were to be moved by rail. By the time you're modeling, trucking was starting to take an increasingly large share of local deliveries. So most of the rail traffic at a modern food processor would be raw materials, inbound. Outbound products would be shipped by rail only if they're bound for a distant destination.

Q Last week I decaled a new, undecorated boxcar, using Solvaset to snuggle them down and Testor's Dullcote to protect them. It was a brand new can of Dullcote, so, thinking the spray would be stronger, I sprayed it from a little farther away than I usually do. When the car dried, it looked like I had sprayed it with white powder. The grooves in the car ends acted like

shelves and the stuff that dried in the grooves looked like dirty snow. The spray never hid the decal film. The folks at Testor Corp. told me it might be dry spray caused by spraying from too far away. My question is what do I do now? These decals are hard to find, so I'd like to fix this if I can. Any suggestion about saving the car and decals?

Walt Hughes, Cincinnati, Ohio

A With spray cans, holding the can too far back from the model often results in a pebbly, spotty texture, as the solvents in the paint start to evaporate on the way to the model. This is probably what happened with your Dullcote. The good thing about clear finishes is you can always add more. Give your car another spray from about 8-10" away. The new coat should conceal the "frosting" effect. I'm not sure if it will help your decal situation, but it can't hurt to try. Next time, to minimize the appearance of decal film, try applying a spray of gloss coat to the model before decaling.

Q I've spent the last year or so searching for an N scale oil pump jack. I've gone to a couple of train shows and have asked several people at train stores. They all look at me like I'm crazy. There has to be someone out there who makes them.

James Beer, Pretty Prairie, Kan.

A Rare or obscure detail parts in any scale can often be found on Shapeways, a site where people upload their designs to be 3-D printed in a variety of plastics and other materials. I found an N scale pump jack there, at what seems a reasonable price for a custom item. Find it at shapeways.com/shops/ngineer under "N Scale Industrial Stuff."

Q What can I do on a limited budget? I've wanted two layouts, one in HO scale and one in 1:20.3 large scale, but I have not very much cash to spend. I'm 16 years old and can't get a job because I have autism. Let me know what to do.

Lucas Hilsendager, L'Anse, Mich.

A Hi, Lucas. Model railroading can tend to the pricey side, so modeling on a budget is a common concern with hobbyists of all ages. But it doesn't have to cost a lot. Here are some ways to keep your railroad's budget in the black.

First, start small. You mention wanting to model in both HO and large scale. I'd advise you to pick one, and you should probably make it HO. A large scale locomotive can cost 3 to 5 times what its HO scale equivalent would cost new. The same is true for rolling stock, track, structures, figures, details, and more. Smaller is cheaper.

Send questions and tips to associate editor Steven Otte at AskMR@MRmag.com.

Second, start small. No, I'm not repeating myself; this time, I'm talking about the size of your layout itself. Start with a compact layout or module that can expand later. Build a town with a passing track and a few industrial spurs on a small shelf, say 1 x 8 feet. Plan the track arrangement so the main line extends to the ends of the shelf on both ends, so you can expand it later.

Third, plan ahead. Read books not only about track planning, modeling, and operation, but also about the prototype railroads. If you can settle on which railroad, region, and era you want to model, you can be sure to buy only items that fit that concept instead of ones that catch your eye on the hobby shop shelf.

Fourth, learn to scratchbuild. Commercial kits can get expensive. Sheets and dimensional strips of styrene and basswood are a lot cheaper than kits, and you'll also be able to fill your layout with one-of-a-kind structures that exactly fit both your layout's space and

its theme. It's the same with scenery items; learn to make your own trees and you'll save a lot of green (pun intended).

Fifth, choose a rural locale. An urban switching layout may look impressive, but all those buildings come at a price. It's a lot cheaper to fill a square foot of layout with a few bucks worth of plaster, paint, and ground foam than it is to cover the same space with structures, even scratchbuilt ones.

Sixth, pick industries to model that can be represented by smaller, less expensive structures, or even no structures at all. Examples might be a truck dump for coal or gravel, a pulpwood loading track, a team track platform, a coal dealer with a small unloading trestle, or a gated track leading off behind some trees, representing an unmodeled industry.

Seventh, shop used. Scour sites like eBay for cars that fit your layout's prototype, locale, era, theme, and industries. For the shelf layout I described above, you probably only need a dozen or so

cars. Shopping used, you might be able to get them for \$100 to \$200.

Finally, start out with an inexpensive direct-current power pack. You don't need Digital Command Control if you're only running one locomotive. Direct-current locomotives are cheaper than DCC-equipped ones, too. You can always upgrade to DCC later.

Good luck with your hobby, and feel free to write back later to tell me how it's going. Happy railroading!

Q Many years ago in *Model Railroader* I read an article about an amazing steel arch bridge called Black Bear Bridge. I would like to build something like this for my HO railroad. Can you direct me to the article? Long time subscriber.

Lee Beam, Williamstown, N.J.

A The article "Building Black Bear Bridge" by Jim Money appeared in our April 1991 issue. If you don't have that particular copy in your back issue stash, you can read and print it by subscribing to our online archive at Trains.com.

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Q How does one change the numbers on a Life-Like E unit? The boards are curved plastic and typically are black with clear or white numbers. If the numbers are clear, light can shine through. I don't know how to make clear numbers on a black background. As for white numbers, no light should shine through. Please respond to both.
Don Murphey, Southlake, Texas

A In both cases, model railroad decal manufacturers have you covered – or at least, they have your number boards covered. Check out, for example, Microscale part no. 87-793. (It's also available for N scale, part no. 60-793.) This decal sheet has clear and white numbers on black backgrounds, black and white numbers on clear, and an assortment of number board frames. Remove the numbers from the existing numberboard (or replace it with a clear one), apply a black frame decal sized for how many digits you'll be using, cut out the numbers you need, and apply them to the frame one by one. You'll need a steady hand to put them on straight, but I think you'll like the results.

Q Besides railroad historical societies, what would be other possible sources where a modeler could find drawings of buildings? Thanks.
Scot Mason, Albion, Iowa

A Practically every county or community of size has its own historical society that may have photographs, plat maps, drawings, and other information on the building you're interested in. Search for it online or ask at your local library. Speaking of which, libraries and universities often have their own historical



READER TIP

Bob Johnson scratchbuilds "empty loads" of dunnage for his flatcars to hide notches in the deck that are used to secure removable loads.

Dunnage hides unprototypical flatcar details

I like to cycle open cars between loads and empties. Some of my flatcars have unrealistic holes and slots in the deck, which the manufacturer's load is supposed to snap into. So when I remove the load, these ugly, unprototypical features are exposed.

What I do is cover them with a custom "empty load" of dunnage – leftover material formerly used to secure a load, like wood boards and blocks. Some odd pieces of chain add to the realism. I don't glue it onto the car, but secure it with stakes that slide into the car's stake pockets. This lets me swap it out for a live load when necessary. – *Bob Johnston, Cambridge, Ont.*

archives. You can also often get architectural plans of contemporary buildings at your city or county's building permit office, though those records may not go very far back; there's not much reason for them to keep files on buildings that aren't still standing.

Q My railroad club is about to get a place where we can build a club layout. A question was brought up that we should have bylaws and rules. Can you give us examples of bylaws and rules that we can tailor to our club?

Rick Robinson, Walla Walla Valley Model RR Club, Walla Walla, Wash.

A Having a clear and legally unambiguous set of club bylaws is a good idea. It not only lets club members know how the club will be run, but also helps to protect your members in case of legal disputes. If you search the Web for the phrase "model railroad club bylaws," you'll turn up a good number of examples. Here are a few I found:

- lmrc.org/mainline/bylaws.shtml
- mrrr.org/bylaws
- nordelmodelrr.org/bylaws
- bcn.boulder.co.us/recreation/bmrc/bmrcbylaws2003.htm
- denverhomodelrrclub.org/Documents/constitution_bylaws.htm **MR**

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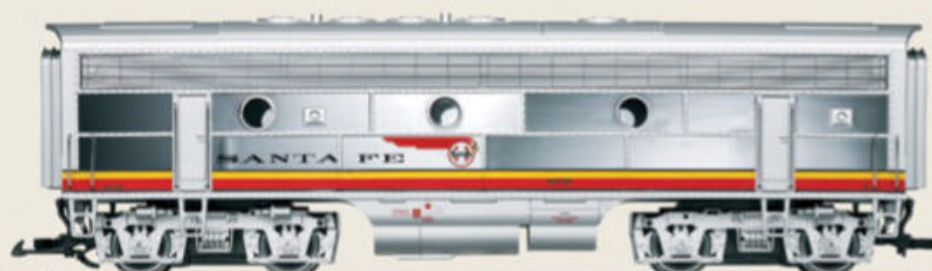


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20585 Santa Fe F7A Diesel Locomotive

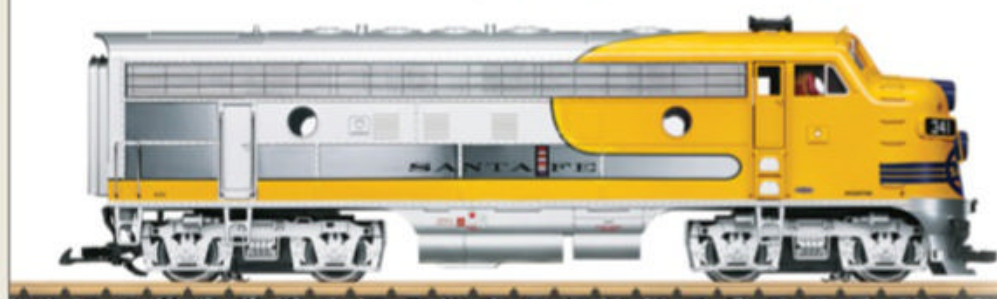
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Cody Grivno used three Pikestuff yard utility buildings to construct this HO scale yard office for our Jones Island project layout. Bill Zuback photo



A compact yard office for Jones Island

The Jones Island section of our HO scale Milwaukee, Racine & Troy is all about big, rail-served industries. This section of our staff layout will be home to an export grain elevator, a salt warehouse, a cement silo, an oil terminal, and a cargo terminal. The only other building on the track plan, published on page 25 of the October 2020 *Model Railroader*, is a yard office.

Since many of the buildings on Jones Island are going to be scratchbuilt, we decided to use kits for the yard office. Three Pikestuff yard utility building kits (no. 541-0005) yielded the yard office shown above. The stock kit has a footprint of 1⁵/₈" x 1⁵/₈". By using parts from three kits, I was able to model a larger structure more appropriate for the space.

The inspiration for the yard office came from two sources. The first was drawings of a Milwaukee Road

standard metal station and outbuilding in the March 1980 MR. The second was a photo of a similar Milwaukee Road structure in Ortonville, Minn., still in use today by the BNSF Ry., that I found on the photo-sharing website Flickr.

In addition to the basic structure, I added a variety of details. These included a bill box between the two doors, a smokejack and sewer vent pipe on the roof, an electric meter on the side, security screens over the windows, and wood in place of clear glazing on the door for the maintenance-of-way (MOW) office.

When we get to the scenery stage of the project, we can further enhance the yard office scene by adding piles of ties and spike plates, sticks of rail, spike kegs, an industrial Dumpster, and a crew truck or two. A structure like this would often be used by both MOW and train crews.

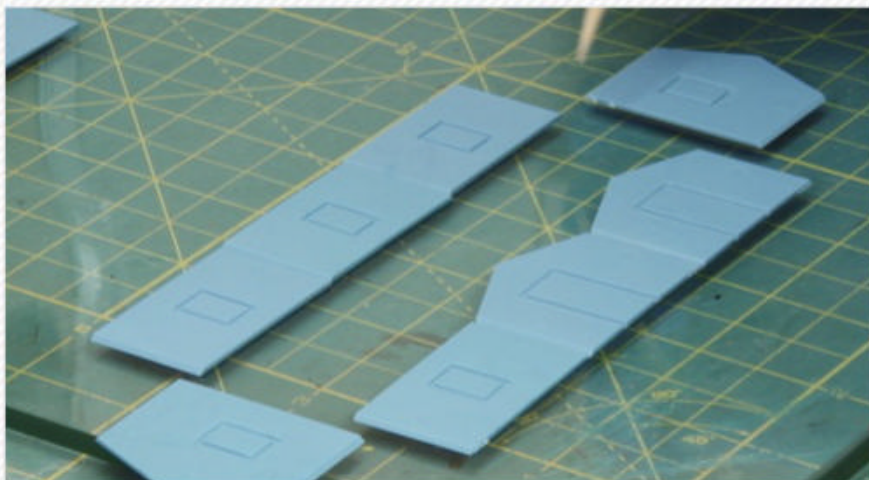
The Milwaukee, Racine & Troy yard office may be a small part of our larger Jones Island project, but it provides another visual entry point on the layout for operators and visitors.



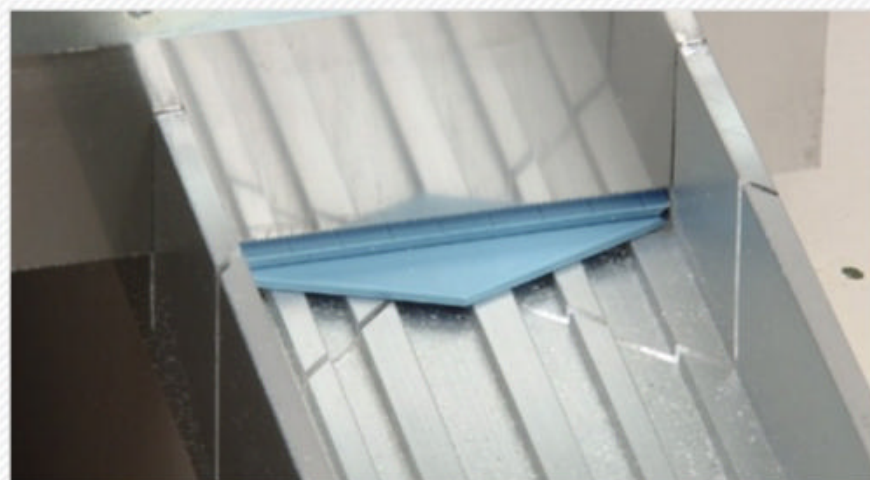
Learn more about both versions of our HO scale layout in the 84-page special issue *Milwaukee, Racine & Troy* and the 83 minute DVD "45 Years on the Milwaukee, Racine & Troy." Order both at KalmbachHobbyStore.com. The magazine is available in print and digital formats for \$9.99 each, or purchase both for \$14.99. The DVD is priced at \$14.99.



STEP 1 WORKING ON WALLS



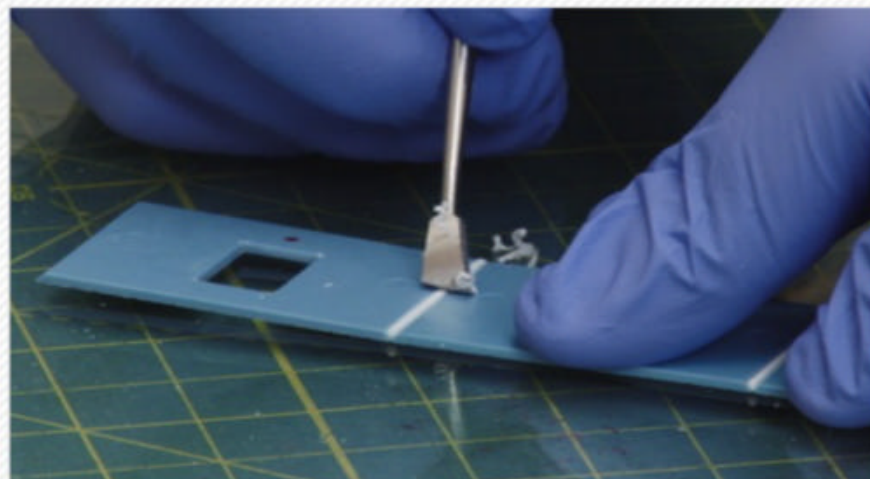
First, I used tweezer-style cutters to remove the parts from the sprues. Then I played around with different arrangements to get the desired door and window locations. As you can see in the image above, the doors are only offered on the peaked end pieces. Though I only used the walls from two kits, I needed a third kit to have enough roof sections.



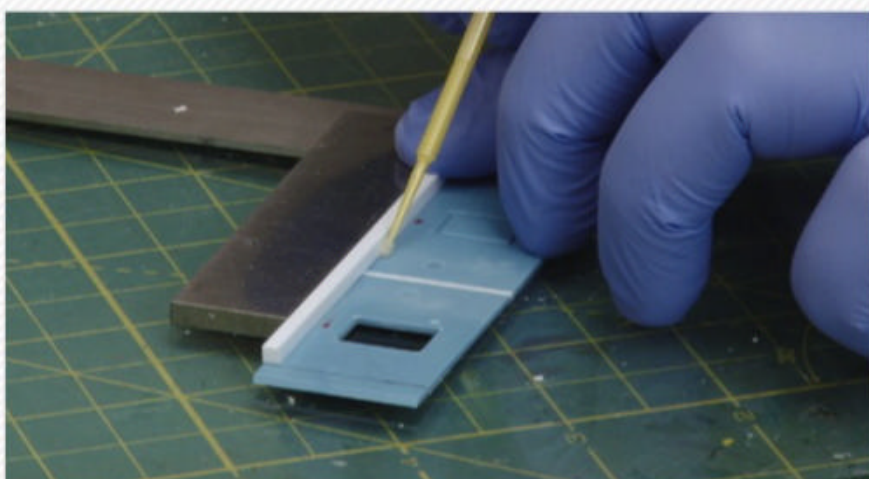
Next, I cut the door and window openings using a no. 11 blade in a hobby knife. Since I wanted the doors on the front wall, I had to cut the peaks off the end panels with a fine-tooth razor saw in a miter box. To ensure the heights would be the same, I attached a side wall to the end piece with double-sided tape. I smoothed any rough spots with a sanding stick.



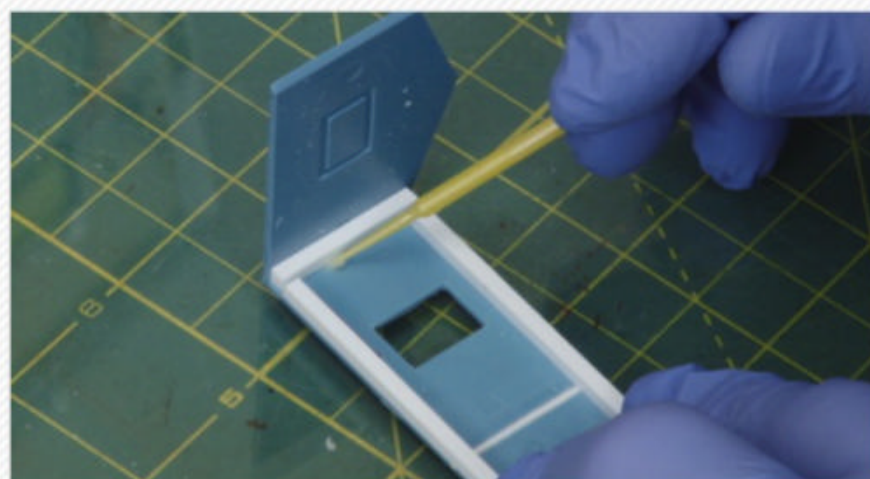
Removing the peaks left little material above the door. After carefully cutting and filing the openings, I was concerned the thin strip of plastic would bow during the assembly process. To minimize this risk, I installed the supplied personnel doors using a plastic solvent cement and a Microbrush, as shown in the photo. I didn't add the windows at this time.



I assembled the wall panels with liquid plastic cement, reinforcing the joints with .040" styrene rod. Once the glue cured, I used a Squadron Tools seam scraper (Kalmbach Hobby Store no. 84145) and a sanding stick to bring the rod flush with the back of the wall. I did this so I could reinforce the walls with styrene strip. If you aren't going to reinforce the building, you can skip this step.



I braced the top and bottom of the side walls, as well as the corners, with $\frac{1}{8}$ " square styrene strip. A machinist's square helped hold the styrene strip even with the top and bottom of the wall while I applied plastic solvent cement with a Microbrush.

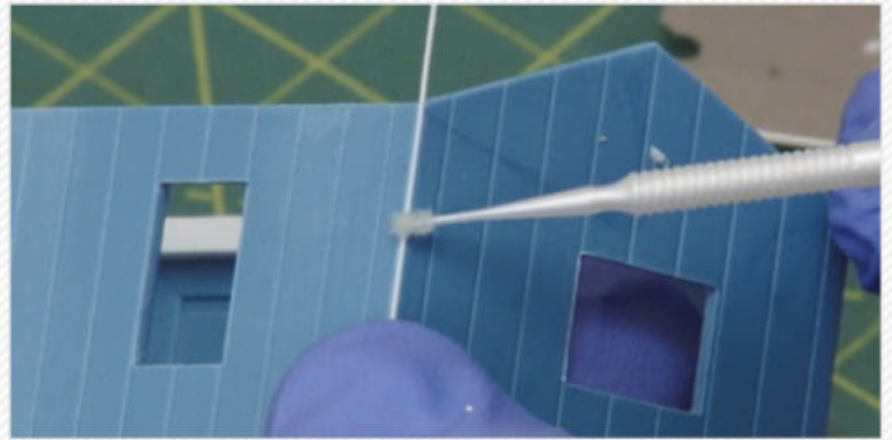


Then I glued the side walls to the end walls. The Magnetic Snap and Glue set (no. 84013 from the Kalmbach Hobby Store) made it easy to position the parts for gluing. Once the glue dried, I removed the magnetic clamps and installed a length of $\frac{1}{8}$ " square styrene in the corner.

STEP 2 TOUCH-UP WORK

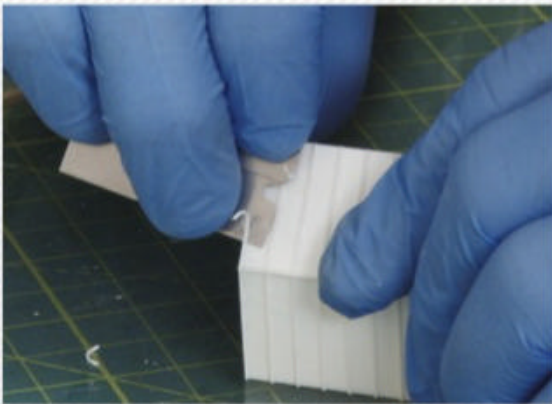


To eliminate the small gap at the butt joint between panels, I first brushed solvent cement over the seam to melt the plastic. After letting the cement cure, I used sanding sticks to smooth any rough spots.

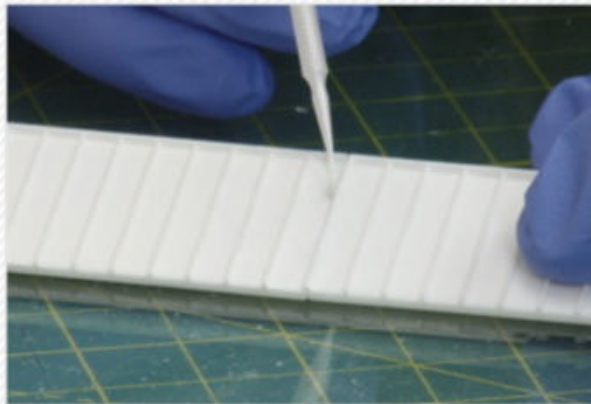


There were two corner joints that had noticeable gaps, which I filled with .010" styrene rod. After the glue dried, I used a sanding stick to knock down high spots on the rod and blend the styrene seamlessly with the plastic walls.

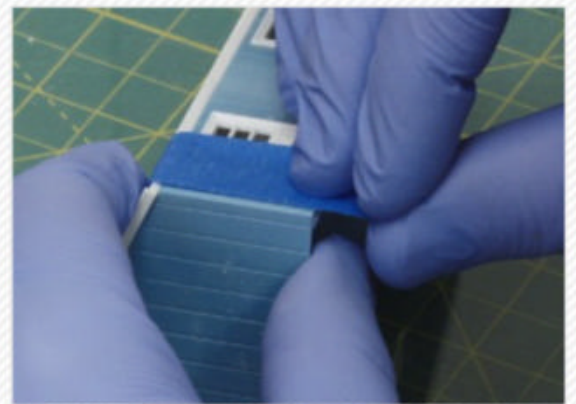
STEP 3 COMBINING THREE ROOFS



Next, I turned my attention to the roof. Fortunately, Pikestuff designed the roof with expansion in mind. I used a single-edge razor blade to cut the batten off one end of the roof. Files and sanding sticks can be used to smooth rough spots.



With an end batten removed from two of the three roofs, I glued the sections together with plastic solvent cement. I applied the glue from the top with a Microbrush, as shown above. Then I flipped the roof over and put it on the joints from the bottom.

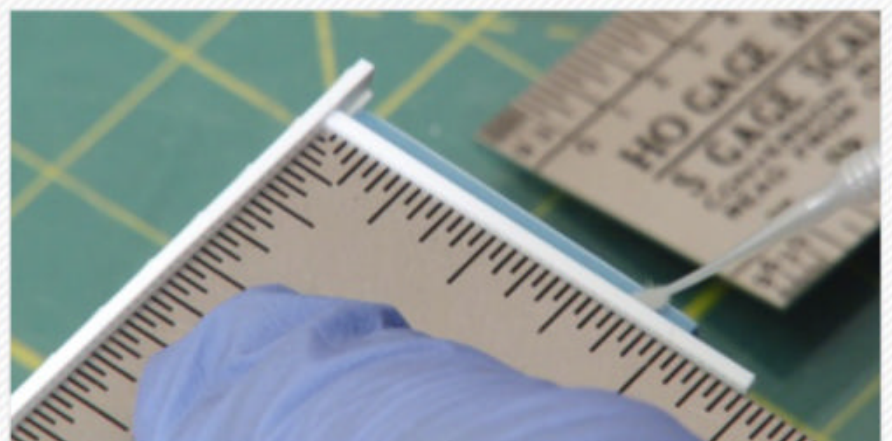


I ran a bead of Model Master Liquid Plastic Cement on the top edge of the front and back walls. This glue dries at a slower rate, which gave me time to position the roof. I used tape to hold the roof in place while the glue dried.

STEP 4 GUTTERS AND DOWNSPOUTS

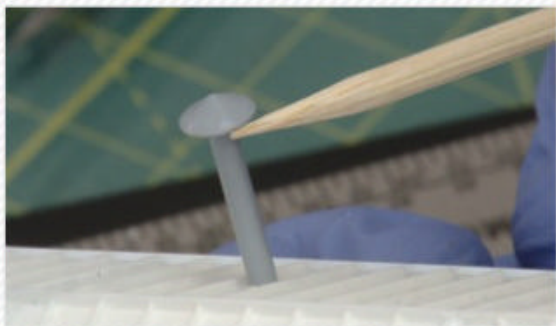


The gutters are .060" styrene channel. Since the roof edge is at an angle, I used a square to hold the channel at a right angle to the wall. I filled the gap between the roof and channel with .010" styrene rod and capped the ends.



I made the downspouts from .040" square styrene strip. To account for the foundation, I cut the downspouts oversized and trimmed them later. I positioned the strips a scale 6" in from the edge of the building.

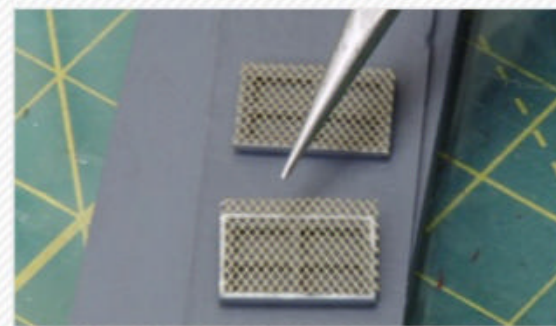
STEP 5 DETAILS



Using the prototype drawings from MR as a guide, I added a vent stack and smokejack to the roof. The vent stack is a short length of $\frac{3}{64}$ " styrene rod. The smokejack is from the Walthers Cornerstone roof details set (item no. 933-3733).



The prototype photo shows what appears to be a bill box between the doors. I couldn't find a detail part that matched, so I used a Tichy Train Group mailbox (no. 8234) instead. I attached the mailbox at roughly door handle height with cyanoacrylate adhesive.



The building in Ortonville also has screens over the windows, which I simulated with Scale Scenics brass Micro-Mesh (no. 652-3501). I attached the mesh to the edges of the windows, which I'd previously primed, with canopy glue.

STEP 6 PRIMER AND PAINT

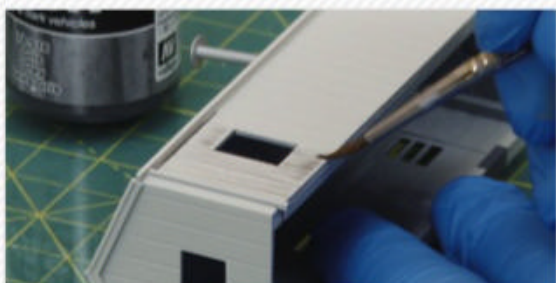


I sprayed the model with Rust-Oleum Painter's Touch 2X Flat Gray Primer. Then I masked the doors and airbrushed the building Vallejo Model Color Silver Grey (no. 70883) thinned 50 percent with Airbrush Thinner (no. 71.261).

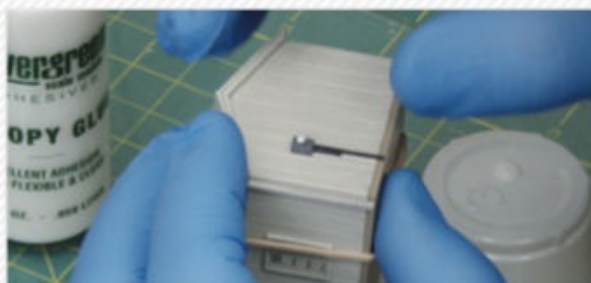


Then I brush-painted the detail parts. I used Vallejo Model Air Yellow (no. 71.078) on the mailbox, Model Air Aluminum (no. 71.062) for the smokejack, and Model Color Oily Steel (no. 70.865) on the vent stack.

STEP 7 FINISHING TOUCHES



I weathered the yard office with Acrylicos Vallejo Gray Model Wash (no. 76.516). As I applied the water-based wash, I kept the brush parallel with the seams on the walls. If any air bubbles appear when applying the wash, simply pull them down the side with the brush.



After weathering the building, I sprayed it with Testor's Dullcote (no. 1260). Then I used Evergreen Scale Models canopy glue to install the windows and window glazing, as well as a power meter. The latter is from the Walthers modern electrical gear set (no. 933-4075).



I added micro-plywood behind the window openings on the left-hand door, similar to the building in the prototype photo. I wrapped up the project by using canopy glue to attach an MR&T herald to the front wall and the foundation to the building. 

WITH A LITTLE **HELP** FROM THEIR **FRIENDS**



❶ Heavy Pacific no. 1025 pulls a Milwaukee Road passenger train over the bridge up the branch line to Mount Morris on Ed and Vicki Adler's HO scale Eagle River Lines. The Adlers recruited the author and several of his friends to build the 11 x 17-foot freelanced railroad in about seven months.

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② A reefer train led by Union Pacific Electro-Motive Division GP9 no. 143 crosses a girder bridge while fishermen try their luck in the river below. The locomotive is an Athearn Genesis model.

A couple recruits a crew of modelers to help build their dream layout

By Bill Neale

Photos by the author unless noted

I HAD JUST FINISHED A CLINIC on weathering when a couple walked up with a question. “Do you know anyone who could help us build a layout?” Little did I know that that question would lead to making a dream come true.

The couple was Ed and Vicki Adler. Ed is a retired doctor who had done some model railroading when he was young and had been collecting structure kits, cars, and locomotives over the years, but had not built a layout before. Vicki is a semi-retired psychologist who had no previous experience with model trains but was quite aware of Ed’s dream of a model railroad. Not only has she been amazingly supportive of his dream all the way, but she also found out she’s a good model builder.

I really didn’t expect such a question at my clinic, but I told her I would be glad to help, and we agreed to meet. This is where some of the folks from the National Model Railroad Association local division were able to step in and help. I led the charge to help Ed, and pulled in some of my friends, Scott Kremer and Norm Logan. Ron King and Joe Bliss helped to get some of the engines running and installed decoders in the older models.

We make a great team using our individual strengths and helping each other. We all have had large layouts for a long time and love the hobby. Both Ed and I were very thankful that these guys came on board and brought such enthusiasm and skills.

Design

I love layout design and have worked on a number of layouts. After some back and forth on the design criteria, Ed and I had a good idea of what the layout should look like. Ed had some simple requirements. He wanted a loop of track for continuous running, and if possible,

a reverse loop. He was frustrated with sectional track and the sharper curves it forced, so he wanted larger radius curves. However, a 4 x 8-foot table could not handle anything larger than a 22" radius curve.

When you think about it, a 4 x 8-foot table really occupies a 10 x 14-foot area if you count the 3-foot aisle all the way around. Ed had a 12 x 17-foot area available, so to solve the radius issue, we decided that the railroad would go around the outside of the area, with the people in the middle. We added a lift bridge for access to the center.

The design was simple, with a double-track oval circling the donut. We were able to build this oval with broad, 36" radius curves and easements going into the straight sections. This would allow Ed to run the biggest of engines and the longest of passenger trains he might desire. We added an elevated area over a corner of the loop. This sent the lower track into a tunnel, which breaks the line of sight for a couple of moments, thus making the mainline feel a bit longer.

Next we added a single-track branch-line that diverged from the double-track



③ This view of the train room shows the lift-up entrance to the control pit at center and the engine facility to the left. The wye leading to the staging yard is behind the engine facility, at far left.



④ Great Northern no. 661, an Electro-Motive Division GP9, works the B. Neale coal mine, named for the layout's primary builder (and the author of this article). The mine is a modified BTS kit.

main. The branch runs up an easy grade to the upper corner, where we built that reverse loop. The loop was built with 24" radius, so there are some restrictions on the equipment that can run on this section of the railroad.

With some negotiation, Ed was able to secure a little bit more room for a small yard along one side of the room. This allowed us to build a wye at the bottom of the branch, along with a 5-track visible staging yard.

We also put this newfound addition to good scenic use by adding the Markie

Drive-In Theater on a short section attached to the end of the staging shelf. The drive-in is named for the Adlers' son, Mark, who had given his father the gift of a Walthers drive-in theater. This kit includes a screen into which a tablet computer can be inserted to show live movies. It was a fun gift, and we were delighted to find room for it. Visitors see the screen showing a series of concession-stand ads and movie previews from the 1950s, another contribution from Mark, who used the skills from his work in advertising to edit the video.

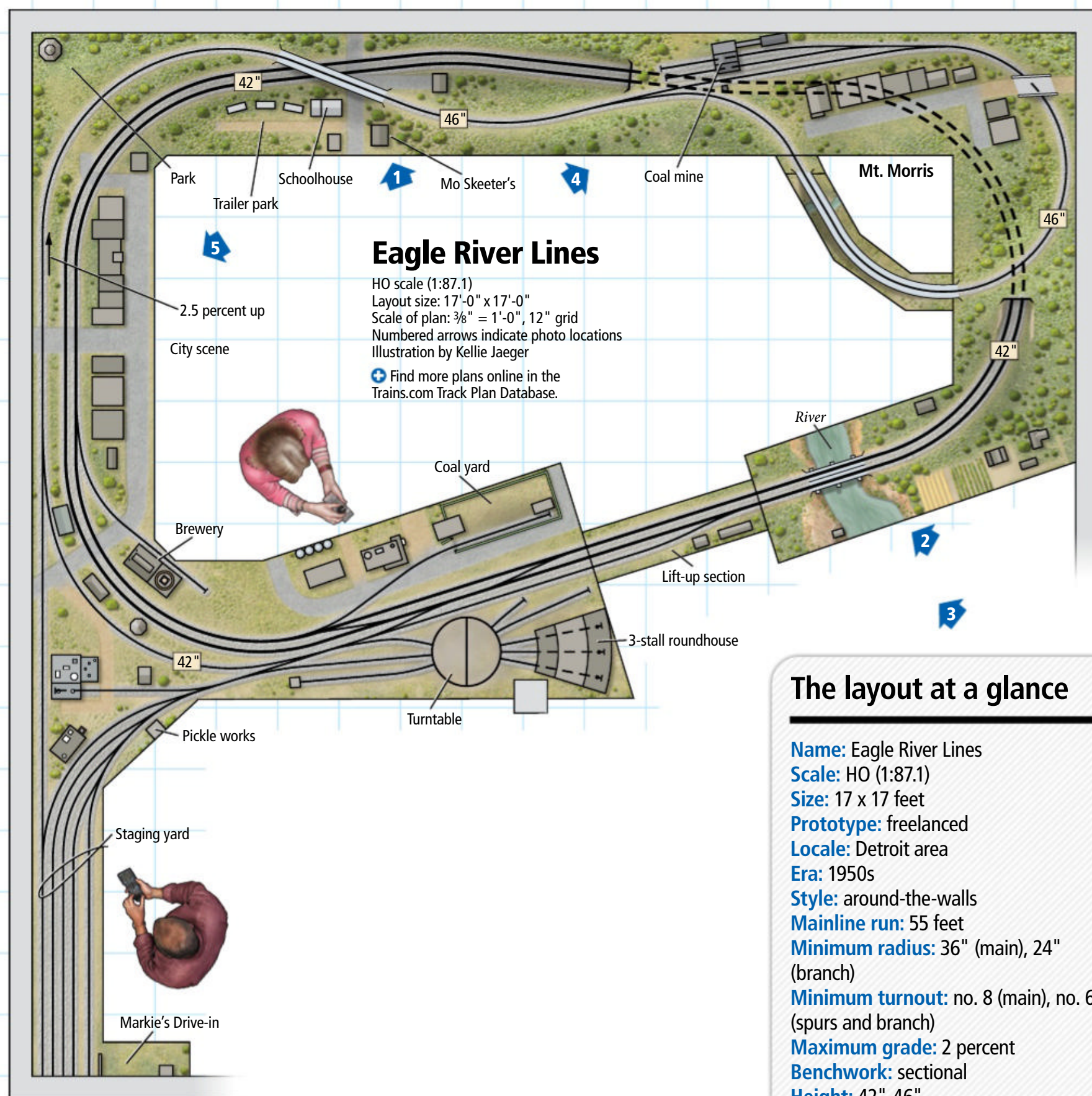
Benchwork construction

We kept the benchwork narrow, no wider than a 2-foot reach. This facilitated quick construction and efficient use of materials. In the long run, it will also make maintenance easier. The only exception was the section that held the turntable, but since this area has access from both sides, the reach was never an issue.

We put Scott's carpentry skills to work building the benchwork. We divided the layout into 2 x 8- and 2 x 6-foot sections. These were built in Scott's garage using pre-cut $\frac{3}{4}$ " birch plywood for the structural members, $\frac{1}{2}$ " furniture grade plywood for the top surface, and birch plywood for the fascia. We used doubled poplar 1 x 2 lumber for the legs. There are a minimal number of legs, with the layout attached to the wall where possible.

Vicki wanted the layout to have a finished appearance that fit with the barn wood theme of the finished basement. We sanded and finished the fascia and legs, staining them to match the weathered gray color of the woodwork in the basement. This gave the whole layout a finished look that adds to the impact of the model railroad.

We transported the benchwork sections over to the Adlers' in a borrowed minivan and assembled them in Ed's basement. Once we screwed together and leveled the modules, we laid out the railroad in pencil. When everyone was satisfied, we started nailing down the roadbed and track. We used cork roadbed and Atlas code 83 track. The Peco turnouts have proven to be very reliable.



Eagle River Lines

HO scale (1:87.1)
Layout size: 17'-0" x 17'-0"
Scale of plan: $\frac{3}{8}$ " = 1'-0", 12" grid
Numbered arrows indicate photo locations
Illustration by Kellie Jaeger
Find more plans online in the Trains.com Track Plan Database.

The layout at a glance

Name: Eagle River Lines
Scale: HO (1:87.1)
Size: 17 x 17 feet
Prototype: freelanced
Locale: Detroit area
Era: 1950s
Style: around-the-walls
Mainline run: 55 feet
Minimum radius: 36" (main), 24" (branch)
Minimum turnout: no. 8 (main), no. 6 (spurs and branch)
Maximum grade: 2 percent
Benchwork: sectional
Height: 42"-46"
Roadbed: cork
Track: Atlas code 83 flextrack with Peco turnouts
Scenery: extruded-foam insulation board and "ground goop"
Backdrop: painted on the walls
Control: Digitrax Digital Command Control

Controls and electronics

We used Tortoise by Circuitron switch motors and the Berret Hill control system. The Berret Hill system was very quick and easy to install and provided a polished, professional appearing control panel. The turnouts are controlled by touch-sensitive capacitance buttons with light-emitting diodes indicating position. The system also allows multiple control panels to control the same turnouts. We put a control panel inside the oval and another outside, allowing Ed to route trains from either location.

The panel graphics were done using PowerPoint and printed on heavy paper. The paper is mounted behind a sheet of glass, with the touch-sensitive control

LEDs taped to the back of the paper. We printed an open $\frac{1}{4}$ " circle for each LED, which then shines through the paper.

We chose the Digitrax Digital Command Control system. All the current DCC offerings work well, but Scott and I both have experience with Digitrax, so we went with the system we were familiar with. The system has run flawlessly. Our local hobby shop, Nankin's, was great to work with. We gave the hobby shop a shopping list of electronics and track, and they gave us a great deal on the whole package.

Scenery and structures

As the track was going down, we worked on where the scenery features

should be. We had agreed on a general organization of the layout features, but the specifics were still up in the air. Some buildings were moved more than a dozen times until we found the right combination with the right look.

Here is where Vicki proved to be a great asset. She has an artistic eye and provided valuable feedback that helped us determine how the layout should look when finished. She's also an adept



5 The downtown scene features many factory-assembled structures with lighted, printed interiors. Norm Logan hand-painted the detailed background, including many recognizable Detroit structures. Scott Kremer photo

modeler, producing several well-built and well-painted model structures.

Once we had a general idea of what scenic features were going where, we brought in our resident backdrop artist. Norm Logan has painted the backdrops for many layouts in the greater Detroit area. Each of Norm's backdrops is better than his last, but for the Adlers, Norm really pulled out all the stops. He painted a magnificent panorama of the Detroit area, with many recognizable structures.



Meet Ed and Vicki Adler

Ed Adler is a retired physician who has been "playing" with trains since he was 11 years old. His wife, Vicki Adler, a psychologist, likes to say the railroad is a substitute for the doll house she never had. They live in the Detroit area and have two sons and daughters-in-law. Their 3-year-old grandson, Oliver, likes to put HO scale autos on the track and rescue them at the last second.

We showed Ed how to lay track, and later, how to do scenery. He proved to be quite good at both. The idea was to provide him with both a finished model railroad and the skills needed to modify and maintain it.

Many of the structures were purchased ready-built, which sped up our construction effort. We drilled holes for the wiring of the lighted structures and hooked them up to Woodland Scenics Just Plug lighting hubs.

The city areas came together quickly. We used .040" black styrene for the paved roads. Using paper patterns, we laid out the roads on a 4 x 8-foot sheet of styrene purchased at a local plastic supplier. We painted the plastic roads with a rattle can, then used fine-tip pens to scribe divisions and cracks in the road.

Scenery forms were built using 1½" extruded-foam insulation board, stacked and glued, then covered with "ground goop," a mixture of white glue, plaster, and vermiculite. Once that set, we used lots of Woodland Scenics ground foam and foliage material to finish the scenery. We made some later additions to the scenery as more buildings arrived. It was easy to cut into the foam insulation and "goop" to create a flat area for a new building.

A showpiece

Now Ed has a finished railroad that he can enjoy as is or change as he wants. Ed and Vicki like to show off their

railroad to the friends and relatives. They are great ambassadors for the hobby, introducing many of their friends to model railroading. They take a great deal of pleasure in turning on the trains and having guests look on in awe while looking at all the details, like the TV running inside the house trailer, the movies showing at the Markie Theater, and the town buildings with lighted and detailed interiors. Of course, they also continue to add to their layout and make changes. That's part of the fun!

The whole effort took about seven months from initial design to finished, fully scenicked, operating railroad. The effort was very reasonable. We would work two to three days a week for about six hours a day. The work went fast because we were experienced, having built layouts before, and knew what needed to be done.

Ed and Vicki made sure we had the supplies we needed each time the group gathered in the basement. It was truly a team effort that resulted in an excellent model railroad. Ed and Vicki are incredible people that made the whole project fun. Is there anything better than making a dream come true? **MR**

Bill Neale models the Pennsylvania RR Panhandle Division in 1939. Since retirement he has served as an NMRA officer on both the regional and national levels. He and his wife, Terry, have two grown children, Jenny and Carrie. They reside in suburban Detroit.

Model a BALLAST HOPPER



Wisconsin & Southern ballast hopper no. 223 rumbles through the Badger State. R.G. Hough V shares how he modeled this HO scale car using a Roundhouse kit and 3-D printed parts.

Commercially available 3-D printed parts made this HO scale car possible

By **R.G. Hough V** • Photos by the author

Like many railroads, the Wisconsin & Southern (WSOR) has a sizable fleet of non-revenue cars, including many ballast cars. On full-size railroads, ballast hoppers are a critical part of the maintenance-of-way fleet. These cars aren't commonly found on model railroads, though.

For this project, I modeled WSOR ballast hopper no. 223, an ex-Soo Line car. I used an undecorated Roundhouse Pullman-Standard PS-2 2,003-cubic-foot-capacity two-bay covered hopper kit as the starting point for my project. [Roundhouse kits are no longer in production. The model is now part of Athearn's line of ready-to-run cars sold under the Roundhouse name. – Ed.]

To convert the car from a traditional covered hopper to a ballast car, I used ballast doors and roof ends from Circus City Decals. These are 3-D printed parts designed specifically for the Roundhouse car.

Since ballast cars are often rebuilt at various locations, details may vary between cars. I recommend referring to prototype photos if you're going to model a specific car.

Whether you're modeling a Class I railroad, a regional carrier, or a short line, ballast hoppers are a must-have piece of maintenance-of-way rolling stock. Run the cars in a work train or a manifest freight, or just spot one or two on a siding. They're sure to get attention from operators and visitors.

Car modifications

I started the project by washing the car and its components in warm, soapy water to remove oils and impurities from the manufacturing process ①, next page. Then I rinsed the parts with water and let them air dry. From this point on, I only handled the model while wearing nitrile gloves.

I used rail cutters and a hobby knife with a no. 11 blade to remove material from the four hopper bays ②. When finished, the bays should be flush with the bottom of the car's sill. I lightly sanded the same areas to ensure a smooth mounting surface for the 3-D printed doors.

Next, I turned my attention to the car ends. I cut two $1\frac{7}{32}$ " x $1\frac{7}{32}$ " pieces of .010" styrene to model the vertical portion of the slope sheet on each end ③.

I finished this part of the project by removing flash from the one-piece metal casting that models the center sill, bolsters, and draft-gear boxes. I also added the supplied brake details on the B end of the car.

Adding 3-D printed parts

Now it was time to work on the 3-D printed ballast door conversion kit from Circus City Decals. I used a pair of rail



1 A clean start. Before starting work on the model, R.G. washed it in warm water with dish soap added. This removed oils and other impurities from the manufacturing process.



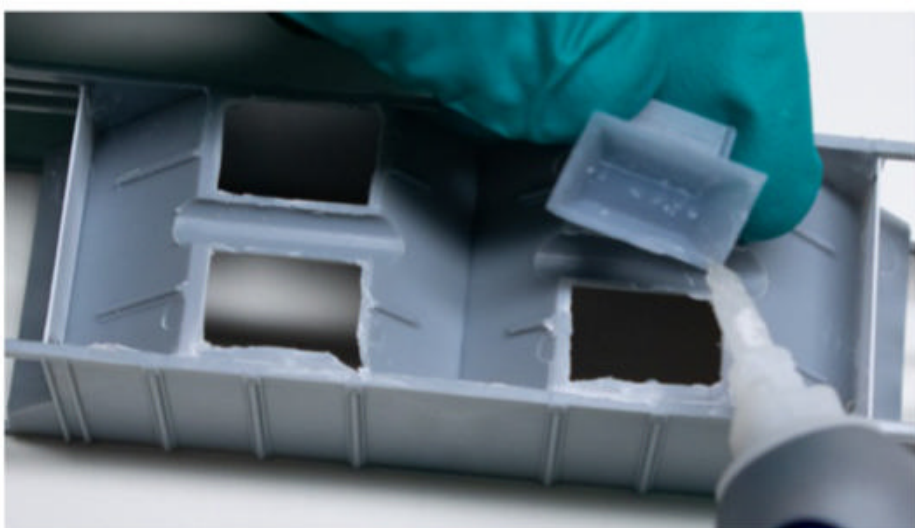
2 Cutting back. In order for the ballast doors to fit properly, the hopper bays needed to be modified. R.G. removed the bays using rail cutters and a hobby knife with a no. 11 blade.



3 Styrene slope sheets. To match the full-size car, R.G. modified the slope sheets using .010" styrene sheet. He attached the thin material with cyanoacrylate adhesive.



4 Making the cuts. Rail cutters were all R.G. needed to remove the 3-D printed ballast doors and roof ends from the support structure.



5 Strong bond. R.G. used Loctite Gel Control cyanoacrylate adhesive to attach the 3-D printed parts to the injection-molded plastic hopper body.



6 Prime time. To provide a uniform base for the final colors, R.G. sprayed the hopper with Tamiya Fine Surface Primer. The aerosol primer is compatible with ABS and styrene plastics.

cutters to remove the ballast doors and roof sections from the sprue **4**.

Then I lightly sanded the two roof pieces with 1,000-grit sandpaper until they were smooth. I also sanded the gluing faces of the ballast doors, but not the sides, as those have delicate parts that can easily be damaged.

After sanding the 3-D printed parts, I attached them to the plastic carbody with cyanoacrylate adhesive (CA) **5**.

To the spray booth

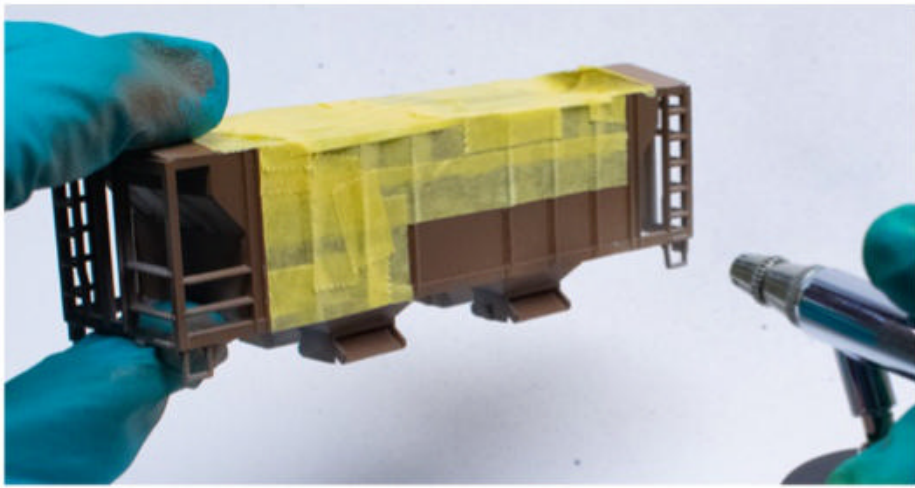
To provide an even base color for the final colors, I spray-painted the car with Tamiya Fine Surface Primer (no. 87064)

6. [Use this, and all paints, in a well-ventilated area and wear proper personal protective equipment. – Ed.]

After the primer thoroughly dried, I used an airbrush to spray the car with Badger Rust (no. 16-172). This color is a close match for the paint patches on the prototype car.

Once the Rust paint dried, I masked the areas that are patched out on the full-size car, using prototype photos as a guide. Then I sprayed the uncovered areas with a 70:30 mix of Rust and Engine Black (no. 16-01). This is shown in **7** on the next page.

I removed the masking tape and let the paint dry. To provide a smooth, glossy surface for the decals, I sprayed the car with Tamiya Gloss Clear (TS-13).



7 Clean and dirty. R.G. first painted the car with Badger Rust. After masking where the Soo Line markings would have been, he sprayed the car with a mix of Rust and Engine Black.



8 Time for decals. R.G. decaled the model using prototype photos as a guide for lettering placement. The lettering is from set no. WSOR 87-18 produced by Circus City Decals.



9 Soo Line heritage. The full-size WSOR no. 223 had Soo LINE lettering rusting through the paint patch. R.G. re-created that look with Apple Barrel acrylic paint.



10 Classic weathering. Monroe Models Dark and Medium Earth Weathering Powders further added to the ballast hopper's well-used appearance.



11 Safety first. Modern-era cars are required to have conspicuity stripes. R.G. used Smokebox Graphics self-adhesive reflective stripes on his model.

Decals and weathering

Referring to the prototype, I lettered the car using a WSOR ballast hopper set from Circus City Decals (no. WSOR 87-18)

8. After the decals were applied, I sprayed the car with Tamiya Flat Clear (no. TS-80).

A multi-step process helped me capture the rusty, hand-me-down appearance of the full-size ballast car. First, I used Apple Barrel Nutmeg Brown and Burnt Umber acrylic paint, a toothpick, and a fine brush to apply the SOO LINE lettering bleeding through the patches **9**. While I had the supplies out, I added small rust spots to the car and painted the wheel faces.

Materials list

Apple Barrel matte acrylic craft paint

20512E Burnt Umber
20521E Nutmeg Brown

Badger acrylic paint

16-01 Engine Black
16-172 Rust

Circus City Decals

3D 87-01 ballast door conversion kit
WSOR 87-18 Wisconsin & Southern ballast hopper decals

Loctite

45198 Gel Control cyanoacrylate adhesive

Monroe Models Weathering Powders

3103 Medium Earth
3107 Dark Earth

Roundhouse

1430 undecorated two-bay covered hopper

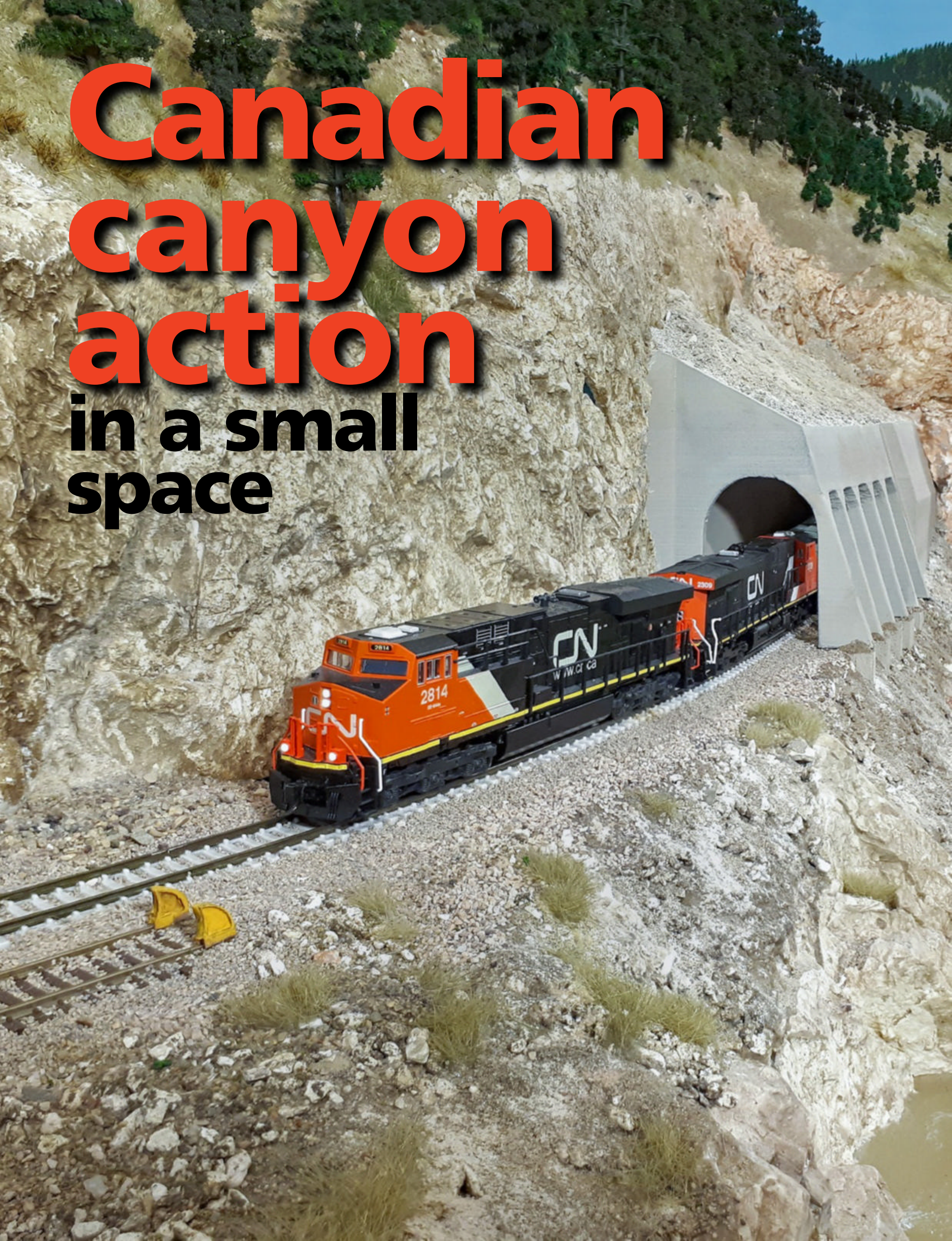
Smokebox Graphics

R187 FRA 224 yellow reflectors

Next, I applied a mix of Monroe Models Dark and Medium Earth Weathering Powders to the trucks and carbody with a paintbrush **10**. To seal the pastels, I sprayed the car with another coat of Tamiya Flat Clear.

After that I applied Smokebox Graphics peel-and-stick reflective yellow stripes **11**. Then I installed the wheels in the trucks, added the couplers, and put the ballast car into service. **MR**

R.G. Hough V lives in Mount Morris, Ill. His HO scale Wisconsin & Southern Electro-Motive Division GP35 was featured in the September 2020 Model Railroader.



Canadian canyon action in a small space



Dramatic bridge and tunnel scenes are the focus of this N scale model railroad

By Scott Lamoureux

Photos by the author

Long trains snaking through impossible canyons and across soaring bridges have long captivated railfans and modelers alike. My Ashcroft Subdivision layout draws on my own inspiration of the Fraser and Thompson river canyons in southern British Columbia (B.C.).

With limited space and a desire for scenery to match the grandeur of the prototype, I started construction of my N scale layout in December 2012. My simple layout evolved as I built it, but has remained true to my original intent: I wanted to be able to run long modern Canadian National (CN) trains with big views and some of my favorite scenes from the area.

An elongated oval track plan uses most of the benchwork from my previous unfinished layout. A semi-permanent duckunder allows continuous running, while a hidden double-ended staging yard allows me to run a variety of trains. In little more than 60 square feet, I can operate big canyon railroading.

It starts with a bridge

I knew that the famous Cisco bridges were going to be central to this layout, and I began construction of the main CN bridge as a test of my skills (and perseverance). I wasn't going to commit to the layout if I couldn't build this bridge convincingly. I had limited building experience prior to the bridge, but aided with plans by Patrick Lawson (January 2000 *Mainline Modeler*), I was able to accurately construct the bridge.

To fit my space, I scaled the plans to 80 percent of full size. The main truss

1 A Canadian National manifest freight winds through Snoonka Tunnels on Scott Lamoureux's Canadian National Ashcroft Subdivision N scale layout. The model railroad features scenes on the Thompson and Fraser river canyons in British Columbia.



arch bridge is scratchbuilt from styrene strips and selected HO and N scale beam lattice parts from Central Valley Models and Micro Engineering, with Gold Medal Models walkways. [See the May 2017 *Model Railroader* for more. – Ed.]

Construction of the bridge took about 1,000 hours and was largely complete by the autumn of 2014, coinciding with the centennial anniversary of the completion of the prototype.

The bridge is designed to fit on a 2 x 4-foot Baltic birch plywood base for recovery if the layout is dismantled in the future. I built up the canyon contours with styrene foam board, and completed the surface with soil-colored paint, grout powders, and dustings of ground foam and static grass.

A layout concept evolves

I intended to also build the Canadian Pacific (CP) Cisco Bridge, but it soon became apparent I didn't have room. I rearranged the layout design to give more background and foreground space for the CN bridge and represented the CP main line with non-operational tracks, along with a track connection built in 1977 between the two railways.

With the CN bridge complete, I modified the existing peninsula benchwork and placed the bridge in position. I built up the remainder of the canyon with foam board and finished it to match the bridge module.

Trees were made primarily from wire wound armatures that were flocked with ground up lichen and painted with camouflage green spray paint. The trees are scaled to be smaller in the background to reinforce the perception of distance.

I painted the backdrop following the excellent techniques described by Mike Danneman (October 2004 MR). I installed a 1/8" hardboard fascia around the entire front of the layout for a clean look.

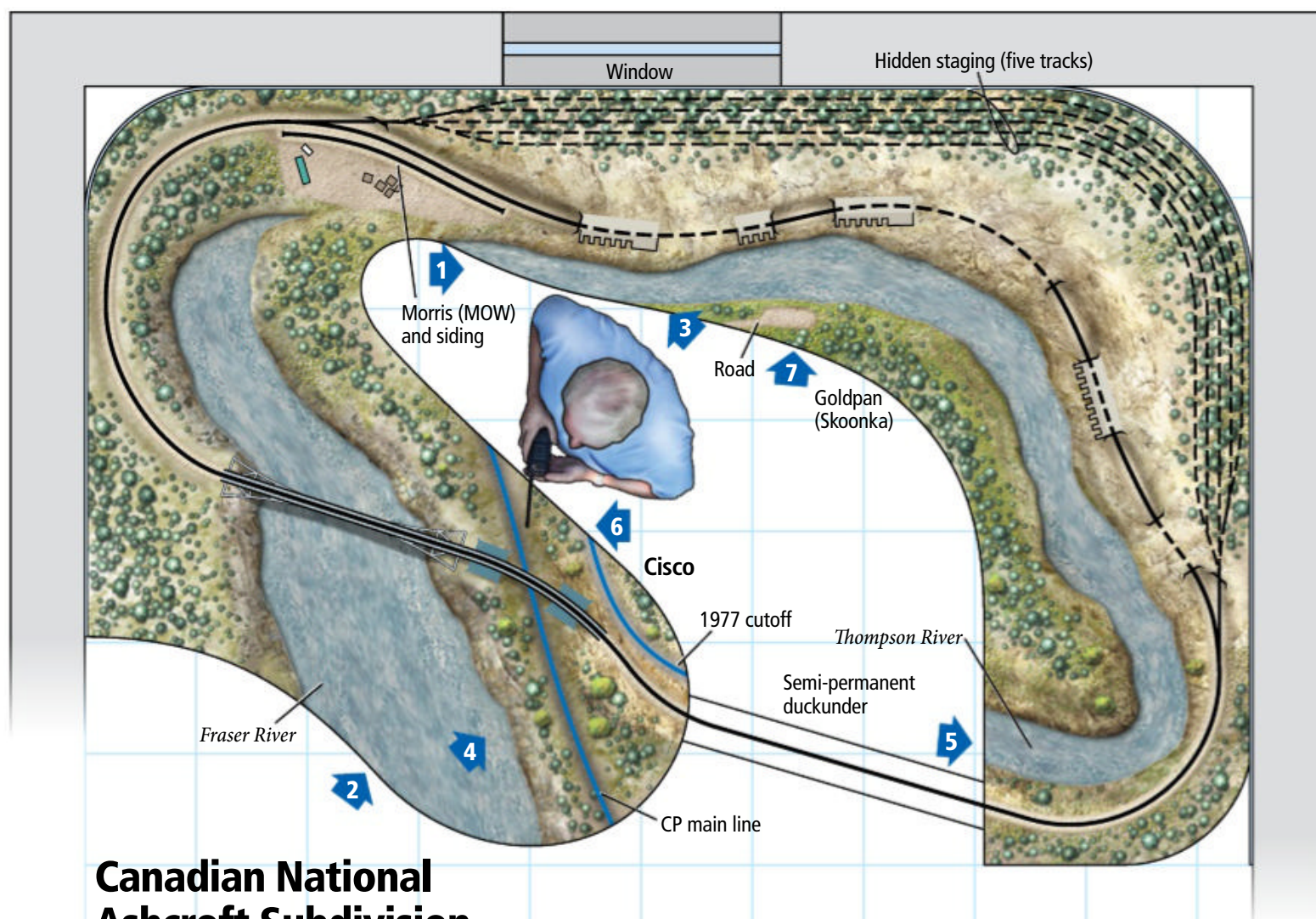
As the Cisco scene approached completion, I contemplated the remainder of the layout. I'd originally planned to keep a yard from my previous layout with some small industries, but I found few prototype ideas that seemed to fit, and I became increasingly interested in modeling another scene from the canyons. I considered three iconic locations: Skoonka Tunnels, White Canyon, and Black Canyon. All three are located in a short stretch of the Thompson Canyon between Lytton and Spences Bridge,

2 This overall view shows the tail of the Cisco Bridge with the Skoonka Tunnels and Thompson River scene across the aisle of this compact layout.

B.C., and I ultimately focused on the Skoonka Tunnels. In part, this decision to only model one scene reflected my recognition that less is often better than more when it comes to a layout.

Hidden staging

One lesson I learned from the tall Cisco scene was that an 18" backdrop height wasn't enough for my purposes, so I began the new section by installing a 36" hardboard backdrop. I removed the existing yard track and laid out a five-track staging yard along the backdrop that would serve as hidden staging. I installed Tortoise by Circuitron switch motors upside down and directly on the track-level surface to control the turnouts, and wired them with an NCE Switch-it Mk2 Digital Command Control (DCC) controller. Frogs are powered with Tam Valley frog juicers. Each track route is controlled by a macro with my NCE PowerCab DCC handheld. I used a series of spreadsheets to assist with the programming steps to



Canadian National Ashcroft Subdivision

N scale (1:160)
Room size: 10'-6" x 7'-0"
Scale of plan: 1/2" = 1'-0", 12" grid
Illustration by Rick Johnson and Kellie Jaeger
Find more plans online in the Trains.com Track Plan Database.

align all of the necessary turnouts for each route.

With the staging tracks fine-tuned and operating reliably, I turned my attention to the Skoonka scenery. The massive rock walls and slopes are constructed from foam board and spray foam, and in places, the scenery separating the visible scenery and the staging tracks is a mere 1" thick.

The staging is hidden by three removable covers for access. Rock castings are made from plaster of Paris, mostly from my own custom molds made with brushable silicon rubber and coarse grained rocks from the area I live in.

Most of the castings are adhered to the foam base with spray foam (a method that has few benefits, and many possible problems!). I paid particular attention to the geological structure in photographs in locating the castings. After final placement, I blended the rock castings with Sculptamold. To hide the joints between the removable staging

3 Scott cast his rock faces in home-made molds with plaster of Paris. A maintenance-of-way scene on a dummy siding adds interest.

The layout at a glance

Name: Canadian National Ashcroft Subdivision
Scale: N (1:160)
Size: 7 x 10 feet
Prototype: Canadian National
Locale: British Columbia
Era: modern
Style: around the walls
Mainline run: 28 feet
Minimum radius: 15"

Minimum turnout: no. 7
Maximum grade: none
Benchwork: open grid
Height: 46"
Roadbed: Woodland Scenics foam
Track: code 55
Scenery: foam board
Backdrop: 1/8" hardboard
Control: NCE Digital Command Control





4 Canadian National and Canadian Pacific share their Fraser Canyon main lines. Trains run westbound on the CN, top, and eastbound on CP.

covers and the fixed scenery I used plastic wrap as a separator while I worked with the wet Sculptamold. I made sure the separation was irregular to avoid catching viewers' eyes. This method, suggested by Mark Dance after successful use on his Columbia & Western layout [featured in *Great Model Railroads 2016*. – Ed.] was highly effective for hiding the joints.

Scoonka

I tried several methods to construct the rock sheds and tunnel portals for the Skoonka scene and ultimately used 3-D prints. I stumbled upon plans for the sheds in an article by Al Lil in *CN Lines*, and ultimately used these to dimension the CAD models. Given how little detail there is on the structures, I was able to print the structures locally and inexpensively with a low-resolution printer.

The horizontal raster lines from the printing were minimized with a light sanding, several heavy coats of spray primer, and a finish coat of acrylic paint.



5 The Thompson River is more turbulent than the Fraser. Scott modeled the water by painting a coat of leveling cement to depict the muddy water, then added waves with thick gloss gel. Pledge Floor Gloss provides the shine to both rivers.

The residual raster lines give the effective appearance of the concrete form casts found in the prototypes.

Most of the Skoonka scene is either exposed rock or sediment, with a thin forest cover and often quite barren ground cover. I used crushed waste

plaster and sediment I had collected from mountain rivers as a base material for much of the talus and other deposits along the canyon. I selected material from locations where magnetic material would be absent, but it's a good idea to test this with a strong magnet prior to



use. I sieved the raw material with several sizes of kitchen strainer and discarded stones that were too large.

I laid down multiple layers of different sizes of sediment on slopes, letting it accumulate to excess and move down the slope to form natural talus and scree surfaces. All materials were secured with an initial coat of white glue on the foam, then applications of diluted matte medium once the material was in place.

I used Woodland Sciences fine ballast throughout the layout and tinted it with dilute black and raw umber acrylic tube paint solutions incompletely mixed in take-out containers. The lack of mixing generated some variation in pigmentation of the ballast after it dried, giving it a distinctive subtle random coloring.

Where vegetated ground cover was present, I placed static grass by hand into sticky white glue. This simple approach is accomplished by rolling a “cigar” shape of static grass in your hand and dabbing it gently on the glue to place the grass. I prefer this approach over the more uniform cover of static devices, although both work well, and my method is certainly slower.

For this section of the layout, I shifted to wire-wound trees I purchased on

eBay. These trees are shipped compressed in a bag and need to be separated and properly shaped. I then air-brushed them with the same green paint that I used for painting the backdrop trees. I placed very small trees on the highest and most distant points to further force perspective. Although the area isn’t densely forested, this section consumed more than 1,500 trees.

As the Skoonka scene developed, I realized there was a small area along the track that could host a small maintenance landing. I installed a cosmetic siding and detailed the area with rusty rail, a worn container, bridge parts, tie stacks, vehicles and figures. It’s a nice spot to put some of my MOW models on display. I’ve come to particularly enjoy this scene that I named Morris, after the nearby siding on the prototype.

The two rivers on my layout have very different characters depending on the season. In winter they are low and clear, but in spring they are fed by snowmelt and they flow high with very muddy water. I wanted to capture the spring look where the water is opaque from the suspended mud.

For both rivers, I leveled the wood surface with an approximately 1/4" pour

6 Scott detailed how he built the Cisco Bridge in the May 2017 *Model Railroader*. The Fraser River, like the Thompson River, is depicted in spring, high on its banks and full of silt.

of leveling cement. This treatment provided a continuous, smooth surface, and filled wood joints and minor gaps along the banks at water level.

After the cement cured overnight, I painted the surface to match my field photographs, and then textured the surface with thick gloss gel. The white-caps were painted with a fine brush and white paint. A final coat of Pledge Floor Gloss (the current name for Future floor polish) gave the rivers a uniform surface. Both rivers are distinctive and give a strong seasonal clue to the layout.

Operations

The prototype railways utilize directional running in the canyons, with westbound movements on the CN line and eastbound movements on the CP. I have modeled the CN line so all trains operate westbound. The advantage of this prototype operation is that it gives me reason to have a CP train as well!



My final layout design led to a simple operating scheme with one train operating at a time. Because the staging tracks vary in length, I have to be careful to match the train lengths to a specific hidden track.

I've found that to add some interest, I can run one train that's longer than the longest (middle) staging track, and by shifting this train in and out of staging and using Skoonka as a siding, I can generate a schedule of train moves necessary to avoid any hidden mishaps.

In practice, I've found that the staging removable covers are rarely moved, and I attribute this largely to careful testing of the staging tracks and slow train speeds through the hidden turnouts and staging. My strategy of having two smaller removable covers on the ends of the staging means most derailments can be handled without removing the larger central cover.

I use modern six-axle locomotives from Kato, ScaleTrains.com, and Fox Valley, and all run smoothly and reliably. Nearly all of my favorite modern prototype freight cars are available in N scale and I run container, unit grain, and manifest trains. Most trains are about 7 feet long and consist of a pair of locomotives with 14 to 18 freight cars. As I weather

and detail cars, I install Fox Valley metal wheels and Micro-Trains Line couplers as necessary, and several of my lead locomotives are equipped with scale size Micro Trains Line couplers for better appearance.

Final thoughts

The layout is mostly completed now, and I enjoy running trains and modernizing my trains with detailing, graffiti, and weathering. There are still a number of spots that need scenic refinement, and I'm working on an etched-metal suspended maintenance of way foot bridge for Skoonka.

The DCC control really makes this layout easy and reliable to operate from a handheld controller, letting me focus on the trains. I've also met many people with an interest in this section of railroad. Little did I know how much the setting I'd chosen would resonate with so many other modelers and railroaders. Through online groups and National Model Railroad Association (NMRA) meetings, I've also met a large group of friends and modelers who share my passion for this remarkable section of railroad. **MR**

7 Scott designed the Skoonka Tunnels rock sheds in a computer-aided design program, then had them 3-D printed locally. He lightly sanded the horizontal raster lines from the prints. The residual texture mimics the forms of the cast concrete prototypes.



Meet Scott Lamoureux

Scott Lamoureux lives in Kingston, Ontario, Canada, with his wife, Linda. He's a longtime modeler in HO and N scales. Scott is a professor and permafrost scientist who spends summers in the Arctic doing fieldwork, so he's a little obsessive about scenery. In addition to disappearing into his train room, he enjoys hiking and traveling.



Even in the 1895 setting of Don Ball's HO scale Stockton & Copperopolis, automatic sprinkler equipment could be found on buildings. Since Don's model railroad is set in California, the water pipes for the system are on the building's exterior.

Add **AUTOMATIC SPRINKLER** details to buildings

Hydrants, alarm bells, valves, and other details add an extra level of realism to structures

By Don Ball

Photos by the author

There are a variety of details available for structures in many scales, including electrical panels; downspouts; and heating, venting, and cooling (HVAC) equipment. Details you don't find as often are those related to fire suppression systems.

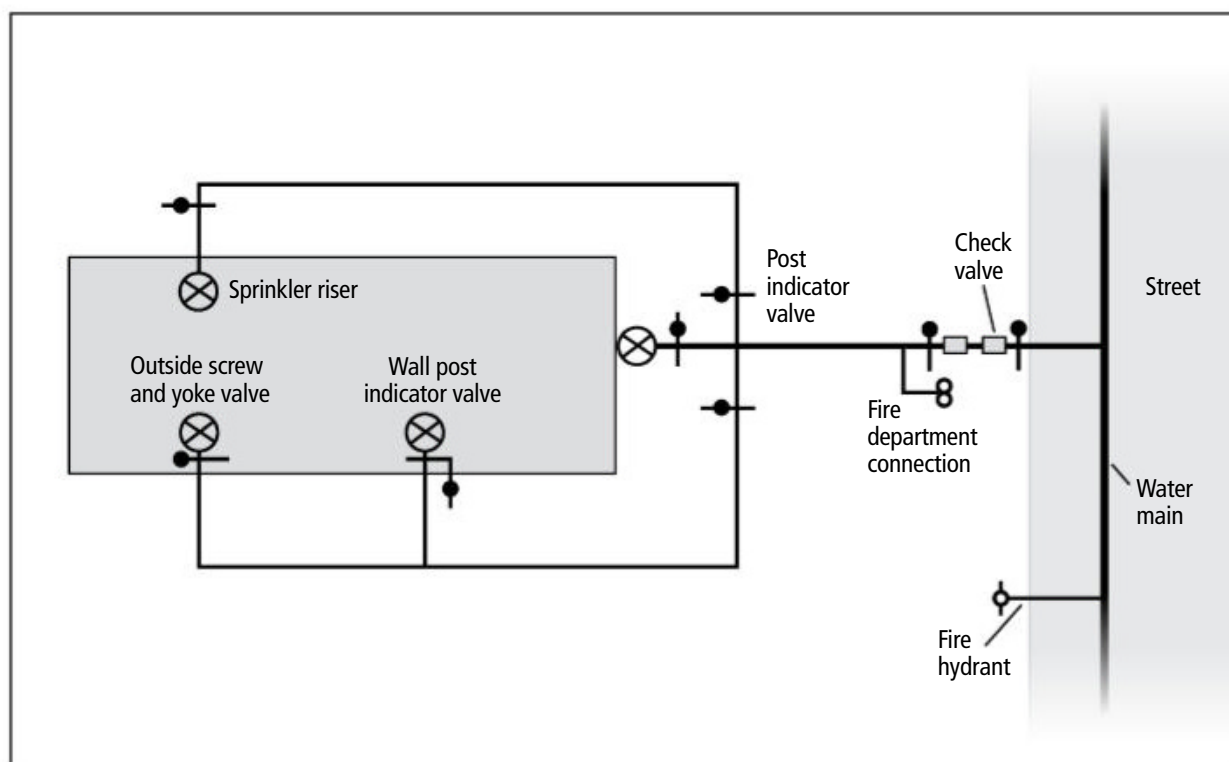
Though you may think of automatic sprinklers as a recent invention, they've been around since the 1870s. A sprinkler system consists of 6" to 8" pipes that carry water from the source (usually a public water main) through shutoff and check valves to the building, where they rise to ceiling height to feed the sprinkler piping and sprinkler heads. The various

components that make up an automatic sprinkler system are shown in **1** on the next page.

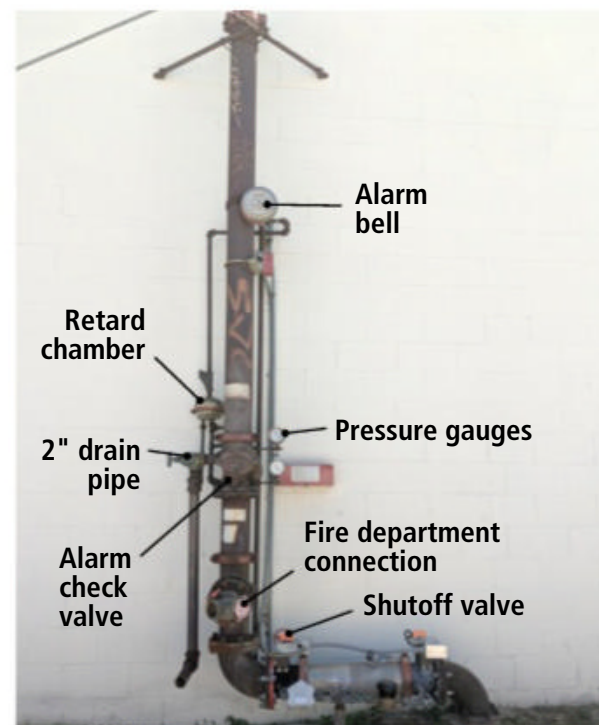
What to model

If much of an automatic sprinkler system is underground, what is there to model? More than you'd think.

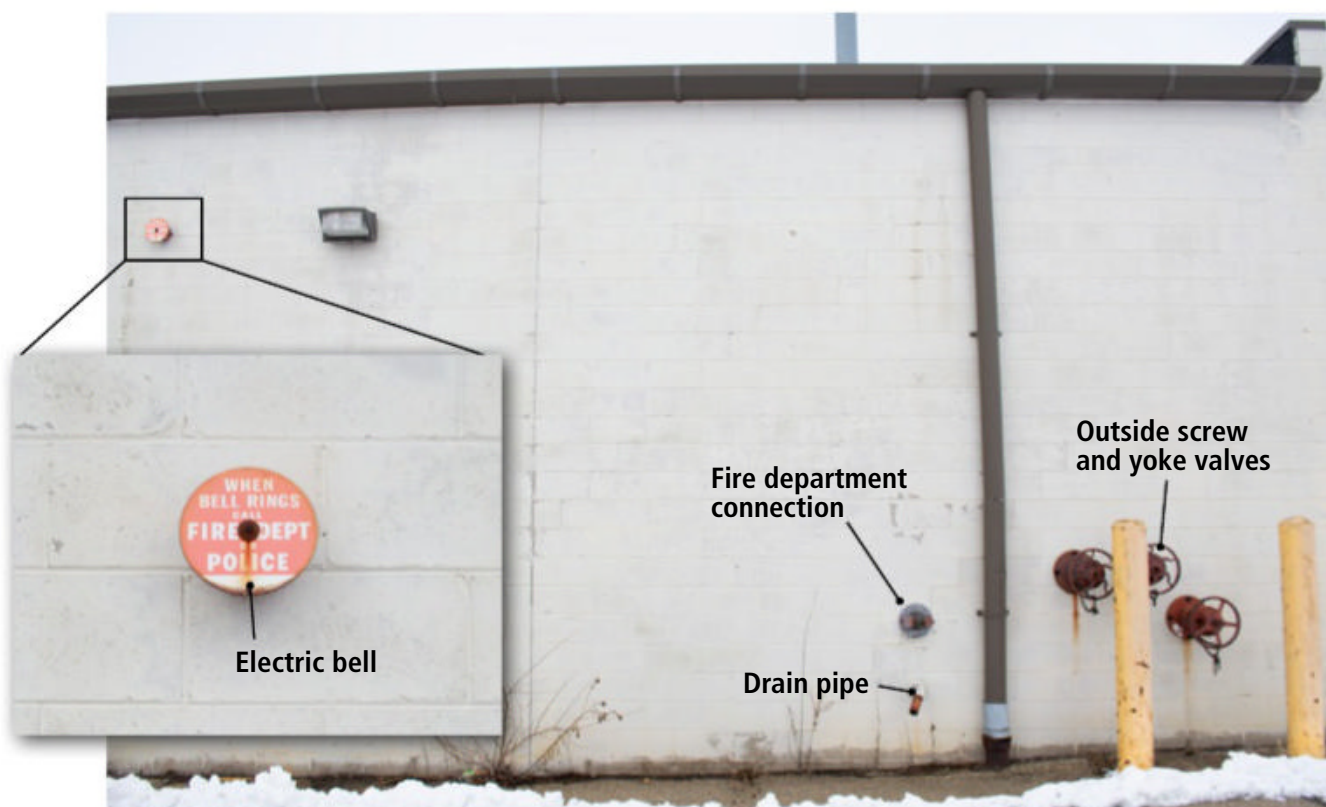
On a building exterior, commonly visible items include an outdoor shutoff valve, a fire department hose connection, and a water motor gong that serves as an alert that the sprinklers have been activated. In warmer climates, where temperatures don't get below freezing, the pipes are usually attached to the side of



1 Typical layout. This illustration shows the various components of an automatic sprinkler system from the street to the building. Not every structure has all of the features shown. Kellie Jaeger illustration



2 Sprinkler riser. Pipes carry water from the public main to the building. The pipe rises to the ceiling to feed the sprinkler pipes and heads.



3 Cold climate setup. In locations where temperatures regularly dip below freezing, pipes and other weather-sensitive parts of the riser are moved inside. These are the details on the back of a former Kmart store in Wisconsin. Cody Grivno photo



4 Wet-barrel hydrant. Water is present in this style of fireplug, which is used in warmer climates.



5 Dry-barrel hydrant. This style of fireplug is common in colder areas. The valve nut on the hydrant's top connects with a valve buried in the street.

the building. See **2** in the upper right corner of this page.

In colder climates, where frozen pipes are more of a concern, sprinkler risers look different. Pipes and other weather-sensitive parts are located inside the building. You can usually identify where the riser is located by looking for other telltale details **3**.

Temperature also dictates the type of fire hydrants used. In warm locations, wet-barrel hydrants are common **4**. Water is present in this style of hydrant. The valves for the connections are on the sides opposite the hose connection.

In colder areas, dry-barrel hydrants are used **5**. The valve nut on the

hydrant's top connects with the valve, which is buried in the street to keep it from freezing.

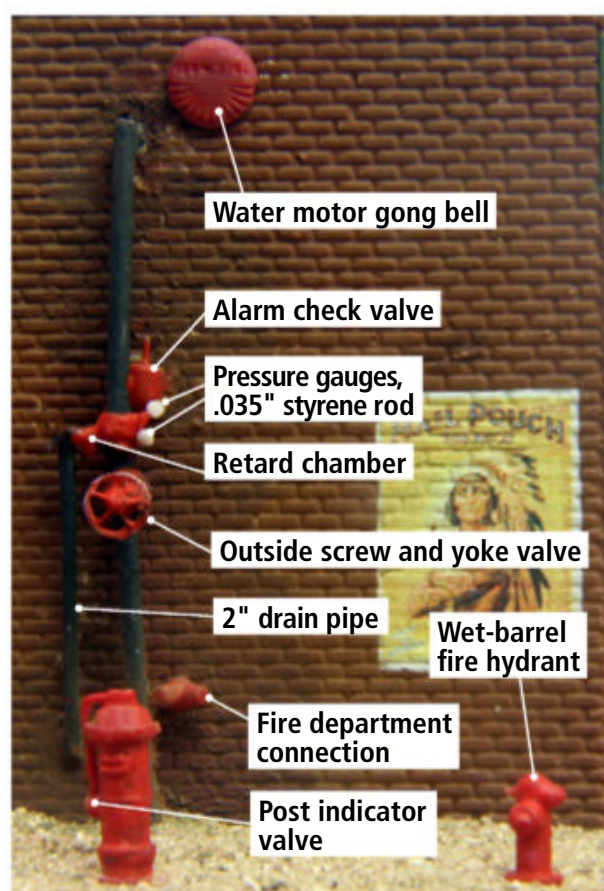
On your layout

A group of modelers, Mark Davidson, Tim Merkel, and myself, got together to determine which parts would be needed to represent an automatic sprinkler system. All of the components in **6**, opposite, are 3-D printed and are available through Tim's 3-D Model Railroading website (3dmrr.com).

In **7** you can see automatic sprinkler details that would be typical for a building exterior in a warm climate. Photo **8**



6 Modern modeling. Tim Merkel 3-D printed sprinkler system parts in HO scale. Among the details shown here are an outside screw and yoke valve, a fire department connection, an alarm check valve and bell, a post indicator valve, and dry and wet hydrants.



7 On the layout. Don used the 3-D printed parts to add a sprinkler riser to the exterior of a building on his HO scale layout. He used styrene rod to model the pipes and gauges.

shows how to model a building where freeze-sensitive equipment is located inside the building.

If you're looking to add some next-level details to your structures, consider an automatic sprinkler system. The parts may be small, but they pack a big punch. **MIR**

Don Ball of Blue Springs, Mo., has written more than a dozen articles for Model Railroader magazine, many focusing on his circa 1895 HO scale Stockton & Copperopolis layout. "A signal for flag stops" was published in the January 2018 issue.



An outside screw and yoke valve is a common sight on many retail and industrial buildings. The red box with the lock contains spare sprinkler heads.

Automatic sprinkler system glossary

An automatic sprinkler system consists of many parts. Here's a list of terms to help you better understand what the various components do. – Don Ball

Alarm bell. Activates when water is flowing in the sprinkler system or fire department connection.

Alarm check valve. Maintains water pressure on the system and channels water to the gong if system is activated.

Dry-barrel fire hydrant. Used in areas where temperatures get below freezing. The valve controlling the water flow is buried in the ground.

Fire department connection. Allows the fire department to connect hoses to the sprinkler system to boost pressure.

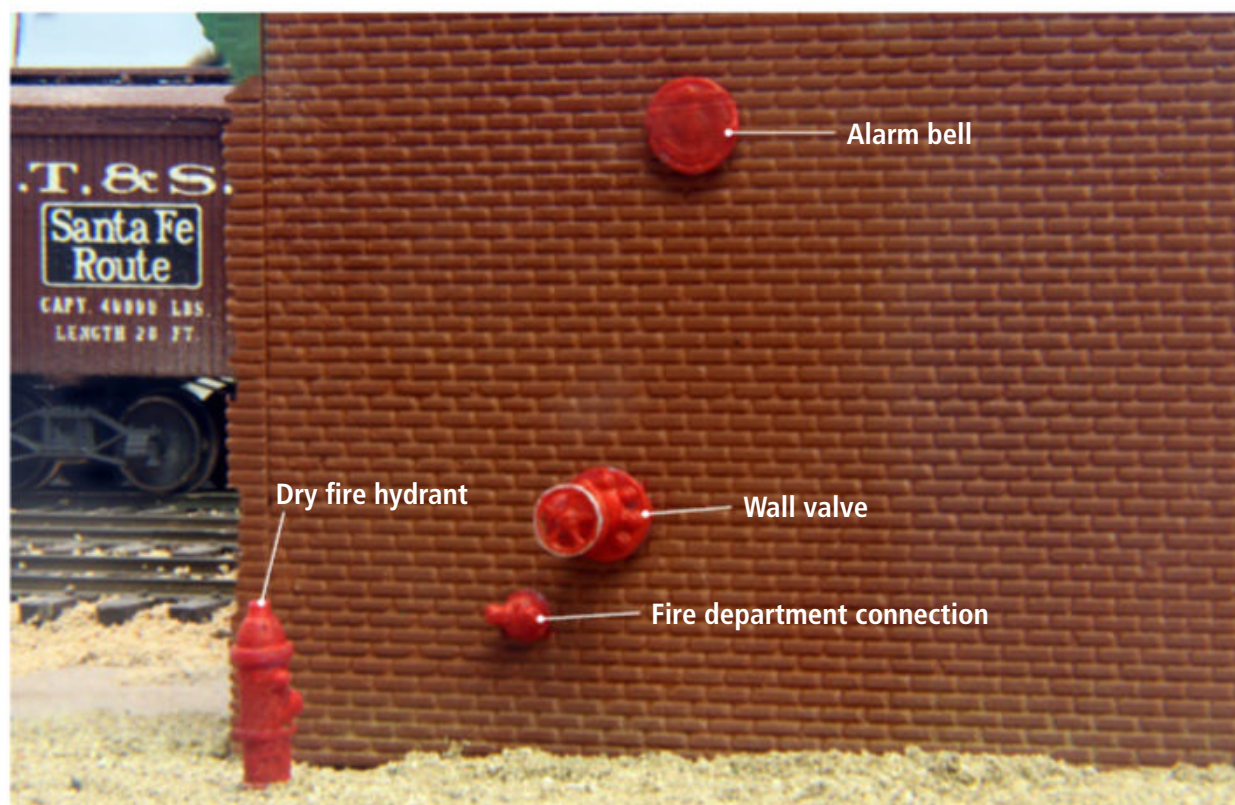
Outside screw and yoke valve. Controls water flow to the sprinkler system. The valve is usually mounted on vertical risers.

Post indicator valve. Operates a sprinkler water main valve buried in the ground.

Retard chamber. Prevents bell from operating due to minor water surges.

Two-inch drain. Used to drain or test system.

Wet-barrel fire hydrant. Used in warmer climates. The valves for the hydrant are located on the visible part of the barrel.



8 Keeping it simple. Even when water pipes aren't visible, details like an alarm bell, wall valve, and fire department connection add visual interest to a building.

Adding sound to a Walthers E9A



The WalthersProto HO scale Electro-Motive Division E9A makes adding sound to a locomotive about as easy as it can be. Allan Gartner shares some tips to make it so.

I wanted a locomotive that would be easy to convert to make for a good first project. I also wanted a locomotive that would be affordable. I picked an HO scale WalthersProto Electro-Motive Division (EMD) E9A with provisions for a 21-pin decoder. I used a SoundTraxx Tsunami2 TSU-21PNEM8 and a Digi-trax SDXH186MTSoundFX decoder for the installations in this column.

SoundTraxx provides a wide array of configurable sounds. You just have to pick the decoder that has the diesel engine sounds you want. You then customize the installation by programming configuration variables (CVs).

Digitrax sells one decoder with several built-in diesels and steam. If it doesn't have the engine sound you want, you can download a sound file from its website. You can also create your own sound files.

Both decoders are very flexible, so you can get just about any diesel or steam sound you want. Select the approach that appeals to you. I'm providing the basics to get you going. Try changing other CVs, using Java Model Railroad Interface's (JMRI) DecoderPro if you wish, once you're comfortable with your installation. DecoderPro is part of the JMRI suite of software available for free download at jmri.org.

This is a simple installation because there's no cutting of plastic, and the only soldering required is to hook up the speakers. If you want a stay-alive circuit to carry your locomotive past dirty spots, this is a little more involved, but I explain that, too.

To open the E9A, remove its front coupler and spread the sides to get the shell off. The E9A has provisions for a flashing beacon, lighted number boxes, and two speakers.

I got two 28mm speakers (no. 810153), two 28mm baffles (no. 810110), and a CurrentKeeper II (no. 810160) capacitor from SoundTraxx. I contemplated the 28mm mega bass speakers, but I couldn't fit a baffle. Without a baffle, it sounded tinny.

The E9A frame had two parts that fit the curve of the shell, ①. These give you an indication of how much room you have under the shell. The E9A has a cavity in the back that fits the CurrentKeeper II like it was made for it.

Remove the plastic parts over the speaker openings. As delivered, they stick up. Reinstall them upside down. This will give you a little more room for speaker baffles.

The baffle kit comes with four parts. You'll use the "end plate" and the "chamber." Glue the end plate onto the chamber with some plastic adhesive, ②, opposite.

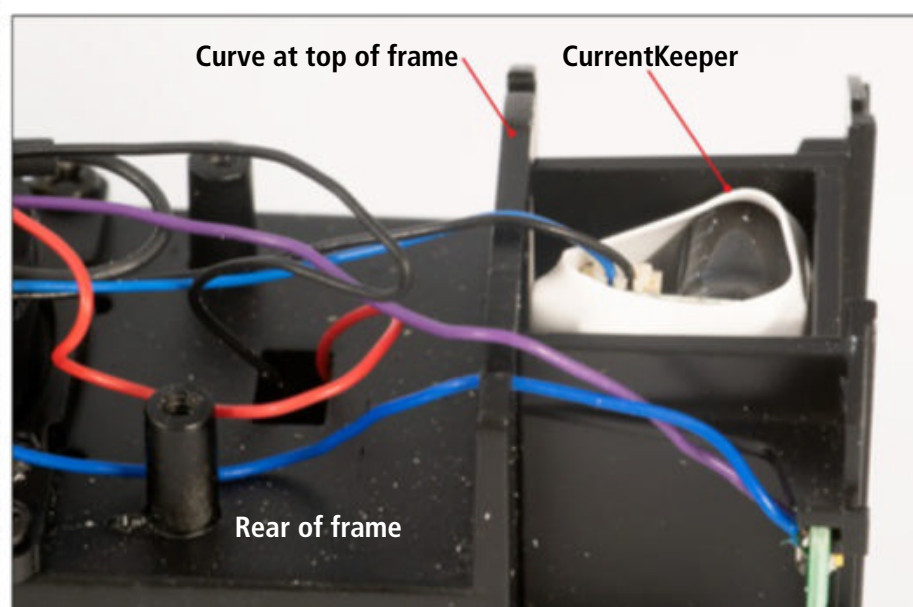
You'll be connecting the two speakers in series. This means you'll be connecting the positive terminal of the front speaker to the negative terminal of the rear speaker. If you don't get this right, you'll find the resulting sound disappointing. The diagram that comes with the speaker identifies the positive and negative terminals. Thread some 30 AWG wires through the holes in the end plate before soldering.

Don't try to snap the baffle into the E9A's speaker mount. It spreads the speaker mount, then the screws won't align with the holes. Instead, glue the baffle to the E9A speaker mount with Walthers' Goo. Don't use so much that you get Goo on the speaker. Then glue shut the holes for the wires, ②.

Cut the wires between the CurrentKeeper II and its connector. Its connector fits the connector for the speaker in the E9A, so be sure you leave enough wire that you can use it again later. If you're not using a CurrentKeeper, buy a CurrentKeeper harness (no. 810158) to get the plug.

The wires for the CurrentKeeper must be soldered to two pins on the 21-pin connector on the E9A's motherboard. You have to be very careful when doing this. I highly recommend a fine-point, 15W soldering iron. If soldering isn't your thing, recruit a friend who can do it for you. Note that you don't have to have a CurrentKeeper, and you can add it later.

Solder the blue wire from the CurrentKeeper to the leg of pin 16 on the locomotive's motherboard, ③. Solder the black wire to the leg of pin 20. The pinouts are shown in ④. After soldering the CurrentKeeper to the motherboard, be sure to use your ohm meter to confirm you haven't shorted to the adjacent pins. Don't risk letting the smoke out of your decoder! Also, if you ever have to remove your decoder from the motherboard, wait



① **Perfect fit.** The CurrentKeeper II fits perfectly into the cavity at the back of the E9A. Also note the ridges on the E9A that fit the curve of the shell.

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until the CurrentKeeper is fully discharged, the lights go out, and the sound stops. Then give it an extra minute to be sure.

The connector you cut from the CurrentKeeper harness matches the plug on the speaker connector on the motherboard of the E9A, **3**. We're going to reuse it to connect the speaker. One of its wires will attach to the free terminal on the front speaker and the other wire goes to the free terminal of the rear speaker. It doesn't matter which ends go to each speaker. You'll have to add some wire to reach the front speaker.

The Digitrax decoder has shrink-wrap on it, so you won't risk a short when plugging it into the socket on the E9A. For other decoders, you may want to put some Kapton tape over the E9A's motherboard before installing the decoder, **3**.

Touch the metal case on the back of your computer to discharge any static electricity before handling your decoder.

Put your decoder onto the motherboard. Make sure the connector is facing upward, just like the one you took out of the E9A. You're done! Try it out before putting the shell back on.

If you chose the SoundTraxx 21PNEM8, you need to select the decoder with your desired diesel prime mover sound before you buy it. The SoundTraxx decoder comes with several prime movers, bells, horns, and other user-selectable sounds. Go to the website to select your decoder.

This decoder is appropriate for people who do their homework up front as to what

prime mover they need. It's easy to configure. The SoundTraxx manual lists names of the various bells, horns, and other sounds. If you know what your prototype used, you can easily select it.

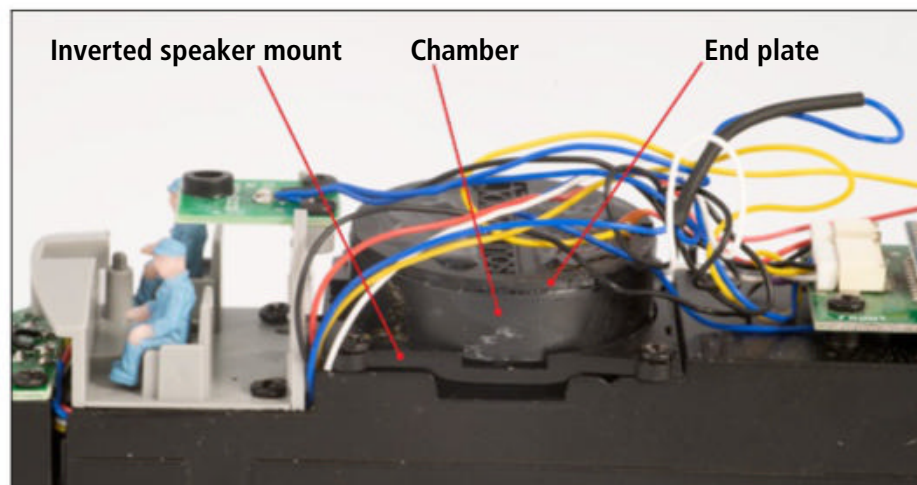
There's a lot of customizing you can do, but the only thing that's necessary to configure is the beacon on the top of the E9A and the address of the locomotive. Program a 5, 6, or 7 into CV51 for the beacon type. F24 will activate your beacon and F25 will illuminate the number boards. Enjoy your locomotive for now. There are more things you can configure than can be covered in this column. See the Diesel User's Guide on the SoundTraxx.com website. When you do, you'll discover there's even a sound for refueling your locomotive!

With the Digitrax

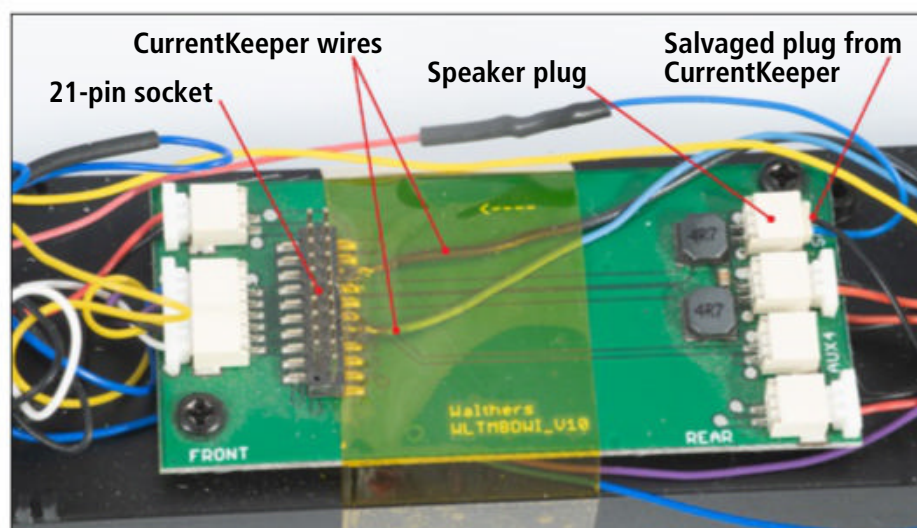
SDXH186MT SoundFX, keep in mind that Digitrax decoders offer transponding – the ability to know not only that a train is in a block, but which train it is. Cool, right? You'll need to add Digitrax transponding receivers to your layout to use this feature. Program CV62 to 2 to activate transponding.

The Digitrax decoder comes with sounds for six diesel locomotives and two steam locomotives. You can select different bells and horns/whistles. This is appropriate for modelers who don't know what their prototype sounds like and just want to pick one that sounds right for their model.

If you do have a specific prototype you want sounds for and it's not one of the sounds included with the decoder,



2 Speaker installation. The end plate and chamber are shown glued onto the E9A's speaker mount.



3 A little soldering. Connect the CurrentKeeper's blue wire to the leg for pin 16 and the black wire to the leg for pin 20. Solder the blue wire from the CurrentKeeper to the base of pin 16 and the black wire to the base of pin 20.

the Digitrax Sound Depot has a library of sounds for other prototypes. You will need a PR4 programmer or DCS240 and the free SoundLoader software. I didn't see sounds for an E9A. Fortunately, you can also load your own sounds.

There aren't as many things you can change with this decoder, but it's still very flexible. The decoder comes with the function button 1 (F1) and F2 functions configured to light the number board and beacon while simultaneously sounding the bell and horn.

This is something you'll want to change. Set CV35 to 0 and CV36 to 0. This divorces the sounds from the lights on F1 and F2. Then program CV37 to 4 and CV38 to 1. This moves the number boards and beacon to F3 and F4. Then program CV51 to 4,

Input 1	1	22	Track right (red)
Input 2	2	21	Track left (black)
Aux 6	3	20	Gnd (ground)
Aux 4	4	19	Motor 1 (orange)
TB Clock	5	18	Motor 2 (gray)
TB Data	6	17	Aux 5
F0 r yellow	7	16	(+) Plus (blue)
F0 f white	8	15	Aux 1
Speaker	9	14	Aux 2
Speaker	10	13	Aux 3
Index	11	12	Vcc

4 Pinouts This chart shows what each of the 21 pins on the motherboard and decoder connect to.

5, or 6 for your beacon type. Program your locomotive address and you're done for now. See Digitrax's CV programming tool at digitrax.com/support/cv. **MR**



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Kato N scale NYC 20th Century Limited set

New York Central's 20th Century Limited is ready to take to N scale rails with the new set from Kato.

The **20th Century Limited** was the top train of New York Central's (NYC) Great Steel Fleet. The train made its 16-hour trip between Chicago and New York City overnight, with trains arriving in the opposite city at 8 a.m., ready for the new day's business.

Inaugurated in 1902, the *Century* became a streamliner in 1938. Ten years later, NYC updated the train with all-new equipment, including Electro-Motive Division (EMD) E7 diesel locomotives.

The 1948 train featured a complete Pullman-Standard consist of all room cars featuring Pullman service.

Distinctive "Lookout Lounge" observation cars with enlarged windows at their curved ends marked the ends of the trains and carried the stainless steel Art Deco *20th Century Limited* tailsign.

New York Central received its first E7s in March 1945, and by February 1948 it had 36 of the 2,000-hp covered wagons on its roster. The locomotives were powered by two 1,000-hp, 12-cylinder 567A diesel engines. The six-wheel trucks each carried two traction motors, driving the outer axles.

Pullman-Standard delivered its passenger car order in 1948 consisting of eight types to re-equip the *20th Century*. Carried over from the 1938 train were 4-compartment, 4-bedroom, 2-drawing room cars of the *Imperial* series,

renamed into the *Bridge* series in 1949. These cars rode on triple-bolster trucks.

The locomotives lasted into the NYC's merger into the Penn Central. The passenger cars went to Penn Central, Seaboard Coast Line, Rock Island, and a few others, including Ringling Bros. and other private owners, or were scrapped.

Kato's 20th Century Limited is an all-new set, from the E7A locomotives to the Lookout Lounge observation.

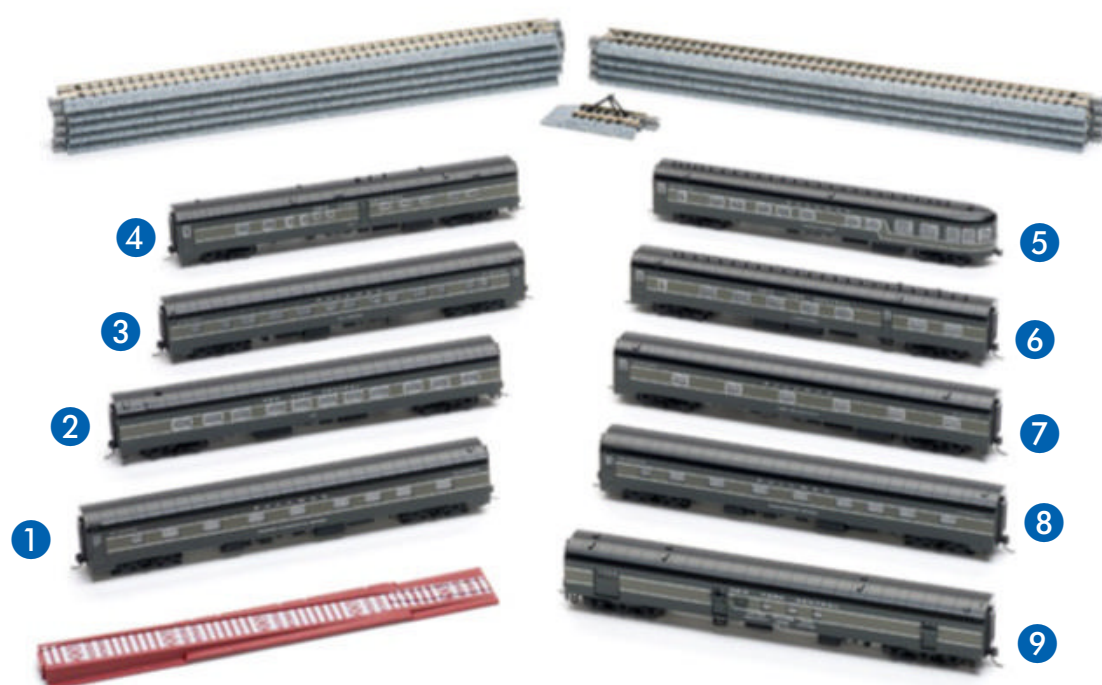
The new EMD E7A measured within scale inches of a drawing in *New York Central System Diesel Locomotives* by William D. Edson with H.L. Vail Jr. and C.M. Smith (1995 TLC Publishing Inc.)

The one-piece body shell snaps onto a die-cast metal frame. The horns and window glazing are separate parts. A molded plastic light tube directs light from the chassis-mounted light-emitting diode (LED) to the headlight and number boards.

The LED is surface-mounted on a simple circuit board that snaps onto the top of the one-piece frame. Kato says the model is compatible with Digitrax DN163K0D or Train Control Systems K0D8-G decoders. Decoder-equipped versions are also available. Modelers wishing to add a sound decoder should be prepared to remove some metal to make room for a speaker.

Phosphor-bronze contacts rise up from the six-wheel trucks to phosphor-bronze contacts snapped into a plastic carrier that in turn is snapped onto the die-cast metal frame. The motor and its two brass flywheels are under the plastic piece. All wheels are powered and pick up electricity.

The rear coupler is truck-mounted; the front coupler is body-mounted. It can stay in place to remove the frame. Just wiggle



The nine-car set includes, clockwise from bottom left, ① sleeper *George Washington Bridge*, ② diner no. 401, ③ sleeper *Bay Bridge*, ④ kitchen/dormitory no. 474, ⑤ observation *Hickory Creek*, ⑥ lounge *Lake Shore*, ⑦ sleeper *Port of Buffalo*, ⑧ sleeper *Queensboro Bridge*, ⑨ RPO/baggage no. 5017. Included are a display track and rerailer decorated to represent the red carpet New York Central rolled out for passengers on station platforms in New York and Chicago.



the frame to the rear to clear the black plastic insert that serves as a light block around the headlight and number boards.

The dark gray paint on our sample locomotives was evenly applied, and the separations between the light gray lighting stripes with white edging are sharp, as is the white New York Central lettering and numbering.

All of the cars' window layouts match drawings and photos in *The Official Pullman-Standard Library: Vol. 2, New York Central* by W. David Randall and William M. Ross (Railway Production Classics, 1987).

The models have one-piece plastic body shells with flush-mounted window inserts. Molded plastic interior pieces are snapped onto the frame/floor pieces. Several of the cars share frame castings, so the underbody detail isn't always specific to the cars. The models also have simple diaphragms around the doors instead of the full-width diaphragms on the prototype. Those would make operation on typical N scale curves impractical.

Most of the cars are equipped with General Steel (GSI) four-wheel trucks, except the *Bridge* series cars, which have triple bolster trucks, and the baggage/RPO, which has six-wheel GSI trucks.

Again, all of the paint is evenly applied, and the light gray striping and lettering is sharp and opaque. Most of the cars weigh 1.2 ounces, with four of them measuring 1.3 ounces. N scale 85-foot

PERFORMANCE CHARTS

DRAWBAR PULL .9 ounces
equivalent to 11 free-rolling passenger cars on straight and level track

SCALE SPEED (DC)	
VOLTS	SCALE MPH
2V (start)	11
3	29
6	86
9	146
12	218
13.84 (max)	247

passenger cars should weigh 1.44 ounces, making the cars slightly underweight.

The Kato magnetic couplers are truck-mounted, except the rear coupler on the observation car, which is body-mounted. The blackened metal wheelsets have metal pickups for optional interior lighting circuits (no. 11-211/212). The observation has operating lights for the lounge portion of the car, rear markers, and tail sign.

I tested this direct-current set on a Kato Unitrack set using a Kato power pack. The EMD E7s started moving at 2V at 11 scale mph and topped out at 218 scale mph at 12V. The power pack maximum of 13.84V produced a 247 scale mph top speed. The fact sheet in the NYC diesel book said its E7s were geared for 98 mph, which was reached at a little over 6V.

The two E7s in the set had no trouble pulling all 13 cars in the combined basic and add-on sets. Everything tracked well even at full speed forward and reverse on

Facts & features

Price: EMD E7A two-locomotive set, \$230 (DC, no sound); \$390 (DCC, no sound); \$630 (DCC, sound). Nine-car set, \$315; nine-car set with lights, \$450; four-car add-on set, \$140; four-car add-on set with lights, \$200

Manufacturer

Kato USA Inc.
100 Remington Rd.
Schaumburg, IL 60173
katousa.com

Era: 1948-1954

Road name: New York Central

Features

- All-new tooling
- Details that match the '50s era consist
- Observation car with lighted tail sign
- Optional interior light kit 11-211/212
- Newly tooled EMD E7A locomotives
- E7A locomotives are DCC friendly and compatible with Digitrax DN163K0D or Train Control Systems K0D8-G decoders
- Weight, locomotive: 5.1 ounces, cars: 1.2 or 1.3 ounces, .2 or .1 ounces light per NMRA RP-20.1

the Kato Unitrack 315mm radius (about 12.4 inches) curves. Further testing on the *Model Railroader*/Trains.com Canadian Canyons layout showed the locomotives easily pulled their train up the 1.6 percent grade of the helix on the layout, but be aware of end overhang on curves, as some of our tunnel portals got in the way of progress.

Whether you simply wish to look at the train (the nine-car set includes a display track and a rerailer decorated to look like the 20th Century's trademark red carpet) or add it to passenger operations on your layout, this is a fine-looking and running set. – *Eric White, senior editor*



The four-car add-on set includes sleepers, clockwise from bottom left, *Port of Albany*, *Powder River*, *Chicago River*, and *Port of Boston*.

ScaleTrains.com HO scale Backpacker well car



A Pullman-Standard/Trinity Backpacker 5-unit articulated well car is the first intermodal car to be offered in ScaleTrains.com's HO scale Rivet Counter line. The newly tooled car features die-cast metal and plastic construction, Barber S-2 trucks with rotating bearing caps, and detailed interior sidewalls.

The prototype. Our sample, DTTX no. 64005, is decorated in Trailer Train's as-delivered scheme. The full-size car, part of the 64005 through 64016 series, was built in May 1987 by Trinity Industries under lot 2107A at Pullman-Standard's Bessemer, Ala., plant.

A stencil on the A unit indicates the car is part of the RWG50A class. What does that mean? R = Trinity Industries, W = double-stack well car, G = M901G high-capacity friction draft gear, 50 = 100-ton articulated trucks, and A = all-purpose.

Facts & features

Price: \$139.99

Manufacturer

ScaleTrains.com
7598 Highway 411
Benton, TN 37307
scaletrains.com

Era: 1987 to 2018

Road names: Trailer Train (six road numbers) and "K" Line/Trailer Train (two numbers)

Features

- 33" (ends) and 36" (articulation points) metal wheelsets, in gauge
- Barber S-2 trucks with rotating bearing caps
- Die-cast metal semi-scale Type E lower shelf couplers, at correct height
- Minimum radius 22" (26" radius required when supplied detail parts are added to B and C units)
- See-through stainless steel walkways
- Weight: 11.7 ounces (7.5 ounces too light based on National Model Railroad Association Recommended Practice 20.1)
- Wire grab irons on A and B units

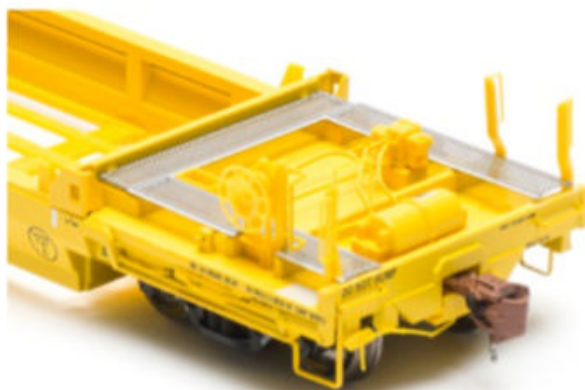
TTX phased out its fleet of 100-ton well cars throughout the 2010s. Three cars from the 64005 through 64016 series were still listed in the January 2018 *Official Railway Equipment Register* (ORER). The cars were no longer in the ORER a year later.

The model. Each unit of the Backpacker has a die-cast metal body with a separate, plastic well floor; etched-metal roping eyes; see-through etched stainless steel end platforms; metal stirrup steps; and Celcon corner uprights and vertical grab irons. The plastic parts are molded in yellow but unpainted. The A, B, and D units have separate air reservoir, control valve, and related wire piping on the platform. The A and B units have wire grab irons on the side and end sills.

The E and C units have a plastic proportion valve and proportion valve pipe. The plastic brake wheel and brake stand, along with the painted wire brake stand grab iron, are on the B unit.

The well car has two small plastic bags with matching sets of modeler-installed parts: a brake chain tensioner wheel, brake chain tensioner rod, and brake chain tensioner rod support for the B and C units, as well as inter-box connector pins and spare bearing caps. If the brake parts are added, the well car will require 26" or greater radius curves. Out of the box, the car can handle 22" radius curves.

Measuring up. For the most part, the paint was smooth and evenly applied. The paint was a bit thick on the male (D) and female (E) articulated couplings,



The B end of the B unit has a plastic brake wheel as well as a separate air reservoir, control valve, and related wire piping on the platform.

causing the E unit to not seat properly. Some minor sanding resolved the issue.

The Backpacker has die-cast metal Type E lower-shelf couplers, which are mounted at the correct height. The couplers don't have trip pins, so they won't work with magnetic uncoupling ramps.

The 33" (ends) and 36" (intermediate) metal wheelsets are correctly gauged. At 11.7 ounces, the car is 7.5 ounces too light per National Model Railroad Association Recommended Practice 20.1. Adding containers will help this.

I compared the model's dimensions to data published in the January 1990 ORER. The major dimensions closely follow published data. The distance over the pulling faces was a scale 1'-6" too long. This is typical on models, as even scale couplers are slightly oversized.

On the rails. Then I took the car to our HO scale Milwaukee, Racine & Troy staff layout, which has 36" minimum radius curves and nos. 4 through 6 turnouts. I ran the car, arranged in a B-C-D-E-A configuration, with seven other five-unit articulated well cars from other manufacturers. The ScaleTrains.com model navigated turnouts without incident while being pushed and pulled. The car stayed on the rails while being pushed up a curving 3 percent grade.

Two 20-foot or one 40-foot container will fit in the well. The upper position can be occupied by containers up to 48 feet long (or 53 feet if put in every other well). I tested containers from ScaleTrains.com, Athearn, Atlas, and Walthers in the well. I was unable to get a pair of Athearn 20-foot containers to fit in the well. Otherwise, all the containers fit properly.

Designing a well car that's accurate and functional isn't an easy task, but ScaleTrains.com pulled it off on this Rivet Counter line model. A smart mix of plastic, etched-metal, and wire details enhance this container hauler, while the die-cast metal bodies make the car a solid performer. Though the Backpackers are sold out at the manufacturer, you can still find them through ScaleTrains.com retailers. – *Cody Grivno, group technical editor*

QUICKLOOK

Atlas O 1937 AAR 40-foot steel boxcar

Price: \$84.95 (undecorated, \$74.95)

Manufacturer

Atlas Model Railroad Co. Inc.

378 Florence Ave.

Hillside, NJ 07205

atlasrr.com

Era: Aug. 1948-March 1970 (Great Northern model, as decorated)

A boxcar built by the tens of thousands for dozens of North American railroads has been released in new paint schemes and road numbers by Atlas O. Part of Atlas' Steam Era Classics series, the Association of American Railroads (AAR) 1937 40-foot boxcar was first issued in 2004. The model features free-rolling trucks with blackened metal wheels, a sharp paint job, and a wealth of separately applied etched-metal, wire, and cast-metal details.

The AAR's 1937 40-foot boxcar design was the first example of

near-universal, voluntary adoption of a car by American railroads. Nearly 93,000 of the versatile cars were built for 64 North American railroads.

However, the Great Northern was not one of those. The railroad did have a car numbered 11565, and it was a 40-foot steel boxcar; it just wasn't an AAR model. The prototype was painted Vermillion Red with a 3-foot black-and-white herald on the left and slant serif "Great Northern" lettering on the right. Atlas's model bears a scheme GN used on other 40-foot boxcars.

Though Atlas' car doesn't model an actual GN boxcar, as a model of an AAR 1937 40-foot boxcar, it's quite faithful. I found AAR plans in Vol. 35 of the *Railway Prototype Cyclopedia*, and Atlas' model matched in its major dimensions, wheelbase, and placement of details like ladders, grab irons, and door hardware.



The see-through roof walk is a single etched-metal piece. The cast-metal ladders and handgrabs were well done. The brake gear matched prototype drawings. The blackened metal wheels were in gauge, and the metal knuckle couplers were mounted at the correct height. It tracked well through a curve of 24" radius Pola sectional track, which is the recommended minimum radius.

The paint job on the car's injection-molded plastic body was smooth and even. The lettering was sharp, opaque, and legible at the smallest sizes.

During the late steam through early diesel eras, 40-foot AAR boxcars like Atlas' model were ubiquitous on the North American rail network. If you model that period, you should have several on your layout. Atlas' O scale version is a well detailed, good looking model. – Steven Otte, associate editor

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A scene on Nigel Thomas' Code 55
Eagle Bridge. Photo: Derek Shore.



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Rapido HO scale Amtrak Horizon passenger cars

It's a good time to be an Amtrak modeler. Rapido's new Horizon passenger cars are here to fill out your contemporary medium-distance trains.

Amtrak started its existence with a hand-me-down fleet of passenger cars and locomotives. In 1988, Amtrak ordered its first new short-haul cars, initially referred to as Amfleet III (Amfleet II came in the early '80s), but referred to upon delivery in 1989 as Horizon cars.

The Horizon fleet was built by Bombardier in 1989 and 1990. The 104 cars were based on a Pullman-Standard design for "Comet" commuter coaches Bombardier had purchased. There were four types of cars – two series of coaches, coach-dinette cars, and all-table cars.

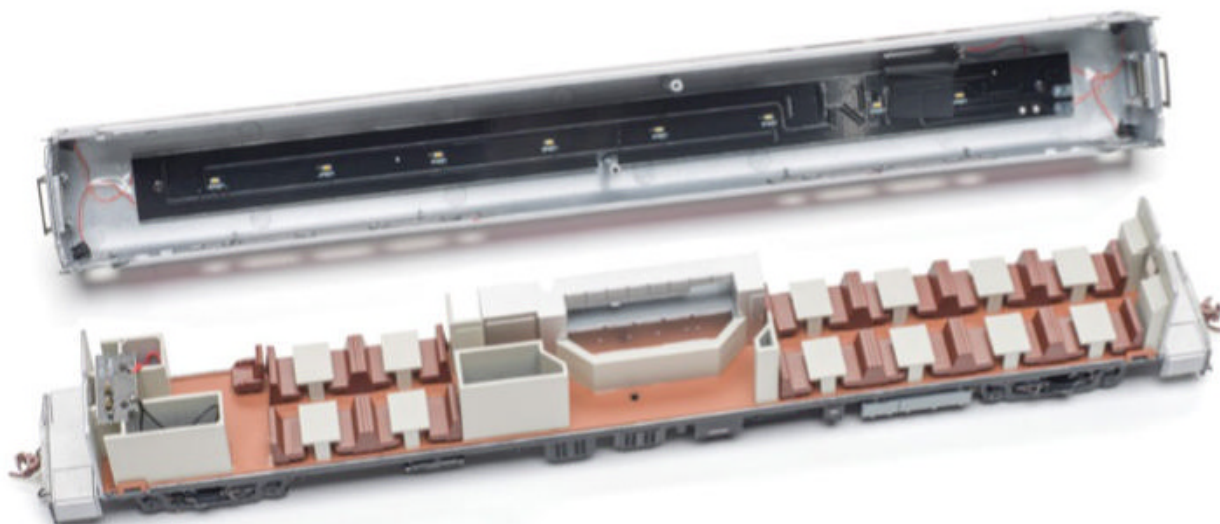
Rapido's model is packed full of detail. A one-piece plastic body casting wraps around about 200 other parts, including detailed interiors and underbodies (there are even ventilated brake discs behind the wheels on the trucks).

The body shells have the appropriate doors and stairs for their paint schemes, and the interiors have appropriate layouts for their eras, as well. And take a look at those interiors! They're painted to reflect the surfaces and materials inside. The serving counter of the dinette is especially impressive.

The instructions detail how to access the interiors. The coaches have four screws – two at each end – and the dinettes have two screws near the center of the car. Once the screws are removed, gently spread the sides of the car to lift the body off the frame.

All paint on the models is smoothly applied, and the striping and lettering is sharp and opaque.

I tested these cars on our staff layout, the Milwaukee, Racine & Troy, when I was testing Bachmann's new Siemens SC-44 Charger. The cars rolled smoothly and tracked well both in forward and reverse as we filmed the train for the review video, which you can see at Trains.com.



Rapido's Amtrak Horizon cars come with complete interiors and interior lighting. The cars' fixtures are painted in appropriate colors.

Facts & features

Price: \$99.99

Manufacturer

Rapido Trains Inc.

500 Alden Rd., Unit 21

Markham, ON

L3R5H5 Canada

rapidotrains.com

Era: 1989-present

Road names: Amtrak (phase 3 [narrow and wide stripes], Phase 4, Phase 6, Amtrak California [dinette only], and undecorated

Features

- Constant interior lighting in DC and DCC
- Full underbody details
- Full multi-color interior detail with separate seats
- Folding or fixed stairs as appropriate
- GSI G70 trucks with free-rolling, turned-metal wheelsets, in gauge
- Metal knuckle couplers at correct height
- Separately-applied metal grab irons
- Weight: 7.7 to 7.8 ounces, about 1 ounce over NMRA RP-20.1 car weight of 6.9 ounces for an 85-foot car
- Working marker lights

I also tested the cars on my home layout, where I pushed and pulled them through Atlas no. 6 crossovers and no. 4 compound yard ladders without any issues. Using the Rapido Lighter magnetic wand, I easily switched the interior lights and marker lights on and off.

If you're contemplating passenger service on your layout, these cars would be ideal for the kinds of shorter trains modelers love to run. – *Eric White*, senior editor 



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Reading train registers

March's On Operation column discussed registering trains. It's just as important to know how to read and interpret registers.

A lesson drilled into me when I began learning timetable-and-train-order (TTTO) operation was this: Trains must not use a train register's record of an extra as evidence of its arrival except as provided for by train order. The actual Erie register page in this photo shows why.

Note the movements of Engine 43: extra east at 4:08 a.m., extra west at 4:35 a.m., extra east again at 7:42 a.m., and once more, extra west at 8:07 a.m. These movements would be typical of a helper. A train order addressed to another crew might read: EXTRA 2472 WEST WAIT AT SWARTSWOOD JCT FOR EXTRA 43 EAST. Why is this not a proper order?

Suppose Extra 2472 West arrived and checked the register at 7:15 a.m. Its crew might decide to proceed because Extra 43 East registered at 4:08 a.m., satisfying the order's demand. One might dismiss such a possibility, arguing that the dispatcher would not allow the situation. The operator, if on duty, wouldn't overlook it, or the "pusher" notation for Eng. 43 would make the crew member checking the register suspicious. However, rail-roaders are only human. Routine leads to carelessness.

Several types of train orders were intended to prevent such an error. For simplicity let's use JU for Swartswood Junction and H for a register station west of there. Many roads relied on a Form W that would read: EXTRA 43 EAST REGISTER AT JU ON ORDER NO 12, giving the number of the Form G

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See Rules 83 and 444.

TRAIN REGISTER

DATE	TRAIN		ENGINE	ENGINEMAN	CONDUCTOR	SIGNALS CARRIED		ARRIVAL		DEPARTURE	
	Sec.	No.				From	To	A. M.	P. M.	A. M.	P. M.
			SWARTSWOOD JCT., N. J.				SEP 1 - 1937				
	X+X	8	303	Ratzelle	Zimmerman	West		301		305	
	X+X	8	305	Ratzelle	Mayer	East		408		408	
	X+X	8	43	C. Mutton	Rucker	East		408		408	
	X+X	8	43	C. Mutton	Tight	West		435		435	
	X+X	8	301	Buakeman	Sullivan	East		742		742	
	X+X	8	43	C. Mutton	Rucker	East		742		742	
	X+X	8	43	C. Mutton	Tight	West		807		807	
	X+X	8	303	Ratzelle	Mayer	West		1008		1012	
	LINE	X151	Rhinehart	Walters	East	Order No 7		1220		1220	
	"	58		Light	East			1220		1220	

This Erie train register page shows four entries for Engine 43, illustrating the problem of the same engine arriving at a register station more than once in a single day. Paul Tupaczewski photo

“run extra” order authorizing its movement.

Extra 43 East must then note this order number in its register entry at JU, available for inspection by other trains. The opposing train would receive a corresponding Form W: EXTRA 2472 WEST MAY CHECK REGISTER AT JU AGAINST EXTRA 43 EAST ON ORDER NO 12. A Form V addressed to Extra 2472 West at JU is an alternative to the preceding “may check register” order: EXTRA 43 EAST HAS ARRIVED ON ORDER NO 12.

Other roads, including Erie, depended on a particular phrasing of Form G to make clear Eng. 43's second run from its first:

AFTER EXTRA 43
EAST WHICH LEFT
H AT SEVEN TEN
(7:10) AM
ARRIVES AT JU,
ENG 2472 RUN
EXTRA JU TO H.
This single

Form G order appeals to me because it's simpler and makes unnecessary the additional Forms W and V described above.

No matter the orders issued, duty requires diligence of all concerned. Two Burlington Northern crews were victims of routine near Denver, Colo. on August 2, 1985. Extra 6311 West received this order no. 28:

EXTRA 6575 EAST HAS RIGHT
OVER EXTRA 6311 WEST
LONGMONT TO CLEAR CREEK
EXTRA 6575 EAST REGISTER

AT CLEAR CREEK
ON ORDER NO 28
OF AUG 2 EXTRA
6311 WEST MAY
CHECK REGISTER
AT CLEAR CREEK
AGAINST EXTRA
6575 EAST ON
ORDER NO 28 OF
AUG 2, made
complete at 5:05
p.m. This order
held Extra 6311
West at Clear
Creek for Extra
6575 East.

The routine: 6575 also powered this movement, a unit gravel train, the previous day when it registered at 4:40 p.m. on order 20.

Extra 6311 West stopped at Clear Creek at 7:10 p.m. A crew member inspected the register and informed the conductor that the opposing train arrived at 4:40 p.m. Fatefully, he failed to check the date and the order number. He also failed to notice a later 8:30 p.m. entry which should have alerted him to the date. Further, no one correlated 4:40 p.m. with order 28's complete time. Tragically, five died when the two trains collided at speed.

We can enrich our operating sessions using train registers to make thoughtful decisions the same way railroaders did. Though we modelers don't risk mortal consequences when we misinterpret a train register, no one wants to earn the nickname "Cornfield," do they? (A "cornfield meet" is railroad slang for a head-on collision.) 

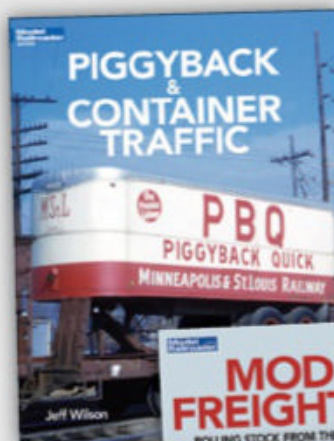


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ORDERS ISSUED,
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DILIGENCE
OF ALL
CONCERNED.
— JERRY**

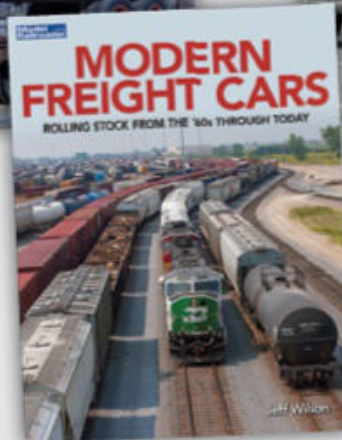
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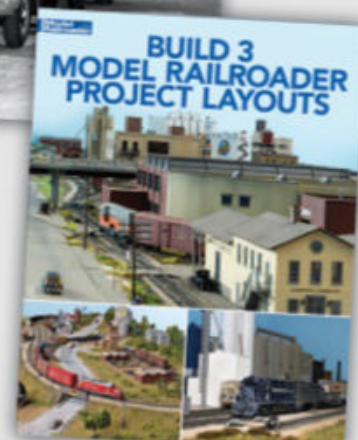
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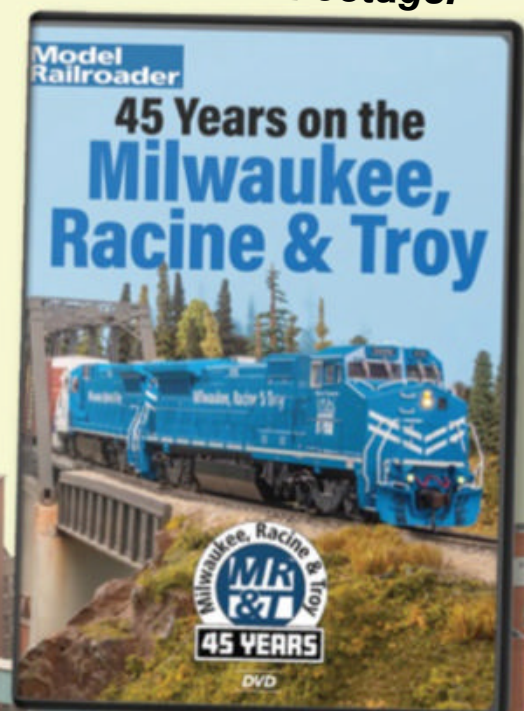
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**MORE ON
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Gregory Wiggins' photo of his Rutland layout is this month's computer wallpaper. Download it for free from [Trains.com](https://www.trains.com)

Conducted by Steven Otte

A Rutland freight led by Alco RS-3 no. 207 crosses over the Otter Creek Bridge on its way to Rutland while below a Delaware & Hudson crew picks up cars dropped off on the Clarendon & Pittsford RR interchange. Gregory Wiggins of Plymouth Meeting, Pa., photographed the scene on his HO scale Bellows Falls Subdivision layout. The locomotives are Atlas models.





After a long day working the mine branch, Chesapeake & Ohio 2-8-0 Consolidation no. 705 rests at the sand house while the crew also takes a short break. The scene was staged and photographed by John Collins of Hartland, Wis., on his freelanced N scale Appalachian layout. The locomotive is a Bachmann Spectrum model John weathered. He used photo-stacking software to increase the depth of field.



After dropping off empty hoppers at Hudson Coal, Norfolk Southern EMD SD40-2 no. 3234 heads east toward Roanoke, Va., with a train of loaded hoppers. Tom Langdale's HO scale NS layout is set in Salem, Va., in June 1991. Tom shot the photo and used Helicon Focus software to improve its depth of field. The locomotive was made by ScaleTrains.com.

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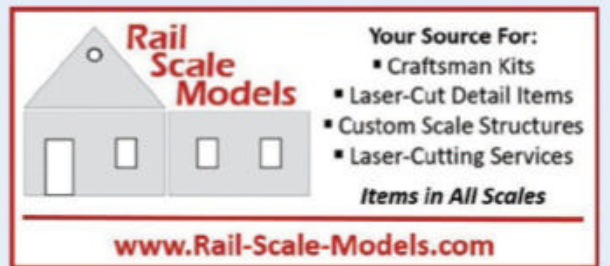
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All ads must be prepaid and pertain to the subject of model railroading.

Schedule of Events

AZ, GLENDALE: ARHS Model Train Swap Meet. Glendale Christian Church, 9661 North 59th Ave. Saturday, May 15, 2021, 9:00am-1:00pm. STRICT COVID PROTOCOLS WILL BE OBSERVED. Admission \$5.00. Tables \$25.00 - To sign up send stamped envelope, check or money order to ARHS, PO Box 5816, Glendale, AZ 85312-5643. Contact: Craig Faris 623-340-3529

FL, BROOKSVILLE: Regal Railways presents Toy Trains & Hobby Show. Hernando Fairgrounds, 6436 Broad St. Saturday, May 22, 2021. 9:00am-2:00pm. Adults \$5.00. Vendors and operating layouts. Serving lunch items. Contact: Joe at 727-244-1341 or visit: www.regalrailways.com for more information.

FL, OCALA: Lions Tri-Annual Train Show. First Christian Church, 1908 E. Fort King St. Saturday, June 12, 2021, 9:00am-2:00pm. Adults \$5.00, children 12 and under free w/ adult. Bring two canned goods and receive \$1.00 off admission. Information: Bob 352-694-6381 or cell 813-203-3216

IN, FRANKLIN: Central Indiana Division/NMRA announces the 2-DAY Franklin Spring Train Show! Johnson County Fairgrounds, 100 Fairground St., Zip: 46131. Saturday & Sunday, May 15-16, 2021. 10am-3pm. Admission \$3, Family \$5. NMRA members FREE w/current membership card. Clinics, CID Annual Meeting, Door Prizes, Displays, Operating Layouts, Free Parking, Food available. Info/table rental: Michael Roderick 317-833-3556, mdrghost@hotmail.com or www.cidnmra.org

IN, PERU: Miami County Model Train Show and Swap Meet. Saturday, April 3, 2021, 10:00am-4:00pm. Miami County Fairgrounds, 4-H Project Building, 1029 W 200 N, Zip: 46970. All scale trains, books and memorabilia. \$3.00/person. Children 5 and under free. Free parking! Proceeds benefit the Light Up Peru! fund. Covid restrictions may apply. Questions, contact Paul Forman at 765-432-1052.

MO, CAMDENTON: Lake of the Ozarks Train Club Show. April 17, 2021. 9:00am - 3:00pm. 1064 N. Business Rt 5, Camdenton, MO 65020. Vendors - \$15 per table. Call Stan Schroeder @ 573-286-9031

MO, JOPLIN: Museum Complex Train Show and Swap Meet. Saturday, May 1, 2021, 9:00am-3:00pm. Schifferdecker Park, 7th Street & Schifferdecker, between the golf course and pool. Adults \$4.00, under 12 free. Rick Gardner, 11486 County Lane 214, Oronogo, MO 64855; 417-673-4888 or e-mail rickgardner4449@gmail.com

WI, LA CROSSE / ONALASKA: La Crosse & Three Rivers Railroad Club's 40th Annual Model Railroad Show. Omni Center, 255 Riders Club Road, Onalaska, WI. May 22-23, 2021. Saturday 9:00am-5:00pm, Sunday 10:00am-4:00pm. Adults \$8.00, \$7.50 with a non-perishable food item, children 11 and under free w/ adult. Info: Belva Thompson 608-780-7364

All listed events were confirmed as active at the time of press. Please contact event sponsor for updated status of the event.

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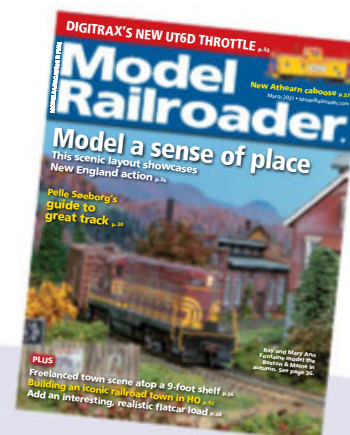
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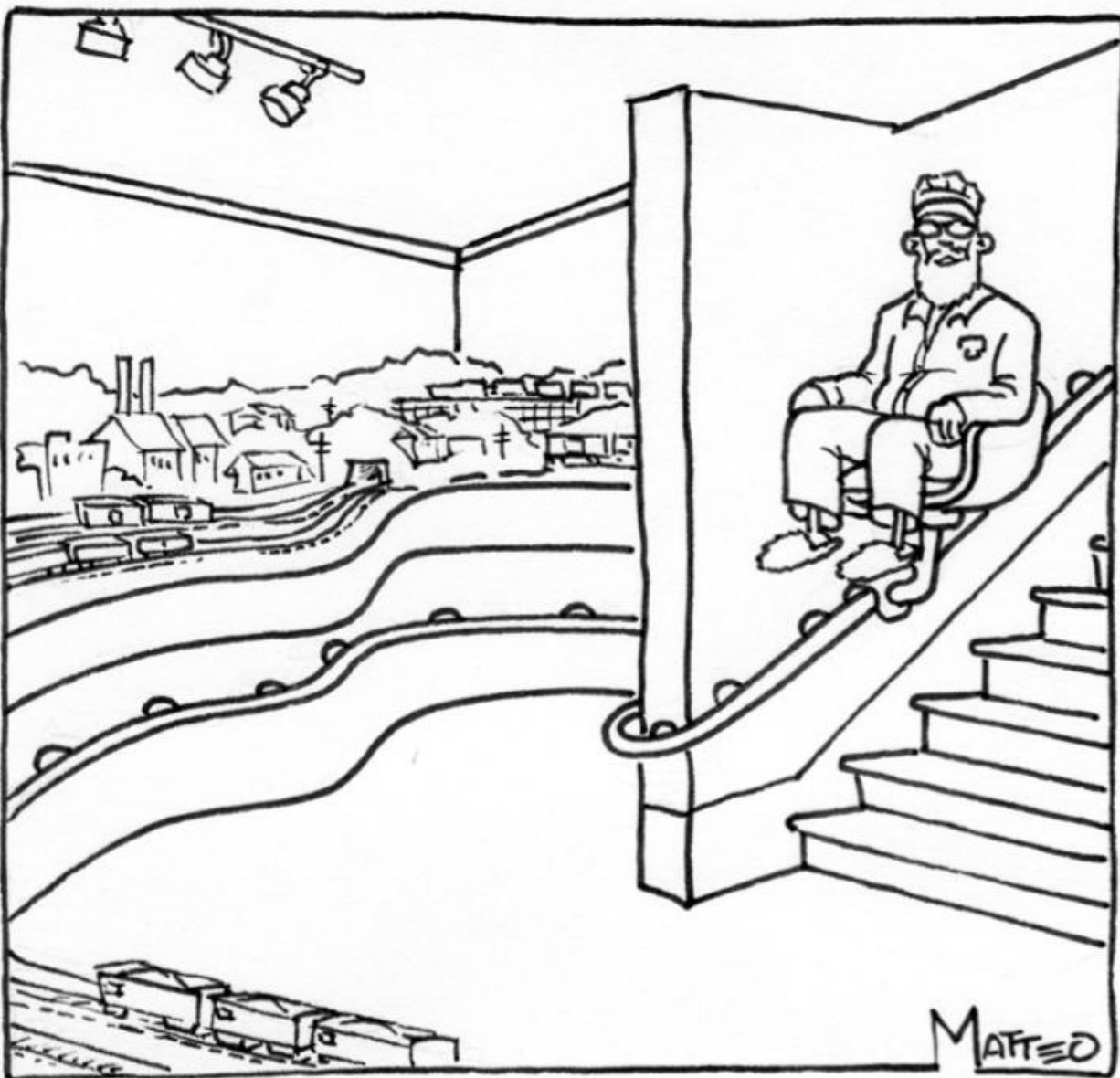
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Lighting surprises, good or bad



When Clark Propst turned on only the aisle lighting for his HO railroad, he noticed an interesting lighting effect reminiscent of a brightly moonlit night. Turning on the rest of the lighting restored full “daylight.” Clark Propst photo

A one-page column is not the place to enter into an in-depth discussion of layout lighting. I’d barely finish listing the myriad options we have available today and explaining the difference between color rendering index (CRI) and correlated color temperature (CCT) when we’d be out of space.

But we can chat a bit about the results of our efforts to illuminate our railroads. That, it turns out, is mostly a matter of paying close attention. Taste also plays a major role where the color of light is concerned, and it won’t hurt to mention that more than 10 percent of males have some degree of color blindness. So you might want to check with your eye doctor about how you perceive color next time you’re trying to figure out what P E C F D spells.

I illuminated my previous model railroad, the HO scale Allegheny Midland, with cool white fluorescent tubes. The color of those tubes was rated in the 4100 to 4300 kelvin (K) range, which is slightly redder than daylight. I never worried

about their CRI; I just bought whatever I could get at the local hardware or big-box store, preferably on sale.

Many of those same fixtures are still producing lumens over my Nickel Plate, most with cool white tubes and a few with 5000K tubes. The latter are more expensive, hard to find the night before an operating session and in short lengths, and seem a bit cold to my eye anyway, even though printers use them to check color proofs.

I also have an about 16-foot strip of light-emitting diode (LED) fixtures in an area where replacing a fluorescent tube, let alone a ballast, would be extremely difficult. Price was not an object in this case. They’re rated at somewhere around 3200K but, surprisingly, blend in quite well with their cool-white neighbors. Other, shorter LED fixtures rated at the same 3200K look quite red and will be replaced.

All of which sets the stage for the accompanying photo taken on Clark Propst’s HO scale railroad. Clark has a

combination of aisle lighting and layout lighting circuits; only some lighting fixtures come on when all he wants to do is see his way around the train room. He uses a mixture of fluorescent and LED lighting fixtures.

He had only the LED aisle lighting on as he walked by this scene and noticed that it resembled a night illuminated by a full moon. So he got out his camera and took the accompanying photograph.

That he happened to notice this interesting layout lighting effect was pure happenstance, but it could have been by design. Or he might have been trying to light the layout evenly and noticed that he needed more lighting in the aisles to avoid the strong top-lit effect, which could make reading car numbers during operating sessions difficult.

The fluorescent fixtures that

illuminate the bottom deck on my railroad put the tubes several inches in from the valance. This top- or back-lights anything close to the fascia, which isn’t a problem for rolling stock, as the closest track to the fascia is 6” in, but some structures are backlit. This acts as a picture frame in some – but not all – cases.

I think the lesson here is not to hang lighting fixtures willy-nilly or even on a predetermined grid pattern until you’ve tested a few of them to see how they light objects on the railroad. If you’re doing this prior to any major modeling work, as you should, you can use C-clamped joists and strips of cardstock or lumber to temporarily support a few structures and inexpensive freight cars (they’re likely to hit the floor). These stand-ins will show you how lighting fixture locations affect your perception of major scenes.

Especially in cases where you’re having ceiling fixtures installed by a professional, you may find that they create unwanted shadows, or wash out desired ones, in a signature scene such as a canyon. You’ll need to adjust the lighting positions or add

accent lighting to fill in or create the shadows.

What for Clark was nothing more than a pleasant surprise, an opportunity to literally view a scene on his model railroad in a new light, might have turned out to be a lighting problem he had to solve. The sooner we find such issues, the better. MR



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