

TAKING THE HOBBY OUT IN PUBLIC p.30



**Athearn
SD70M-2
tested** p.56

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**Creating drama
on a big O scale layout** p.38

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is back!
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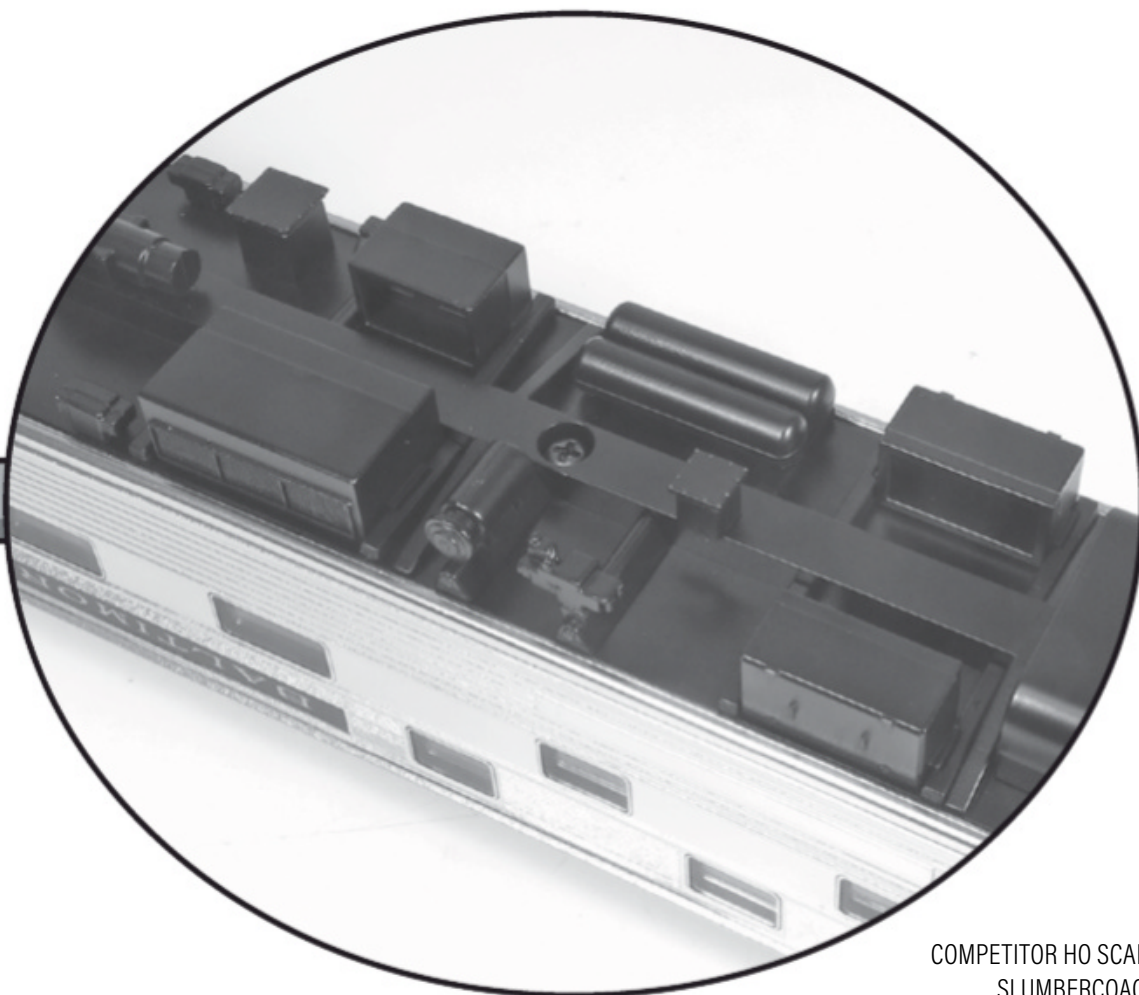




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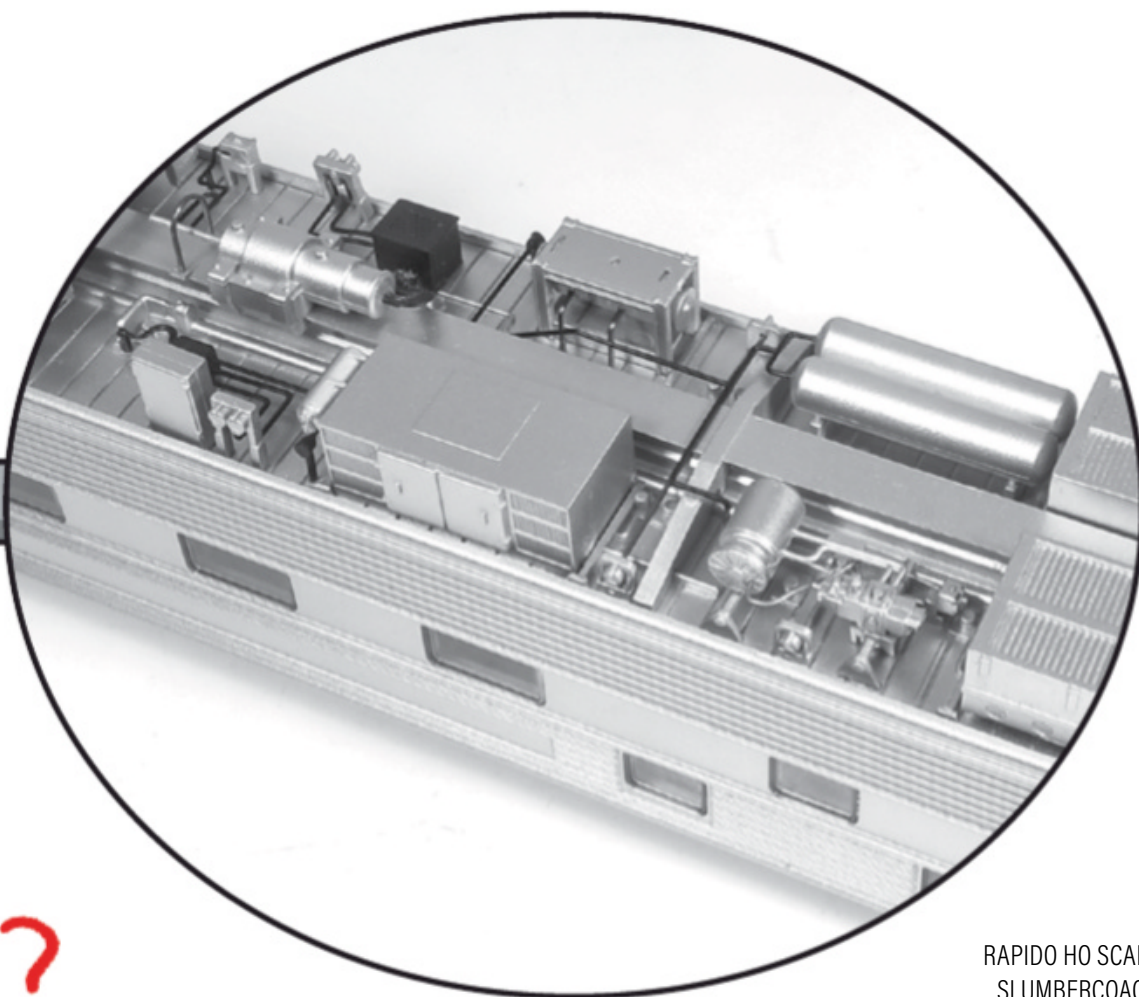
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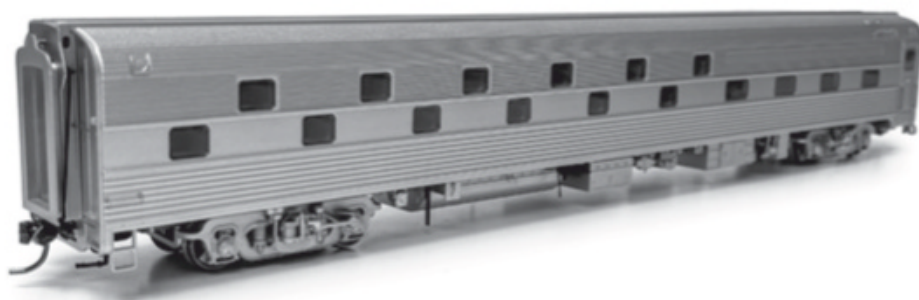


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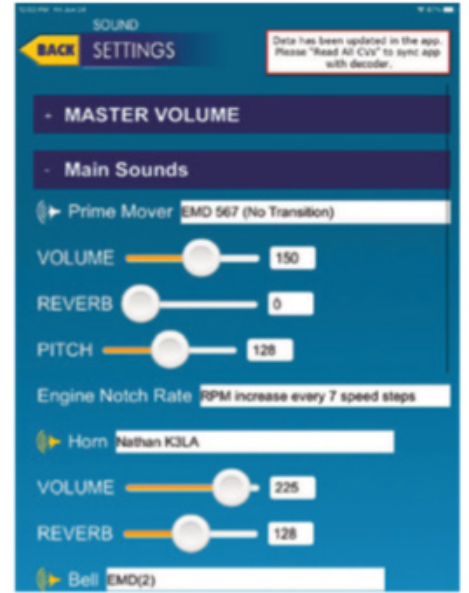
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On the cover: Spokane lights up for late-night operations on the Chooch Enterprises founder's O scale layout.

Mike O'Connell photo



Next issue

In October, experience hard-coal railroading in Pennsylvania on an N scale railroad. Plus, visit an HO scale UP layout, add paper figures to structures, and more!

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HO Scale
Athearn Genesis 2.0
EMD SD70M-2

Product Reviews

Flatcars & boxcars & diesel locomotives, oh my! Would you like to sneak a peek at a product before adding it to your layout? Well, *Model Railroader's* Senior Editor Cody Grivno and Editor Eric White have you covered. Under the Videos & Photos tab, scroll down to Product Reviews (under the News & Reviews section). There are pages of product reviews from staff that can give you the insight your looking for on a particular locomotive, model kit, or Digital Command Control starter set, for example. Interested in bringing the modern era to your HO scale model railroad? The Athearn Genesis 2.0 Electro-Motive Diesel SD70M-2 may be a solid option.



Cody's Workshop

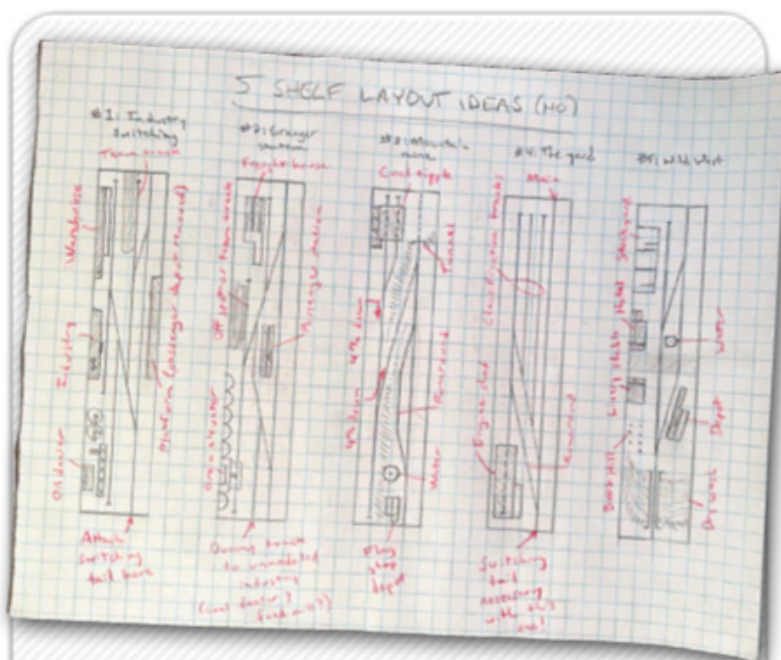
Applying decals? Check out Senior Editor Cody Grivno's newest episode of *Cody's Workshop*. Watch as he decals and finishes an N scale locomotive. The Atlas EMD GP38-2 diesel locomotive model was painted to match the Milwaukee, Racine & Troy model railroad colors. To see the steps used to complete this project, go to Trains.com. Under Videos & Photos, scroll over to Series on the left, then down to *Cody's Workshop*. Don't forget to sign up for your Trains.com Unlimited Membership to access this and other videos.



Eric Grabczyk
Discovery World, Exhibit Maintenance Manager

Layout Visits

All Aboard! In this issue, you'll find a feature on Discovery World's new train exhibit called "All Aboard." If you're interested in learning more, just visit Trains.com (under the Videos & Photos tab, go to the Layouts section, and scroll down to Layout Visits) to watch behind-the-scenes videos taken at Milwaukee's nonprofit science and technology center. If you're a member with unlimited access, you can check out these video extras and much more. If you're just visiting Trains.com, you can enjoy several free articles per month.



Build a Model Railroad

Timesaving, space-saving, and just plain fun ideas to consider for building a shelf layout. Senior Associate Editor Steven Otte has five recommendations for adding a shelf layout in your home. Visit Trains.com and click the How To tab. Under the Build a Model Railroad section, you'll discover a plethora of plans drawn up by Steve. So grab a snack and delve into a few. The "Five ideas for a shelf layout" is great for those looking for something compact.

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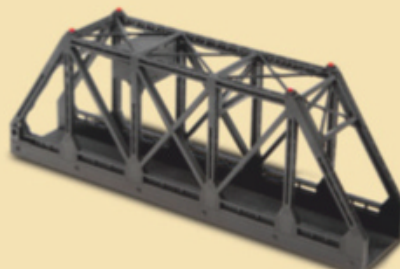
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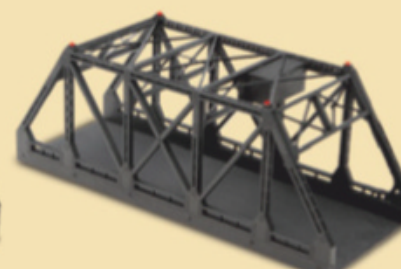
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Welcome to my job. That's what George Carlin used to say at the beginning of his show. This is a good job, and one I've been preparing for and thinking about for quite a while now.

There have been 11 before me. My predecessor, Carl Swanson, is moving over to *Trains* magazine.

Along with my promotion came another: Cody Grivno is now senior editor at *Model*

Railroader. And we'll be adding a new staff member to take the position created when Carl moved offices. You can find the particulars for the job at Kalmbach.com.

When these changes happen, a natural question is, will you be changing anything? The answer is yes, but I don't know what yet. We've had some preliminary discussions, but as I'm sure you know from your job, there's a period of

adjustment and learning just what the new job entails.

But here are some guiding ideas I plan to use as I contemplate change: *Model Railroader* is a magazine for all model railroaders. We want to welcome the beginner, intrigue the advanced modeler, and entertain everyone.

We want to show people how to model railroads. That means building layouts, then operating them. Now, before you throw up your hands and say "Oh no! There will be pages and pages about train order and timetables!" relax.

While I think operating is fun, just like any other aspect of this hobby, you can stir in as much or as little of any aspect as you like. There will still be articles on building models, creating scenery, planning layouts, laying track – all of those things you've always found in the pages of *Model Railroader*.



As Tony Koester likes to say, this is a broad-shouldered hobby, with many facets. I can find something to enjoy in all of them (yes, even ballasting track), and I hope to share that enjoyment with readers.

We've been doing that for nearly 90 years, and we hope to be doing it for decades more. Come along, it's going to be fun!



You might be seeing a bit more of Eric's Pennsylvania RR Washington Avenue Branch in future issues. Eric White photo

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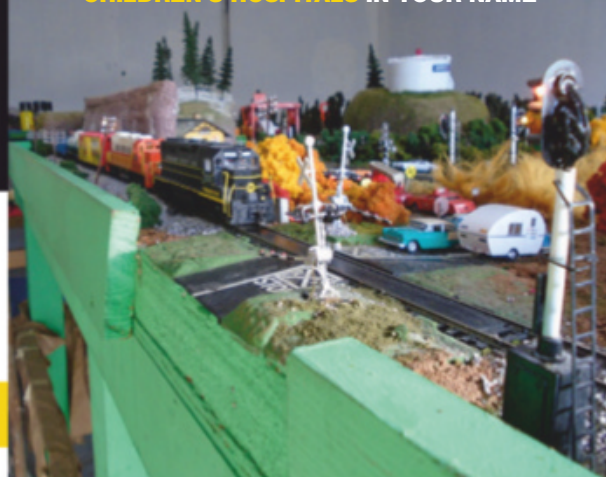
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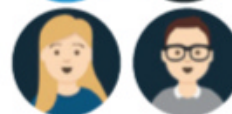
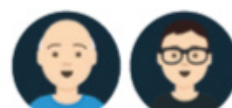
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HO scale



General Motors Diesel Division F59PH diesel locomotives.

These four-axle commuter engines are now available from Rapido Trains. The HO scale General Motors Diesel Division F59PH diesels are decorated for GO Transit (as-delivered scheme in eight road numbers, with angled side herald in one number), Metra, Metrolink (as-delivered, teal stripe, and ribbon schemes), Trinity Rail Express, AMT (Montreal), and

ex-GO Transit lease (unnumbered), in three numbers per scheme unless noted. The models have a die-cast metal chassis, detailed cab interior, underbody details, etched-metal grills, and metal end handrails with plastic stanchions. Direct-current models sell for \$225. Versions with a dual-mode ESU LokSound sound decoder are priced at \$335. Rapido Trains Inc., 905-474-3314, rapidotrains.com

Rapido to offer HO Canadian piggyback flats

Newly tooled HO scale Canadian piggyback flatcars are in the works from Rapido Trains.

Road names in the first release of flatcars are Canadian National (Vancouver Iron & Engineering) and Canadian Pacific (Marine Industries) in six road numbers per paint scheme. Assembled but undecorated models will also be available (as-built CN and CP versions).

Features on the models include a heavy die-cast metal center sill, photo-etched deck surface, Barber S-2 trucks with metal wheels, and Rapido semi-scale metal knuckle couplers.

The flatcars will be priced at \$54.95 each or \$329.70 for a six-pack. Release date for the flatcars was not available as of press time. For updates on the project, visit rapidotrains.com.



Rapido Trains recently announced HO scale piggyback flatcars based on Canadian National and Canadian Pacific prototypes. Undecorated models will also be available.

Athearn announces new N scale tank car

Athearn recently announced that it's adding a 13,000-gallon tank car to its N scale Genesis series. The model is scheduled for release in July 2023.

The tank car will be decorated for Union Tank Car Co. (black and white paint schemes), GE Rail Services (white with black band and NATX reporting marks), Grupo Mexico (white), and Procor (black and white paint schemes). The tank car will be available in six road numbers per paint scheme (three single cars and one three-pack).

Features on the N scale tank car include separate, factory-applied metal grab irons and handrails; body-mounted McHenry double-shelf couplers; etched stainless steel crossover platforms and top platforms; machined metal RP-25 contour metal wheels; and prototype-specific end sills, top platforms, and brake systems.

The Athearn Genesis N scale 13,000-gallon tanks are priced at \$44.99 each and \$124.99 for a three-pack. For more information, visit athearn.com



Union Tank Car Co. is among the first paint schemes available for the new Athearn Genesis cars. This N scale 13,000-gallon tank car model is scheduled for release in July 2023.



HO scale locomotives



- **Electro-Motive Division SW1000 diesel switcher.** BNSF Ry. (“Primed for Grime” Burlington Northern patchout); Chicago, Burlington & Quincy (black, red, and yellow); Denver & Rio Grande Western (black and orange); S&S Shortline Leasing (green and white, one road number); and VIA Rail Canada (gray and yellow). Two numbers per scheme unless noted. Separate, factory-installed wire grab irons; detailed cab interior; and McHenry scale knuckle couplers. Direct-current model with 21-pin NEM connector, \$219.99; with dual-mode SoundTraxx Tsunami2 sound decoder, \$319.99. Add \$10 for Primed for Grime models. June 2023. Athearn series. Athearn Trains, 800-338-4639, athearn.com

HO scale freight cars



- **Bay-window caboose.** Chicago & North Western (yellow and green with “Since 1848 Pulling Together” slogan), National Railways of Mexico (yellow and black), Norfolk Southern (red and silver),

HO scale



Milwaukee, Racine & Troy American Car & Foundry two-bay Center Flow covered hopper. This custom-decorated Accurail kit is now available from the Kalmbach Hobby Store. The HO scale Milwaukee, Racine & Troy two-bay Center Flow covered hopper (era 1990s+) features a one-piece body; a separate underbody; modeler-installed outlet gates, stirrup steps, hatch covers, crossover platforms, brake wheel, and brake appliances; a steel weight; roller-bearing trucks with plastic wheelsets; and Accumate couplers. The car (\$27.99) is offered in one road number. Kalmbach Hobby Store, KalmbachHobbyStore.com

Rock Island (blue and white), Southern Pacific (brown and orange with “Trailer-Flatcar Service” slogan), Susquehanna (yellow and black), and Union Pacific (Armour Yellow with safety slogan). Two road numbers per scheme. Separate, factory-installed smokejack and brake wheel; body-mounted McHenry scale couplers; and caboose trucks. \$36.99. June 2023. Athearn series. Athearn Trains, 800-338-4639, athearn.com



- **Assorted freight car kits.** Illinois Central Gulf Pullman-Standard 4,750-cubic-foot capacity three-bay covered hoppers (orange with small herald and large reporting marks; orange with large reporting marks only; and orange with “Illinois Central Gulf” lettering, small reporting marks and road number, and small herald), single car, \$21.98; three-pack, \$64.98. Boston & Albany 41-foot steel gondola (Boxcar Red with “Boston & Albany” lettering), single car,

\$19.98; three-pack, \$58.98. Chessie System American Car & Foundry two-bay Center Flow covered hopper with Baltimore & Ohio reporting marks (1980s solid yellow repaint), \$20.98. Milwaukee Road 40-foot single-sheathed boxcar with Chicago, Milwaukee, St. Paul & Pacific herald (Boxcar Red with white graphics), \$19.98. Injection-molded plastic kits with solid-or roller-bearing trucks as appropriate, plastic wheelsets, and Accumate couplers with modeler-installed trip pins. Accurail, 630-365-1173, accurail.com



- **Skeleton logging truck.** Single truck without logs, \$60. Single truck with three or six logs, \$74.99 each. Late fall 2022. KR Models Canada, 780-863-2330, krmodels.ca



- **Pacific Car & Foundry boxcar.** St. Louis Southwestern (Cotton Belt, with DFL/Youngstown, Superior, and Youngstown doors), Canadian National (CNA reporting marks with Superior doors), Golden West Service (GVSR

Multiple scales



LD101 dual-mode command station. ANE Model has released this control system for direct current and Digital Command Control layouts. The LD101 dual-mode command station (\$120) has analog control for DC and digital control for DCC. The system features a main control box, a handheld controller with cable, a transformer, and a user manual. Among the system's features are 28 and 128 speed steps; 28 functions; 9,999 locomotive addresses; programming on the main; and consisting. It has a maximum current of 2A (2.5A in DCC). ANE Model Co. Ltd., 886 3 4270573, anemodel.com

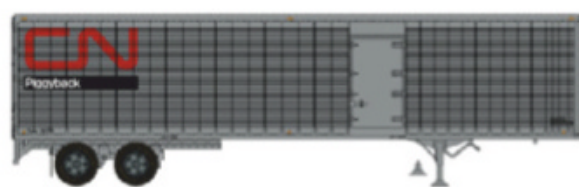
reporting marks with Youngstown doors), and Southern Pacific (brown with Superior and Youngstown doors and Golden West Service patchout with Superior doors). Also available painted brown but unlettered with Superior and Youngstown doors. Separate, factory-applied metal grab irons, uncoupling levers, and door tracks; scale-sized draft gear with detailed Hydra-Cushion underframe; full underbody brake rigging; and newly tooled 70-ton trucks with turned metal 33" wheels. Release date to be announced. Single car, \$54.95; six-pack, \$329.70. Rapido Trains Inc., 905-474-3314, rapidotrains.com

HO scale details and accessories



• **Can-Car Industries 26-foot dry van.** CP Rail, Canada Cartage, CN Express/Messageries (with side door), CN Piggyback (with side door), CP Express & Transport, Smith Transport, Reimer Express Lines Ltd., and Simpsons. Three

trailer numbers per scheme; also available painted silver but unlettered (with and without side door). Landing gear with two separate pieces to simulate in-motion or parked positions; separate, factory-applied mudflap; detailed wheel and axle area; and two styles of front stabilizing bars. Release date to be announced. \$31.95. Rapido Trains Inc., 905-474-3314, rapidotrains.com



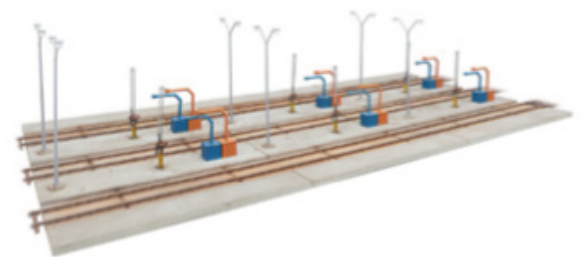
• **Trailmobile 45-foot dry van.** CN Piggyback (with side door), Canada Cartage, Caravan Leasing (with side door), CN SuperTherm, CP Rail (with side door), CP Transport, Smith Transport, Taggart Trucking, and Wilson's Truck Lines (with side door). Three trailer numbers per scheme; also available painted silver but unlettered (with and without side door). Landing gear with two separate pieces to simulate in-motion or parked positions; separate, factory-applied mudflaps; and detailed wheel and axle area. Release date to be announced. \$31.95. Rapido Trains Inc., 905-474-3314, rapidotrains.com

HO scale passenger equipment



• **Turbo Train 2.0.** Amtrak/U.S. Department of Transportation (1971 Amtrak national tour paint scheme). New drive system, completely redesigned single-axe trucks with needlepoint axles; all-wheel electrical pickup; golden-white light-emitting-diode headlights; redesigned roof-mounted SMD interior lighting system; and dual-mode ESU LokSound V5 decoders and speakers in each Power Dome Car. Will negotiate curves down to 18" radius. Mid-2023 release. \$789.95. Produced by Rapido Trains Inc., available exclusively from Heartland Hobby Wholesale, 800-713-8274, hhwonline.com

HO scale structures



• **Diesel fueling facility.** Injection-molded plastic kit includes six of each of the following: large and small walkways, spill containment pans, fueling cranes, cooling water booms and cabinets, lube oil booms and cabinets, and non-working overhead lights. Kit builds three-track fueling pad. Can be adapted for longer two-track model. \$37.98. Wm. K. Walther's Inc., 414-527-0770, walther's.com



• **IHOP restaurant.** Unpainted milled styrene, laser-cut acrylic, and self-adhesive micro-plywood parts. Parts may require light sanding in joints for cosmetic reasons. Photo-illustrated instructions included. Measures 11½" x 7¾" x 3¾". \$110. Summit USA, 337-436-8481, summit-customcuts.com

N scale locomotives



- **Norfolk & Western class Y6b 2-8-8-2 steam locomotive.** Norfolk & Western (as-delivered black with gold lettering in five road numbers, fictional 1960s blue scheme in one number, and fictional Tuscan Red-and-gold scheme in one number). Also available painted black but unlettered. All versions have class 22I tender. Die-cast metal body and chassis; a light-emitting diode (LED) headlight; wire grab irons and boiler handrails; air tank, air pump, and piping details; traction tires on two axles; a turned brass bell; cab window glazing; and Buckeye-style tender trucks with roller-bearing journal details. The Y6b will be equipped with Micro-Trains compatible front and rear couplers, a dual-mode Paragon4 sound decoder, and a built-in capacitor pack. \$599.99. Broadway Limited Imports, 386-673-8900, broadway-limited.com

HO scale



Pullman-Standard 4,750-cubic-foot capacity three-bay covered hopper.

Burlington Northern (January 1980 as-delivered Cascade Green scheme in new road numbers), Chicago & North Western (blue Rock Island patchouts in three versions, two numbers each), Illinois Central Gulf (1979 as-delivered simplified orange-and-black scheme in new numbers), Kansas City Southern (December 1979 as-delivered brown scheme), Klemme (Iowa) Coop (April 1979 pink scheme, six numbers), Missouri-Kansas-Texas (December 1979 green-and-yellow scheme in new numbers), Peavey (May 1980 as-delivered blue scheme in six numbers), Rock Island (June 1978 as-delivered blue scheme in new numbers), and Soo Line (2007+ Peavey patchout in one number). Each road name offered in 12 numbers unless noted. See-through etched metal running boards and crossover platforms, wire grab irons, and uncoupling levers.

\$52.95. Tangent Scale Models, 828-412-3886, tangentscalemodels.com

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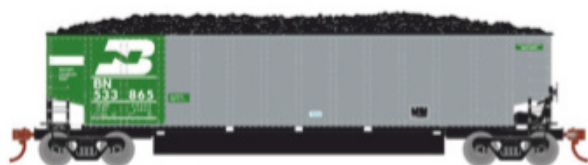
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HO scale



General Steel Castings 53-foot bulkhead flatcar. Chicago, Burlington & Quincy; Atchison, Topeka & Santa Fe; Burlington Northern; Northern Pacific; Soo Line; and Union Pacific are the paint schemes on this Walther's Mainline car. The HO scale model (\$34.98), offered in three road numbers per scheme, has a newly tooled die-cast metal body, 33" turned metal wheelsets, and Proto-Max metal couplers. Wm. K. Walther's Inc., 414-527-0770, walther's.com

N scale freight cars



- **Johnstown America BethGon coal gondola.** Burlington Northern (silver, green, and white), BNSF Ry. (silver, black, and white), Conrail (brown and white), CSX (aluminum and yellow), Union Pacific (aluminum and yellow), and data only (aluminum and yellow, one five-pack). Three five-packs per scheme unless noted. Injection-molded plastic body, removable coal load, and body-mounted McHenry scale couplers. Five-pack, \$174.99. June 2023. Athearn Trains, 800-338-4639, athearn.com

O scale freight cars



- **40-foot modern tank car.** Procor (Optimiser, teal and white), Allied Chemical (Folian Fertilizer, white, blue, and red), Honeywell (ACTX reporting marks, white and yellow), Ozone Waters (white, blue, red, and yellow), Standard Chlorine of Delaware (blue and white), and Transportation Energy (black and yellow). Two road numbers per scheme. ABS body, die-cast metal trucks, and couplers. \$84.95. Fourth quarter 2022. Premier line. Atlas O, 908-687-0880, shop.atlasrr.com

Z scale locomotives



- **Alco PA-1 diesel locomotive.** New paint scheme: Southern Ry. Two road numbers. Six-axle trucks with blind middle axle (no flange), 7mm can motor with dual flywheels, and optional front coupler cover and snow plow. American Z Line, 614-764-1703, americanzline.com



- **Electro-Motive Division SW1500 diesel locomotive.** New paint scheme: CSX (dark blue and yellow). Three road numbers. Directional light-emitting-diode lighting (LED), AutoLatch couplers, and adapters for retrofitting with Micro-Trains no. 905 couplers. American Z Line, 614-764-1703, americanzline.com

Z scale passenger equipment



- **New York Central 20th Century Limited cars.** Pullman Imperial-series 4-double-bedroom, 4-compartment, 2-drawing-room sleeper (six car names);

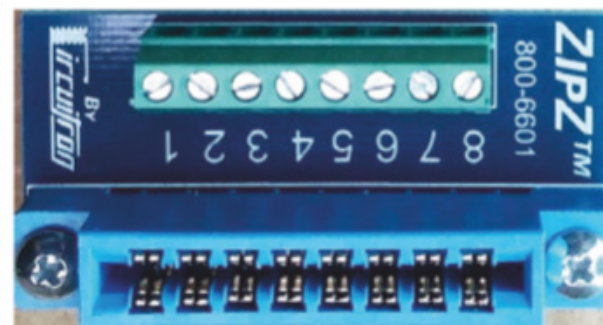
diner (two numbers); River-series observation (two car names); and United States Mail Railway Post Office (two numbers). Injection-molded plastic body and AutoLatch couplers. American Z Line, 614-764-1703, americanzline.com

Scenery



- **Water Under the Bridge.** HO scale photo backdrop. Includes optional, trimmable 3" x 14" downward river extension to back a single-span bridge scene. Extendable at either end through more than nine different scenes. Sky top enables upward extension. Backdrop measures 8" x 72". Junior Roll Out line. \$26.95. BPH Enterprises, 705-739-4878, sceniking.com

Electronics/controls



- **ZipZ edge connector and terminal block.** Solderless connection system. Layout wiring connects to terminal block. Edge connector slides onto Tortoise or Smail circuit board. Also fits older (tan) Tortoise circuit boards. \$5.95 each; six-pack, \$32.95. ZipZ kit six-pack (parts only, requires soldering), \$27.95. Circuitron Inc., 815-886-9010, circuitron.com

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A newly repainted Milwaukee Road PS2 covered hopper is seen after being donated to a rail museum in February 2011. All those abbreviations, numbers, dates, and codes convey vital information about the car. Harry Gaydosz photo

What does freight car lettering mean?

Q What is all the information posted on the sides of freight cars? For example, I have noticed build or rebuild dates and brake information.

Jack Pfleeger

A There's a lot of variation in freight car lettering. It can depend on the car type, the car's owner, and the era, since regulations and practices changed over the years. But there are some things that are common.

The Federal Railroad Administration (FRA) requires very little when it comes to car markings. All freight cars must bear the reporting marks of the car owner and a car number unique in that owner's roster. These must be stenciled prominently on both sides of the car in letters no less than 7 inches high, although 9 inches is more prevalent these days. Although common practice is to center these above the truck on the observer's left, they can be placed elsewhere on the car body if necessary. Another thing required on all cars by the FRA is the car's built-on date (BLT), which must be in letters at least 1 inch high. In addition to the BLT date, you might see the date a car was rebuilt (REBLT).

The next most common markings you'll see on a freight car give its capacity. This data includes the car's weight empty (LT WT) and maximum load it can safely carry (LD LMT). Older cars also list the weight the car is designed to carry (CAPY), which is less than the LD LMT. A new car that's not been reweighed since it was built will often bear the label NEW and the built-on date; cars that have been reweighed since then will have a reweigh date and a code indicating which car shop performed the test.

You'll often see dimensional data on freight cars, too. This will include the car body's external width and height (EW and H) and its extreme width and height (EXW and H), which includes things that stick out from the car's side like ladders, grab irons, and door tracks. Boxcars and hoppers will have some internal dimensions, as well, such as IL (inside length), IW (inside width), IH (inside height), and volume in cubic feet (CU FT).

Other markings were added in modern times. The Clean, Oil, Test Stencil (COTS) panel, a black-and-white rectangle that can have multiple panes, is used to track information about the car's brake system and wheel bearings, as well as when and where they were last serviced.

The KarTrak Automatic Car Identification label, a vertical black rectangle with 13 different colored horizontal stripes, was designed to be read by automated trackside devices. It was mandated by the Association of American Railroads (AAR) starting in 1967, but was abandoned in 1977.

For information on other markings, download National Model Railroad Association Data Sheet D5e at nmra.org/sites/default/files/d5e.pdf.

Q I'm thinking of adding Woodland Scenics Just Plug lights to my layout. I have a water tower and freight house that already have lights. Can they be converted to this system?

Wes Barteck

A That depends on whether your water tower and freight house lights already have resistors wired into them. Just Plug lights don't have resistors; the resistors needed to drop the voltage to the right level for the LED are built into their Light Hubs. So if your lights already have resistors, a Just Plug Light Hub might not put out enough power to light them. However, if there are no resistors on those lights, they should work with the Woodland Scenics system just fine.

And speaking of Woodland Scenics...

Q In a recent MR [June 2022] there's an article about lighting a building; it shows the wires embedded in some sort of clay or gum. I can't find whatever it was. I'm trying to light a scratchbuilt lighthouse. Any ideas?

Richard Smiraglia

A That's Ribbon Putty, which comes in Woodland Scenics' Just Plug Light Block Kit. However, any similar moldable product like hobby clay, poster putty, or in a pinch even Play-Doh would do.

Q Why does my engine slow down at one end of my oval layout?

Gene Gunselman

A While it can be difficult to diagnose electrical problems remotely, yours is pretty obvious. If you're operating on direct current, and I bet you are, the speed of your locomotive is governed by the voltage supplied to the motor. So if your locomotive is slowing down, that means the motor is getting less voltage. While track is a pretty good conductor of electricity, it still has a significant amount of resistance when compared to copper wire. I'd bet you have only one set of power feeders to your rails, and they're attached where your train moves the fastest. Add another set of power feeders to the far side of the loop – be sure that they're the same polarity as the first pair – and your locomotive will soon show more pep in its step.

Send questions to senior associate editor Steven Otte at AskTrains@Trains.com.

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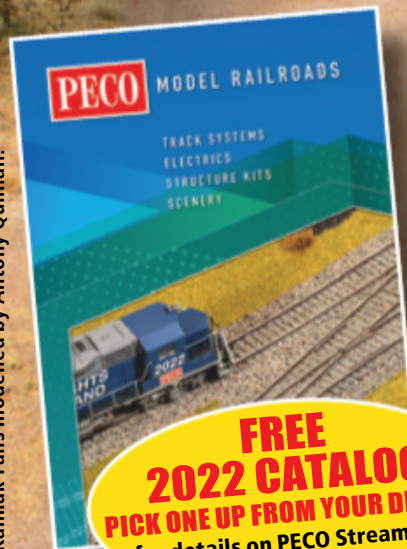
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Photo: Kamiak Falls modelled by Antony Quinlan.

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Greg Hodges wondered how many *Model Railroader* readers can identify this unusual railcar (right). It's not such a mystery; U.S. Government helium cars like this one supplied gas to military airships and NASA rockets. Editor Eric White built one (left) for an article we published in December 2017. Prototype photo by Greg Hodges; model photo by Bill Zuback

Q I've always liked unusual railcars – the more unusual, the better. I wonder how many readers might be stumped by the identity of the railcar in this photo? Hint: It's pretty heavy; otherwise, it might just float away.

Greg Hodges, Powhatan, Va.

A That car's not so mysterious; its unique appearance makes it fairly easy to identify. And it's been available as a model kit since at least January 1938, when the first ad for an O scale wood model from Hawk Model Airplane Co. appeared in *Model Railroader*. That's a U.S. Department of the Interior helium car (the MHAX reporting marks correspond to the Bureau of Mines Helium Field Operations). The first 14 cars, built for the U.S. military by General American Tank Car Co. in 1930, had 28 cylinders and one diagonal brace on each end of its open-frame sides. The next group, built by GATX in 1942 and 1943, had 30 cylinders and four diagonal cross braces per side as the car in your photo shows.

You're right about them being heavy; at 243,400 pounds empty, they were some of the heaviest freight cars ever built. But that was due to the weight of the high-pressure metal tanks, not to hold them on the rails. A full load of helium at 3,000 psi didn't make them lighter; it added just over 1½ tons.

These cars were used to ship helium from federal extraction facilities in the region of the Oklahoma Panhandle, North Texas, and Southwest Kansas, all of which were served by the Atchison, Topeka & Santa Fe. The destinations were federal government sites such as the U.S. Naval Air Stations in Lakehurst, N.J.; Hitchcock, Texas; and Tillamook, Ore., as well as NASA's Cape Canaveral and Cape Kennedy. Defense Department use of lighter-than-air craft slowed down

in the early 1950s, but government rail shipments of helium to military research and NASA destinations continued until the government privatized the helium industry in 1996. An article about the Santa Fe's helium operations was printed in the fourth quarter 2014 issue of *The Warbonnet*, the magazine of the Santa Fe Railway Historical & Modeling Society.

The design of these cars has changed little since the second GATX batch in 1943; the biggest change was the omission of the roof walk in the late 1950s. The 30-cylinder design, with roof walk, is the one represented by Ambroid's well-known HO scale craftsman kit, first announced in MR's August 1962 issue. Our editor, Eric White, wrote an article about his experience building this vintage wood car kit in our December 2017 issue. Model manufacturer AHM sold a ready-to-run plastic version in the 1960s and '70s that can occasionally be found at railroad swap meets and dusty hobby store clearance bins; MR contributor Alain Kap wrote about how to upgrade these cars in August 2014. And I wrote about how the prototypes were loaded and unloaded in "Ask MR" in June 2018.

Helium cars may be rare – only about 200 of the prototypes were built – but their unique look means more modelers know about them than you might think.

Q I've asked in the past about what size wheelset I should use, but have a hard time comprehending, I guess. When I measure the wheels that came on the cars (mostly Rivarossi), they measure smaller than the standard 33". Other sources tell me I should be using 36". Where can I get hard facts on what to use where?

Bruce Bankes

A If you're replacing the wheelsets on an existing model, simply measure the

wheels you're replacing, and use the same size. They might not actually be the same diameter as the prototype car used, because some models sacrifice fidelity in wheel diameter to maintain prototype axle spacing while accommodating deeper wheel flanges.

But as a rule of thumb, freight cars of 100 tons or over generally use 36" wheels, while those under that weight take 33". Passenger cars generally use 36" wheels because the broader tread contact patch provides a smoother ride over rail gaps, frogs, and the like. But there are plenty of exceptions to both of those rules. The most reliable way to know is to measure.

Q There are many different types of adhesives as well as different types of material to be glued together. I would like to know which glues work best for the materials used in model railroading. Also, how can I tell the difference between the types of plastics used in model kits so I know which glue to use?

Jerry McKenna

A I wrote a run-down of the various types of adhesives used in model railroading for my "Ask MR" column in the March 2017 issue. If you don't have that copy in your back-issue stash, you can read it (and any other issue from 1934 to today) by subscribing to our online archive at trains.com/mrr/magazine/archive-access/.

As for identifying different kinds of plastics: The vast majority of the plastic in model kits today is styrene. Other kits are made from milled acrylic sheet, similar to plexiglass, which has its own special adhesive. These can also be assembled with cyanoacrylate adhesive (CA, or "super glue"). Some older kits are cast resin, which might look like plastic but requires two-part epoxy or CA to assemble. Items made by 3-D printing can be

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Vanderbilt tenders, like the one in this 1916 Alco photo of Southern Pacific 2-8-2 Mikado no. 786, may look like an inefficient use of space, but there's a reason Vanderbilt tenders have round tanks: they're stronger than rectangular ones. Fuel oil was carried in the squared forward section. David P. Morgan Memorial Library collection

made from ABS, polyethylene, polycarbonate, or other plastics; whatever they are, they usually take CA.

Some scratchbuilding supplies, like architectural shapes, vacuum-formed sheet, cast detail parts, and clear window glazing, can be made from ABS, acrylic, acetate, or other plastics; the manufacturer's website can tell you what kind of glue to use on each. Some locomotive and car detail parts are cast from Delrin, a slippery engineering plastic. Use a tacky glue like Walthers Goo on those.

Then of course there are structure kits made from laser-cut wood, etched brass, cast white metal, or cast Hydrocal, but there's not much risk of confusing any of those with plastic.

And speaking of glue...

Q I was given a plastic model assembled with super glue which I would like to partially disassemble. Anyone know of anything that will cause super glue to release?

Carl Wallenmeyer

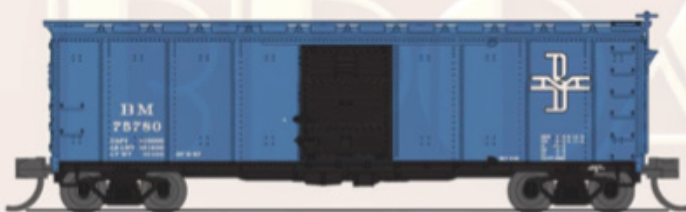
A Unfortunately, anything that would dissolve cyanoacrylate adhesive (a.k.a. super glue) would also attack the plastic. If you can't break the glue joints manually, you might try cutting them apart with a hobby knife. Otherwise, you're stuck (pun intended).

Q What is the advantage of Vanderbilt tenders? It seems to me that with the same principal dimensions, a Vanderbilt tender would contain less water than a rectangular tank.

Chuck Moore

A One answer is hydrodynamics. Vanderbilt tenders have round tanks because they have to hold a lot of water, which is heavy. The radial bands of a cylindrical tank are better able to withstand the strain of carrying that much weight than the right-angle welds at the edges of a rectangular tender. A second benefit is improved visibility; since a Vandy tender is narrower at the back, it makes it easier for the cab crew to see their train when backing up. **MR**

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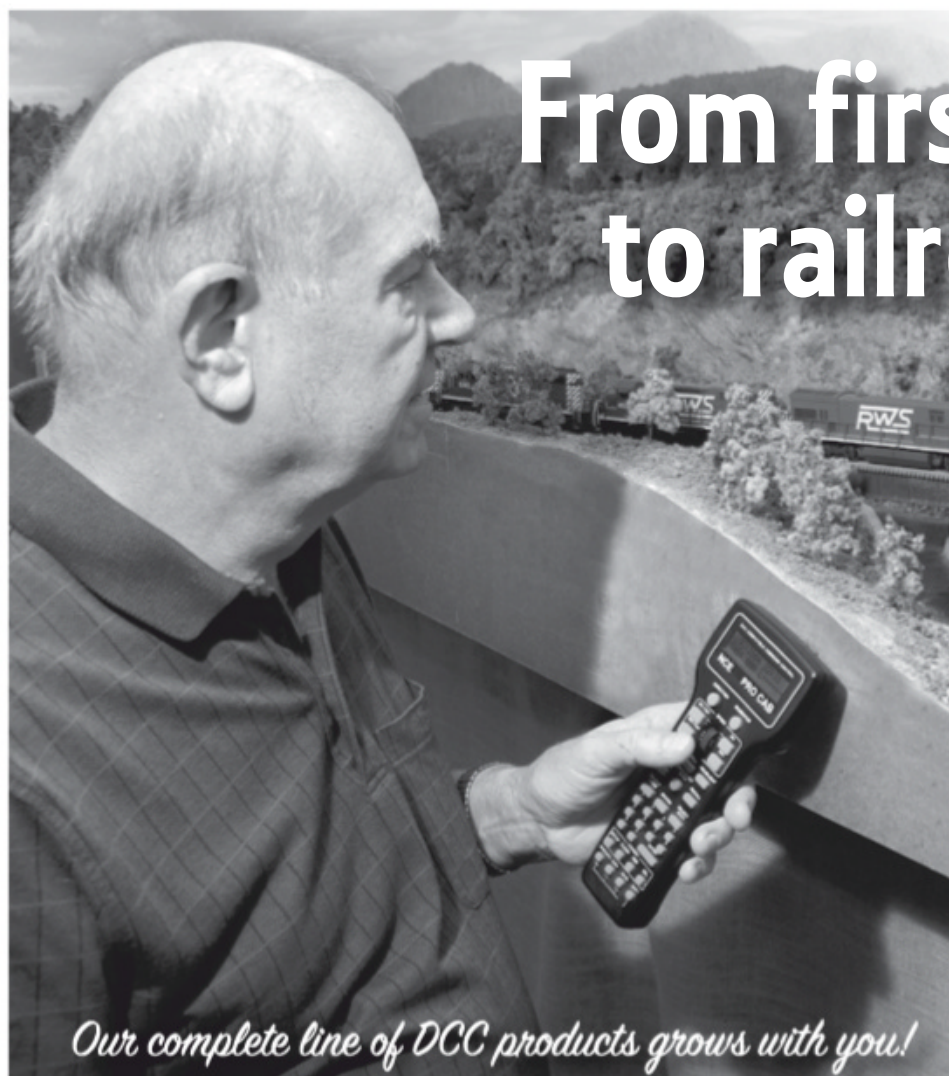
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Cody Grivno shares how he decaled and weathered this Walther's Mainline HO scale 53-foot gondola to match a Burlington Northern prototype. The full-size car that inspired the project is shown in the inset image. Photos by the author



Quick and easy gondola weathering

As a Burlington Northern modeler, I don't often find myself on the lookout for Delaware & Hudson (D&H) freight cars. However, when Wm. K. Walther's Inc. announced that D&H was one of the paint schemes on its 53-foot Railgon gondola, I knew I had to get a few.

Twice during the late 1990s I encountered unusual 53-foot gondolas in my hometown. Both were painted black with DELAWARE & HUDSON lettering and "The D&H" herald. Curiously, both had

BN reporting marks. The cars were numbered 560967 and 560949.

I initially wrote off the two gondolas as oddities in the BN fleet. However, in my research I learned that BN had two groups of ex-D&H cars: 560900-560949 and 560950-560972. According to information in David Casdorph's *Burlington Northern Color Guide to Freight and Passenger Equipment* (Morning Sun Books, 2001), the cars were acquired by BN in 1990. The gondolas were built a

decade earlier by Bethlehem Steel Car and were part of the D&H's 15000 series.

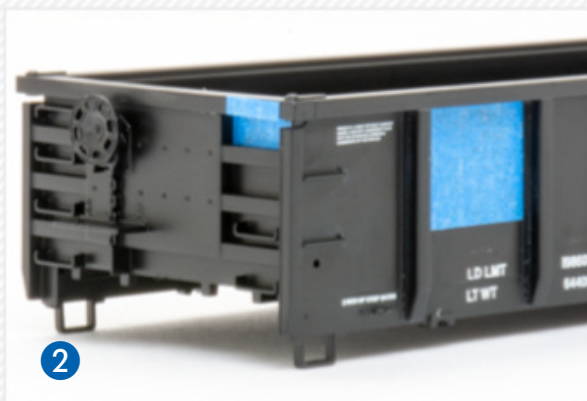
Thanks to Walther's, most of the leg work was already done for me. All I had to do was remove the original reporting marks and road number; weather and decal the carbody; and make some enhancements to the trucks, couplers, and wheelsets.

In the end, I was rewarded with a gondola that captures the essence of the prototype I spotted years ago.

STEP 1 EXTERIOR WEATHERING



I used Walther's Solvaset, a decal setting solution, and a Faber-Castell eraser pencil to remove the reporting marks and road number from the sides and ends of the car ①. I also removed the capacity line from both sides using the same technique. That data had been removed from the full-size car no. 560967.



Next, I cut blue painter's tape into patches to mask where the new reporting marks and road number would be applied to the sides and ends ②. I wanted to keep these parts of the car clean during the weathering process.

With the tape applied, I used an airbrush and Vallejo Model Air acrylic paints to weather the gondola. To give



STEP 1 EXTERIOR WEATHERING (CONT'D)



the paint a faded look I used White Gray (no. 71.119), thinned to a wash with Vallejo's airbrush thinner **3**, opposite. I used a paint handle to hold the car, which is why it's upside down in the photo.

I let the White Gray dry for a few hours before applying Rust (no. 71.080) to the body panels **4**. I thinned the paint to a similar consistency. I sprayed each panel from bottom to top, doing my best to keep the Rust off the exterior posts and top chord.

Happy with how the weathering looked, I removed the masking tape. In preparation for decaling, I airbrushed the

car with Vallejo Gloss Varnish (no. 70.510) **5**. I thinned the clear coat 3 parts varnish to 1 part Airbrush Thinner (I used no. 71.161, which is a 200ml bottle. Smaller bottles are available as item nos. 71.261 and 71.361).

After giving the varnish the weekend to dry, I added the BN reporting marks and road number with Microscale sets 87-1302 (sides) and 87-1277 (ends) **6**. I used Micro Set and Micro Sol setting solutions when working with the decals. Then I sprayed the sides, ends, and underbody of the car with Vallejo Matte Varnish (no. 70.520) to give the gondola a uniform, flat finish.

STEP 2 RUSTY INTERIOR

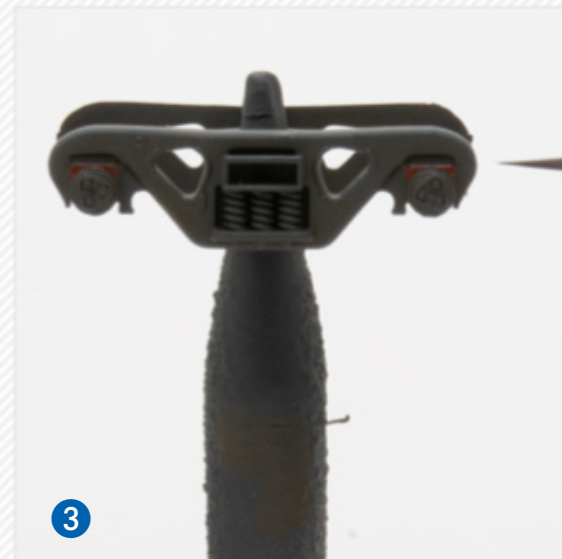


I carefully masked the sides and ends of the gondola using blue painter's tape and Post-it notes. Use extra caution on the ends so as not to damage the BN reporting mark decals on the top chord. I then spray-painted the interior Tamiya Red Brown (no. TS-1) **1**.

The next day, I overcoated the paint with Testor's Dullcote (no. 1260) from a spray can. Once that dried, I applied Monroe Models Quick Age Weathering Wash (no. 978) with a paintbrush. While the Quick Age was still wet, I held a small piece of foam with tweezers and blotted the wash **2**. This yielded a mottled finish, as gondola interiors rarely weather in a uniform pattern. The blotting also minimized tide marks (hard lines where the wash stops leaching). Notice how the alcohol-based wash reacted with the Dullcote, further enhancing the effect.

Then I used a 10-0 Flex-I-File paintbrush to flow Monroe Models Dark Rust Weathering Wash (no. 979) into the seams for the floor panels, beaver tail connection plates, bolster blocks, and body bolsters **3**. This simulates the rust that develops in the recesses of gondolas.

STEP 3 TRUCK ENHANCEMENTS



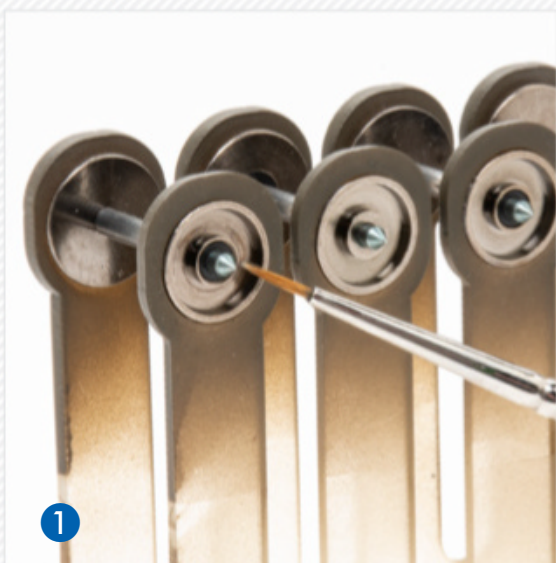
Trucks are an often overlooked weathering opportunity on freight cars. But in a few simple steps, you can make them look more like what you see underneath full-size freight cars. Here's how I enhanced the trucks on the Walther's Mainline car in just three easy steps.

First, I removed the original wheelsets and put in temporary plastic ones. Why? The plastic wheelsets are used to mask the axle sockets. Alternatively, you could mask the sockets with poster putty or a liquid mask like the Micro Mask shown in **Step 4**. Then I placed the trucks on a jig and spray-painted them Tamiya Black Rubber (no. TS-82) **1**.

After the paint dried, I used a Microbrush to apply AK Interactive enamel Track Wash (no. AK 083) **2**. The reddish-brown wash adds a subtle warm tone to the side-frames, giving them the look of oxidized metal. Keep the wash out of the axle sockets.

Finally, I used a paintbrush to pick the roller-bearing adapters with Vallejo Model Color Burnt Cadmium Red (no. 70.814) **3**. Dark red and brown are typical colors for roller-bearing adapters. Other details you could highlight include the bearing caps and springs. Use prototype photos as a guide when weathering trucks.

STEP 4 REPLACEMENT WHEELSETS



The gondola was equipped with 36" metal wheels mounted on plastic axles. Though the stock wheels are fine, I prefer solid metal wheelsets, so I replaced them with Walther's Proto no. 920-2303. I wiped the axles with isopropyl alcohol to remove residue from the manufacturing process. Then I set them in an American Model Builders wheelset painting jig. Once in the jig, I used a paintbrush to apply Microscale Micro Mask (no. MI-7) to the tips of the axles **1**.

After the Micro Mask dried, I spray-painted the wheels with Tamiya NATO Black (no. TS-63) **2**. The grimy black

color serves as the base for subsequent weathering. Notice that the jig keeps the paint off the wheel treads but leaves the other surfaces easily accessible whether you're using spray-paint or an airbrush.

I let the paint dry for 24 hours before spray-painting the wheelsets with Testor's Dullcote. After the flat finish dried, I used a Microbrush to apply Monroe Models Dark Earth Weathering Wash (no. 974) to the front, back, and axle of each wheelset **3**.

When finished, I scraped the Micro Mask off the tips of the axles with a no. 11 blade.



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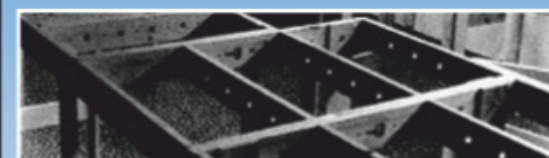
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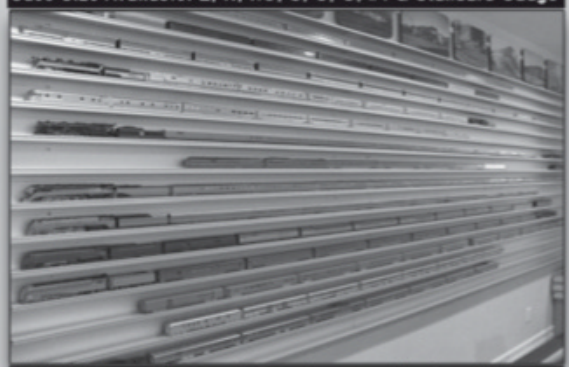
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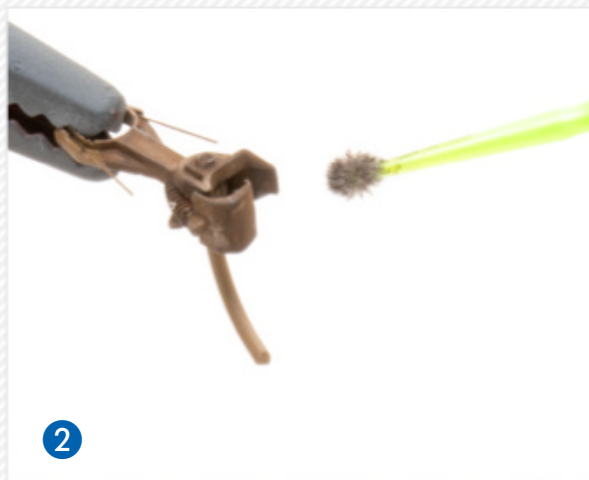
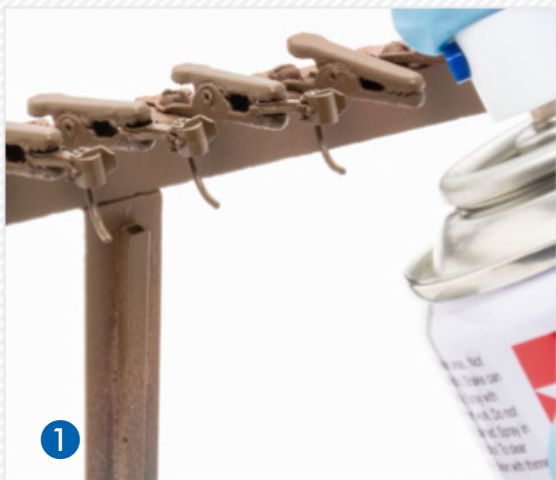
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STEP 5 REALISTIC COUPLERS



I replaced the stock couplers with Kadee no. 148 whisker couplers to match the rest of my rolling stock fleet. I gave the couplers a weathered look using a multi-step process. First, I placed the couplers in a jig and spray-painted them Tamiya Red Brown ①. Build up the paint in light layers so you don't gum up the knuckle springs.

I let the paint dry for a day. I then spray-painted the couplers with Testor's Dullcote. After that dried, I used a Microbrush to apply Monroe Models Quick Age Weathering Wash ②. Similar to the gondola interior, the

alcohol-based wash reacted with the Dullcote, giving the couplers a gritty metal look.

The weathered brown trip pins didn't look realistic. To fix that, I brush-painted them Vallejo Panzer Aces Dark Rubber (no. 306). Notice that I left the tip of the pin unpainted to simulate a weathered glad hand ③. Use flat black and flat aluminum for a new hose and glad hand.

With the couplers finished, I reassembled the gondola. The ex-D&H car with BN reporting marks and a new road number adds some interest to my freight car fleet. **MR**

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ALL ABOARD!

Discovery World's new train exhibit features an HO scale layout based on 20th-century Milwaukee

By Nastassia Putz
Photos courtesy of Discovery World



① Visitors to Discovery World in Milwaukee, Wis., can enjoy the “All Aboard” layout depicting scenes loosely based on the Milwaukee Road. The HO scale model railroad measures 10 x 35 feet and was built by Stephan Lamb Associates.



② At the heart of the layout is the Milwaukee Road's Everett Street Depot, based on the prototype known also as the Milwaukee Union Station. This railway station, built by the Chicago, Milwaukee, St. Paul & Pacific in 1886 (The Milwaukee Road), closed in 1965. Wisconsin Central and Milwaukee & Northern trains also used it.

“ALL ABOARD”

is the name of a 10 x 35-foot HO scale model railroad at Discovery World, a family-oriented science and technology museum in Milwaukee, Wis. Set in the steam-to-diesel transition era, the free-lanced layout opened to the public in November 2021. The exhibit is intended to support Discovery World's mission of Science, Technology, Engineering, and Mathematics (STEM) education.

Model railroader Richard Griggs' family donated the layout to Discovery World after Griggs' death. Their goal was to inspire children to become engineers, designers, scientists, and makers. The layout was professionally built by Boston-based Stephan Lamb Associates.

The layout in a nutshell

Though the layout is not prototypical, Lamb says it's based loosely on 20th century Milwaukee and Midwestern scenes along the Milwaukee Road and Chicago & North Western railroads in Wisconsin. The layout represents a typical Milwaukee scene combined with a suburban scene from the 1940s to '60s.

The Milwaukee Road's Everett Street Depot is at the heart of the layout. The station was built from a Walthers Cornerstone kit. Several other structures on

the layout were either Woodland Scenics Built-Up buildings or assembled by Lamb and his team from kits. Roughly 90 percent of the buildings have interior lighting, and there is also a working signaling system from Custom Signals.

Milwaukee-specific kitbashed buildings were added to re-create some of Griggs' fond childhood memories, specifically Usinger's Sausage, Pabst Brewery, and Ambrosia Chocolate Co. Other trackside industries along the two main lines are based on businesses and architecture that would be typically seen in the region during this time period. There are cabins and logging scenes, farms and factories, and other vignettes with figures and vehicles scattered about.

Currently, two trains run simultaneously on separate loops. The trains are controlled by an NCE Digital Command Control (DCC) system capable of running six trains at a time – a future goal of the museum.

The layout's journey

Some model railroads travel after construction, which includes from state to state. For the All Aboard layout, this happened several times. First built in Massachusetts by Lamb and originally referred to as The Milwaukee Road, the 18-module layout took 2,224 hours to build and deliver to





3 This view shows how the All Aboard layout is displayed inside the museum. The walls with Plexiglas panels are set back from the front of the layout so workers can easily access the layout for track cleaning and other maintenance. It also prevents visitors from touching the scenery and trains.



4 An 85-foot *Rapids*-series Skytop Lounge carries the markers on a Milwaukee Road passenger train. The passenger cars are Wm. K. Walther's Inc. models. Walther's has partnered with Discovery World to assist in handling the ongoing maintenance and any changes made to the layout.

its first destination. It was initially set up in Griggs' Ohio home in August 2013, then transported seven months later to his new residence in Slinger, Wis. After his death, Griggs' family donated it to Discovery World in March 2020.

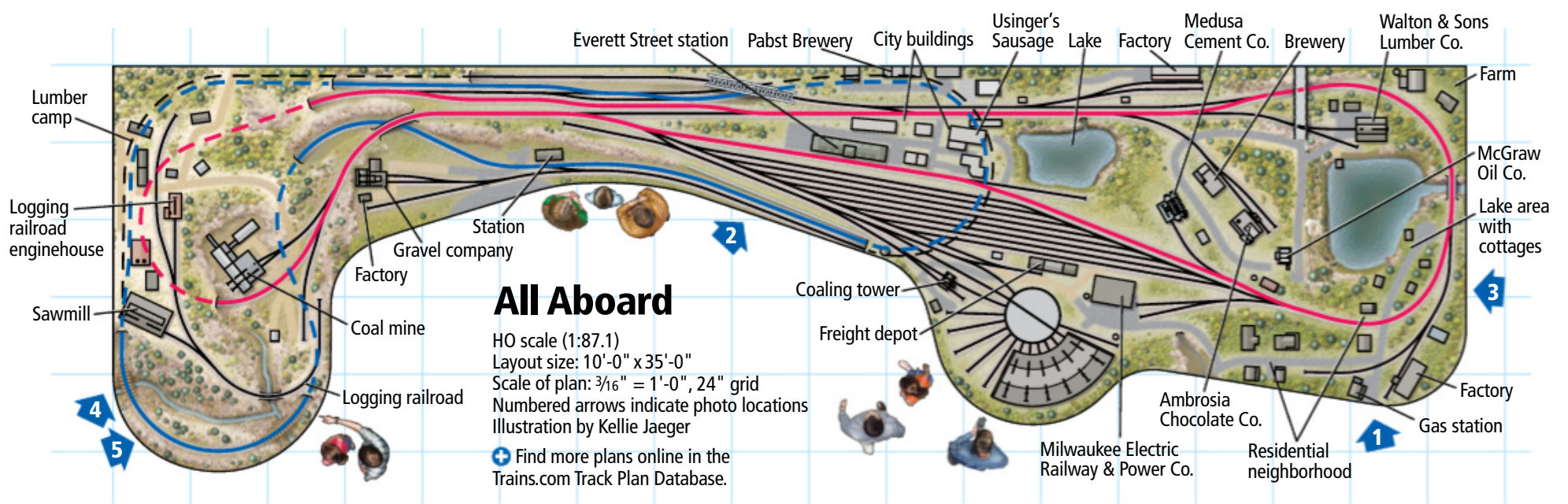
Before the 18 modules were disassembled for a third move, Discovery World CEO Bryan Wunar and Wm. K. Walther's Inc. President Stacey Walther's Naffah established a partnership. The Walther's company will assist with the

ongoing maintenance required to keep the model railroad operating smoothly, while Discovery World exhibits it to the public. According to Walther's Naffah, a lot of behind-the-scenes finessing went into making this exhibit possible.

Eric Grabczyk, Discovery World exhibit maintenance manager, explained how he and Lamb's team dismantled the layout and drove it to the museum in a box truck. The railroad remained stored away during the first wave of the COVID-19 pandemic. Lamb was thrilled to know that it wasn't getting tossed into a dumpster and says that Griggs would have really loved this!

Lamb later came back to Milwaukee to assist Grabczyk and Walther's employees with the final setup.

"It took us about a week just to get it assembled and another to get it rewired," says Grabczyk, who after this experience has a real appreciation for all the work



The layout at a glance

Name: All Aboard
Scale: HO (1:87.1)
Size: 10 x 35 feet
Prototype: freelanced, based on Milwaukee Road
Locale: Wisconsin
Era: 1940-60s
Style: walkaround

Mainline run: Red Track, 58 feet;
 Blue Track, 49 feet
Minimum radius: 24"
Minimum turnout: no. 5 (yard), no. 6 (other)
Maximum grade: 3 percent
Benchwork: open grid
Height: 32"
Roadbed: Woodland Scenics Track Bed

Track: Walthers (Shinohara) code 83 flextrack
Scenery: Sculptamold/plaster cloth over extruded-foam insulation board
Backdrop: Photos of Ohio landscape mounted on tempered hardboard
Control: NCE DCC



5 On opening day, two young boys are pressed against the Plexiglas looking in awe at the train exhibit. Perhaps they are dreaming of the day that they can have their own model train layout just like this one.

that goes into model railroading. Grabczyk explains the wiring as a “spaghetti mess” with the incredible amount of wiring and multiple circuits involved.

Keeping kids on track

Children are the target audience for the layout, so to give them an opportunity to interact more with the layout, Discovery World lowered the

benchwork. Originally, the layout was built 54 inches tall, but to give children a better view it was cut down to 32 inches.

It seems this approach worked. When the All Aboard layout/exhibit opened as a part of the holiday experience at Discovery World back in November, Wunar noticed that kids spent a lot of time observing it and would call their siblings or parents over to show them what new discoveries they had found.



Bright and attractive graphics made from paint and vinyl were applied to the wall behind the layout.

Discovery World photo

What's that on the wall?

Behind the layout is a wall of railroading facts that span more than the length of the layout. This part of the display was created by Cassie Coates, a Milwaukee Institute of Art & Design student. She used paint and vinyl to create the graphics.

Coates started working on the project as an intern in June 2021. The internship gave her an opportunity to work alongside museum professionals while creating the graphics from initial idea to final installation. – *Nastassia Putz*



The layout is packed away and stored into a truck with temporary shelving installed by Stephan Lamb Associates. Pieces were disassembled, wrapped up, and bagged to protect them from damage in transit. Stephan Lamb photo

5 tips for moving a layout

Many people spend years building their dream layout into their home, never thinking that they might someday have to move. But life happens, and things change. When building your layout, even if you're not planning on moving, you might want to build it so that it can be disassembled in sections in case the unexpected happens.

Here are some tips from professional layout builders that will get you started and keep you on the right track:

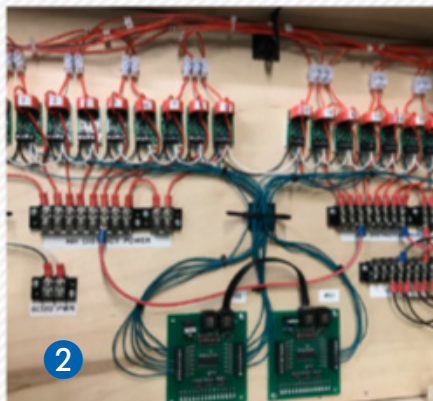
Build modular sections. ① On average, these sections should be about 3 x 6 feet, such as this module built by Pelle Søbørg, so they can fit through the smallest door to the outside. Some doors are less than 3 feet wide, so measure the door width first to avoid having to cut down tall scenery pieces.

Organize your wiring. ② Wiring should be labeled and color-coded. Terminal strips or Molex plugs will make it easier to unwire and reconnect your layout.

Make backdrops removable. Don't attach your backdrop to the wall. Attach it to tempered hardboard that can be secured to the back of the layout.

Secure the scenery. Some modelers choose not to glue their ground cover and ballast to their layout. If you never have to move the layout, this is not an issue. However, if it does have to be moved, that loose material will fall off and turn into a real mess. This can be prevented by gluing your scenery down prior to the move.

Don't bury screws. Be sure that benchwork screws or bolts are easily accessible. You don't want to have to saw legs off because benchwork braces, fascia, scenery, and other elements made the fasteners inaccessible. – Stephan Lamb and Scott Perreault



A model railroad exhibit entices children and opens the doors to exploring topics like scale and proportion, electrical systems, and transportation, according to Wunar.

"So that when kids go out into the world and learn more about how the world around them works, they'll be better prepared to take on topics beyond just simply the idea of a model railroad," he says.

And it's not just kids who gravitate toward it. Every time Wunar or Grabczyk view the layout, they notice something new. The layout is a fluid experience because of the level of detail throughout its many components. It's not meant to be taken in all at once.

Walthers Naffah says she is excited about the exhibit because of its capability to bring families together to enjoy the hobby first-hand. After years of conversations with Discovery World CEOs, her "work dream come true," as she calls it, has finally manifested itself through this generous donation.

By partnering with Discovery World, Walthers Naffah's goal is to help bring years of enjoyment and hands-on learning opportunities to children and their families.

Discovery World sees the intersection between the hobby and how it plays a vital role in teaching kids STEM or STEAM (Science, Technology, Engineering, Art, and Mathematics).

"They believe in what we are doing!" says Walthers Naffah.

She hopes to expand similar teaching opportunities to kids at science and technology centers around the U.S. Sparking a child's interest at a young age is key to creating a new generation of model railroad hobbyists.

More changes, perhaps a few additions, and a curriculum tied to the exhibit may be underway in the near future. Nothing has been confirmed yet and many possibilities remain on the table. As long as the endgame is the same, the rest can be interchangeable.

The ultimate goal is to teach and solidify these much-needed skills in future generations, says Wunar. **MR**

Discovery World is a non-profit science and technology center located in downtown Milwaukee. The All Aboard train exhibit runs eight hours a day, five days a week. The museum offers exhibits, educational programming, events, memberships, and more. Those interested in visiting, volunteering, or interning can learn more at discoveryworld.org.



Mike Tylick scratchbuilt a gated crossing for his On30 Marshfield & Old Colony layout. With the gate blocking the Braintree Electric Ry., M&OC no. 70 safely leads its train over the diamond at Harbor Junction.

Add a gated crossing to your layout

A simple way to protect lightly used junctions

By Mike Tylick • Photos by the author

As I was working on my On30 Marshfield & Old Colony layout, I ran into a dilemma. At Scituate Harbor, there's an at-grade crossing between the railroad's Egypt Beach Branch and the Braintree Electric Ry.'s Scituate Pier line. By the 1930s setting of my model railroad, traffic was minimal on both lines. On the M&OC, an occasional freight car would be spotted at the pier during the fall and winter for the cranberry and

commercial fishing seasons, respectively. Two or three short trains a week were all that was needed to serve Egypt.

On the Braintree Electric, beach season was mostly over by fall. There was still enough business to warrant a few trolley cars each day on weekends through October.

Sparse as traffic was, I needed some way to protect the crossing. Though I've always liked operating signals, they

seemed excessive for a crossing with limited traffic. Semaphores didn't make much sense, either. A ball signal seemed inappropriate for my area, and making a working one was more than I wanted to take on. That's when I decided to model a gated crossing.

Various styles of gated crossing are used by railroads to protect junctions, **1**. The setup is pretty simple. A gate (or gates) is typically set against the junior



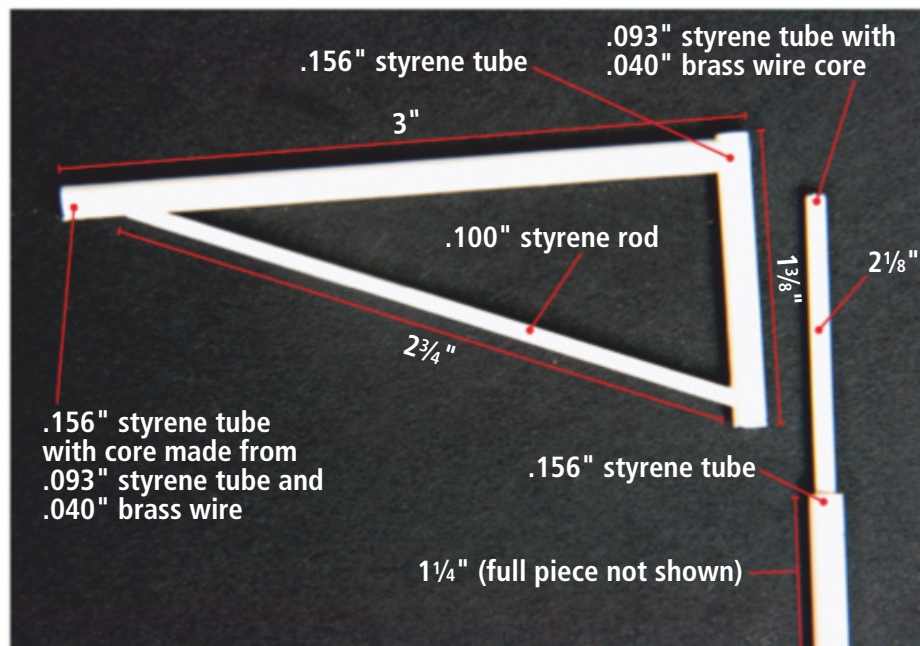
① Prototype example. A pipe gate with a stop sign attached protects the junction of the Ashley, Drew & Northern and Missouri Pacific in Monticello, Ark. The gate is lined against the AD&N. Terry A Holley photo



② Made of metal. When Mike Tylick built a gated crossing for the F scale Chester & Beckett RR, he used $\frac{1}{16}$ " brass tube and .040" wire. The gate and locking posts are code 160 rail.



③ Take one. Mike initially thought about scratchbuilding a metal gate for his On30 layout. However, he found the metalwork more difficult in a smaller scale and thought the parts looked oversized.



④ Take two. Styrene proved to be a more viable option for the gate. Mike cut the gate post oversized so he had enough material to solidly anchor it in the layout.

route. In railroad speak, that's the railroad that arrived at the location second. Trains must approach the crossing prepared to stop. When the train comes to a stop, an employee must look and listen for an approaching train. If no train is coming, the engineer sounds a single whistle blast, the gate is opened, and the train moves over the diamond. Once the train has cleared the crossing, the gate is restored to the normal position.

Though I had experience building these gates before in a different scale, I tried a different technique for my On30 layout. The gates protecting the crossings are often homemade, meaning they may vary from location to location.

What to use

When it came time to build the gate for my On30 crossing, I initially

considered using metal components. I'd successfully used code 160 rail, .040" wire, and $\frac{1}{16}$ " brass tube to model a gated crossing on the F scale Chester & Beckett RR, a group project that I'm involved with **②**. Being constructed from metal, the gate has held up well to regular handling during operating sessions.

When I attempted to build a similar gate in O scale, the metalwork proved more difficult, and I couldn't find tubing small enough to look right **③**. Painting the gate a light color would only accentuate the oversized parts.

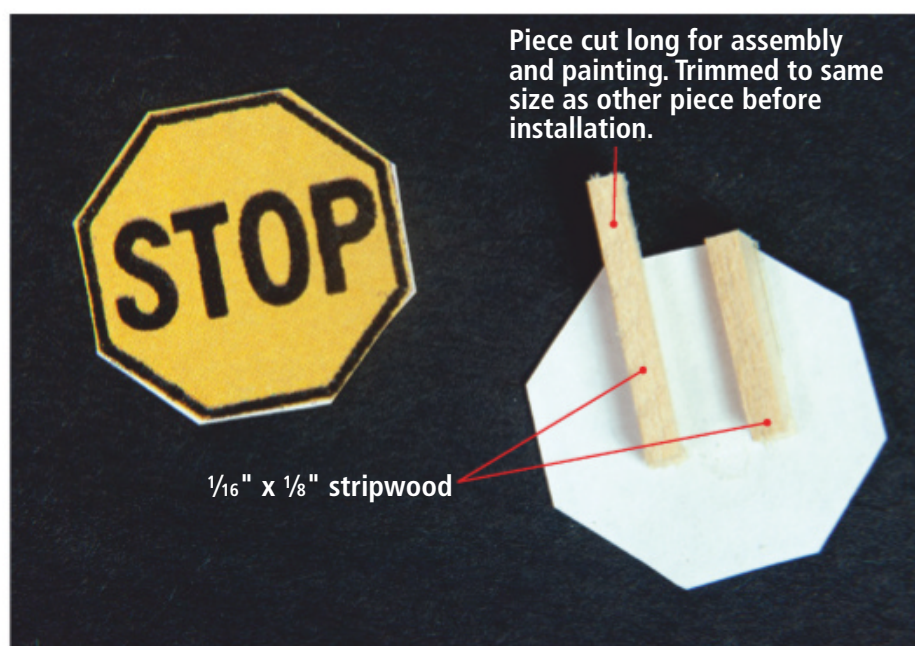
Fortunately, I came across a gate at a nearby town beach that used a different design. It had a tube that swung around a solid core. Instead of using metal, I opted to model the gate using styrene rod and tube **④**. I reinforced critical parts of the gate with additional styrene tube and brass wire.

Stop signs and paint

I found a photo of a yellow stop sign, appropriate for my modeling era, on the internet. After scaling and duplicating the image, I printed the signs. To give the signs extra strength, I applied them to a cardstock backing.

Since the signs would be mounted back to back, I attached two $\frac{1}{8}$ " x $\frac{1}{16}$ " stripwood spacers to the back. Though not shown in **⑤** on the next page, I painted the back of both stop signs black. I set the signs aside for now.

Next, I brush-painted the gate with Delta Ceramcoat Harvest Yellow and the base of the post with the same company's flat black. After the paint had dried, I weathered the gate and stop sign with thinned raw sienna paint and brown and black watercolor washes **⑥**. Then I attached the stop signs, making sure



5 Period signs. After scaling and printing stop signs, Mike attached them to cardstock. He added stripwood spacers since the signs would be mounted back to back on the gate. He painted the back of both signs flat black.



6 Painted and weathered. Mike painted his freelanced gate with Delta Ceramcoat paints. He weathered the gate and signs with thinned raw sienna acrylic paint and black and brown watercolor washes.



7 On the layout. Here's what the gate looks like on Mike's On30 Marshfield & Old Colony. About 1/4" of the mounting post (partially hidden by the pilot of the locomotive in this photo) is visible above grade.

they were roughly over the centerline of the track.

Installation and application

I used a 5/32" bit to drill a hole for the mounting post **7**. White glue and subsequent scenery glues hold the gate post securely. Approximately 1/4" of the post is visible above grade. I didn't include a

locking post for the gate. On full-size railroads, the gate is often secured to a post with a switch lock.

The freelance gated crossing has added a new element for operators to be on the lookout for when operating trains on my Marshfield & Old Colony layout. Since the gate is positionable, it also adds a hands-on element to the model railroad. Though the gate

I designed is for an On30 layout, the techniques shown could easily be adapted for other modeling scales. **MR**

Mike Tylick needs no introduction to longtime Model Railroader readers. The Massachusetts resident has been writing articles for the magazine more than 35 years. Mike models the Marshfield & Old Colony in On30.

One night in Spokane

The O scale Pacific Railway & Navigation Co. comes alive after dark

**By Kirk Reddie
and Mike O'Connell**

Photos by Mike O'Connell



❶ In this bird's-eye view of downtown Spokane on Mike O'Connell's Proto:48 Pacific Railway & Navigation Co. layout, Northern Pacific no. 1364 awaits a green signal to clear Parkwater Yard. The RPO is loaded on the Great Northern track and ready to hook up with the PR&N *Express*, heading west from Spokane.





2 On the lower Northern Pacific freight house track, a Great Northern boxcar prepares to unload maintenance supplies and equipment for Parkwater Yard.

Welcome to Mike O'Connell's Proto:48 Pacific Railway & Navigation Co. The prototype was purchased in 1915 by the Southern Pacific, which had acquired controlling interest of the railroad almost a decade earlier.

Though businesses saw the value of the coastal timbered rain forests, the wet tunnels and severe rainstorms prompted locals to call it the "Punk, Rotten and Nasty." PR&N was also known as the Tillamook Line, named for its Oregon terminal. And it is from this point that the fictional history diverges.

Mike, the builder of the PR&N, extends the history of the line. His PR&N is a trunk line and bridge route. But over time, the railroad's owners needed access to western Washington. The PR&N wanted to match the value of the Spokane, Portland & Seattle RR, which was owned by the Great Northern and Northern Pacific.

The model railroad is a series of scenes beginning with the Oregon coast and ending in Spokane. It shares trackage with the GN and NP from the waterfront industries of Tacoma, Wash., climbing the rugged Cascade Range and ending in the Inland Empire of Spokane.

Mike's passion is for historical architecture, especially buildings no longer standing. He uses the moving railroads to actively merge the many scenes together. This article features a visit to

Spokane, the eastern end of the railroad. It's nighttime when Spokane's railroads come alive.

How it started

Mike is fascinated with miniatures, especially model trains and architecture. After 46 years in business, Mike recently retired as owner and founder of Chooch

The layout at a glance

Name: Pacific Railway & Navigation Co.

Scale: Proto:48 (O fine scale)

Size: 40 x 60 feet

Prototype: Northern Pacific; Great Northern; Spokane, Portland & Seattle; and PR&N

Era: mid-1950s

Locale: Pacific Northwest

Style: walk-in multi-deck

Mainline run: approx. 1,200 feet

Minimum radius: 84"

Minimum turnout: no. 7 (spurs), no. 8 (main)

Maximum grade: 1.75 percent

Benchwork: modular

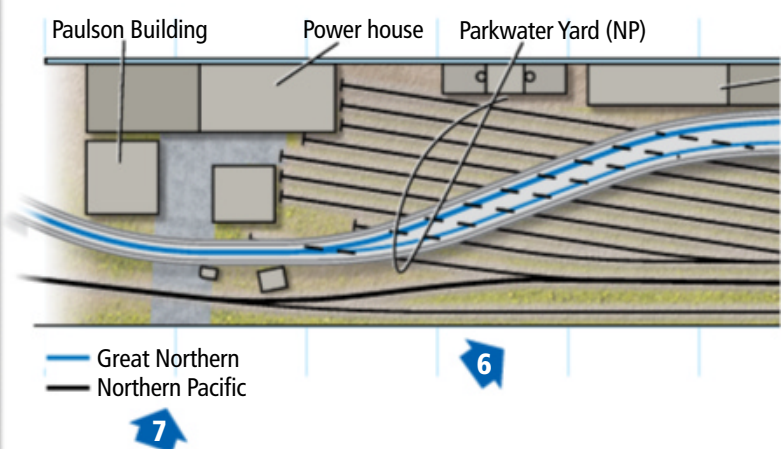
Height: 40" to 90"

Track: handlaid code 100 and code 125 rail with cast-resin pre-ballasted ties

Backdrop: hand-painted on 1/8" tempered hardboard

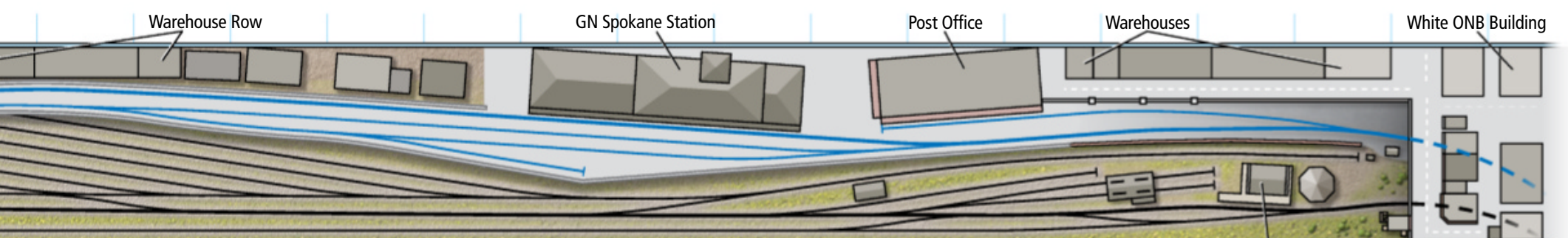
Scenery: plaster cloth and Sculptamold

Control: NCE DCC with wireless throttles





3 Northern Pacific no. 134 switches cars in the lower Northern Pacific trackage in Spokane's Parkwater Yard. It's one of four classification yards on the PR&N. The Spokane scene hosts the Great Northern and SP&S passenger station on the upper bridge.



3

Spokane on the PR&N

O scale (1:48)
Room size: 26'-8" x 42'-7"
Scale of plan: 1/4" = 1'-0", 24" grid
Numbered arrows indicate photo locations
Illustration by Kellie Jaeger

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

Spokane

2

4

5



NP Parkwater Station

1

Downtown businesses



④ Locomotive no. 599 has just dropped off the PR&N's only Railway Post Office car. The RPO will be loaded with Spokane's timely first-class mail. In two hours, it will be on its way to pick up and deliver first-class mail to the communities to the west.

Enterprises, a maker and vendor of model railroad scenery products. Many Chooch products Mike created can be seen on his PR&N layout.

The layout began with a 3 x 4-foot self-contained diorama called "Circa Thirty." The name refers to the 1930s era of the display, which showcases trains and trolleys on two different levels in a mythical small town called Charisma. An aspiring designer, Mike built the display to demonstrate his skills to prospective employers. Slide shows synchronized to narration by actor Claude Akins highlighted each of the structures on the diorama. He built the structures from wood and styrene, but many door and window castings, brick walls, and



⑤ The Repair in Place facility (RIP Track) makes minor repairs to get rolling stock back in service. The most common repairs are wheel replacement and brakes, but occasionally cars will need paint and updated lettering.



windowed storefronts he cast in resin from homemade rubber master molds.

Circa Thirty was featured in the September 1975 issue of *Model Railroader*. It was his first article about his layout, and the last until this one. At the end of the 1975 article, Mike stated he wanted to write a follow-up article in the next 20 years or so. "I'm a little behind schedule," Mike said.

Planning the PR&N

The PR&N is all about reproducing the architecture of the late 19th century. Mike uses the movement of trains to tie these architectural vignettes together. It's a point-to-point layout, with staging yards representing the east and west ends. In the middle is a mountain range peaking at Miller Pass and descending in both directions. It can take about 30 minutes for a train to travel the whole approximately 1,200-foot main line without stopping.



6 On a return trip from the Midwest, westbound Northern Pacific FT no. 5402A leads its train through the NP Main Track Siding on its way back to Tacoma. This time, it neither picks up nor sets out cars. The three crew members are under pressure to make up a local train for Palouse.

Mike created an operation timetable before designing the track plan. Planning for operation showed Mike how much fun the layout would become. Suddenly, the right of way and destinations revealed themselves, and it all came together.

Mike used track planning maven John Armstrong's circle-and-domino method to design the plan. After determining the largest possible circle that the space could accommodate was an 84" radius, he placed the circles representing the curves and connected them with straight segments made up of 2 x 8-foot and 4 x 8-foot dominoes. He also worked to avoid duckunders.

Mike planned the layout to put operators and observers inside the layout. He thought it was the most efficient use of the train room, and the trains would look better from inside. This also gave him room for a workbench where he could build and repair models. The only part viewed from the outside is Tacoma.

Construction

Mike created cardstock templates for curves, straight sections, and turnouts to transfer the track plan to the actual room. Since the ceiling peaks at 16 feet, the layout could have a number of levels. Mike stapled the cardstock templates together on the floor in layers representing the different decks of the layout.

Visit the PR&N

Mike O'Connell's Pacific Railroad & Navigation Co. layout will be open to visitors in September as part of the 2022 National Narrow Gauge Convention, which will be in Seattle/Tacoma, Wash., Sept. 1-4. For more info, go to SeattleNNGC.com.



To maximize the operational interest of the layout, Mike planned to create numerous online industrial customers. The industrial buildings would be built first so the layout could be operated as soon as possible. All the other buildings would be considered scenery and finished when there was time.

The layout was drawn and laid out in two dimensions, but experiencing the layout in three dimensions amazed even Mike. Once the actual higher track levels were built – some of the mountain track-age is 80" above the floor – viewers could look up at the trains running through the mountains. In order to minimize the risk of derailments on the 500 feet of

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7 Spokane, known as the “Inland Empire,” is an important railroad city. It’s the last city of its size until the tracks reach Minneapolis-St. Paul, Minn. An SP&S Z-8, no. 910, is heading west to Portland via Tacoma on the Great Northern tracks.

mountain trackage, Mike included only one turnout on that section. So far, “train catchers” have not been necessary as part of their operations.

Creating Spokane

Mike attended Gonzaga University in Spokane in the early 1970s. He found it to be a magnificent railroad town, as it offered so many railroad sights to take in. The Great Northern main track ran south of campus, and it was a quick hop to the GN station.

A model of that station is the center of Mike’s scene. It was built by Norm Hochhalter in the late 1960s and took more than 5,000 hours to create. Each window in the structure is functional.

The prototype station was on Havermill Island, connected by a system of bridges. Mike’s version of the station is elevated and served by tracks on a deck girder bridge. Mike wanted to model the elevated trackage of the Northern Pacific station across town, so he selectively compressed the scene and transplanted the GN station there.



Meet Mike O'Connell

Mike became interested in modeling at an early age. Born in Tacoma, Wash., he attended Gonzaga University in Spokane, Wash. Both cities have great railroad histories and were a huge influence on Mike. An avid rail and architecture photographer, Mike has given his entire 45,000-photo collection to the Pacific Northwest Railroad Archive, which will make it available online. Mike lives in Maple Valley, Wash., with his wife, Jeanne. They have four children and four grandkids.

offering detail products in O scale, so he had to make his own details and structure elements. Founding Chooch in 1974 was a way to do that. Mike particularly enjoyed the fact that if he needed something for his layout, once he figured out how to make it, he could offer it to modelers. "I was really fortunate that many things I needed became successful products," he said.

When he started modeling, casting resin in room-temperature-vulcanizing (RTV) rubber molds was the only game in town. Today, Mike uses a laser cutter to make layout details and patterns for buildings from Plexiglas or laminated Strathmore board. The billboards and bridges in Spokane are made from laser-cut Strathmore board. The faded "ghost signs" printed on the sides of his buildings – formerly accomplished with paper signs or water-slide decals – were instead painted using laser-cut stencils.

With computerized laser cutters and 3-D printing, Mike says model railroading is entering a new era of discovery. "Soon, we will be able to make components that we could only dream of," Mike said. "Even virtual models will have a place in our hobby." **MR**

Kirk Reddie is editor and publisher of N Scale Railroading Magazine. His own N scale layout last appeared in MR in March 2022's Trackside Photos. He lives in Seattle.

Spokane is selectively compressed to offer the viewer a selection of architectural vignettes. All the structures in the city are replicas of real buildings, constructed using countless photo references and drawings.

Mike sees lighting as essential for bringing scenery to life. He uses Par 20 light-emitting diodes (LEDs) to transition the city scene from cool to warm lights. The cool lights project from one side of the layout and the warm lights from the opposite side, giving an effect Mike calls "astonishing." He says the

lighting effect helps to bring the scene a more realistic feeling.

Almost all structures have some sort of interior details. Mike likes to use a variety of shapes, textures, and colors to fool the eye into seeing more detail than there really is. The viewer's imagination fills in the gaps, as though the details were really in the scene.

Building his way to the future

When Mike built the Circa Thirty module, there were only a few suppliers

A fresh take on the Santa Fe

Noted modeler Chuck Hitchcock's 28 x 30-foot HO scale layout depicts branchline railroading in Kansas

By Chuck Hitchcock

Photos by Paul Dolkos



I've always had a model railroad in the basement, first in my initial home many decades ago and the two different layouts in my residence of 47 years. All these railroads were based on the Atchison, Topeka & Santa Fe Ry.

Then my wife, Jenny, and I moved into a retirement community in January 2018. I had no plans to build another railroad. Instead, I wanted to enjoy our Thursday model railroad lunch bunch, operating sessions at layouts in the Kansas City area, and the Saturday morning breakfast group. But several months later Jenny suggested we should look for a single-family house.

So the search began. We were fortunate to find a house that had an unfinished basement. Soon thoughts of building another railroad began to surface. After much conversation about building a modestly-sized model railroad with my

modeling friends, ideas began to take shape. Being a lifetime Santa Fe modeler there never was much question about which railroad would be modeled. But what, exactly, would I model?

There were many good suggestions, but the one that seemed to surface more was the idea of a Santa Fe branch line. But where? And set in what era? The Santa Fe had many branch lines in Kansas, so there were many possibilities. The answer was the 28 x 30-foot HO scale Ottawa Junction Ry., circa 1952.

Inspired by an article

My track plan was inspired by an article by Steve Flanigan in the December 2012 *Model Railroader*. It took first place in a track planning contest. His plan, based on Southeastern railroads, has a short line running north from a con-

nection with a Class 1 railroad and a second line running south. Though I wasn't going to model Southern lines, it provided a good basis for my own plan.

There were several Santa Fe short lines in Kansas that I could incorporate in a plan. Borrowing Flanigan's concept, I selected Ottawa, Kan., as my base town and created a plan with branches running north and south from there.

My layout design places a Santa Fe interchange at Ottawa Junction, just around the corner from the layout's main yard at Ottawa. The branch line track crosses the mainline on a 60-degree crossing, while a curved connection and crossover permits car storage on either side of the mainline tracks. Though I don't run mainline trains on this track, it provides an accessible staging yard for cars being moved to and from the branch lines.

1 Atchison, Topeka & Santa Fe 2-8-0 no. 2518 is on the point of train No. 40 seen passing Ottawa Junction, Kan. The scene takes place on Chuck Hitchcock's new 28 x 30-foot Ottawa Junction Ry. layout.





② Burlington, Kan., is one of two modeled towns on the Gridley Branch. Fairbanks-Morse H16-44 no. 2803 nears the at-grade crossing with the Missouri-Kansas-Texas with a cut of cars. The water tank to the left of the diesel was still active in 1952.

With the plan concept in hand, I had a 28 x 30-foot basement space finished with wallboard, a partial room partition, rug squares on the concrete floor, and the ceiling painted. My daughter and her husband have a contracting company that handled this work, making the room finish much easier.

I wanted to serve as many of the prototype industries that existed in the early 1950s as possible. I made several field trips to the area. Not only was much of the track gone, many of the structures of businesses were also gone or significantly altered. Coming to my rescue was friend, Mark Davidson, who loves research. He assembled a photo and data binder of views of the various industries and towns along the tracks.

A new model railroad

Ottawa serves as the base of operations for the two branch lines. The town itself hosted a number of industries, including a stockyard, lumberyard, six bulk oil dealers, coal companies, moving



③ At the center of the layout is Ottawa, Kan. Electro-Motive Division GP7 no. 2707, wearing the Santa Fe "zebra stripes" scheme, adds cars to the head end of train No. 79. The four-axle locomotive is also in charge of local switching.

and storage companies, and others too numerous to mention and model in the space available.

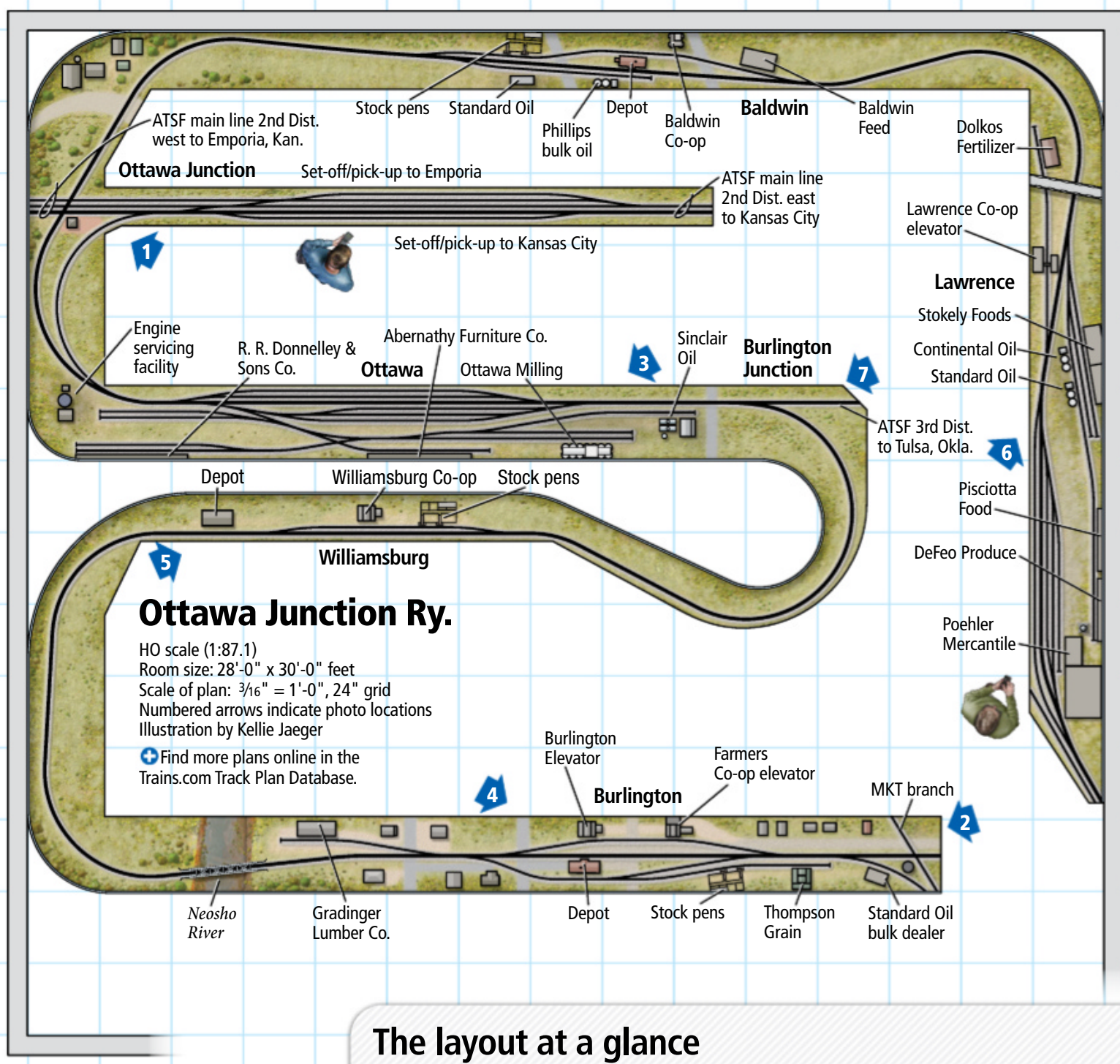
In Ottawa I have an Electro-Motive Division GP7 that does the local switching as well as picking up and setting out inbound and outbound cars for points east and west on the ATSF main line that serves as staging.

I have two towns north of Ottawa. The first is Baldwin, Kan. I modeled the town as it looked in the early 1950s based on information supplied by old maps. Industries at that time were a

stock pen, two bulk oil dealers, and two grain elevators. The track plan models the locations of the industries as it was then. Today only the two elevators remain, neither of which are rail served.

After Baldwin is Lawrence, Kan. I modeled the industries almost as they existed in the early 1950s. First is the Lawrence Co-op Elevator, which is still active but hasn't been rail served since the mid-1980s.

To the west of the elevator is Stokely Foods. The building is still present, but with the addition of a new outer shell



The layout at a glance

Name: Ottawa Junction Ry.
Scale: HO (1:87.1)
Size: 28 x 30 feet
Prototype: Atchison, Topeka & Santa Fe
Locale: Kansas
Era: 1952
Style: walk-in
Mainline run: 24 feet on Second District, 24 feet on main line through Ottawa
Minimum radius: 30"
Minimum turnout: no. 6

Maximum grade: none
Benchwork: 3/4" plywood on brackets or 2 x 2 legs
Height: 53"
Roadbed: none on branch, 3/16" camper tape on main
Track: code 70 branch, code 83 main
Scenery: under construction
Backdrop: walls painted blue
Control: CVP Easy DCC with radio throttles

looks very different. Fortunately, we were able to find a fairly decent black-and-white photograph of the building as it existed when it was Stokely Foods.

Moving to the north we find two bulk oil dealers, Continental Oil Co. and Standard Oil. They've been gone for a number of years but were present in my modeling era.

Farther north is the Poehler Mercantile Wholesale Grocery. It was an active wholesale supplier of groceries in Oklahoma and Kansas until the early 1950s and used rail to deliver its products. The building was purchased in the 1980s and redeveloped into condominiums.

Only two industries weren't a part of the real Lawrence scene, DeFeo Produce and Pisciotta Foods. I got lazy and reused structures from the previous layout. The industries fit nicely into the available space.

South of Ottawa

The Gridley Branch runs south from Ottawa. The prototype branch line

– now gone – was approximately 52 miles long and served 10 small towns. Gridley was at the far end, but there was little to model there, as the wye track was nothing more than a way to turn motive power. Rail traffic to the other towns was mostly limited to an elevator and a stock pen. Several had small depots ranging from a tiny structure to a small maintenance shed.

Burlington was the only town of appreciable size on the line. There the railroad served three elevators, a lumberyard, a stock pen, and a bulk oil

dealer. When we visited the Burlington area, we first inspected the line east of town where the track once crossed the Neosho River on a truss bridge nearly 150 feet long. The bridge was gone, but the stone supports were still present. My good friend Keith Jordan offered to build a model of the bridge, and I responded within seconds and accepted his kind offer. Another time-consuming task successfully delegated!

Although Burlington once hosted two railroads, a casual observer wouldn't know they ever existed. Signs of their



④ Atchison, Topeka & Santa Fe heavyweight combine no. 2633 is spotted in front of the Burlington, Kan., depot. The car, dubbed “the old gal,” was later shoved east of Burlington to be out of the way during in-town switching.

Learning from the pros

Some years ago friend Dave Lambert and I drove to Newton, Kan., to visit with another friend and longtime employee of the Santa Fe, Lloyd Stagner. At that time we needed additional information about the consists of the mail trains, and Lloyd shared his notes, commentary, and much information that was helpful and useful.

Later that morning we had lunch with Lloyd and one of his old friends, Mike Hurley. Mike worked as a conductor for many years, which included some time on trains 79-80, the Burlington Local. He told an interesting story of how they worked Burlington, Kan. Upon arrival they spotted the combination coach (Mike called it “the old gal”) at the depot for unloading of passengers and less-than-carload lots. After that was completed they pushed the combine east to the bridge, where it would be out of the way of in-town switching.

After the in-town work was done, the locomotive would go out to bridge and move the combine to the depot for loading. Apparently this was the usual procedure in towns where there was more than a few pickups and setouts.

We’ve printed a condensed version of these instructions on the cover sheet for the Burlington job. I think this prototype-based operations adds interest to operating sessions. – *Chuck Hitchcock*



⑤ Chuck accurately captured the flavor of Santa Fe branchline railroading in Kansas. Here, the 2803 arrives at the depot in Williamsburg. Train No. 79 will set out two empty stockcars and one empty boxcar before continuing to Burlington.



presence are found only with close observation. A Katy branch line was the first railroad to reach town. It was followed two years later by the Santa Fe. Since the Katy was first, they claimed trackage rights over the Santa Fe.

Interestingly, Burlington’s bulk oil dealer was located along the interchange track between the Katy and the Santa Fe. A photograph of the interchange track taken in the early 1920s shows the dealer.

A group of us made a field trip to Burlington several years ago, and on the way we stopped at Williamsburg, Kan., to check on a structure we’d heard about. We found the unusual-looking building was still standing and concluded it must have been a coal loading facility, given its shape and square loading hatches.

Operating sessions

Two Santa Fe 2507-class Consolidations handle the Lawrenceburg branch line with one serving as protection power. A Santa Fe Fairbanks-Morse H16-44 takes care of the work on the Burlington branch. There are about 125 freight cars on the layout. Operating sessions typically last about three hours.

Originally we operated with three two-man crews. When the COVID-19



6 Santa Fe no. 2518 brings train No. 40 into the yard at Lawrence, Kan. Once in the yard, the 2-8-0 will cut off from the train to begin working the industries, including Continental Oil and Stokely Foods in the background.



7 With the turnout set for the diverging route, H16-44 no. 2803 leads train No. 79 on to the Gridley Branch. As soon as the rear car clears the switch, the turnout will be restored to the normal position, which on the prototype was the Santa Fe's Third District to Tulsa, Okla.

pandemic hit, we reduced this to three one-man crews with social distancing and masks required for the safety of everyone. These precautions allowed us to have monthly operating sessions and feel safe and comfortable doing so.

I began building the layout with the help of model railroading friends on weekly Wednesday work sessions. Benchwork and track started in

November 2018 and quickly took shape. The first operating session was held in April 2019. (The story of the railroad's construction up to that point is detailed in *Model Railroad Planning 2021*). Now, after another two years of scenery and other work, the railroad has reached the stage you see here. Thanks to the help of many people, I once again have an operating model railroad. 



Meet Chuck Hitchcock

Chuck Hitchcock has been an active model railroader for more than 50 years. He has been involved in many of the hobby's organizations and supportive of its activities. Chuck's wife, Jenny, has always been a great supporter of his hobby, as have his adult children, Doug, Sarah, and Megan.



Workbench lighting can be tricky, especially when working on dark-colored models. A simple solution was waiting for E. Philip Doolittle at the home improvement store.

30 MINUTES TO BETTER VISION

Create 'footlights' for your workbench with LED strip lights

By E. Philip Doolittle

Photos by the author

Here's a project you can complete in much less than an hour that will give you lasting benefit as you work on your models.

My workbench is illuminated by fluorescent lamps on the ceiling above my head and on the wall above my test/programming track. I also have a small "high intensity" lamp with magnifier at the right. Nonetheless, as you will see in the accompanying photograph below, the small steam locomotive is poorly lit.

When I sit down to work on the model, my shadow interferes with the

light from the ceiling fixture. Follow along as I adopt the old theater lighting idea of "footlights" to my workbench to banish that shadow.

Phil is a retired automobile engineer who lives north of Detroit, Mich. He has been a National Model Railroad Association member since 1973. Theater, painting, sail and power boat cruising, and folk music are interests that compete with his modeling time. Phil and his wife, Althea, have one son and two wonderful grandchildren.



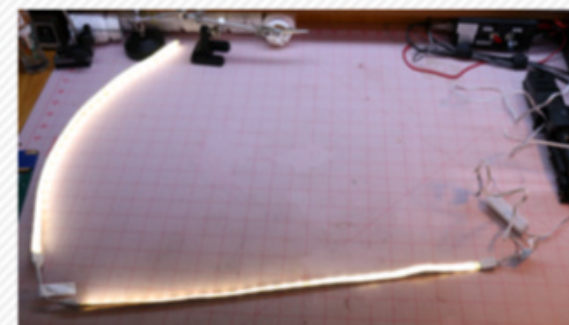
THE PROBLEM

Working on this steam locomotive shows the problem when working with dark-colored models. The side of the locomotive facing me is in shadow.



FINDING A SOLUTION

I found this light-emitting diode (LED) system at my local big box home store. Make sure it comes with a power supply for the LEDs and check that the length is appropriate for your bench.



In the package were two LED strips, a short connecting wire, a power supply with switch, and instructions.

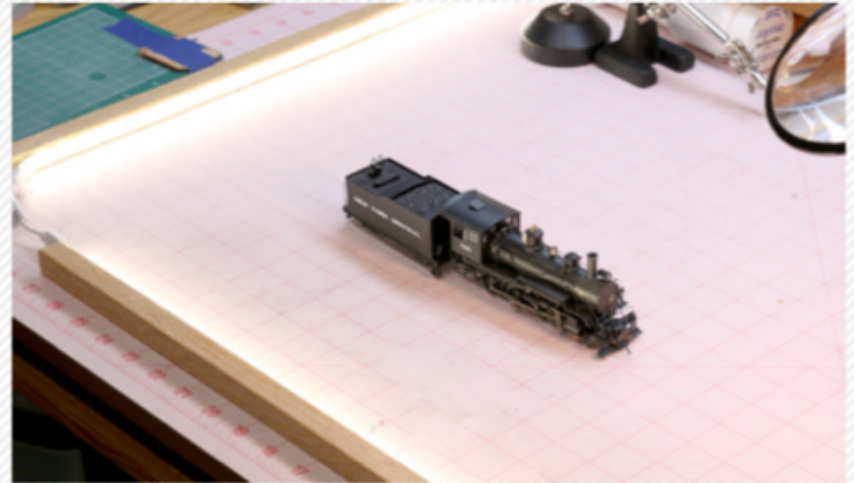
It's a simple matter to connect the parts together. As you can see, the LEDs give off a bright light.



BRINGING IT TOGETHER

I found a couple pieces of oak, $\frac{3}{4}$ " x $\frac{5}{8}$ " x $16\frac{1}{2}$ " long. I attached the LED strips to the wood with the peel-and-stick backing on the strips. Make sure the material you stick your light strips onto is smooth so the adhesive will have a stronger grip.

With the lights attached to the wood strips, I simply lay the fixtures on the workbench when I need light.



THE RESULT

I chose to fasten the wood strips to the cutting board surface of my workbench with a few double-stick "glue dots." Note that one strip is between my seat and the model, and the other at a right angle, providing side lighting. I haven't found the low wood strip to be in the way of my modeling at all. In fact, it has saved some small errant parts from finding their way to the floor.

And here's the proof of the lighting installation. Compare this image to the photo at the beginning of the article. You can clearly see the valve gear, driver spokes, pilot, and tender wheels of the locomotive. With all of this extra light, there's no more squinting to see what I'm working on! 



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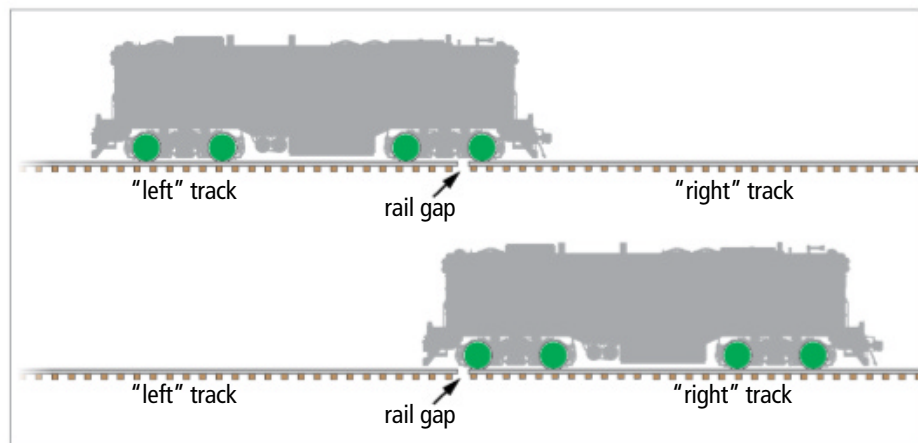


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P40519

Minding the gap



1 Using a locomotive with all-wheel power pickup, watch the wheels as it slowly rolls over a track gap. If the locomotive stops as soon as the first power pick-up wheel crosses the gap (top), you have a short. If the locomotive stops after all its wheels cross the gap (bottom), you don't have power to the track on the right.

Modelers sometimes have problems with locomotives crossing rail gaps. The problem occurs when crossing a double gap between booster districts or, even more common, crossing into or out of a reversing section.

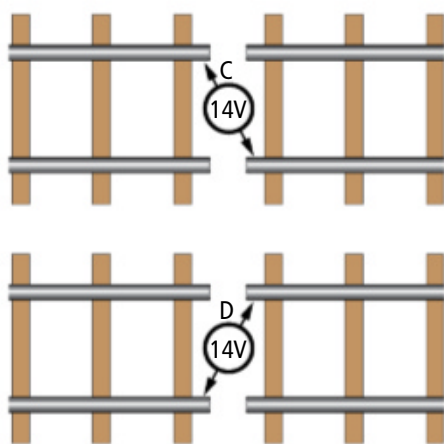
Start with a locomotive on the first wired piece of track and get it running. As you wire your layout, advance the locomotive. As long as it successfully crosses the gaps, keep smiling. Don't wait until after you have wired everything up to test it! You'll find it a lot less frustrating and easier to troubleshoot if you test as you go along.

Look at it this way, if your locomotive won't cross the first gap successfully, you have at most two problems. The feeder going to either one rail or the other is wrong. This is better than hundreds of unknown problems.

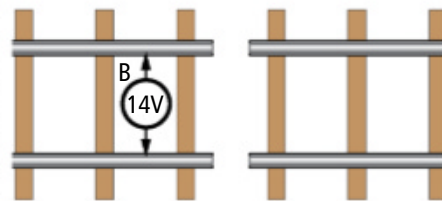
Use a diesel with all-wheel power pickup and no stay-alive to test your track. Go slowly. If it stops as soon as the lead truck crosses a double gap **1**, you have a short. If the locomotive stops after the rear truck crosses the double gap, you probably aren't getting power to either or both rails in that section (on the right in my diagram).

Some DCC systems provide an audible alert when a short occurs. If you hear the alarm, stop immediately! Grab your locomotive and move it back across the gap. If your ECB (Electronic Circuit Breaker) doesn't make a sound, check its short-indicating light-emitting diode (LED).

If your locomotive stops, determine whether you have a short quickly. If you aren't sure, assume you have a short and move the locomotive. Don't just assume that your locomotive stopped due to dirty track. Not all systems can tolerate a sustained short.



4 If either "C" or "D" are reading 0V, then the rail your meter lead is attached to on the right isn't powered. Don't take this reading without measuring "E" first! If you do, you may mistake a reversed polarity issue for a lack of power issue.



2 Take this reading first. If your train runs on this section of track, you know things are good there. You're taking this reading to serve as a baseline.

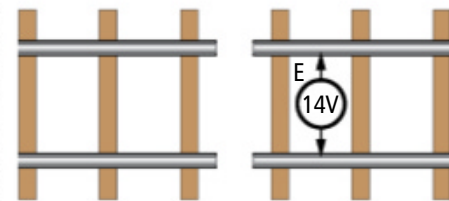
Note: Some of the less expensive DCC systems don't have short circuit protection. To find out, deliberately short the output of your system with a coin, screwdriver, or other conductor. If it doesn't alarm in some way, invest in an at least one ECB and put it between your DCC system and your track. Most ECBs at least have an LED that lights up when a short is detected.

Whether by an indicator or sound from your booster or ECB, or by careful observation of your diesel, you should have some idea of what your problem is. Now is the time to take some voltage measurements and confirm your situation and figure out what is wrong.

Before you do, know what voltage to expect. Most digital voltmeters won't accurately



5 If using T-taps like this one, make sure the spade is centered in its sheath before attaching to the tap. Insert it about halfway and check with a small flashlight. Then push it all the way in.

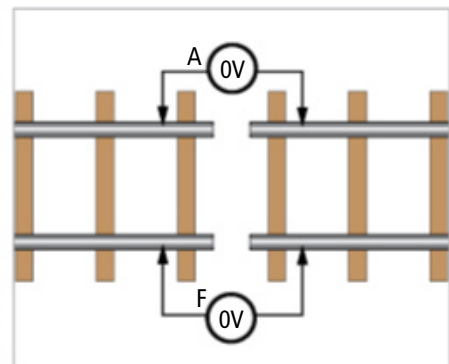


3 Take this reading second if your locomotive didn't successfully cross the gap. If your reading is close to your baseline voltage, your track polarity is probably wrong, causing a short. If it's about 0V, you probably don't have one or both feeders attached to your track bus.

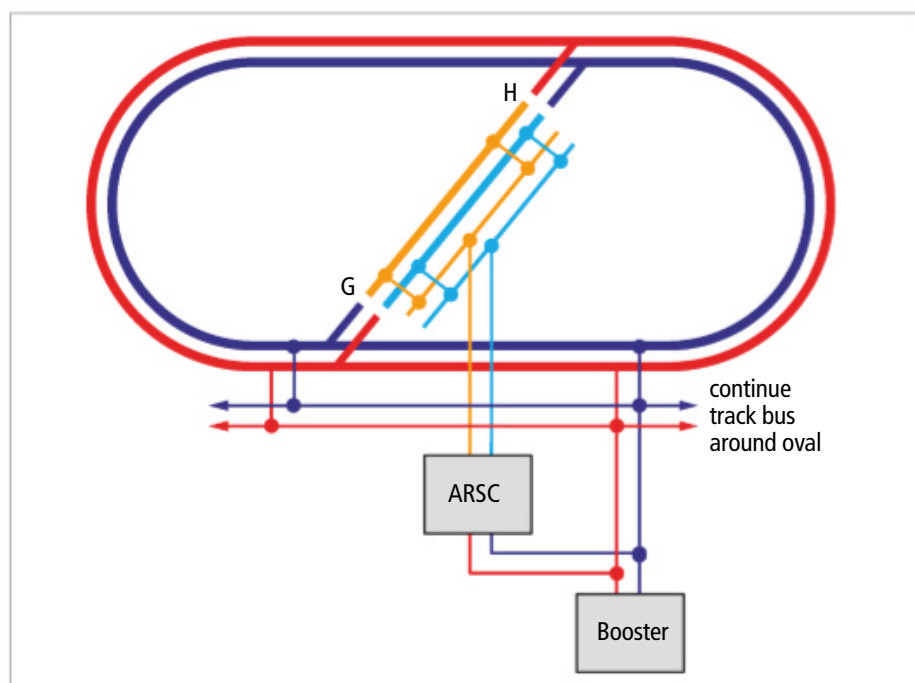
display DCC track voltages. Some may be off by several volts. So you may not get the 14V for HO. (N and Z scales operate at lower voltages. S may operate the same as HO. O and G operate at higher voltages.) Take the measurement shown as "B" in **2**. For your meter, this is your "baseline" voltage and what you should expect as you proceed with your troubleshooting. Subsequent readings may not be exact. It's OK to be off by a few tenths of a volt. If you're using block detection using diode detectors, your track voltage will read about .7V less than at your booster.

Don't move the diesel across the gap. Don't leave it straddling the gap as you proceed in troubleshooting.

After you know what voltage reading you should



6 If "A" or "F" reads the same as your baseline voltage and you aren't using an Automatic Reverse Section Controller (ARSC), you have a track polarity problem.



7 A gap-crossing example for a reversing section. Note that the double gaps at “G” and “H” are reversed. You can’t hook these two points up without an Automatic Reverse Section Controller. Note also that the reverse section has its own track bus shown in yellow and cyan. Don’t connect your main track bus, shown in red and blue, to your reverse section.

expect from taking measurement “B,” take measurement “E.” **3** This should be about the same as measurement “B.” If “E” is 0V, you probably don’t have two wires feeding that section of track, either in whole or in part.

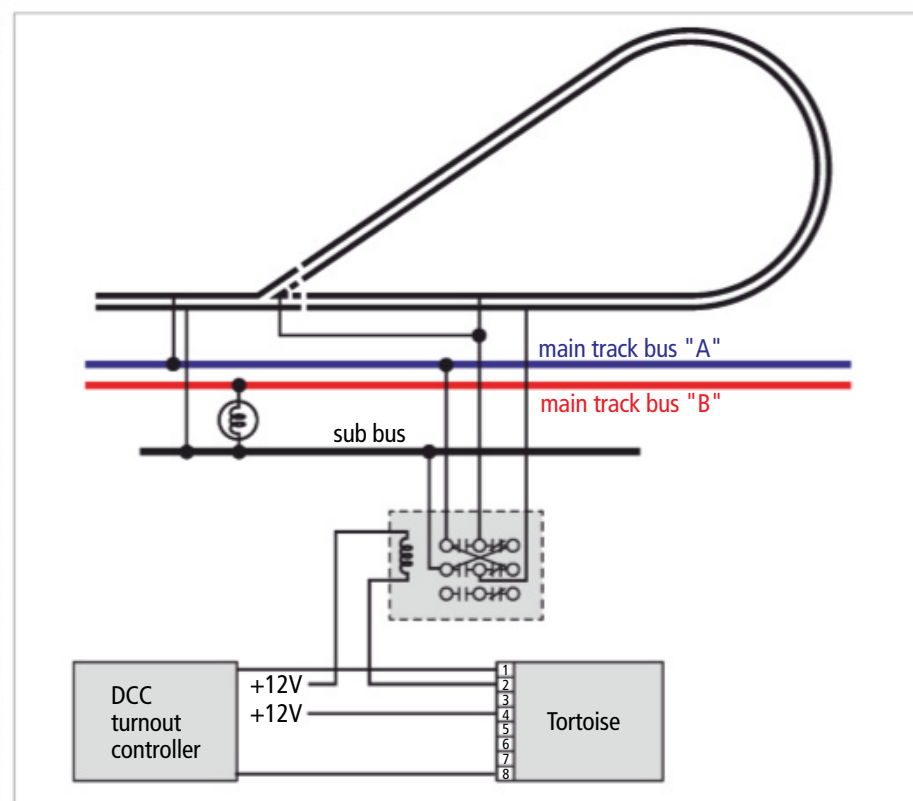
Take readings “C” and “D.” **4** If either reads about 0V, then you may not have a connection between your rail and your track bus. If reading “C” is good, then you have a connection between your track bus and your lower right rail. If reading “D” is 0V, you may not have a good connection between your track bus and the upper right rail.

If you’re using T-taps **5** to connect your feeders to your track bus – whether it be the main track bus or the output of your Automatic Reverse Section Controller (ARSC) – inspect the spade lug in the T-tap. Make sure it is centered when inserted. I’m not sure all T-taps have this problem, but this is a common problem with the budget ones. Make sure the spade is centered before inserting. If you pull it out and the spade is bent to one side, you’ve found your problem.

Take measurements “A” and “F.” **6** If either isn’t 0V, you may not have wired the track on the right side correctly. If both “A” and “F” are reading close to your baseline voltage, then you definitely have a polarity problem. You can also confirm this by moving the locomotive completely across the gap. If it starts moving, this confirms a polarity issue.

If the double-gap problem you’re trying to solve is on the border between two booster districts, try swapping the track bus wires coming out of the second booster. If you’re keeping track of which wire is which coming out of your boosters and you made your own signal cables going between your command station and boosters, you may have gotten a connector on the signal cable backward. Read your manual carefully to learn how the connectors should be installed on your signal cable.

If the double-gap issue you’re troubleshooting is for a reversing section, reversed polarity can be OK initially. The ARSC should



8 Using a relay to reverse a balloon track. If the balloon track polarity is wrong, swap the two wires leading to it. If you’re powering the turnout frog, you may have to move the frog wire to the other output from the relay. See the April 2021 DCC Currents.

automatically correct the polarity as the locomotive crosses the gap. See crossing “G” in **7**. Once “G” is correct, “H” will be reversed, and “A” and “F” will read your track voltage. Once the locomotive crosses “H,” the ARSC should reverse polarity. The polarities at “G” should now be reversed and read your baseline voltage.

If polarity doesn’t reverse properly when crossing “G” and “H,” a common problem with reversing sections is that modelers connect the main track bus (shown red and blue) to the reversing section (shown in orange and cyan). The reverse section should only be wired to the output of your ARSC. This seems to be a common problem. It may be because modelers wire up their layout before realizing they’ve created a reversing section and then don’t remove the old main track connection before hooking up an ARSC.

Some ARSCs have sensitivity adjustments. So maybe all you need to do is make an adjustment. Sometimes

getting the adjustment right can be tricky, so I prefer those that don’t require adjustment.

If you’re using a relay attached to a turnout to reverse the track power in a balloon track **8**, you probably just have the output of the relay backward to the balloon track. See the April 2021 DCC Currents.

Wire your layout slowly and carefully, checking each section as you go. Rushing and wiring up too much before testing are frequent mistakes. You can avoid frantic requests for help if you take your time, and your layout will be up and running much sooner than later. The internet can be a great source of help, but if you made a wiring error(s), there are just too many possibilities for anyone to be able to zero you in on your problem. Ultimately you will be the one that has to locate the specific point of the problem. Hopefully, this brief column is proof that troubleshooting doesn’t have to be painful if you test your wiring as you go. **MR**



Bachmann N scale streamlined PRR K4s 4-6-2

Though only a few of the Pennsylvania Railroad's famed class K4s Pacifics were ever streamlined, the iconic Art Deco-inspired steam locomotives made an indelible impression in the memory of American railfans. Bachmann Trains, which previously produced an HO scale model of the streamlined K4s (see our review in the May 2019 issue), now offers a version in N scale. The model, equipped with a SoundTraxx Econami Digital Command Control (DCC) sound decoder, is a faithful rendition of the sleek, retro-futuristic locomotive.

A Pennsy workhorse. It may seem odd when looking at the graceful lines of a Pennsylvania RR K4 that in the early 1900s, the Pacific was considered a brute. Most of the Pennsy's high-speed passenger traffic was pulled by E2 and E3 Atlantics. The first PRR Pacific – Alco-built class K28 no. 7067 – was the prototype of a boiler that could be used, with slight changes, on the class K4s Pacifics and class L1s Mikados. (The “s” stood for “superheated.”) Beefier than other PRR locomotives of its day, and with massive 27 x 28-inch cylinders, the Pacific type proved up to the challenge of the mountains in Lines East territory. The Pennsy would eventually roster 425 class K4s, 350 of which were built in its Juniata

shops. (The other 75 were built by Baldwin in the Philadelphia area.)

In the 1930s, an art movement called Streamline Moderne was developing out of Art Deco, and rail passengers were gaga over the Pennsy's stylish electric GG1. The Pennsylvania wanted more streamlined locomotives to pull its other crack passenger trains in non-electrified territory, and selected class K4s no. 3768 as its test subject. The railroad tapped Raymond Loewy, the designer of the GG1, to streamline the K4s in 1936.

Loewy's sleek, shrouded design, similar in silhouette to the New York Central's *Commodore Vanderbilt* of two years earlier, proved in wind tunnel tests to cut headwind drag by as much as one-third. Four other K4s were streamlined in 1940 and 1941 by Loewy's associate, C. Louis Otto. They were assigned to pull the trains of Pennsy's Fleet of Modernism, including the *Broadway Limited*, *Liberty Limited*, *Trail Blazer*, and *Jeffersonian*.

Other than no. 3768, the Loewy-designed locomotive, the four streamlined K4s Pacifics were nos. 1120, 2665, 3678, and 5338. Bachmann offers all four road numbers of the Otto design in N scale. After 1950, all five streamlined K4s had their shrouding removed. None were preserved.

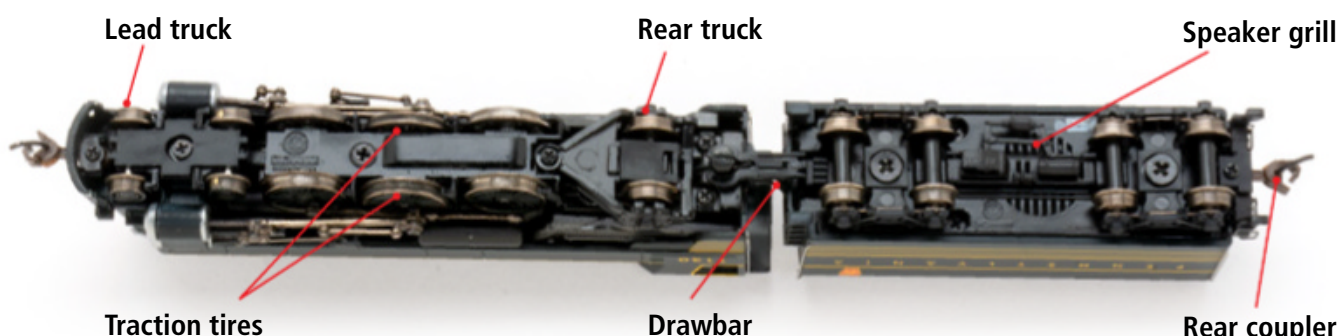
Inside and out. The Brunswick Green paint is as smooth and the printing as sharp as on Bachmann's HO scale streamlined K4s. The lettering is crisp and the stripes straight and opaque, though they're yellow, rather than the gold leaf used by the Pennsy in this era. The trust plates on the side of the smokebox and on the rear of the tender are almost legible under magnification.

The model's paint scheme, printing, details, and overall appearance matches a color rendering by Alan B. Chesley published in *The Many Faces of the Pennsy K4* by PRR historians Bert Pennypacker and Alvin F. Staufer (N.J. International Inc., 1984).

Though the locomotives' streamlined shrouding originally included partial side shrouding over the locomotive's wheels, it was later removed for ease of maintenance. Bachmann's model depicts the locomotives without this shrouding.

All the model's major dimensions that I checked came within a few scale inches of the measurements on a Pennsylvania RR builder's diagram that I found online. The wheel spacing also matches the diagram's dimensions, but that means that in order to accommodate N scale's proportionately deeper wheel flanges, the wheel diameters have to be smaller. According to my caliper, the pilot wheels are a scale 32" instead of the prototype's 36", the drivers are 72" instead of 80", and the trailing truck's wheels are 42" rather than 50". The locomotive's underframe is slightly taller in order to make up for the deficit this causes in the engine's height.

The motor is fully enclosed within the die-cast-metal boiler. Gears turn the second and third set of drivers; the side rods transfer motion to the front set. The side rods aren't actually attached to the rear



The N scale model has slightly smaller than prototypical wheels in order to maintain prototypical axle spacing in spite of N scale's necessarily larger flanges.

PERFORMANCE CHARTS	
DRAWBAR PULL	.96 ounces 8 free-rolling N scale passenger cars
SCALE SPEED (DC)	
VOLTS	SCALE MPH
8	4.8
9	11
10	25
11	41
12	59
13.5 (max)	87
SCALE SPEED (DCC)	
SPEED STEP	SCALE MPH
1	8.6
7	54
14	91
21	106
28	106

drivers, but their ends move in tandem with the wheels' rotation. This allows more side-to-side play in the drivers so the locomotive can handle tighter radius curves. The center drivers are fitted with rubber traction tires.

A die-cast metal weight, speaker, printed circuit board, and decoder are stacked in the tender. Painted with stripes to match the Pennsy's Fleet of Modernism cars, it also has a molded coal load, wire grab irons, and a working, directional light-emitting-diode backup light.

Road test. The locomotive is equipped with a dual-mode SoundTraxx Econami DCC sound decoder. "Dual mode" means the locomotive can be controlled under either DCC or direct current. I first tested it under DC.

As I slowly increased the voltage to the rails, I heard the sound of the steam locomotive starting up at about 5.5V. When the voltage reached 8V, the bell

started ringing. With just a touch more voltage, the locomotive started rolling at 4.8 scale mph. The bell shut off after a few seconds. The engine chuffs were synchronized to the wheel revolutions. As I brought the locomotive to a stop, I heard the squeal of flanged wheels on steel rails. No other sounds were available under DC control.

The prototype ran at an average speed above 50 mph when pulling a full passenger train; when running light, it could hit close to 100 mph. Under DC control, the Bachmann model displayed a similar speed range. It reached 59 scale mph at 12V, and at 13.5V – the maximum voltage of the power pack I used for the test – it hit 87 scale mph. Though DCC sound decoders often have small useful operating ranges under DC, I found the range of Bachmann's model to be adequate.

More sounds were available under DCC control. I rang the bell (using function key 1), played the horn (F2 and F3), and triggered a blowdown (F10). Function F11 played a flange squeal, which also plays automatically when the throttle is quickly reduced. The side rod clanks also become more prominent as the locomotive slows.

I also tried Drifting Mode, which simulated the locomotive rolling down-grade. When I pressed F5 while the locomotive was running, the steam chuffs faded away, leaving only the sounds of the Walschaerts valve gear and side rods clanking. Function 6 brought the chuff sounds back. This is a feature that will likely see a lot of use on layouts set in the mountains of PRR's Lines East.

The locomotive's speed range was a bit speedier under DCC. At speed step 1, the locomotive started at 8.6 scale mph. I tried lowering the value of Configuration Variable 2, Vstart, to 0 to bring down this starting speed. I found, though, that CV2 was already set at 0, so I couldn't lower the starting speed.

The decoder's speed was on the high side throughout the speed curve. At speed step 7, the locomotive had already reached 54 scale mph, half the prototype's speed range and close to its top speed when pulling a full train. It reached 106 scale mph at speed step 21, the same as speed step 28, suggesting the locomotive's speed curve flattened out above speed step 21. I programmed CV5, Vmax, to a value of 120. This dropped

Facts & features

Price: \$475

Manufacturer

Bachmann Trains
1400 E. Erie Avenue
Philadelphia, PA 19124
www.bachmanntrains.com

Era: 1940 to 1950

Road numbers: 1120, 2665, 3678, 5338

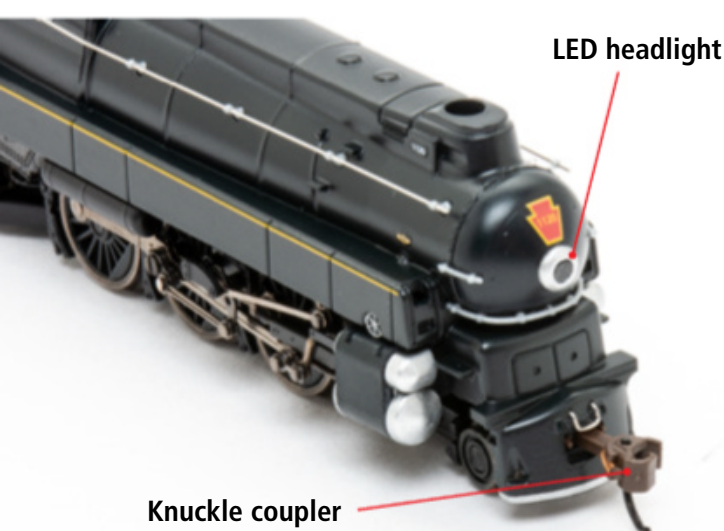
Features

- Blackened metal wheels, in gauge
- Die-cast metal boiler
- E-Z Mate Mark II couplers, mounted at correct height
- Light-emitting diode headlight and backup light (directional)
- Minimum radius: 9.75"
- SoundTraxx Econami Digital Command Control sound decoder
- Weight: Engine alone, 3.6 ounces; engine and tender, 4.7 ounces
- Wire handrails, grab irons, and coupler lift bars

the speed at step 28 to a much more realistic 88 scale mph, giving the locomotive a more useful range of operation. See the SoundTraxx website (soundtraxx.com) and navigate through the SUPPORT dropdown to the Econami manual to learn more about speed tables. I also programmed the decoder's long address to the cab number, 1120.

Our test bench force meter showed the locomotive could muster almost an ounce of drawbar pull, enough to handle a train of 8 free-rolling N scale passenger cars. I put the engine on our N scale Milwaukee, Racine & Troy State Line Route project layout for a real-world test. I hooked it up to a 13-car freight train and turned up the throttle. It had no problems pulling the train through the layout's 18" curves, no. 6 crossovers, and 1 percent grades.

A little gem. Bachmann's N scale streamlined K4s Pacific warms the heart of a Pennsy steam fan like me. It's a model as well engineered as it is accurate. If I modeled in N scale, I'd be looking for some PRR Fleet of Modernism coaches and observations so I could put it where it deserves to be, proudly at the head of the *Broadway Limited*. – Steven Otte, senior associate editor



The prototype streamlined Pennsylvania RR K4s had concealed, swing-away front couplers. The model has a standard knuckle coupler on the front.



Athearn Genesis 2.0 HO scale EMD SD70M-2

Athearn has released an upgraded version of its Electro-Motive Diesel (EMD) SD70M-2 in its Genesis 2.0 line. The HO scale model has new walkway variations; see-through etched-metal steps; and additional light-emitting diode lighting effects, including illuminated number boxes, ground lights, and marker lights (the latter on select Canadian National units).

Electro-Motive Diesel produced the 4,300hp SD70M-2 from 2005 to 2010. Though similar in appearance to the SD70ACe, the SD70M-2 is equipped with DC traction motors. By the end of the production run, just 331 of the six-axle road units were built. Original owners were Canadian National, CIT Group (EMD demonstrators), Florida East Coast (FEC), and Norfolk Southern.

Our sample is decorated as FEC no. 105, part of the railroad's 104 through 107 series built by EMD under order

number 20076923 in August 2008. The four units were painted in the red, white, and blue RailAmerica paint scheme. Four other FEC SD70M-2 diesels, 100 through 103, were built in 2006 and painted blue and yellow.

The arrival of 24 General Electric ES44C4 diesels in 2014 marked the end of the SD70M-2s on the FEC. The 100 through 107 were returned to the lessor. The 105 bounced between lease service and storage from 2015 to 2021.

In late 2021 the 105 and 107 were acquired by the Florida Gulf & Atlantic RR (FGAR), a 430-mile Class III line owned by RailUSA that operates in the Florida panhandle and southern Georgia. In 2022, the 105 was repainted red, white, and blue (sans pinstripes) with the FGAR herald on the long hood.

Athearn's EMD SD70M-2 features an injection-molded plastic body and die-cast metal underframe. The model has

Celcon handrails and stanchions, wire grab irons picked in yellow, metal lift rings and windshield wipers, and a cast brass five-chime air horn.

Rubber m.u. and trainline hoses, plastic uncoupling levers, and m.u. cables are on the front and rear pilots. The front pilot also has a snow plow, while the rear is fitted with spare Type E and F coupler knuckles.

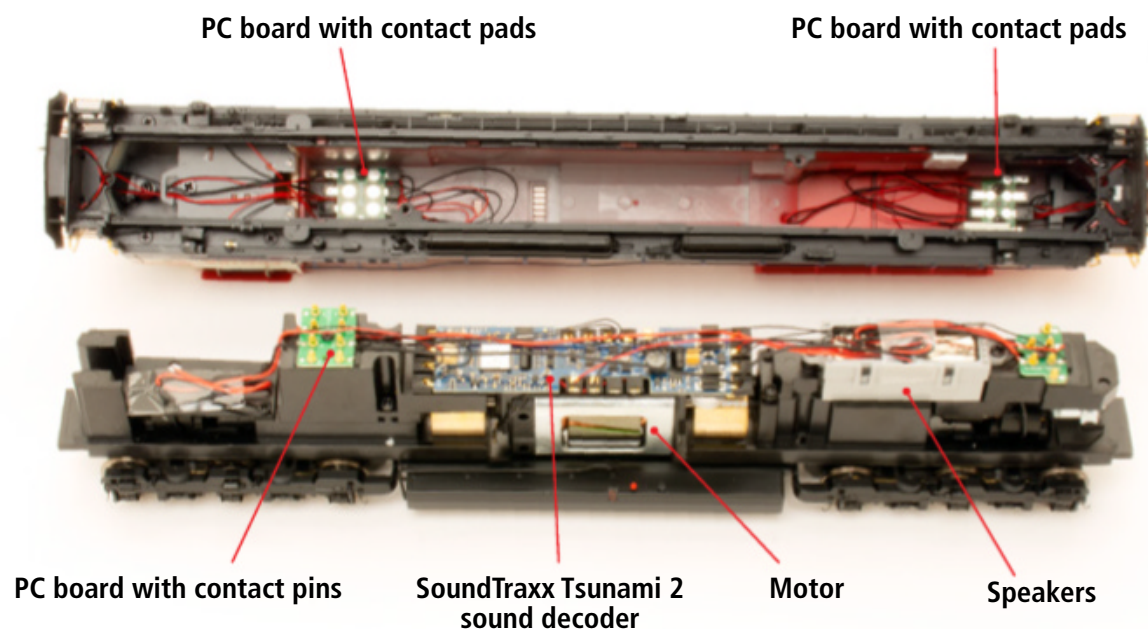
The FEC model has an isolated cab with a nose-mounted headlight. This is one of four cab styles Athearn offers on the model. The engineer's side of the cab has a small vent not found on the full-size 105. The RailAmerica logos on the front and back were on the prototype from late 2008 through early 2011.

While the front window glazing is clear, the glazing on the sides and rear of the cab is tinted. Additional cab details include wind deflectors, mirrors, and sunshades.

The cab roof, which on the FEC model has an antenna dome on top, is a separate piece secured with magnets. The cab interior consists of a floor, engineer's console and desk, control stand, conductor's console, three seats, a rear wall, and forward-facing camera. There are no crew figures.

The long hood is a multi-piece assembly. For example, the radiator housing consists of separate fans, radiator fan housings, fan rings, conduits, panels, and large lift rings. See-through etched-metal parts include the dynamic brake grills, air compressor compartment grill (conductor's side only), and rear door grills. The FEC model has a CN-style electrical cabinet behind the cab on the conductor's side.

Not to be overlooked are the underbody details. The model is equipped



The SoundTraxx Tsunami 2 sound decoder is located above the motor. Contact pins are aligned with contact pads screw-mounted to the underside of the shell.

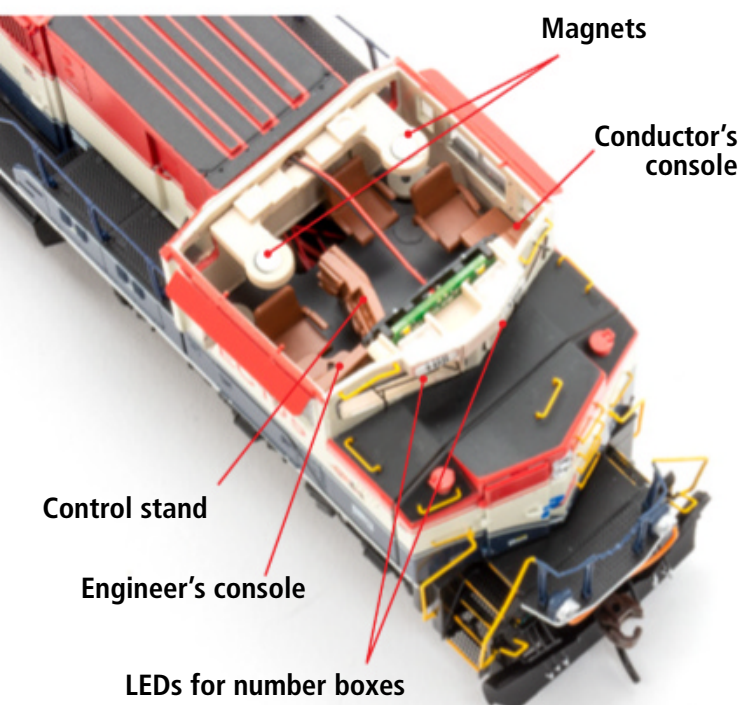
PERFORMANCE CHARTS	
DRAWBAR PULL	3.52 ounces 49 freight cars on straight, level track
SCALE SPEED (DC)	
VOLTS	SCALE MPH
8.6 (start)	1
9	2
10	15
11	25
12	27
13.2	47
SCALE SPEED (DCC)	
SPEED STEP	SCALE MPH
1	4
7	33
14	66
21	80
28	82

with HTCR-4 truck sideframes fitted with sand lines, brake cylinders, and shock struts.

The fuel tank is secured to the chassis with a single screw. Details on the tank include fillers, gauges, and breather pipes. Additional underbody parts include the frame rails, air tanks (engineer's side only), air filter, and electronic bell.

To separate the shell from the chassis, I removed the front and rear draft-gear boxes plus two additional screws, one on each end of the fuel tank. With no tethered wires, the shell slips right off.

Centered in the chassis is a Genesis five-pole skew-wound motor with two brass flywheels and a multi-link drive-train. The SoundTraxx Tsunami 2 sound decoder is clipped to a printed-circuit board mount above the motor.



The roof is secured with two magnets. Underneath is a detailed cab interior with a control stand, seats, consoles, a floor, and a rear wall.

Dual, downward-facing cube-type speakers are in a plastic housing over the rear truck. An injection-molded plastic no. 2 traction motor blower, visible through the dynamic brake grill, is located above the rear truck.

Two small printed-circuit (PC) boards with contact pins are attached to weights on the underframe. Corresponding contact pads are screw-mounted to the underside of the shell. Wires from the pads go to the LEDs for the headlights, ditch lights, and ground lights.

Our sample is painted in the short-lived FEC RailAmerica scheme. (Fortress Investment Group purchased FEC in 2007. The firm also controlled shortline operator RailAmerica. However, FEC wasn't a RailAmerica property.) There was some minor red overspray on the engineer's side number board. The front headlight housing should be red, as should the vertical faces on the raised frames around the radiator fans. The horizontal strip between the bottom of the radiator panels and top of the radiator section doors should also be red, not white.

The color separation lines were mainly crisp, with some minor distortion in the pinstripes passing through the handbrake recess. Warning label placement matched prototype photos I found online.

I compared the model to prototype drawings in the July/August 2007 issue of *Diesel Era* magazine. For the most part, the model's dimensions matched or were within scale inches of the published data. The calipers in our shop indicated the radiator fans were a scale 4" too tall.

The SD70M-2 we received is equipped with a dual-mode SoundTraxx Tsunami 2 sound decoder, so I tested it in both environments. For direct-current testing, I used an Athearn power pack. The sounds came on at 7V, which is typical of dual-mode models. At 8.6V the road locomotive ran at a 1 scale mph. The SD70M-2 topped out at 47 scale mph at 13.2V.

I turned to an NCE PowerCab for Digital Command Control (DCC) testing. At step 1, the unit moved at 4 scale mph. At step 28, the unit achieved a top speed of 82 scale mph. The full-size SD70M-2 has a top speed of 70 mph.

Facts & features

Price: Direct-current model with 21-pin NEM connector, \$249.98; with dual-mode SoundTraxx Tsunami 2 sound decoder, \$339.98

Manufacturer

Athearn Trains
2904 Research Rd.
Champaign, IL 61822
athearn.com

Era: Late 2008 to early 2011
(as decorated)

Road names: Florida East Coast (RailAmerica scheme), Canadian National (with 25th anniversary logo in one road number; red, white, and black scheme in two numbers; and Grand Trunk Western heritage unit in one number), Norfolk Southern (Thoroughbred scheme), Providence & Worcester (brown and orange, two numbers), and Vermont Ry. (red and white, two numbers). Three numbers per scheme unless noted.

Features

- All-wheel drive and electrical pickup
- Body-mounted McHenry scale couplers, at correct height
- Minimum radius, 18"; recommended radius, 22"
- Removable cab roof and detailed cab interior
- RP-25 contour metal wheels, in gauge
- Rubber m.u. and trainline hoses
- Weight: 1 pound, 3.1 ounces

The model tips the scales at 1 pound, 3.1 ounces and has a drawbar pull of 3.52 ounces. That's equivalent to 49 free-rolling freight cars on straight and level track.

For real world testing, I ran the SD70M-2 on our Milwaukee, Racine & Troy and Wisconsin & Southern layouts. The unit handled a mainline freight and industrial switching without any issues. The locomotive was able to muscle 11 50-foot boxcars up the curving 3 percent grade at Winter Hill.

The Athearn Genesis 2.0 EMD

SD70M-2 diesel is offered in a mix of paint schemes covering original and secondary owners. The detail-rich HO scale model is well-suited for those modeling contemporary Class I and regional railroads. — *Cody Grivno, senior editor*

Spring Mills Depot HO scale DOD flatcars



Spring Mills Depot has released its highly detailed modern era HO scale heavy-duty military flatcars. The cars come in multiple configurations and paint schemes to allow modelers to re-create train loads of war materiel.

These heavy-duty, steel-deck flatcars are designed to carry two M1 Abrams main battle tanks. These pieces of armor are too heavy to be carried by the Army's older flatcars, which were designed to carry M48 and M60 tanks.

Known as the 40000 series due to their DODX number series, these cars are 68 feet long on their decks and ride on six-wheel Buckeye trucks equipped with roller bearings.

The 40000s were built in multiple groups, with the first arriving in 1981, built in the shops of Fruit Growers Express. Cars built by Thrall entered the fleet in 1983, and were followed by two orders from Ortner, received in 1985. The final order came from General Railway Equipment in 1987. Similar buffer cars for use in trains hauling nuclear flasks were built by GRE in 1992. They're numbered in the 39000 series and have flat steel decks.

Spring Mills Depot's models carry a ridiculous amount of detail, including metal grab irons and brake pipes, and separately applied brake rigging. There are also multiple variations of each car, which isn't a surprise when you consider Spring Mills Depot is a veteran-owned business that knows the subject matter.

Our two samples were an Ortner transport car and an GRE buffer car. The transport car was painted in the urethane green scheme. It's a sort of light olive drab that first appeared in 1996. This model has raised deck numbers simulating the welded-on deck position numbers added by the DoD when the painted-on numbers wore off.

Other specific details include the three sets of four tie-down channels (FGE cars have six channels at each end and four running through the center of the car); the straight sides of the Thrall, Ortner, and GRE cars; and trucks "pointed" away from the B end of the car.

All painting was smooth and opaque, and the lettering was clear, sharp, and legible. The transport cars include a set of container cleats with instructions for installing them. Spring Mills Depot also offers Conex, Tricon, and Quadcon containers in a three pack for \$49.95, and a set of 20 tie-down chains for \$39.95.

Both of our samples, the transport car and a GRE buffer car, weighed 4.7 ounces, about .5 ounces less than the National Model Railroad Association Recommended Practice (RP) 20.1 of 5.25 ounces. The Kadee metal knuckle couplers were mounted at the correct height, although the trip pin on one coupler was slightly low. The turned metal 36" wheelsets are factory-painted with a weathered metal finish on both wheel faces and the plastic axles. On each car, one of the center sets of wheels was slightly tight in gauge. It should be a simple matter to twist them open.

Facts & features

Price: \$64.95

Manufacturer

Spring Mills Depot
P.O. Box 1616
Spring Mills, MD 21158
www.springmillsdepot.com

Era: 1981 to present, depending on paint scheme

Road names: DODX Buffer Car (olive green), DODX Buffer Car (urethane green), DODX Navy Material Car (silver), and DODX Transport Flat Car (olive green, urethane green, or cascade green). All available in multiple road numbers. Transport cars available unnumbered with decals for side numbers, sill numbers, various build dates, and COTS.

Features

- Factory-weathered, turned metal wheelsets, in gauge except one axle
- Kadee metal knuckle couplers, at correct height
- Modeler-applied container cleats on transport cars
- Multiple prototype-specific details
- Two frame styles
- Weight: 4.7 ounces, about .5 ounces less than NMRA RP 20.1

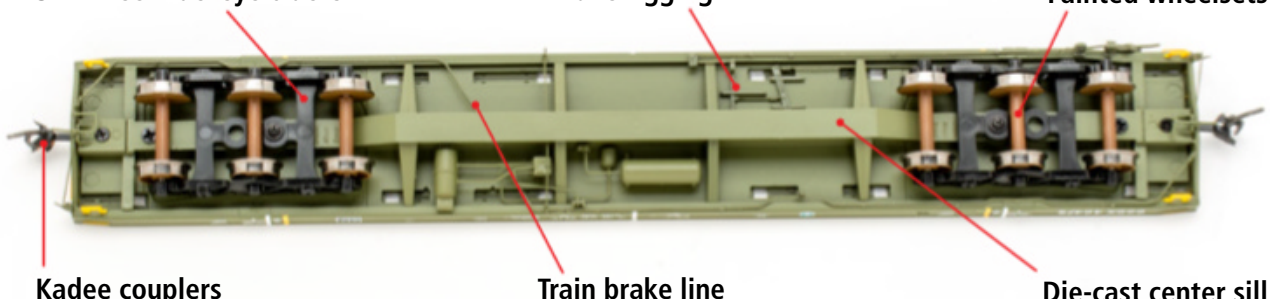
The cars are free-rolling, but prefer wider radius curves. I took the cars to the recently completed Jones Island section of the Milwaukee, Racine & Troy staff layout, where the cars were able to traverse the 27" radius curved viaduct that leads onto the island. A no. 7 curved turnout created a bit of bind through the diverging route. The cars had no trouble with the no. 6 ladders in the yard.

Solid trains of military equipment can appear anywhere in the country. If you want to model this traffic on your layout set any time after the M1 Abrams tank was adopted, you need these cars. – *Eric White, editor*

Six-wheel Buckeye trucks

Brake rigging

Painted wheelsets



Kadee couplers

Train brake line

Die-cast center sill

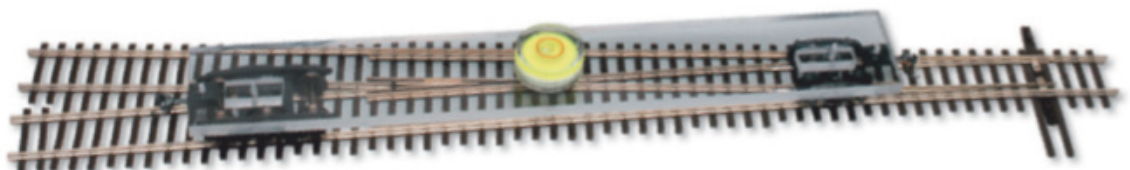
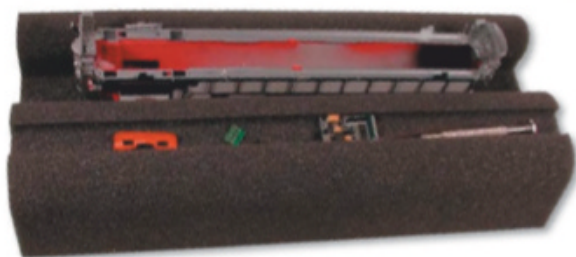
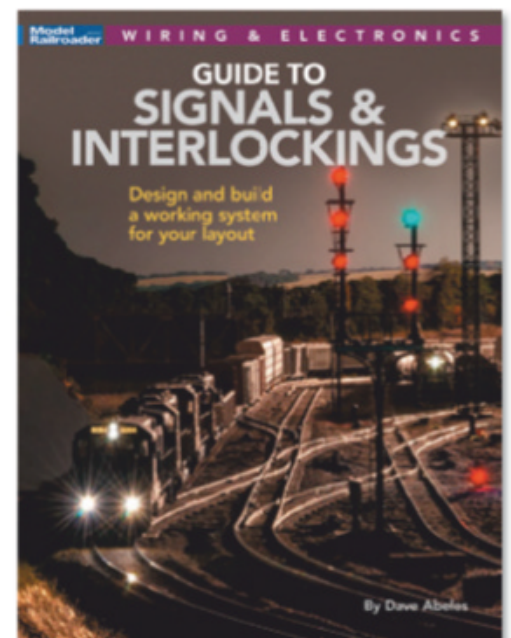
The Spring Mills Depot DODX 40000 heavy-duty flatcar has a die-cast metal center sill. Complete brake piping and rigging is installed on the underbody.

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The station agent

Summertime saw me visit my hometown station during open hours. After inspecting the team track and its loading platform, I edged into the waiting room. It was refreshingly cool, scented with a faint woody mustiness. A tidy cabinet of cardstock blanks flanked the ticket window beside an open door from which a typewriter clattered. A casual “hello” when it paused could produce an invitation to come in.

Official-looking papers stuffed cubbyholes surrounding the agent’s desk. A circular rubber stamp holder and shelves of thick books that I learned were tariffs were at his fingertips. We’d visit a little, sometimes interrupted when he copied a train order or message and rushed trackside to deliver it.

An agent was a railroad’s commercial representative at a location. An operator was devoted to railroad operation, in communication with a dispatcher, reporting the time trains passed (“OS-ing”) and concerned with a block system or train orders. An agent operator handled all these responsibilities.

These jobs are rich in detail, some of which layout operation can imitate.

The operator’s job translates readily. Most layouts use a “system” operator, a single person who covers multiple stations from a central location. He’ll copy train orders dictated by the dispatcher and then display train order signals at the stations at

which the orders will be delivered. The signal can be the familiar semaphore type or a color light signal, manually operated or remote-controlled, but it needs no more than a simple red push pin displayed near the station involved. The order can be hung on the fascia there; instead, the crew could report to the operator’s desk to receive the order.

A prototype operator OS’d after observing a train’s passage and recording its time. Typical layout practice has a crew play the operator’s role, OS-ing to the dispatcher by phone or radio. Some layouts have crews give times to the system operator for relay to the dispatcher. Either way, “OS Middletown” (the station name) alerts the dispatcher, who replies “OS.” “Extra 53 west by at 1254 p.m.”

Much agent work is invisible to modelers. The agent collected bills of lading and prepared waybills. He collected freight charges, if not prepaid by a shipper. He phoned customers to advise them of incoming shipments and receive instructions for

placement, especially where a business unloaded at more than one location. He also received requests from customers for empty cars for loading and relayed them to the railroad’s car distributor.

One duty more interesting to modelers was a daily “yard check,” an inspection of all the yard and industry tracks a station served. The agent recorded each



Longtime Milwaukee Road agent Al Paske works at his Brookfield, Wis., desk in the early 1980s, surrounded by the tools of his trade. Jerrold F. Hilton photo

car’s reporting marks and number and its condition, loaded or empty. This information helped produce a drill slip (switch list) for the local that described the necessary switching.

Many layouts see a form of yard check. Mine takes place before an operating session. I change waybills to give new destinations for cars to be moved and prepare drill slips for the local crews involved.

Two Erie-Lackawanna sources described duties like those above. Don Wallworth’s unpublished manuscript added housekeeping responsibility: cleaning windows and toilets, sweeping floors, and stoking the pot-bellied coal stove. I can imagine him rubbing his hands after unlocking the door and checking if the stove was still warm. He would poke a hole in the bank he left the night

before, watch for yellow flame to start licking through, and stand back in case the fire erupted with enough force to blow open the upper door or lift the lids in the stove top. As amusing as this might be, I suppose most modelers would choose a refrigerator for the layout room, not a stove.

Dennis Yachechak started his career as a relief agent in 1964, working a variety of agencies in northern New Jersey. This had more appeal to him than railroad operation because he learned about the business of railroading – ticket sales, freight customers, drill orders – in his words, “where the money came from.” While I’ve yet to see a model railroad where money came from anyone but its owner, depicting elements of railroad business like these makes layout operation more convincing. **MR**



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Atchison, Topeka & Santa Fe 2-8-2 Mikado no. 4089 leads Extra 4089 West through the Arizona desert on its way to Flagstaff, Ariz. The action takes place on Tom Thompson's HO scale Albuquerque Division Third District layout. Tom weathered the Broadway Limited Imports locomotive with Premier Prismacolor pencils and Pan Pastels. The rocks are made from Bragdon Enterprises and Cripplebush Valley products. Tom also took the photo.

Reading Co. no. 3675, an Electro-Motive Division GP40-2, leads westbound train HN-23 out of Buck Mountain Tunnel. John Shucavage of Tamaqua, Pa., detailed and weathered the Atlas model and photographed it on Jim Hertzog's Shamokin Division layout. Jim's layout was last featured in *Model Railroader* in May 2022.



Two General Electric ES44AC diesel locomotives head up a Union Pacific manifest freight across the Wyoming prairies. Dave Easto photographed the scene on an N scale layout he built to test model photographic techniques. The locomotives are Kato models; the freight cars are from Atlas, with weathering with Humbrol paints and Mig powders. The scenery is static grass and Woodland Scenics ground foam.



Great Northern 2-8-0 Consolidation

no. 1147 departs after spotting boxcars at the Washington Farmers Co-Op Association Granary in Bellingham, Wash. The waterfront industry has been recently rebuilt into a multi-use facility. Herb Ershig of Bellingham scratchbuilt the HO scale structure. The locomotive is a Broadway Limited Imports model.

Mark Turner photo

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Schedule of Events

AR, CONWAY: Central Arkansas Train & Hobby Show. Conway Expo Center, 2505 E. Oak Street, Conway, AR 72032. August 27-28, 9:00am - 4:00pm. Vendors, Layouts, Contests. Admission \$8.00, 12 and under free. Contact RAIL & SPRUE Hobbies, 1200 John Harden Drive, Jacksonville, AR 72076. 501-982-6836, or railandsprue@aol.com

CA, SACRAMENTO: TTOS-Sacramento Valley Division River City Toy Train Show. Scottish Rite Masonic Center, 6151 H Street, Sacramento, CA 95819. Saturday, October 1, 2022, 10am-3pm. Admission \$5.00, children 12 and under FREE w/paid adult. Buy/Sell/Trade, operating layouts, free parking, food. Drawing for kids w/paid adult (must be present to win). Contact: Bryan Stanton at brsta@comcast.net

CA, TULARE: TRAIN, TOY, & MODEL KIT SHOW at the International Agri-Center, 4500 S. Laspina St., Tulare, CA 93274 (on Route 99). November 12-13, 2022. Both days, 10am-4pm. Admission: \$10 per person; \$15 per family with FREE parking. Up to 300 selling tables plus operating train layouts. Questions: send email to TulareTTMShow@gmail.com

FL, BROOKSVILLE: Regal Railways presents Toy Trains & Hobby Show. Hernando Fairgrounds, 6436 Broad St., Brooksville, FL 34601. Saturday, September 10, 2022. 9:00am-2:00pm. Admission: \$5.00 adults, children under 12 free. Vendors and operating layouts. Contact: Joe at 727-244-1341 or visit: www.regalrailways.com for more information.

FL, PINELLAS PARK: HR Trains & Toys, Inc., presents the 74th (original) Train Show. October 22 & 23, 2022. Both days, 10am-5pm. 7900 49th St. N., Zip: 33781. Free parking in adjoining Pinellas Park Performing Arts Center lot. All scale sizes. Vintage trains, trains for kids, and toys! Competition ribbons/prizes awarded for best layouts! 727-526-4682, www.HRTrains.com

GA, ATLANTA: Scott Antique Markets (featuring Anton's Antique Toy & Train Show), September 8 - 11, 2022. Atlanta Exposition Center, 3650 & 3850 Jonesboro Rd., Atlanta, GA 30354. Thursday: 10:45am-6pm, Friday & Saturday: 9am-6pm, Sunday: 10am-4pm. Admission \$5, good all weekend. Contact: Anton 937-397-3499, or email: tweissmann6@gmail.com

IA, DELMAR: Delmar Train Show & Swap Meet. Sunday, September 4, 2022. 10am-4pm. Delwood School Gym, 311 Delmar Avenue, Delmar, IA 52037. Admission: Free Will Donation. Free tours of Delmar Railroad Museum. Vendor tables: \$15 each (limit 10 tables per vendor). Food & drink available. Free parking/handicapped accessible. Information: sjebsen@fbcom.net

IA, ELKADER: 10th Annual Elkader Model Train Show-Swap Meet. Sunday, August 21, 2022. 10:00am-3:30pm. Johnson's Reception Hall, 910 High Street. Adults \$5, children 6-12 \$2, under 5 FREE. Free parking, lunch-stand and door prizes. Information: Larry Lerch, 563-880-2066 or 563-245-3345

IN, FLORA: Depot Day Festival Model Train Show. Saturday, September 24, 2022, 11am-5pm. Flora Community Park, 4H Exhibit Building, 102 N. Fourth Street, Flora, IN 46929. Enjoy the authentic model train layouts brought to you by members of Central Indiana N-Trak and Central Indiana Division/National Model Railroad Association. For more information, visit: www.floraindianadepot.org

IN, INDIANAPOLIS: Central Indiana Division/NMRA announces the Franklin Train Show at the Johnson County Fairgrounds, 250 Fairground St., Franklin, IN 46131. August 27-28, 2022. Saturday 10am-4pm, Sunday 10am-3pm. Admission \$3, Family \$5. Demos, Displays, Operating Layouts, Door Prizes, Free Parking, Food available. Info/table rental: Michael Roderick, 317-833-3556, FranklinTrainShow@hotmail.com or www.cidnmra.org

MA, TAUNTON: OLD COLONY MODEL RAILROAD CLUB 22nd ANNUAL MODEL RAILROAD SHOW. Clarion Hotel (former Holiday Inn), 700 Myles Standish Blvd., Taunton, MA 02780. Route 495, Exit 25. Sunday, September 18, 2022, 10:00am-3:30pm. Adults \$5.00, children under 12 & scouts in uniform FREE. Contact Dennis Ingalls, 508-558-9883, email: dingalls@comcast.net

NJ, BRICK: ECTP and Collectibles LLC presents The Brick Train Show. Elks Lodge, 2491 Hooper Avenue, Brick, NJ 08723. Sunday, August 21, 2022, 9:00am-2:00pm. Admission: \$7.00; under 12 free with adult. John LaLima 732-845-5966. Go to www.eastcoasttrainparts.com and click on The Brick Show.

NY, HAMBURG: TCA Upstate NY Chapter Fall Train Meet! St Mary's of the Lake Church School Hall, 4737 Lakeshore Rd (Rt 5), Hamburg, NY 14075. Saturday, September 17, 2022. TCA Members: 9:00am. General Public: 9:30am-2:30pm. Admission: TCA Members, free. Non-members, \$5.00, children 12-17, \$3.00, under 12 free w/ paid adult. Contact: Bob 716-440-3156, Email: tca.upstatenychapter.events@gmail.com

OH, FOSTORIA: 20th Fostoria Rail Festival, 1001 Park Avenue, Fostoria, OH 44830. Saturday, September 24, 2022, 10:00am-4:00pm. Admission: \$5.00, children 10 and under free w/adult. Information: Fostoria Rail Preservation Society, 419-435-1781, EllenGatrell@gmail.com, www.FostorialronTriangle.com, Fostoria Rail Park Facebook

TX, AUSTIN: Austin Train Show. Over 25,000 sq.ft. of railroading fun for the whole family! Palmer Events Center, 900 Barton Springs Road, Austin, TX. August 27-28, 2022. Saturday 10am-5pm, Sunday 10am-4pm. Admission \$8 (includes both days), 12 and under FREE w/adult. Vendors, model and Lego railroads, clinics, home layout tour included. For more information visit: austintrainshow.org

WA, BATTLE GROUND: Southwest Washington Model Railroaders, Great Train Swap Meet. Battle Ground High School Gymnasium, 300 W. Main St., Battle Ground, WA 98604. Saturday, September 24th, 9:30am-2:30pm. \$10.00 Beat-the-Crowd (9:00am), Adults \$5.00, Students \$3.00, under 6 FREE with adult. Free parking. Vendor tables \$25.00. Contact Larry: 360-619-8899, Larry.sprekel@gmail.com

WA, CHEHALIS: Lewis County Model Railroad Club, Annual Fall Train Show and Swap Meet. Southwest Washington Fair Grounds, Blue Pavilion Building, 2555 N. National Ave., Chehalis, WA 98532. October 8-9, 2022. Saturday 10:00am-4:00pm and Sunday 10:00am-2:00pm. Admission \$5.00. Free parking. Contact information: Ted, 360-985-7788 or TedsTrains@LewisCounty.com

WA, KELSO: LK&R MRR Club Train Show and Swap Meet. Saturday, September 10, 2022, 10am-3pm. Admission: \$5.00. Three Rivers Mall, Kelso, WA. Interstate 5, Exit 39, southwest corner. Over 150 tables. Information for vendors and guests, see our web site at: http://lkrtrains.yolasite.com or contact Kerry King 360-431-3992, email: lkrtrains@gmail.com

WA, SPOKANE: River City Modelers Fall Model Train Show, Spokane Fairgrounds, 404 N. Havana. Sunday, October 9, 2022, 9:30am-3:30pm. Admission: adults \$6, 12 & under free. 200+ tables of Railroad related items for sale, operating layouts, Free-MO, Operation Lifesaver & more. Free Parking. For table rental or general info, contact: Shirley Sample, 509-991-2317 or shirley@busnws.com

WI, MONROE: Green County Model Railroaders 44th Annual Model Train Show & Swap Meet. The Stateline Ice and Community Expo, 1632 4th Avenue West, Monroe, WI 53566. September 24-25, 2022. Saturday & Sunday, 10am-4pm. For information contact Kevin Johnson, 608-558-9332, or visit www.gcmrrinc.org

CANADA-ON, KITCHENER-WATERLOO: Sunday, September 18, 2022. BRESLAU TRAIN SHOW hosted by WOD-NMRA. Manufacturers, vendors, and operating layouts. 8,000+ sq.ft. of space. Preview: https://youtu.be/B2iMihfR0GE Ample free parking. Door prizes. Breslau Community Centre, 100 Andover Drive, Breslau, ON. 10am-3pm. Admission: Children under 12 FREE; General - \$5.00; NMRA members - \$4.00. TrainShow@wod-nmra.ca

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

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Asking 'stupid' questions



A new shelf in the Charleston, Ill., yard alcove will provide a place for the yardmaster to sort waybills and temporarily hold other paperwork. Its installation was prompted by an inquiry from an operator. Tony Koester photo

I once hosted an operating session on a weekend that had a lot of activities that competed for crew members. I therefore went to the Extra Board, and an experienced operator happened to be visiting one of my regular crew who could attend. We therefore wound up with four “boomers.”

All but one of them had attended a previous NKP session, but none of them was intimately familiar with the regular operations of the St. Louis Division. And that was good.

It's easy for a host to assume all is well when in fact there are a lot of loose ends. They fail to come to the host's attention because the regular crew knows about them and has devised workarounds. Then along comes a boomer who hasn't a clue about how something is supposed to work. That's when I hear my name called.

Even some of my regular crew are “Philadelphia lawyers.” They question everything that isn't spelled out in black and white on a Train Description Card or some other piece of paperwork that is supposed to tell them what they and their train are supposed to be doing.

I just finished updating the instructions for my through and fast freights based on a conversation I had with Ted Pamperin. Ted lives nearby and hosts op sessions on his Chesapeake & Ohio, which is set in West Virginia during World War II when traffic was frightfully high (see *Great Model Railroads 2022*). Ted therefore sees the need for clear instructions from both sides of the fence: as a layout owner and as one of my experienced crewmembers. His counsel is therefore worth very careful consideration.

In this case, he pointed out that the instructions for the

freight he was operating stated that “work en-route” could entail a message from the yardmaster or dispatcher (via an operator), or it could be up to his own initiative. For example, the Third Subdivision's sole local, No. 45, should not work interchanges except to retrieve cars to be spotted locally (another example of a poorly worded instruction I corrected at Ted's behest). Interchange traffic often contains “hot” cars, so having the local drag them along for up to 16 hours isn't a good idea.

Instead, through freights, and occasionally fast freights, work the interchanges. Since there isn't always an agent at each town to ensure this work is done (each of

the two agent-operators has to cover four depots/towers, which aren't always “open”), some initiative on the part of the crews is required. The instructions said that the through freight crews might have cars to set out at interchanges, but they were moot about picking up interchange cars.

This ambiguity generates the sort of “stupid question” that a visiting operator would typically ask. Of course they'd make the pickup, I assumed. But the boomer would be puzzled and probably not do anything to avoid making what he or she perceived to be an even bigger mistake: “Who picked up those cars for MB-98?” I don't know about you, but I really hate to be called out by someone in a loud voice.

I keep a small notebook handy during operating sessions, and I usually wind up with a list of things to do before the next session. Some are new ideas that will enhance operations. Example: Neighbor Perry Squier pinch-hit for the usual yardmaster at Charleston, Ill. “What about adding a shelf to hold waybills being sorted?” he asked. It bugs me when folks put things on the railroad,

and I'm sure it bugs them when they are provided no other place to sort waybills.

There are indeed no stupid questions; to the questioner, it's needed information. And we “experts” will often learn something by finding out what prompted the question. 



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