

EXPERT TIP: SCALE-LOOK SWITCH RODS p.27



New Atlas S4 diesel tested p.13

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Big layout fulfills big dreams

Visit this museum model packed with inspiring scenes of western Pennsylvania railroading p.36

Paper skyscrapers dominate Easy technique yields realistic results

p.48

PLUS

Build a camera car p.32

Track plan for a spare bedroom p.44

Protect a lift gate automatically p.58

The HO scale Mon Valley rolls over the Keystone Viaduct on the WPMRR layout. See p.36

\$7.99



Vol. 90 • Issue 12

Windy City



Classics

F40PHM-2 LOCOMOTIVE



**HO
SCALE**



3D CAD renders and art are subject to revision before final production.



HEP E9 LOCOMOTIVES



Photo by Bruce C. Nelson. Courtesy of the Kevin EuDaly collection.

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Getting out and getting under



On the cover: A Mon-Valley F unit leads a passenger train over Keystone Viaduct on the 40 x 100-foot WPMRM club layout. Forrest Nace photo



Next issue

January's 90th anniversary issue is packed with features! Meet our latest project railroad, visit two layouts, map out a route, build palm trees, model a circus train, and more!

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N SCALE CODE 80: N-7 TWICE AROUND VIA "UP AND OVER"

From Book #6: Introduction to N Scale Model Railroading

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N Scale Item #11007

Products Required: Straight sections, radius sections, turnouts, a crossing, bumpers, insulated joiners and terminal joiners, necessary electrical components

If you enjoy watching a long train work its way up and down the grades of a long winding main line, the N7 is the layout for you. On this layout, yard tracks are available for breaking up and storing long trains, and a passing track with two industry spurs is available to provide additional operating diversions.

HO CODE 80/100: HO-7 THE JUNIOR PRETZEL

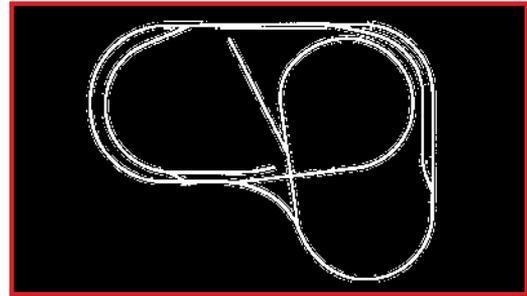
From Book #9: Beginner's Guide to HO Model Railroading

Minimum Table Size Required: 6' x 8'

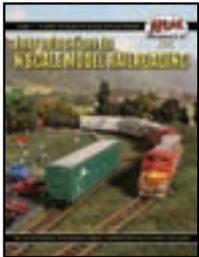
Code 83 Item #10007-83, Code 100 Item #10007

Products Required: Straight sections, radius sections, Snap-Switches, rerailers, terminal sections, a crossing, bumpers, rail joiners and the necessary electrical components

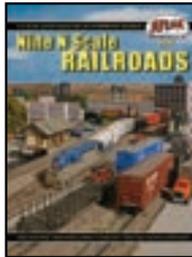
Since it is built on an extended platform, there are many possibilities with the HO-7; such as longer runs, longer trains and more realistic operations.



Books & Instructional Guides



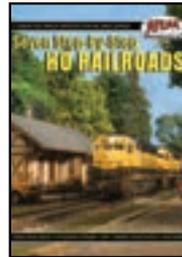
Item #6: Introduction to N Scale Model Railroading



Item #7: Nine N Scale Railroads



Item #11: Atlas HO Layouts For Every Space



Item #13: Seven Step-by-Step HO Railroads



Item #12: The Complete Atlas Wiring Book



Item #360/361: N or HO Track Planning Templates

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Atlas Track Planning Software 3-D viewer



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Built by Others: the MT&W

Grant Graeber was an armchair modeler for almost six decades until he finally decided that it was time to roll up his sleeves and build a layout. His inspiration? The Black River Junction project layout, built by *Model Railroader* staff, that graced these very pages in 2007. By modifying the track plan the way he wanted and adding a second extension, he completed a layout he loves to operate. The Black River Junction was our layout, and the Miserable, Tired & Weary is his!



Meet Allan Gartner

You know his name from the monthly DCC Currents column, but do you know that he's built multiple model railroads, including an outdoor garden layout? With this month being the his last installment of the monthly column, it's time to get to know the man who knows so much about DCC and electronics. How did he get into the hobby? Is he also an artist and airbrush master? What do his previous layouts look like? The answers to those and so much more are only found on Trains.com.

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Yes, there are still trains under the tree

Every issue of *Model Railroader* has one or two layout visit stories where we take readers into another model railroader's home to see what he or she has been building.

Often, these stories start with the line "My first train was a Lionel loop of track under the Christmas tree." Many of us soon realized there was one too many rails on those Lionel tracks (if you grew up in an American Flyer family, this wouldn't have been an issue), and we started looking around for something that better represented what we saw out in the real world.

While I was introduced to miniature trains through my father's Lionel set, my first trains came in the form of a Tyco set with a pair of Santa Fe F units, one powered and one a dummy. A family friend soon suggested an upgrade, and my first Athearn locomotive, a Santa

Fe SD45, was soon at work, which led to a request for a more permanent home for my trains and a series of basement train layouts.

Since my youth, I've always associated late fall with trains, both full-sized and models. When I was a child, crisp late November and early December days were the time we'd go ride the Santa train on the New Hope & Ivyland RR or look for local model railroad clubs that were hosting open houses.

As I said last month in this space, the Pacific Southern layout, which we featured in the November issue, was the first club I visited. But there were others, including the North Penn club in Lansdale, Pa., and the Logan Southern club in Souderton, Pa. (neither of which are still around), as well as the Cheltenham Hills Model Railroad Club, which

makes its home in a former Reading Co. freight house in Elkins Park, Pa., and the Gatsme Model Railroad Club at the Rockledge Model Railroad Museum in Rockledge, Pa. If you're in the Pittsburgh area, you can add the Western Pennsylvania Model Railroad Museum, this month's cover story, to your open house tours.

Autumn is also the time model railroad operating sessions start up again. As I write this in early October, I've just returned from my first trip to MinnRail in the Minneapolis/St. Paul area. I hope to have a story on Rich Remiarz's Great Northern Willmar Division before too long. It was also impressive to see and operate on Jeff Otto's Missabe Northern, with its two huge ore docks. Between those two sessions, Russ Nyquist let me sort ore on his



Soo Line Ashland Division, and Dave Zuhn's model of the State Belt Ry. in San Francisco took me back to the Bay Area.

Other trips are planned for later in the fall, and I'll be sure to share where we've been. But in the end, it will be good to get back home with the family, where there will certainly be a train running around under the tree.

Model Railroader

Model railroading is fun!

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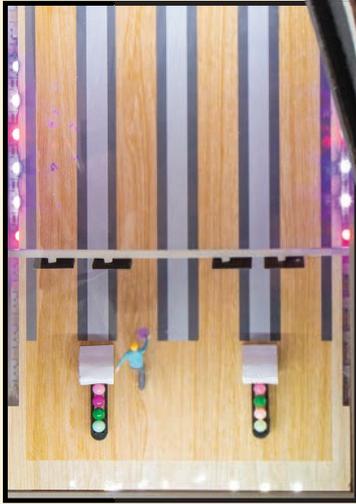
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HO scale



Alco RS11 diesel locomotive. This HO scale model was one of several items on display at the Rapido Trains booth at the 2023 National Train Show in Grapevine, Texas. The locomotive is offered decorated for Duluth, Winnipeg & Pacific; Burlington Northern; Central Vermont; Delaware & Hudson; Maine Central; New York Central; Nickel Plate Road; Portland

Terminal; Northern Pacific; and Seaboard Air Line. The RS11 features newly tooled roadname-specific details, full underbody piping, and a new 5-pole, skew-wound motor. Direct-current models are \$225, while models featuring an ESU LokSound sound decoder sell for \$335. Rapido Trains Inc., 905-474-3314, rapidotrains.com

Train shows are bigger in Texas

The 2023 National Train Show in Grapevine, Texas, was the first National Train Show that I've attended, and it sure was big. The three-day event was held in August at the Gaylord Texan Resort and Convention Center in the Dallas-Fort Worth metropolitan area.

Lining the show floor were a wide assortment of manufacturers, vendors, and operating layouts. ScaleTrains even brought its Road Trip RV onto the convention center floor. The company also announced the newest Museum Quality line locomotive, the HO scale SD45X.

Atlas announced that it's entering the Z scale freight car market with the Evans 53-foot double-plug-door boxcar, which you can read about below.

Rapido Trains had a plethora of pre-production and production models on display, including the HO scale Alco RS11 road switcher (above) and C-40-3 caboose (opposite).

Speaking of pre-production displays, PIKO America showcased its new Krauss-Maffei ML-4000 diesel-hydraulic locomotive. The model features many intricate details.

2023 was also a year of innovation at the National Train Show. Jacksonville Terminal Co. had a 3-D printed version of its newly-designed Very Real Knuckle Coupler (page 12), a brand new coupler system for the N scale market. SoundTraxx announced its PNP board replacement version of the popular Blunami decoder, and Logic Rail showed off its Woodland Scenics JustPlug-compatible lighting effect board.

The 2023 National Train Show highlighted some exciting times for the hobby. – Bryson Sleppy, associate editor

Atlas enters Z scale freight car market

In late August 2023, Atlas Model Railroad Co. announced that it is entering the Z scale freight car market. The company's debut car will be the Evans 53-foot double-plug-door boxcar, which it also offers in N, HO, and O scales. The Master Line model is scheduled for release in the second quarter of 2024.

Road names in the first run of Z scale models will include British Columbia

Ry., Burlington Northern, Mountain Pine Lumber, Northwest Hardwoods, Union Pacific, and Wisconsin Central. Each road name will be offered in two road numbers.

Features on the newly tooled boxcar will include a die-cast metal underframe, metal wheels, and knuckle-style couplers. The manufacturer's suggested retail price for the boxcar is \$29.95.



British Columbia Ry. is one of six paint schemes Atlas will be offering on its first run of Evans 53-foot double-plug-door boxcars. The Master Line model is scheduled for release in the second quarter of 2024.

Club offerings



- **Association of American Railroads 40-foot steel boxcar.** Accurail HO scale injection-molded plastic kit produced for the Kankakee Model Railroad Club. Decorated for Florence Stove Co. Available in two road numbers. Single car kit, \$30. Assembled with Kadee couplers, \$35. Add \$6 postage. Kankakee Model Railroad Club, 197 S. East Ave., Kankakee, IL 60901



- **Various HO scale Accurail kits.** Ford Stampings Car 50-foot welded-side double-door boxcar; Grand Trunk Pacific 40-foot steel gondola; and Copper Range United States Railroad Administration hopper. One road number per scheme (renumbering decals available). Single boxcar, \$27.98; single gondola or hopper, \$22.98. Shipping \$8.55 (one car) or \$10.35 (multiple cars); \$23.40 for foreign orders of any size. Illini Chapter PCS, 918 W. Coalfax St., Palatine, IL 60067

HO scale locomotives



- **Electro-Motive Division SD39 and SD38 diesel locomotives.** SD39: Minneapolis, Northfield & Southern; Atchison, Topeka & Santa Fe; and Southern Pacific. SD38: Cargill, Conrail, GATX Locomotive Group, McCloud River, and Norfolk Southern. One to three road numbers per scheme. Direct-current model, \$169.99; with DCC and sound, \$239.99. Add \$10 for Primed for Grime. Athearn Trains, 800-338-4639, athearn.com

HO scale



- **Pullman-Standard 40-foot Mini Hy-Cube boxcar.** The Kalmbach Hobby Store recently released its newest piece of exclusive Milwaukee, Racine & Troy rolling stock. The HO scale Pullman-Standard 40-foot Mini Hy-Cube boxcar (**\$54.95**) is offered in two road numbers, both painted Santa Fe Red. The model features separate, factory-applied ladders and stirrup steps; see-through crossover platforms; wire grab irons; and etched-metal uncoupling levers. The boxcar, produced by Tangent Scale Models, is available from the Kalmbach Hobby Store, KalmbachHobbyStore.com



- **Electro-Motive Division SD45X diesel locomotive.** Southern Pacific and EMD Demonstrator. One to three road numbers per scheme. Light-emitting diode ground, walkway, tricolor front class, cab interior, control stand, number box, and beacon lights. Detailed cab interior with separate floor, seats, standard control stand, and sliding cab windows. Detailed Rockwell-cast HT-C truck frames. Direct-current model, \$279.99; with DCC and sound, \$379.99. Museum Quality line. ScaleTrains, 844-987-2467, scaletrains.com



- **Krauss-Maffei ML-4000 diesel hydraulic locomotive.** Southern Pacific. Three road numbers available. Separate, factory-applied grab irons and ladders. Prototype-specific light-emitting-diode lighting. See-through radiator grills with fan detail. Clear window glazing. Available with RP-25 contoured wheels

or for 3-rail HO scale. Direct-current model, \$269.99; with DCC and sound, \$389.99. Add \$10 for 3-rail. PIKO America LLC, piko-america.com

HO scale rolling stock



- **Southern Pacific C-40-3 offset-cupola caboose.** Sierra RR, Southern Pacific, and Texas & New Orleans. Multiple road numbers available. Era-specific window styles and roofwalk configuration. Light-emitting diode interior lighting and roof marker lights as appropriate. \$119.95. Rapido Trains Inc., 905-474-3314, rapidotrains.com



- **Chicago, Burlington & Quincy wide-cupola caboose.** Burlington Northern; Chicago, Burlington & Quincy; and Fort Worth & Denver. One or three road numbers per scheme. Road number-specific details including see-through end platforms and steps,

N scale



National Steel Car 73-foot centerbeam flatcar. Rapido's wood-hauling flatcar model is a new addition to its N scale rolling stock line. The car is available painted for TTX, BC Rail, BNSF Ry., Canadian National, CP Rail, Mississippi Delta, and Northwestern Oklahoma. Each scheme is offered as one single car and a six-pack. The N scale model features road-specific top truss, deck, and underbody configurations as well as multiple brake stand options and truck types. Single cars are **\$44.95** and six-packs are **\$269.70**. Rapido Trains Inc., 905-474-3314, rapidotrains.com

window screens, and underframe detail. Interior light-emitting diode lighting with DCC functions. With DCC and lights, \$119.99; with DCC, lights, and sound, \$159.99. Genesis line. Athearn Trains, 800-338-4639, athearn.com



• **Thrall 86-foot high-cube boxcar.** Detroit & Toledo Short Line; Atchison, Topeka & Santa Fe; Baltimore & Ohio; Burlington Northern; Chicago & North Western; Conrail; Erie Lackawanna; Grand Trunk Western; Illinois Central; Milwaukee Road; Norfolk & Western; Penn Central; Pennsylvania RR; Rock Island; Southern Pacific; and Union Pacific. Three or six road numbers per scheme. Four or eight side doors as appropriate. Stanray roof with detailed door tracks. Detailed brake wheel and factory-applied metal grab irons. ClassOne ModelWorks.com, 816-243-0044, classonemodelworks.com

HO scale details and accessories



• **Morgan Olson Route Star Van.** United Parcel Service, Central Beverage Distributors, Crusty's Pizza, Dough & Joe, FedEx, Fire Department - Special Operations, Magic Pan Bakeries, Police

Crime Scene Investigation, Road Cones Ice Cream, Tacos 2 Go, Tri-State Power, and United States Postal Service. Fully assembled. Newly tooled, officially licensed replica. Five body styles with correct rear doors. Contemporary delivery van and food truck versions. \$21.98. SceneMaster line. Wm. K. Walthers Inc., 414-527-0770, walthers.com

N scale details and accessories



• **Very Real Knuckle Coupler.** New coupler system. Direct replacement for many existing coupler boxes. Available painted black and rust. Molded air line hose included. Available with or without trip pin. Multiple shims included. Offered with long, medium, and short shank. Jacksonville Terminal Company, jtcmodeltrains.com

Electronics/controls

• **EFX-16 light board.** Board includes 16 Woodland Scenics JustPlug terminals. Each channel can be adjusted with DCC or LCC. Adjustments include brightness, lighting effects, and triggers. Price TBA. Logic Rail Technologies, 281-251-5813, logicrailtech.com

In Memoriam

Dr. Brian D. Pate, 1928-2023

Brian Pate, 95, died on August 28, 2023.

Builder of particle accelerators by day, he was also a well-known modeler and builder of at least two layouts, the first

being the standard gauge Burrard, Delbrook & Pacific. Brian's HO N3 Klondike Mines Ry. was featured in *Model Railroad Planning 2007* and reappeared in 2019 when it moved to Dawson City in Canada's Yukon Territory. He was the founder of VanRail, an operating session event that first took place in 2002. His efforts inspired many throughout the hobby.



• **Blunami BLU-PNP8 sound decoder.** Universal factory board replacement sound decoder. For use in a wide variety of HO and S scale models. Same diesel sound profile options as previous Blunami and Tsunami2 decoders. Eight function outputs. 2W, 8 Ohm load audio amplifier. 16 sound channels. Maximum motor stall current of 2A. Measures 74 x 17 x 5mm. \$162.95. SoundTraxx, 970-259-0690, soundtraxx.com

Z scale locomotives



• **Electro-Motive Division SD40T-2 diesel locomotive.** Denver & Rio Grande Western; Kansas City Southern; New York, Susquehanna & Western; Southern Pacific; St. Louis Southwestern (Cotton Belt); and Union Pacific. Three different nose lengths. Prototype-specific headlights and placement. Ditch lights as appropriate. Price TBA. American Z Line, 614-764-1703, americanzline.com

Atlas N scale Alco S4 diesel locomotive



The Alco S4 diesel locomotive from Atlas Model Railroad Co. is in stores now. The N scale end-cab switcher, part of the company's Master Line, features railroad-specific details, a die-cast metal hood and chassis, and directional light-emitting-diode headlights.

Alco produced the S4 between August 1950 and January 1961, manufacturing more than 790 units for railroads in the United States, Canada, and Mexico. Montreal Locomotive Works built 29 identical S7 switchers for Canadian National in mid-1957.

The S4, rated at 1,000hp, was equipped with a 6 cylinder 539 engine. The diesel featured wider radiator shutters than the S1 and S3 and had a tapered exhaust stack base. The latter indicated the engine was turbocharged.

The sample we received is decorated as Atchison, Topeka & Santa Fe 1517, part of the railroad's 1500 through 1537 series. The 1517, built by Alco under order number S3167 in July 1951, was originally painted in the railroad's black-and-silver zebra stripes scheme. Later it was repainted in the blue-and-yellow pinstripe scheme that debuted in 1960. The 1517 was retired in December 1975.

The Atlas Master Line S4 is cleverly designed. While the grab irons, louvers, and door hinges are cast on the long hood, the shutters, number boards, locomotive pipes, and the top of the exhaust stack are factory-applied parts. I was unable to find early prototype photos of the 1517, but

images from the 1970s show it with an oblong stack, not a round one. Atlas offers the switcher with vertical or horizontal shutters as appropriate.

Plastic was used for the cab, which is offered in riveted and welded versions as appropriate. The Santa Fe model has a welded cab, but prototype photos show the 1517 with a riveted cab.

The pilots are also plastic. A pair of pins near the top fit into holes in the metal chassis. Both pilots have molded footboards, freestanding uncoupling levers, and a trainline hose.

To separate the hood and cab from the chassis, you first need to remove two screws between the front truck and pilot. Then release the handrails from the back of the cab and gently lift up.

Our sample is decorated in Santa Fe's blue-and-yellow pinstripe scheme. The railroad started painting the grab irons and vertical handrails yellow in September 1966. The lettering placement matches prototype images of the 1517. The window gaskets on the rear of the cab are picked in black. The area between the bottom of the rear cab door and the walkway should be blue.

I tested the model, equipped with an ESU LokSound V5 decoder, with an NCE PowerCab. From the box, the model moved 2 scale mph at step 2. At step 28, the locomotive topped out at 61 scale mph, 1 mph faster than the prototype.

I also ran the locomotive, which closely follows published dimensions, on our N scale Milwaukee, Racine &

Troy State Line Route. At step 1 the unit hesitated slightly. The performance improved as I increased the speed. Adjusting the configuration variables and giving the unit some break-in running will help with performance.

The new Alco S4 nicely complements the S2, which has been part of the Atlas N scale lineup for a decade. The end-cab switcher will look right at home working the yard on layouts set between the 1950s and 1980s. – *Cody Grivno, senior editor*

Facts & features

Price: Direct-current model, \$134.95; with ESU LokSound V5 sound decoder, \$244.95. Subtract \$10 for undecorated models

Manufacturer

Atlas Model Railroad Co.
378 Florence Ave.
Hillside, NJ 07205
shop.atlasrr.com

Era: September 1966 to December 1975 (as decorated)

Road names: Atchison, Topeka & Santa Fe; Baltimore & Ohio; Boston & Maine; CP Rail; Grand Trunk Western; Pennsylvania RR; and Southern Pacific. Two road numbers per paint scheme; also available undecorated (with vertical shutters).

Features

- Association of American Railroads type A trucks
- Body-mounted Accumate couplers, at correct height
- Metal wheels, correctly gauged
- Weight: 2.2 ounces



Walthers HO Trinity 4750 covered hopper



As a Burlington Northern fan, I was absolutely thrilled when Walthers announced the Trinity 4,750-cubic-foot capacity three-bay covered hopper. The newly tooled model, based on a BN prototype, is part of the manufacturer's Mainline series and features injection-molded plastic construction.

The model we received is decorated as BN 466071, part of the railroad's 466000 through 466999 series built by Trinity Industries at its Greenville, Pa., plant under File 2111 between June and October 1990. From 1990 to 1995, BN ordered 5,500 Trinity 4750 covered hoppers, numbered 466000 through 469999 and 471000 through 472499. The cars were the backbone of BN's grain hauling fleet and were often run in 104-car unit trains during the railroad's final years.

The BN covered hoppers became part of the BNSF Ry. fleet following the merger with Atchison, Topeka & Santa Fe in 1995. The cars, assigned to BNSF's 466000 through 471499 series, are being repainted into the railroad's Mineral Brown scheme. Early repaints have the circle-cross herald, a scheme offered by Walthers. Newer repaints feature the post-2005 herald.

The Walthers Mainline model has a plastic body with separate slope sheets. Up on top, the car has a one-piece running board and hatch cover castings. Both parts have pins that fit into holes in the body. The running board support brackets are factory-installed parts. The lateral portion of the running board closest to the full-height ladder has a molded grab iron. I appreciated that the running board supports were painted Cascade Green to match the carbody on the BN car. Nice attention to detail!

The end cages are factory-applied castings with molded corner posts, ladder stiles, end posts, hand brake posts (B end only), ladder rungs, and grab irons. Though the housing and brake chain are molded, the brake wheel is separate. The plastic crossover platforms are also free-standing parts.

The B (brake) end of the car has an air reservoir, brake cylinder, and control valve. A pair of molded pipes run from the control valve to the air reservoir. A third pipe from the control valve terminates in the slope sheet.

The underbody is a separate casting with six tabs (three along both long edges) that lock into slots molded on the inside of the body. Factory-installed intermediate center sills have a tab along the top edge that's glued into a slot.

The outer sills, draft gear box, and end frames are cast as a single piece attached from the inside with a washer-head Phillips screw. The body bolsters and bolster block are a separate casting. The draft-gear box covers are secured with a Phillips-head screw.

Our sample is neatly painted in its as-delivered BN scheme. All of the white printing is opaque and legible. The CAUTION stencil, builder's logo, and COTS panel are all shifted one body panel too far to the right.

I found prototype drawings of the Trinity 4750 covered hopper in *BNSF Railway Freight Cars: Volume One* by Robert C. Del Grosso (Great Northern Pacific Publications, 2004). The Walthers car matches or is within scale inches of published dimensions.

The Walthers Mainline Trinity 4750 covered hopper rides on American Steel Foundries 100-ton trucks with correctly

gauged 36" metal wheels mounted on plastic axles. The body-mounted Proto-Max metal couplers are at the correct height. At 5.1 ounces, the covered hopper is .3 ounce too heavy per National Model Railroad Association Recommended Practice 20.1.

The Trinity 4750 was a much-needed three-bay covered hopper for HO scale modelers, and Walthers delivered. A solid train of Cascade Green cars would look sharp on an early 1990s BN layout. — Cody Grivno, senior editor

Facts & features

Price: \$34.98

Manufacturer

Wm. K. Walthers Inc.
5601 W. Florist Ave.
Milwaukee, WI 53218
walthers.com

Era: 1990 to present (as decorated)

Road names: Burlington Northern (as-delivered scheme), BNSF Ry. (Mineral Brown with circle-cross herald), CSX (tan), Illinois Central Gulf (orange), Kansas City Southern (Mineral Red), Louisville & Nashville (Family Lines scheme), and Missouri-Kansas-Texas (green and yellow). Four road numbers per scheme; also available undecorated.

Features

- 36" metal wheels mounted on plastic axles, in gauge
- Proto-Max metal couplers, at correct height
- Weight: 5.1 ounces (.3 ounce too heavy per National Model Railroad Association Recommended Practice 20.1)

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ScaleTrains HO scale 40-foot PS-1 boxcar kit



The Pullman-Standard (PS) 40-foot PS-1 boxcar, a staple on prototype railroads from the late 1940s through the 1980s, is now available as an easy-to-build HO scale kit from ScaleTrains. The injection-molded plastic model, which uses former M.T.H. Electric Trains tooling, features a one-piece body, various modeler-installed parts, and a freestanding brake system.

Pullman-Standard produced its first 40-foot PS-1 boxcar in 1947. The popular body style stayed in the PS catalog into the early 1960s.

Our sample is decorated as Union Pacific 100844, part of the railroad's B-50-40 class numbered 100000 through 101599. The 1,600 cars in this group, constructed by PS in 1948, featured welded sides; 6-foot, seven-panel Superior doors; and PS ends.

To assemble the kit, the manufacturer recommends the following tools: a hobby knife, small Phillips screwdriver, liquid plastic cement, and small tweezers. The eight-step assembly process is documented on the back of a double-sided sheet included with the kit.

The welded-side body has molded side and end ladders, bracket-style grab irons, and placard boards on the ends. Additional features on the B (brake) end of the boxcar include the brakewheel housing, brake platform, and retainer valve. The brake wheel and running board are modeler-installed parts.

A pair of 6-foot, seven-panel Superior doors are included with the kit. The doors have molded placard and route boards, handle, and opening/closing/locking mechanism detail. The doors slide on a track concealed inside the car.

The underbody is a separate piece. Molded details include the center sills, floor boards, draft-gear boxes, train line, stringers, cross members, body bolsters, and bolster blocks. The brake system, couplers and centering springs, steel weight, and screw-mounted draft-gear box covers are modeler-installed.

The ScaleTrains boxcar we received is neatly painted UP Synthetic Red with yellow graphics. The model has a reweigh date of August 1966. The solid-yellow lettering was adopted in 1947, the "Be Specific - Ship 'Union Pacific'" slogan debuted in November 1949, and the 20" Union Pacific lettering was introduced in July 1956.

The boxcar's dimensions closely follow drawings published in *Union Pacific Freight Cars, 1936-51* by Terry Metcalfe (Metcalfe Publications, 1989). At 3.8 ounces, the car is correct per National Model Railroad Association Recommended Practice 20.1. The body-mounted plastic semi-scale Type E couplers are at the correct height. Note that the couplers don't have trip pins, which may be an issue if you use a magnetic uncoupling system. The 33" metal wheelsets, mounted in solid-bearing trucks with brake beam detail, are in gauge.

It has been fun to watch the ScaleTrains Kit Classics line grow in the past year. If you're in the market for a 40-foot PS-1 boxcar, you'll want to check out this budget-friendly, easy-to-build kit. It will give you a good reason to spend some time at the workbench. – *Cody Grivno, senior editor*

Facts & features

Price: \$19.99

Manufacturer

ScaleTrains
4901 Old Tasso Rd. NE
Cleveland, TN 37312
scaletrains.com

Road names: Union Pacific; Atchison, Topeka & Santa Fe; Canadian Pacific; Chesapeake & Ohio; Chicago & North Western; Milwaukee Road; Minneapolis, Northfield & Southern; and New York Central. Three road numbers per scheme.

Era: 1947 to 1980s (varies depending on paint scheme)

Features

- 33" metal wheelsets, in gauge
- Plastic semi-scale Type E couplers without trip pins, at correct height
- Positionable 6-foot, seven-panel Superior doors
- Solid-bearing trucks
- Weight: 3.8 ounces, correct per National Model Railroad Association Recommended Practice 20.1



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Above: This model of a wood-sided Canadian Pacific overhead bunker reefer car mystified modeler Wes Barteck, who is used to seeing reefer cars have ice hatches only on the ends of the roof. Inset: This builder's photo of Canadian National Ry. 212404 shows the shorter door an overhead bunker reefer car should have. The ice hatches spaced along the length of the roof are barely visible from this angle. Color photo by Wes Barteck; black and white photo, David P. Morgan Library collection

The mystery of the overhead bunker reefer

Q I was given an older model of a reefer car that has hatches across the whole roof instead of on each end (see photo). Is this a special type of reefer for handling a specific cargo?

Wes Barteck

A Though that kind of refrigerated car is more common north of the border than in the United States, it's just a basic reefer. Unlike the end-bunker ice reefer we're all used to seeing, this is an overhead-bunker reefer. As the name implies, the ice or brine coolant tank stretches along the roof the full length of the car.

Overhead bunker reefer cars were common on Canadian railroads, though a few were rostered by American roads, according to Kalmbach Books author and railroad historian Jeff Wilson. They weren't developed for a particular cargo, but simply to distribute the cooling more evenly along the car's length, rather than concentrating the cold on the ends. These reefers were used for any purpose an end-bunker reefer might be put to, such as meat, produce, dairy products, or canned goods.

I'm not sure if your car is as-built or whether it might have been kit-bashed. As you can see in the accompanying builder's photo of a Canadian National steel overhead bunker reefer car, the door should not be the full height of the side, as it is on your model. That's because the top 2 feet or so is occupied by the ice bunker or brine tank. So it's likely that a previous owner of your car added the extra ice hatches to make it resemble a prototype that wasn't available in model form at the time.

I was pleased to discover that we published a dimensioned drawing of CN No. 212404, the same steel overhead bunker reefer car in the inset photo above, in our November 1964 issue. Even though your car is wood-sided, since it appears to have been scratchbuilt or kit-built from wood, it might date from about the same time as our drawing. Even if it's not, it's still a fascinating model of an unusual prototype.

Q I've read the articles on how to patch out locomotives and rolling stock, but how often are these techniques used by cash-strapped short lines? It seems a lot easier (and cheaper) to slap a patch on a new locomotive and get to work than repaint a used locomotive.

Michael Schlobohm

A Prototype railroads, whether cash-strapped or not, would rather not spend money they don't need to. So railroads that acquire locomotives in another railroad's paint scheme, whether through a merger or a purchase of used units, usually if not always opt to patch out locomotives rather than repaint them. The same goes for freight cars and other rolling stock. Repainting can wait until the locomotive or car is due for regularly scheduled maintenance.

One of my colleagues over at *Classic Trains* magazine called the practice "rampant," not just on short lines, but on Class I railroads, too. So if you want to build a truly prototypical rolling stock roster for your model railroad, you'll probably want to include a few patch jobs in there.

Including patch out locomotives and cars on your model railroad isn't just realistic – it's practical, too. Hobbyists modeling a freelanced line probably don't want to have to repaint every locomotive they buy before putting it on the rails. Patching out a locomotive that's factory-painted in the scheme of a former owner is an easy way to quickly add to your roster.

Patch-out locomotives also give your model railroad a sense of history. If you're modeling a railroad shortly after a major merger – say, Union Pacific in the late 1990s, Conrail in the late '70s, or Burlington Northern in the early '70s – some patch-out locomotives let viewers know the heritage of your line.

Patching out the reporting marks and road numbers of a locomotive or car is simple. The first step is to cover up the existing lettering, heralds, and logos. One way is to use solid-color decal trim film, available from hobby decal vendors including Microscale. This is the technique used by M.R. (Matt) Snell in our July 2012 and August 2018 issues.

Alternately, you could mask and paint patches, as Kim Nipkow did for an

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

article in our December 2014 issue. One benefit of this technique is it let Kim also repaint a battery box door in Union Pacific Armour Yellow, as if a damaged panel had been replaced by the locomotive's new owner. After painting the patches, it's simply a matter of adding the new reporting marks and numbers.

An even easier way to simulate patch jobs on cars is to mask off the reporting marks and car numbers before weathering. When you remove the masking, those areas will appear clean and freshly painted, as if they had been patched.

Q Reading Jerry Dzedzic's essay on "Turning waybills into dollar bills" (August 2023) made me realize that I don't know anything about how prototype railroads handle the inspection and shopping of freight cars. Are cars sent in for inspection, paint, and maintenance at fixed times, or after a certain number of miles, or only when a problem is found? And how are these car moves handled operationally? It seems like this could be a logical



When railroads change names, merge with another railroad, or buy a used locomotive, they don't necessarily rush their rolling stock to the paint shop. Often, instead, they opt to patch out locomotives and cars with new numbers and reporting marks. Kim Nipkow photo

source of traffic across my pike, or even a new "industry" if I found space to model a car maintenance shop.

Mark Herrman

A Railroads are pretty serious about inspecting and maintaining their rolling stock. The Interstate Commerce Commission (and, after 1966, the Federal Railroad Administration) requires regular inspection and maintenance of railcars, which is meticulously documented both in the railroad's records and on the cars themselves. Car markings such as a REBLT date and, more recently, the Consolidated Stencil (mandated by the Association of American Railroads) list when cars' brake equipment, bearings, and more were last inspected.

To summarize (or, as the kids say these days, "tl;dr"), regular in-depth inspections are scheduled after a certain amount of time or miles have gone by. In addition, a car must be inspected for defects every time it leaves a station. This can be done before or after it's placed in a train. Among the items that must be inspected are the wheels, axles, bearings, trucks, underframe, draft gear, couplers, and safety equipment. Trains are also usually subject to an informal "rolling



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Norfolk Southern carmen roll a truck with bad wheels out from beneath a steel gondola in the Luther Yard shops in North St. Louis, Missouri, in March 2013. Installing a RIP track or car shop on a model railroad can add operating options to a layout. Steve Smedley photo

inspection" whenever they pass a railroad official in a yard, station, or tower. This isn't an in-depth examination, but more of a cursory look. On top of all that, railroads have automatic trackside equipment to identify and notify officials of dragging equipment, derailed wheels, and hotboxes. Bad equipment is bad for the bottom line, so the railroads generally don't mind subjecting their rolling stock to this frequent scrutiny.

In the case that such a defect is found by any of these means, the car is "bad

ordered." The car is usually set out immediately, and a visible card or sticker (the "bad order" tag) is applied to the car, usually on the door if it's a boxcar or the like. This tag includes information like the reporting mark and car number, the name of the inspecting railroad, the nature of the defect(s), and where the car is to be taken for repair. If the car is loaded, it's generally not unloaded unless it is necessary to do so to make the repairs and the unloading point is along the route to the repair site. The car is

then moved to somewhere it can be repaired. The bad order car is generally moved in a special movement, not a regular train, because many types of defects call for restricted speeds.

Depending on how extensive the needed repairs are, the car might go to a RIP track ("Repair In Place") or a car shop. Often found in or near classification yards, RIP tracks can handle quick repairs like repairing a broken grab iron or door latch, repacking a wheel bearing, or swapping out a broken coupler. More extensive work involving a car's trucks, structural members, or brake gear must be done at a car shop. Most railroads have at least one of these, usually situated at a major yard or engine terminal, but smaller roads might contract their major repair work to an outside company or another railroad.

How might you use this information to add maintenance operation to a layout? First you'll need somewhere to take your bad order cars. Even if you don't have space for a car shop, most model railroads can fit in a RIP track.

Next, create an "inspection deck" of cards. 90-95% of them should say "No issues found." On the others, give a defect like "Bad bearing on 3rd car in train" or "Broken safety appliance on next-to-last car." Have the engineer draw a card before leaving the yard. If a defect is drawn, have the engineer set out that car to be routed to the RIP track. **MR**



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Conducted by Steven Otte



A gas-electric industrial switcher takes a ride on the transfer table at the Cargill plant in Atchison, Kan., in this 1990s-era photo. Mark Huff photo

Transfer table looks like the real thing

I enjoyed Mr. Perry's article about building a transfer table [August]. He mentioned he had trouble finding prototype pictures. More than 20 years ago, I took some pictures of the transfer table at the Cargill plant southwest of Atchison, Kan. I recently tried to take updated pictures, but there were rows of hopper cars in the way. As I recall, there were only about three tracks coming to the transfer table, but at least eight tracks led away from it on the other side. Mr. Perry's transfer table looks really close to the actual thing.

Mark Huff, Kansas City

Knocked out by the YV

I was knocked out by the article in the September issue on Jack Burgess' Yosemite Valley layout. I've been a fan of the YV since my teenage years and have been a long-time admirer of Jack's layout. It is one of the most exact reproductions of a prototype I've ever seen.

There were two facts in the article that surprised me, however. First, I'm astonished that Jack has never operated a train on the layout by himself. Having a layout of such grandeur would be too great a temptation for me!

Secondly, I was disappointed that Jack doesn't run passenger trains. The YV ran a beautiful collection of varnish, and I'd surely miss seeing it reproduced in HO.

Neither of these things diminish Mr. Burgess' accomplishment one whit, however. They're just examples of the old saying: "It's your layout."

Ted Waterhouse, San Luis Obispo, Calif.

The dream or the masterpiece?

You accomplished with your "dream 4 x 8 layout" and its 20-foot mainline run and nine spurs what the 16'-6" x 21'-0" Cascade & Twin Mountain "masterpiece" didn't with a 247-foot run and only four industrial spurs [September]. One can have a lot of fun operating the 4 x 8, whereas the masterpiece is pretty, but just goes around in circles.

More than a few readers will find the 4 x 8 dream track plan to be just what they've been looking for, build it, and enjoy model railroading. Thanks for this contribution to the hobby.

Chris Roehl

Correction

The builder of the Virginian & Ohio model railroad is W. Allen McClelland. Allen was misnamed in November's editorial. We regret the error. **MR**

Comments, suggestions, and additional information on Model Railroader articles and departments are welcome in this column. Every comment will be read, but not all can be printed or answered. Make your statement in 300 words or less, and send it to **Railway Post Office, Model Railroader magazine, P.O. Box 1612, Waukesha, WI 53187**, or e-mail editor@modelrailroader.com. Please include your name, city, and state.

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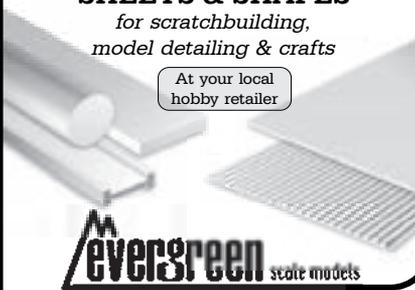


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Tall autumn reeds with feathery tops are a common sight in wild wetlands (inset). Since Brent Monahan was unable to find a scenery manufacturer offering such reeds for sale, he made his own. Photos by the author

Modeling marsh reeds

Over the past few years, model railroad scenery manufacturers including Woodland Scenics, Noch, and JTT Scenery Products have crafted many types of impressively realistic flora to enhance realism in model railroading. Bachman Industries, for example, offers the type of summer reeds that grow at the edges of bodies of water or in marshy areas. They feature green stems. The plumes are somewhat coarse, and each piece is about 1" high.

But I have not found the type of fall and winter season reeds that have feathery plumes that stand taller than a person. Perhaps they are too delicate for packaging and shipping. Several fall stems without plumes have been discontinued or are on extended backorder.

Tall, beige reeds with fine, feathery plumes are not difficult to create, however. Follow along as I explain how I made clusters of autumn reeds to line my layout's riverbanks.

Materials list

JTT 95085 Golden Brown Field Grass or
Woodland Scenics FG171 Natural
Straw Field Grass
parchment paper
yellow wood glue
acrylic or latex paint
fine sawdust
small dipping trays (2)

STEP 1 REEDING IS FUNDAMENTAL



Parchment paper is used to keep baked goods from sticking to the surface of a baking pan. Its finish also allows dried wood glue to be peeled off easily, which makes it perfect for my purposes. It can be found in grocery store baking or storage aisles.

For the final steps of adding the plumes, below, I used a mini loaf tin

(seen at left in the photo above), which limited each clump of reeds to about 4" long by 1½" wide. So I squeezed out several lines of wood glue onto parchment paper, about ¼" thick and no more than 4" long. I mixed into the glue a drop or two of water-based paint that blended with the color of the underlying terrain.

I then cut some Woodland Scenics or JTT tan and brown stems into short, random lengths, and stuck clumps of them into the glue. I didn't worry about whether they were vertical or at angles, since in nature not all reeds grow in the same direction. The varied lengths of the stems also increased their realism.

STEP 2 ADDING PLUMES

When I had created about a dozen of these reed bases, I allowed the glue to harden overnight. The next day, I peeled them off the parchment paper. The bases were still flexible, which would make them easier to eventually glue to the terrain.

To make convincing looking feathery plume tips, I gathered sawdust made by a miter saw with a 12", 80 tooth, circular blade. I filled my first pie tin with ½" of wood glue, inverted each reed cluster, and dipped the tips into the glue. I then immediately dipped the glued tips into the fine sawdust in the second tin. If the plumes looked skimpy, I dipped the stems into the sawdust again. I set the results aside to dry and harden for several hours.

My final step was positioning the various clumps and blending them into the ground area with more of the glue/paint mixture. Be ready to use a mini-vacuum or soft brush to pick up the bits of sawdust that fall into "watery" areas. **MR**



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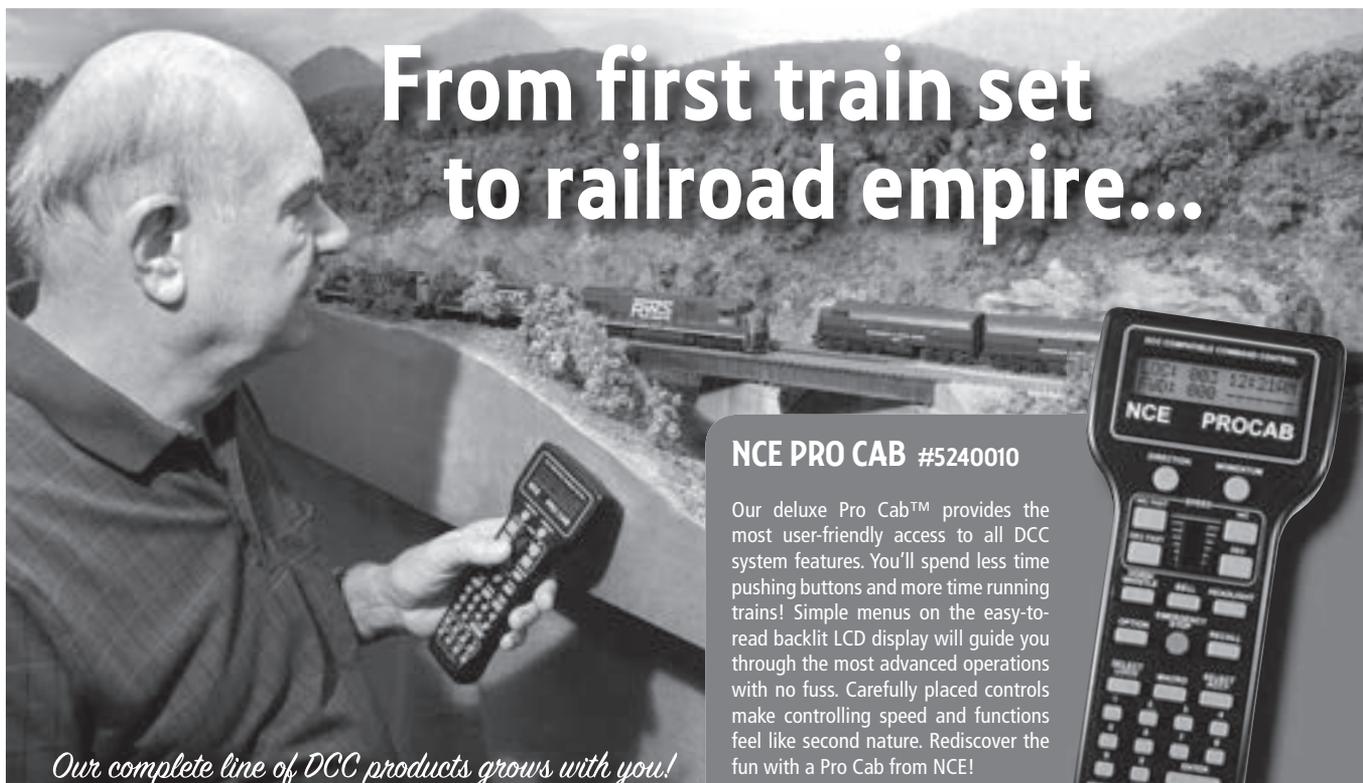
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Bill Pistello and Larry Naus put a lot of effort into building simple, reliable turnouts that also turn heads on Bill's DuPage RailNet O scale switching layout.

A PROTOTYPICAL look for TURNOUTS

A few parts and tools take the look of handlaid turnouts to the next level

By Larry J. Naus • Photos by the author

A person starting out in the hobby of model railroading doesn't have to look far before the subject of turnouts comes into question. Adding a few turnouts to that simple oval of track now requires that train routing decisions must be made. The game is on. Now you have a railroad to manage.

Consider a typical operating session. As guests arrive and before trains begin to move, it's not uncommon for a group to gather and discuss track work, and more specifically, the turnouts. As Bill Pistello was planning his O scale switching layout, construction of the turnouts became his main focus.

Bill decided to use the Fast Tracks system for building the 16 turnouts used on his layout. However, the methods used in the following article could be applied, in whole or in part, to any commercially made turnout. The O scale turnouts would be No. 4.5 built with code 125 rail and operated using manual ground throws. I joined with Bill in an effort to combine our talents to build a simple, more prototypical looking throw mechanism, with mechanical reliability being a high priority.

Larry Naus is a plastic injection tool and mold maker by trade.

Materials list

Caboose Industries

2025 HO scale sprung ground throw

McMaster-Carr

91864A002 0-80 x $\frac{5}{16}$ " cap screws

92736A001 0-80 hex nuts

8951K17 $\frac{3}{8}$ " x $\frac{3}{8}$ " x 6" brass bar

K&S Metal

8162 $\frac{1}{16}$ " x 12" brass rod

Plastruct

AR-2 $\frac{1}{16}$ " acrylic rod

Tichy Train Group

1107 .040" phosphor bronze wire

Miscellaneous

12" x 12" x $\frac{3}{16}$ " plastic, type 1 PVC

STEP 1: PROTOTYPE AND PARTS



Although our system doesn't include every single nut, bolt, and bracket found on a prototype turnout, it does closely represent the look and feel of a turnout found in a typical industrial switching complex **1**. In addition, it has proven itself reliable over the past few years, including many operating sessions.

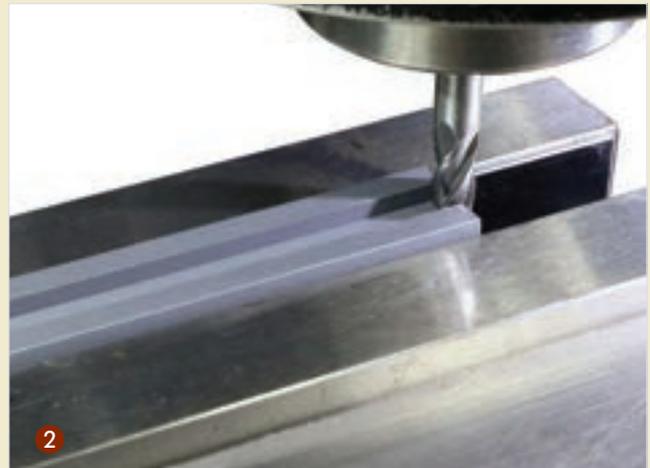
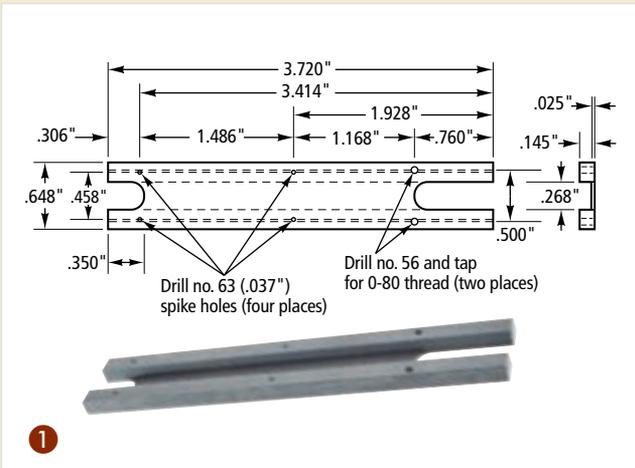
The parts used to build our system are shown in **2**. Part numbers can be found in the materials list.

Bill determined early on that HO scale ground throws from Caboose Industries (No. 2025) would be his choice for manual operation. The HO scale ground throws are closer

to prototypical size and appearance when used on an O scale layout. In addition, the .190" travel is more than enough to operate the points through the full range of travel. A 0-80 screw and nut combination act as double duty to secure the ground throw to the head blocks and to provide a limit to the travel of the throw lever **3**.

The throw lever can over-travel in a downward direction, making it difficult to lift with a fingertip. A drop of cyanoacrylate adhesive (CA) to the top of the hex nut secures its position on the cap screw and eliminates the need for readjustment every time the screw is removed.

STEP 2: HEADBLOCK TIES



The backbone of the system, as on the prototype, are the two headblock ties, which are actually milled as one piece taken from a $\frac{3}{16}$ " thick sheet of type 1 PVC plastic **1**. This piece provides a rigid and stable platform for the components of the throw mechanism and the way they relate to the turnout track work.

After milling the space between the head block ties **2**, four spike holes and two 0-80 threaded holes for the ground throw are drilled in specific print locations **3**.

Two 0-80 screw holes that will anchor the ground throw are threaded into the PVC. I next sanded or filed the sharp edges, then dragged a razor saw over the exposed surfaces of the headblock to re-create the look of a weathered, rough wood tie.



STEP 3: POINT RAIL CLAMPS



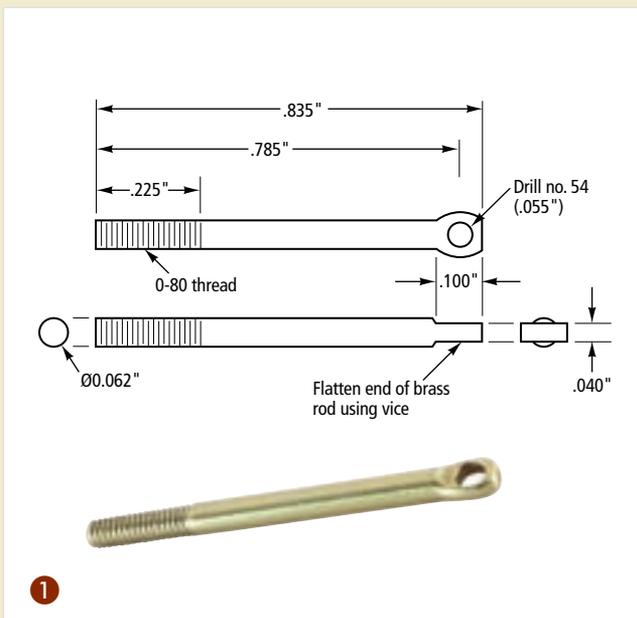
Next, the $\frac{3}{8}$ " x $\frac{3}{8}$ " brass bar (McMaster-Carr 8951K17) was clamped in the vise, resting on its adjacent sides as the drilling and threading operations are done in the same sequential manner ①. To reduce the chance of breaking a delicate 0-80 tap, I used a No. 55 drill instead of the recommended No. 56 tap drill. This will reduce the stress on the tap and still yield a 50 percent thread, which is more than adequate for the task at hand. At this time, file any sharp corners and edges. An added option, if available, would be to bead-blast the clamps for a cast-metal look.

Using the Dremel (No. 199) cutter again in the final milling operation, I undercut and parted the finished pieces from the main body of brass ②. A light sanding or filing

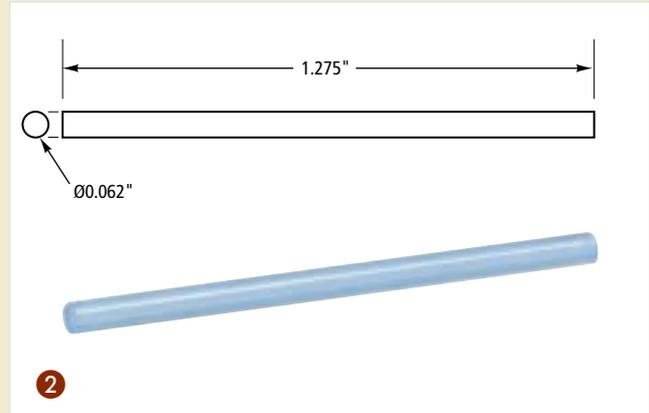
may be necessary to remove any nubs or burrs left on the bottom surface of the clamp as it separates from the main body of brass.

I milled a channel in the Fast Tracks fixture to facilitate the soldering of the brackets to the point rails at the proper location ③. To aid the soldering process, I cut a clearance groove in the center of the channel to minimize the heat sink effect of the aluminum fixture. Small pieces of $\frac{3}{64}$ " thick wood served to isolate the solder from the stock rails and to center the points at a neutral travel position for joining the point clamps. The solid point rail option provided with the Fast Tracks fixture was used for smoother operation.

STEP 4: SWITCH ROD



The switch rod is made from $\frac{1}{16}$ " diameter brass ①. I flattened the end in a vise until a surface was created wide enough to drill a .055" diameter hole (with a No. 54 drill) that would fit the pin on the ground throw. Once the turn-out is completely built with the ground throw components installed, it's possible to adjust the throw mechanism before installation.



I cut an 0-80 thread with a threading die on the opposite end. This will serve as the adjustment during the final assembly and installation. One complete turn of the rod will change the adjustment by .0125".

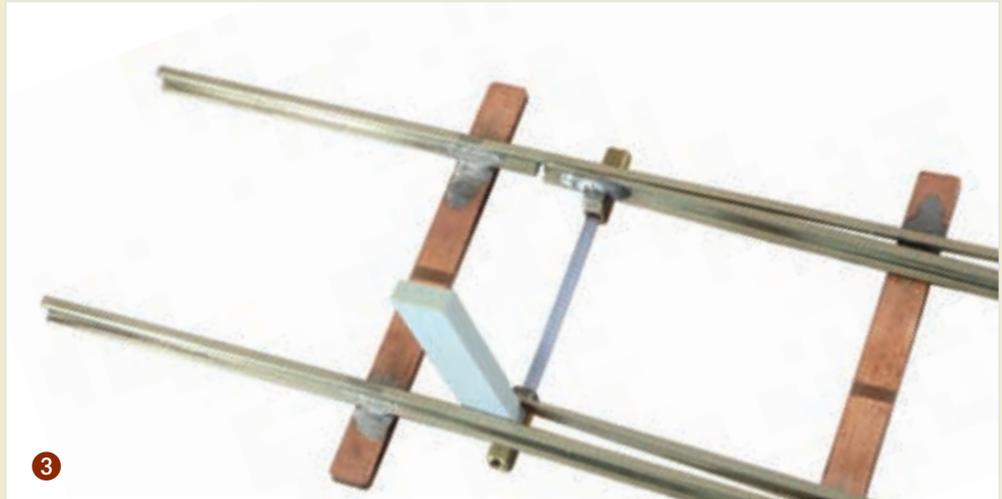
A $\frac{1}{16}$ " diameter clear acrylic rod joins the two point rails ②. Acrylic was chosen because it's a good electrical insulator and rigid enough to maintain mechanical integrity, but flexible enough for slight changes in rail geometry as the points are moved to the limits of the throw. Lightly sand the switch rod to provide tooth for the glue bond.

One end of the rod is inserted fully into one clamp, allowing the opposite end to be inserted into the other clamp. When the point gap is set and the point rails are secured in position, the acrylic rod is roughly centered

STEP 4: SWITCH ROD (CONT'D)

between the two clamps
③. I then applied a drop of thin CA to each end of the rod to lock this adjustment in place.

Bill wanted a point gap that more closely matches that of the prototype. We found that a gap of .096" allows for reliable operations and more closely matches that of the prototype. I made a gauge from a small piece of scrap plastic, but the shank of a No. 41 drill bit would do the job just as well.

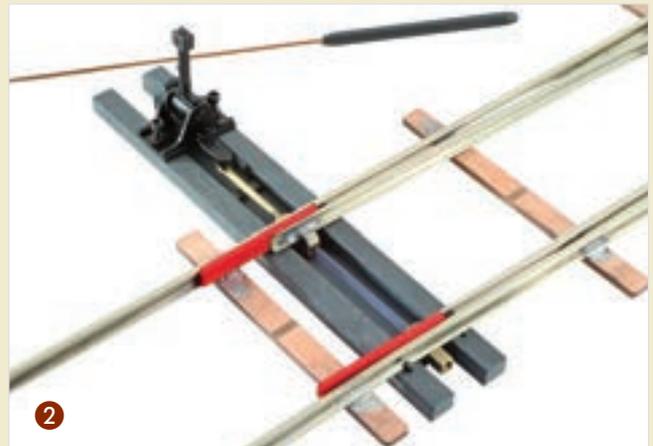


STEP 5: FINAL ASSEMBLY



I secured a $\frac{3}{64}$ " – $\frac{1}{16}$ " spacer between the headblock ties to prevent disengagement of the switch rod from the ground throw ①. Only three of the spike holes are used, as the outward curve of the stock rail will partially block the fourth hole. The left- or right-hand orientation of the turnout and the inside or outside mounting of the throw mechanism will determine which three holes will receive spikes. Once the spikes are driven home, I trimmed the extra length flush with the bottom of the head blocks.

Then I used the wood shims again between the point rails and stock rails to secure a midpoint travel position ②. The handle on the Caboose Industries ground throw is then positioned vertically, representing center of travel of the throw bar. Simply turn the switch rod in or out to align with the pin on the throw bar. Check for smooth operation and make any final adjustments. A tool made from a piece of .040" diameter rod (Tichy No. 1107) will simplify this adjustment, as it can be difficult to turn the throw rod between the two head block ties ③. If the turnout trackwork is complete and has been gauged for proper operation, the entire assembly should be ready for installation on the layout. [MR](#)



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Building a camera car



This scratchbuilt car gives Lou Sassi spectacular on-board videos of his On30 Sandy River & Rangeley Lakes railroad

By Lou Sassi • Photos by the author unless noted

While visiting us one Christmas my youngest son, Aric, who is an avid downhill biker, brought along his GoPro camera for us to shoot some video with on my On30 Sandy River & Rangeley Lakes. I grabbed a flatcar I had sitting around and we placed the camera on its deck. Aric explained to me how I could interface my Apple iPhone SE with the camera and not only watch but also record the train's view as it rolled along. I was so impressed with

the results that the next time he visited we ordered a GoPro Hero 6 in black for me and again shot some video.

One shortcoming of placing the camera on an On30 flatcar, which we noticed immediately, was that it shook whenever the wheels rolled over a turnout. This was caused by one wheel of each axle dropping into the frog of the turnouts. After some thought I came upon the idea of building a simple camera car that rode on a single Walther's HO scale Pullman six-wheel passenger car truck. However,

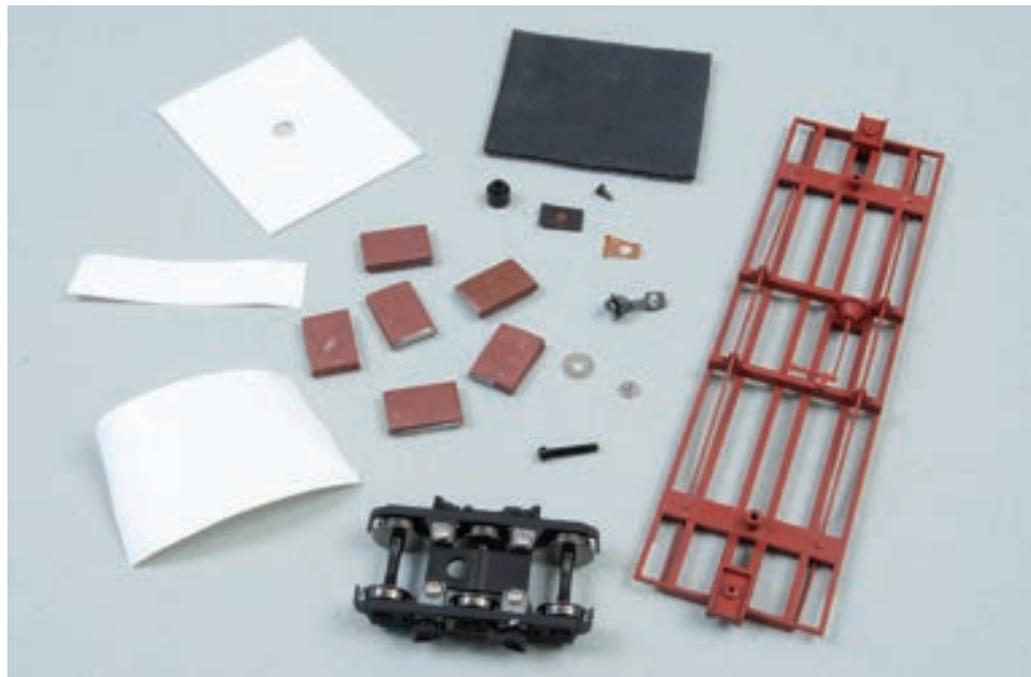
any six-wheel truck will do the trick. By having three, rather than two axles, when one wheel drops into the frog while passing through the turnout, the other two adjacent wheels will keep the camera car level.

Parts needed

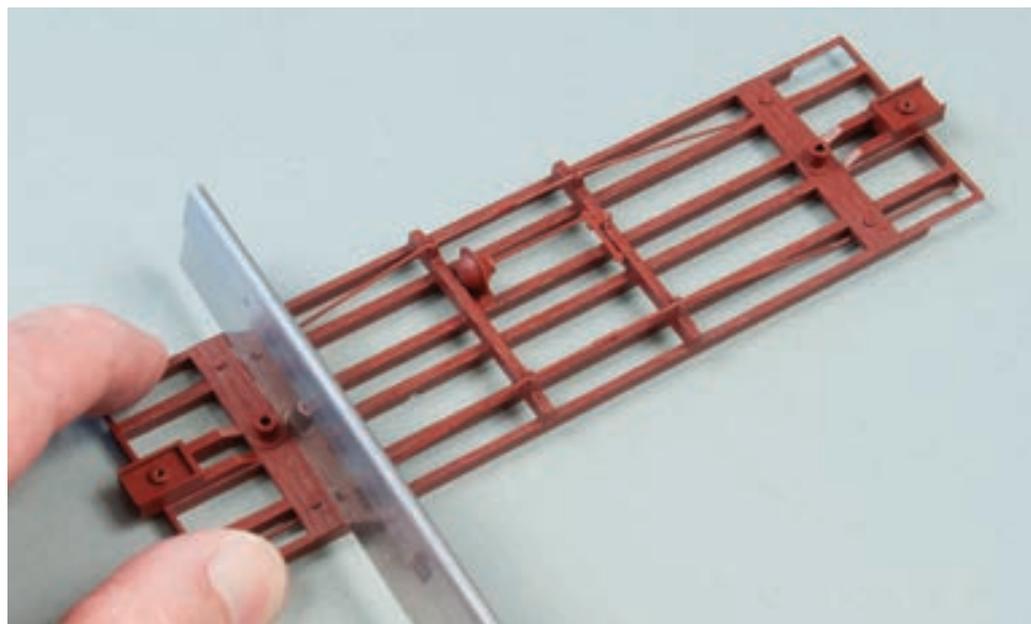
Once the set of Walther's trucks arrived, I built a 8 x 9½ scale foot deck for the car out of .040" styrene and an underframe from the two ends of a



Sandy River & Rangeley Lakes No. 15 takes an extra train out on the line to shoot some video with the GoPro.



① Parts needed (from top clockwise) for the project include a chunk of mouse pad; a low-profile underframe; a three-axle truck; carpet tape; a .040" styrene deck; a low-profile underframe spacer; a coupler and mounting parts; a washer, nut, machine screw; and weights.



② Lou cut off both ends of the low profile underframe with a razor saw. Each end was cemented together to create a short, low profile underframe for the GoPro car.

low-riding Bachmann freight car underframe. Note that all the dimensions referred to in the text are in O scale feet. The bolster of one end of the underframe would serve as the mounting point for the truck. The parts needed are shown in ①. Clockwise from the top is an 8 x 9½ scale foot piece of discarded mouse pad, a Bachmann low profile underframe, a Walther's three-axle truck, carpet tape, a .040" styrene deck with a hole reamed into it to allow access to the mounting screw and nut, a Kadee No. 5 coupler

and mounting hardware, a thin brass washer, a machine screw and nut, a Bachmann low profile truck spacer, and six ¼-ounce lead weights.

Building the camera car

I began by cutting both end sections of the underframe along the inside edge of each bolster ②. After cutting the mounting lug off one bolster (both lugs can be seen in ①) with a razor saw, I glued them together using liquid plastic

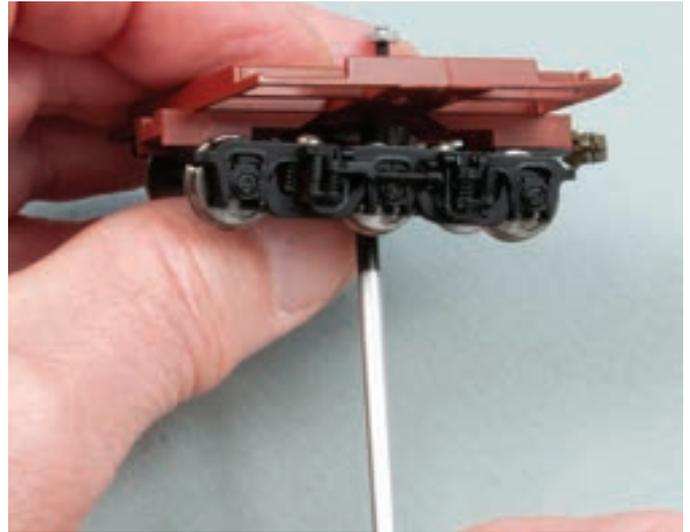
cement. This made the total underframe length 8 scale feet. I cut the length of the .040" styrene deck the same size, but increased the width to 9½ feet to match the width of the camera.

Once the deck was cut out, I reamed a hole in it for the mounting screw and nut ③ (next page). Before mounting the screw through the washer, truck, spacer, and the bolster lug.

I threaded the nut onto the screw ④, tightened everything up, and trimmed



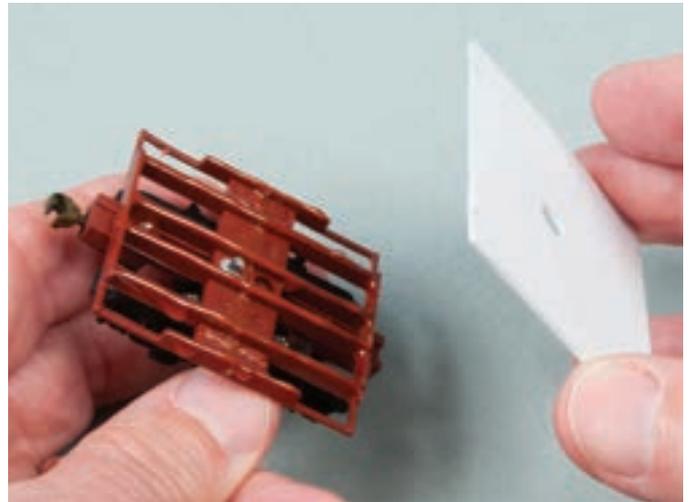
3 In order to allow access to the mounting screw and nut for the truck, Lou reamed a hole into the styrene deck.



4 Once the truck was in place, Lou attached it to the underframe and deck with a machine screw and nut.



5 After trimming the screw with a pair of nippers, Lou used a toothpick to apply a drop of Aleene's tacky glue to the nut. This helped lock the assembly into place.



6 Lou applied liquid plastic cement to the stringers on the kitbashed flatcar. With the glue still wet, he placed the .040" plain styrene sheet deck in position.

off the excess length of machine screw with a pair of nippers.

I then applied a drop of Aleene's Tacky Glue to the nut and screw to lock them together 5, applied plastic cement to the underframe stringers, and mounted the deck in position 6. Once the glue had dried, I stuck double-sided carpet tape to the deck, peeled away the protective layer on the top, and applied the mouse pad material 7.

After running the car around the layout a few times, I decided to add more weight to keep the short but light-weight car from wobbling. I used a drop of Aleene's Tacky Glue to secure six 1/4-ounce lead weights to the mouse pad, three in front and three in back of where the camera would sit 8.

Basic smartphone controls

Interfacing the GoPro with your smartphone is the best way to shoot video on the railroad. It also allows you to watch the action on the phone as it's happening in real time. Before you can interface your phone with the GoPro you must have an app that will allow you to do so. I chose "GoPro Quik." The basic program is free; just find it in your smartphone's application store and download it.

I always shoot video at 1080p resolution and 60 frames-per-second. That should be set up in the camera before shooting.

Manipulating the GoPro with the smartphone is a bit involved. For those who haven't attempted this, here are some basic steps to begin

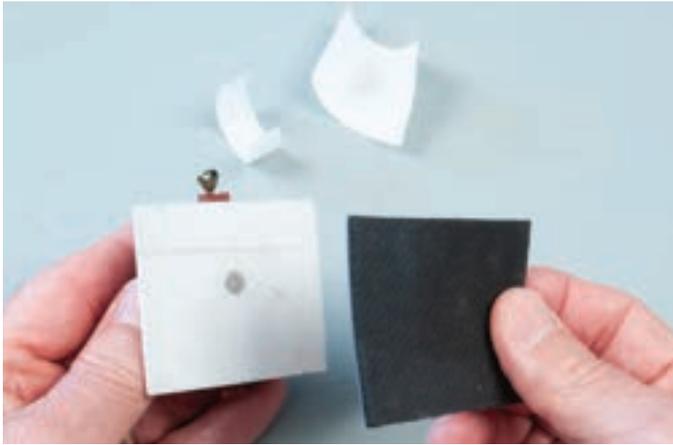
controlling the GoPro with your smartphone. First turn on the camera, then go to "settings" on the phone. Go into "Wi-Fi" and tap on the camera's network. In my case it is GP50107924.

Next, go into the "GoPro Quik" app on your phone and tap on the camera icon in the upper right of the screen 9 (opposite). This brings up the next screen, where you will tap on "Control your GoPro" 10.

When you tap on this you'll hear the camera beep as it interfaces with the phone. You will be able to see what the camera is recording on both the camera and the phone screens.

I prefer to shoot in wide-angle mode. To do this, go into "Settings," scroll to "Wide" and tap on it, then hit "Done" to exit the screen. You have the option of zooming in and out in the wide mode. Simply slide the red circle along the bar

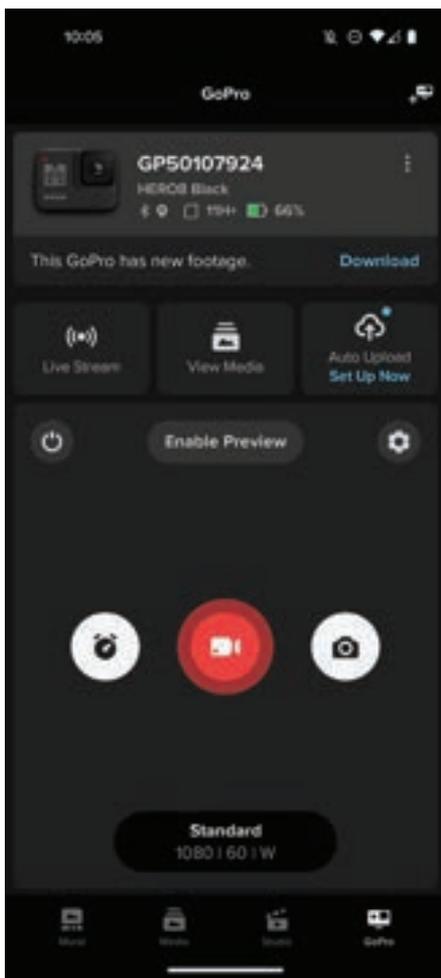




7 After applying pieces of carpet tape to the top of the deck, Lou attached the mouse pad material. This prevents the GoPro from sliding around.



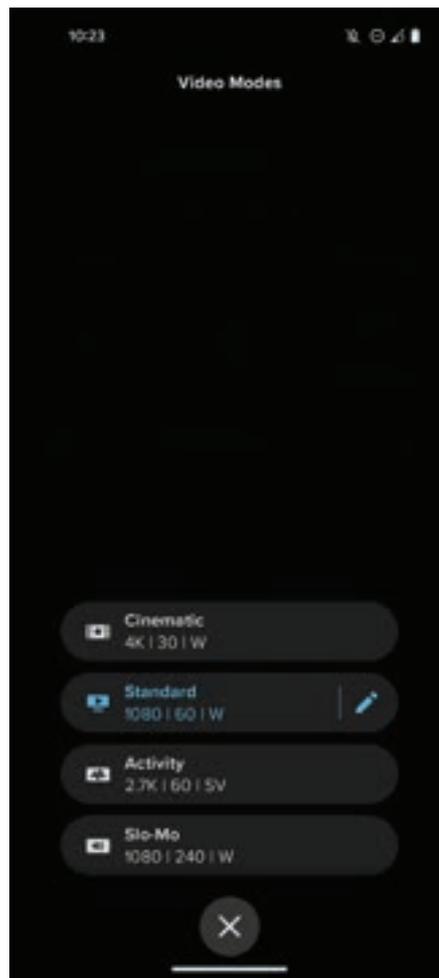
8 To finish the build, Lou added lead weights to the mouse pad to minimize how much the car wobbles. Wash your hands thoroughly after handling lead, which is hazardous.



9 After you open the “GoPro Quik” app on your smartphone, the screen should look like this. To enter recording mode, press the camera symbol at the upper right-hand corner of the screen.

on the right side of the page with your finger until you’re happy with the cropping of the image.

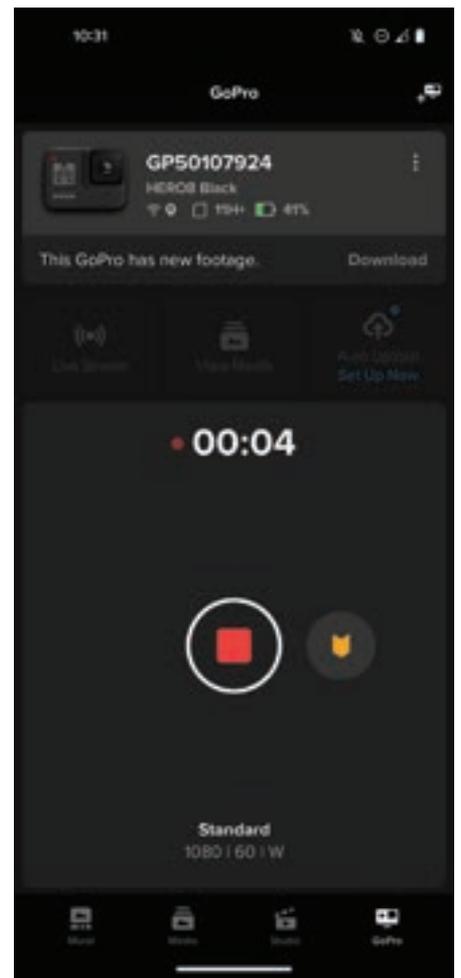
Once you’ve selected Wide, it will remain the default setting for the camera until you change it. You will, however,



10 Click “Control your GoPro” in order to get to the zoom and record options. Options include resolution, frames-per-second, and aspect ratio. Press the pencil icon to fine-tune your settings.

have to reset the zoom each time you use the camera.

Finally, tap the large circle in the middle of the screen 11 and it will change to a square, outlined in a circle, to indicate that the camera is recording.



11 To begin recording, tap the large circle in the middle of the screen. It should turn into a red square with a white circle outline. Hit that button again to stop recording.

Hit the square again when you want to stop recording.

For more instructions on how to use your smartphone to control the GoPro camera, visit the support page online at gopro.com. [MR](#)



This 40 x 100-foot HO scale model railroad is set in the steam-to-diesel transition era

By Forrest Nace

Photos by the author

Since 1988, members of the Western Pennsylvania Model Railroad Museum (WPMRM) have been working on a 40 x 100-foot model railroad set between Pittsburgh, Pa., and Cumberland, Md. The HO scale layout, which features historically accurate scenes, is among the largest displays in the United States.

Approximately 350 steam and diesel locomotives decorated for the Baltimore & Ohio and the group's freelanced Mon-Valley System (short for Monongahela Valley) move more than 2,400 freight

and passenger cars across the layout. The computer-controlled model railroad is kept up to date with the latest technology, and the museum has plans to make the layout even larger in the years ahead.

A rich history

The WPMRM was founded in 1938 as the Pittsburgh HO Model Railroad Club (PMRC). Believed to be the third oldest model railroad club in the U.S., it's quite possibly the oldest model railroad club devoted to building strictly in HO scale at its inception.



Amazing ALLEGHENY museum layout

The PMRC's early members helped pioneer the hobby of model railroading. Many of the members were involved in the founding of the National Model Railroad Association (NMRA) back in 1935. Their first "layout" was a simple loop used to help develop standards for the NMRA in its efforts to improve the manufacturing and operation of early model railroad equipment.

The group has called four locations home over the years. When a move was forthcoming in the mid-1980s, the Pittsburgh Model Railway Historical Society was formed as a tax-exempt

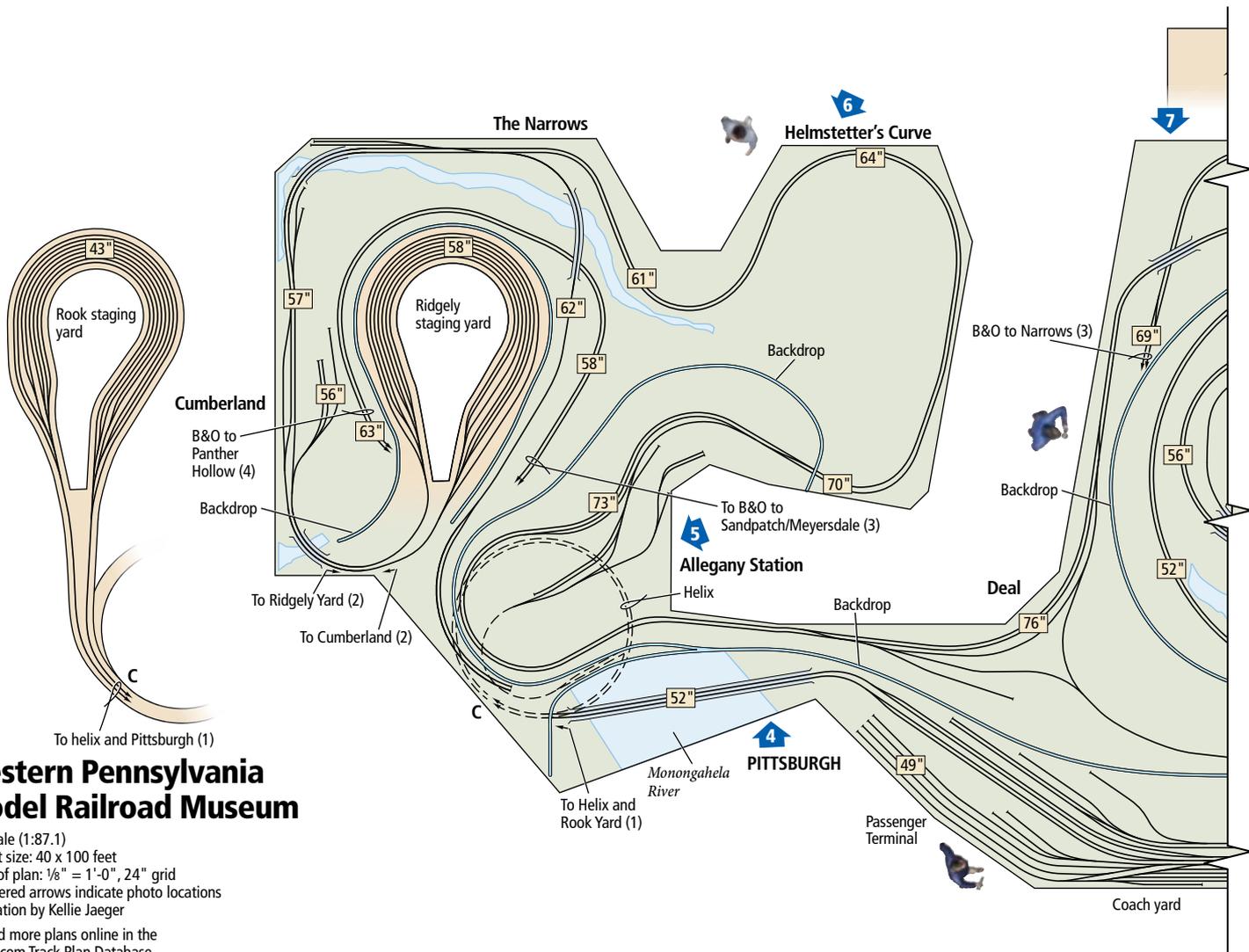
nonprofit. In 1998 the group was renamed the Western Pennsylvania Model Railroad Museum.

Land was purchased just north of Pittsburgh in Gibsonia, Pa. In 1986, construction began on a new two-story, 8,000 square foot building designed by architect C.J. Riley, a model railroader himself. [Riley's book, *Realistic Layouts: Use the Art of Illusion Like a Pro* was published by Kalmbach and is available at KalmbachHobbyStore.com. – Ed.]

The upper floor houses the 4,000-square-foot HO scale model railroad. The lower floor includes an office,

1 Mon-Valley System No. 2687, a United States Railroad Administration 2-10-2, leads a westbound freight over the Salisbury Viaduct on the Western Pennsylvania Model Railroad Museum's HO scale layout. Below, a meet is taking place between steam and diesel powered Baltimore & Ohio freights.

library, gift shop, food and beverage area, display cases of historic model railroad items, an O-27 Lionel layout, an operating N scale display, and an interactive 4 x 8 HO scale layout for children to operate. There are also wooden trains for children to play with.



Western Pennsylvania Model Railroad Museum

HO scale (1:87.1)
 Layout size: 40 x 100 feet
 Scale of plan: 1/8" = 1'-0", 24" grid
 Numbered arrows indicate photo locations
 Illustration by Kellie Jaeger

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



➊ This wide-angle view shows how the 4,000-square foot layout fits in the upper floor of the group's building in Gibsonia, Pa. McKeesport is in the foreground, Glenwood Yard is to the left, and Confluence is at right.

The Steel City

When the track plan for the current model railroad was being designed, members decided that if they were to be a historical society and museum, re-creating prototype locations and

operations was important. The group agreed Pittsburgh would be one of the primary modeled cities.

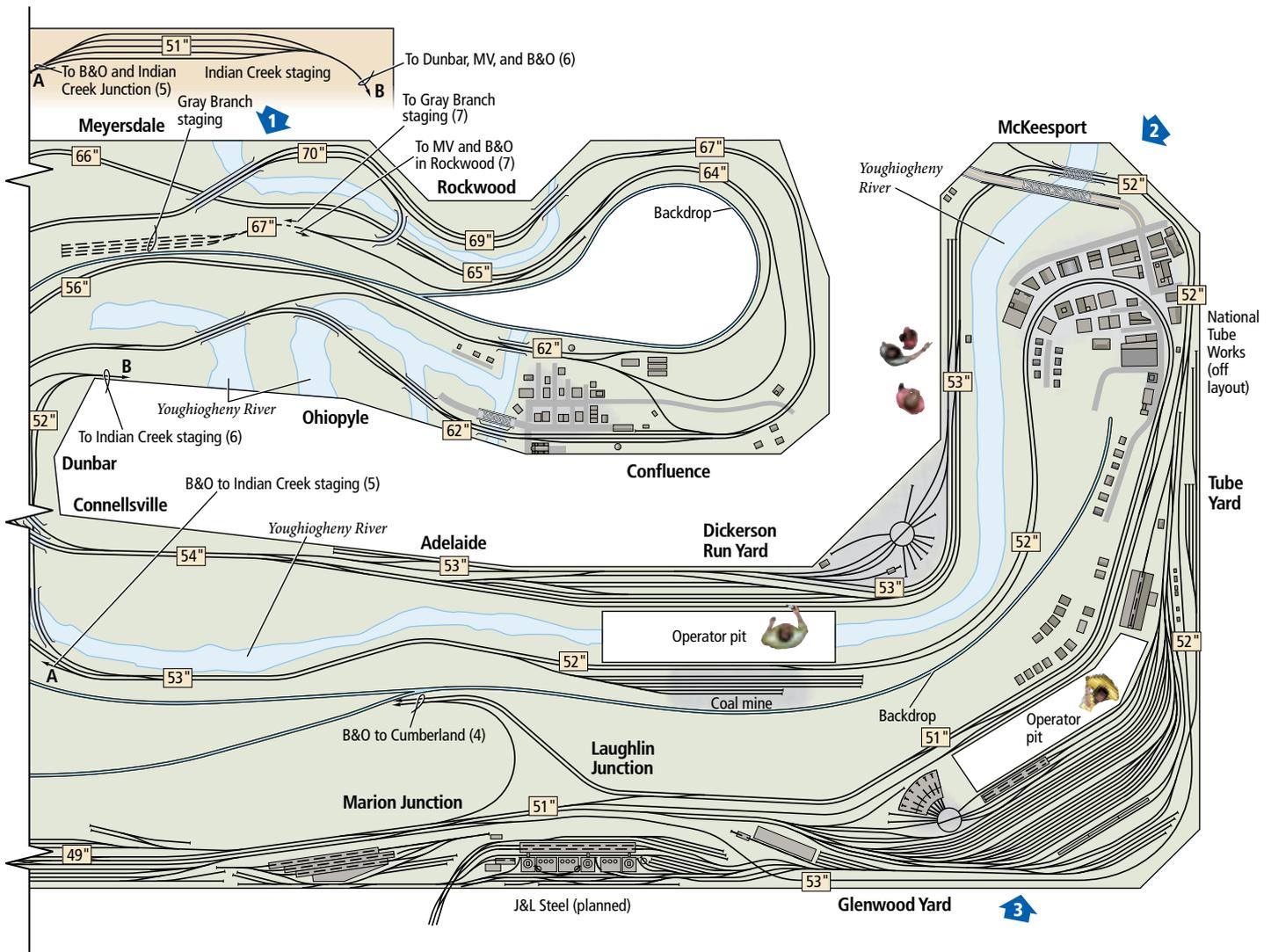
The Pennsylvania RR was the obvious prototype railroad to model. But it was calculated that accurately representing the two-mile long passenger terminal

and coach yard facilities alone would take 120 feet to model. The Pennsy also lacked steel mills and related heavy industries near Pittsburgh's "Golden Triangle" along the Allegheny River within city limits.

The Baltimore & Ohio's presence in Pittsburgh was all within city limits, relatively close to downtown, and could be modeled within the space available. Key locations included the Smithfield Street station; J&L Steel Co., with its blast furnaces, coke works, and in-plant MonCon RR; and the Glenwood freight yard and engine terminal, complete with a roundhouse, turntable, and coal dock. Cumberland, Md., was selected as the easternmost city to be modeled.

A fresh take on freelancing

Freelance modeling can be viewed as an anything and everything goes approach to the hobby, one that can easily stretch believability to the limit. Layouts such as W. Allen McClelland's Virginian & Ohio and the Rensselaer



Model Railroad Club's New England, Berkshire & Western showed that freelanced railroads could look and operate like the prototype.

Using those layouts as inspiration, the WPMRM's members started thinking of a new freelanced railroad. After using the Allegheny Valley Lines name for many years, the group chose Mon-Valley System (M-V) as the name of its new line. According to its version of history, the M-V was created through acquisitions of the Pittsburgh & West Virginia, Pittsburgh & Lake Erie, Western Maryland, and Virginian Ry. The freelance Mon-Valley did in the 1930s and '40s what CSX and Norfolk Southern did in later years with acquisitions.

Mon-Valley trains coming into Pittsburgh cross the Wabash Bridge (ex-P&WV), pass behind Smithfield Street station and J&L Steel Co., traverse Marion Junction, and enter Glenwood Yard, where the M-V and B&O interchange traffic.

Heading east out of Glenwood Yard, the M-V crosses the Youghiogheny River

The layout at a glance

Name: Western Pennsylvania Model Railroad Museum

Scale: HO (1:87.1)

Size: 40 x 100 feet

Prototype: Baltimore & Ohio and freelanced

Locale: Pittsburgh, Pa., to Cumberland, Md.

Era: 1953

Style: walkaround

Mainline run: Mon Valley, 443 feet; B&O, 357 feet

Minimum radius: 36" (main)

Minimum turnout: No. 8 (main), No. 6 (branch lines and yards), No. 4 (industrial)

Maximum grade: 2%

Benchwork: L-girder

Height: Mon Valley, 50" to 76"; B&O, 52" to 66"

Roadbed: Homasote

Track: code 83 (main and branch lines), code 70 (yards and industries), code 100 (hidden staging)

Scenery: screen and foam with plaster coating

Backdrop: painted or tree-covered tempered hardboard

Control: Digitrax LocoNet Digital Command Control

Bridge (ex-P&LE) at McKeesport, Pa., and then arrive at the Dickerson Run Yard and servicing facility (ex-P&LE) just west of Connellsville, Pa.

Continuing east, M-V trains travel over the ex-WM mainline from Dunbar, Pa., to Cumberland, Md. Except for Helmstetter's Curve, the B&O parallels

the M-V all the way from Laughlin Junction to Cumberland, with the steep grades of both routes accurately recreated. This gives the WPMRM a pair of double-tracked, Class I railroads to keep a heavy parade of freight and passenger trains rolling for the enjoyment and education of museum visitors. It also



④ A pair of Mon-Valley Alco DL109 diesels rumble over the east end of the Wabash Bridge in Pittsburgh. Kits and backdrop paintings give this scene a convincing big-city look.

allows for large operating sessions when more than 30 members are present.

A big fleet

Considering its 40 x 100-foot layout, it probably isn't a surprise that the WPMRM has a large fleet of locomotives and cars. The Rolling Stock Committee, one of several committees of the WPMRM, is responsible for all purchases, upgrades, maintenance, painting, and repairs.

Equipment reliability is critical. When a particular model works well,

usually several are purchased, not only for operation but also to do component or chassis swaps. Swapping components allows the custom-painted diesel shells, boilers with cabs, and tender bodies to be reused. This approach also gets bad-ordered locomotives back on the layout much faster, which is important during open houses.

The WPMRM uses a railroad bad order form to document and track any issues with motive power and rolling stock. Locomotives that need a motor upgrade are equipped with one from Kato whenever possible. The club primarily uses TCS decoders, but will turn to other brands if they fit better inside a particular locomotive.

All rolling stock is equipped with Kadee couplers, metal wheels, and

wheel-mounted resistors. The resistors allow the TrainController software to track train locations. This is especially useful if a train is derailed, stalled, or has become uncoupled, as the dispatcher can see on the computer screen all blocks that are occupied.

Structures and lights

At open houses, it's not uncommon for visitors to recognize houses from their old neighborhoods, churches they attended, or businesses family members worked at or owned. Many of the buildings on the layout were kitbashed or scratchbuilt using prototype photos or blueprints as a guide.

In recent years, club members have become proficient at using 3-D printing



③ Glenwood Yard is bustling with activity. As Mon-Valley 2-10-2 No. 2687 prepares to depart with an eastbound freight, 2-10-4 No. 2714 takes on coal. Above, a 2-8-0 spots a pair of hoppers at the massive coal dock.

technology. This lets them design and make unique structure and detail parts in house.

Many of the buildings have full interiors, and most have a room or two that's illuminated. Visitors enjoy seeing an operating TV screen in the living room of a house and the flash from an arc welder inside a manufacturing plant. The light-emitting diodes (LEDs) used in the models are operated at a reduced voltage to soften their output.

About a third of the signals needed for the layout have been installed. The B&O signals are from Signature Signals, while those on the M-V are kitbashed to a generic design. The dwarf signals are 3-D printed at the museum. Scratchbuilt

and commercial semaphore signals are also used at select locations.

Keeping up with the times

Automation has long been a focus of the WPMRM. From its inception, the intent of the M-V layout was to be current with the latest technology. The initial automation used the Computer/Model Railroad Interface (C/MRI) System created by well-known model railroader Bruce Chubb, builder of the HO scale Sunset Valley. Today the club uses TrainController Gold V9 from Freiwald Software and Digitrax's LocoNet DCC system.

TrainController enables the creation of computerized dispatch panels, schedules for trains to follow, and control of automated activities on the layout like sounds and room lighting. Additionally, Java Model Railroad Interface (JMRI) is used to program decoders and generate virtual dispatcher panels that can be used on tablets or mobile phones to operate the layout.

As the WPMRM model railroad has continued to grow and become further automated, the Engineering Committee has implemented new LocoNet components from a number of manufacturers including Digitrax, RR-CirKits, Team Digital, Train Control Systems, AccuLites, and others.

The layout is powered by a Digitrax DCS240+ command station and six DCS100 boosters, all connected to a LocoNet backbone including five LNRP repeater modules. This creates a LocoNet network across the model railroad. There are three Digitrax 20 amp power supplies powering the layout.

The model railroad is electrically separated into 22 nodes, each covering a section of the 4,000-square foot layout. A node consists of at least one Digitrax PM42 power management board and one Digitrax BDL162 occupancy detector, which combined create four power districts and 16 detection blocks. A node may include switch controllers, signal boards, additional coil-based detection boards, and auto-reversers.

There are 193 wiring districts on the layout, each generally 24 to 30 freight cars in length, to keep the trains apart from one another. Switches between or across the districts are also detected to control train movements through the interlocking. Districts are generally detected for occupancy using a current-sensing BDL168 detector, with stopping blocks at the normal running stopping end of each district.

As additional detection is installed for expanded operations, stopping blocks are being added to both ends of the wiring districts using coil-based, current-sensing RR-CirKits Watchman boards. Each block has a profile in TrainController that defines the maximum allowable speed within a block.

There are 363 turnouts on the layout, controlled primarily by Circuitron's Tortoise slow-motion switch motors. These are controlled by Team Digital's SRC16 or Digitrax's DX64 stationary accessory decoders.

⑤ The WPMRM layout is set in 1953 during the steam-to-diesel transition era. While Mon-Valley Alco RS3 No. 923 switches hoppers at the Allegheny Coal Co., a 2-6-6-6 passes the office with an eastbound on the main line.



Sharing the hobby

The museum is primarily funded through open houses held Friday through Sunday (except holidays) from mid-November to mid-January, as well as the entire week of December 26 through 31. The layout and track are thoroughly cleaned before the doors are opened to visitors. The track and locomotive wheels are usually cleaned twice during the open house schedule.

During the museum's public hours, trains are automatically operated by the TrainController software, with a dispatcher monitoring all movements. Usually, 20 to 28 M-V and B&O trains are operating at any time, with as many as 18 more that rotate on and off the layout from staging. Train speeds are programmed for a scale 40 to 45 mph to keep the trains moving at a realistic, but brisk, pace.

⑥ Helmstetter's Curve is a popular railfanning location on the M-V. An older red caboose marks the end of a freight train heading down grade. The coal train heading up hill needs an assist from 2-6-6-6 No. 2945, seen pushing against caboose No. 419 in the M-V's 1950s blue-and-white scheme.



Photo courtesy WPMRM

About the museum

The **Western Pennsylvania Model Railroad Museum** is located at 5507 Lakeside Drive in Gibsonia, Pa. The volunteer, non-profit 501(c)(3) is dedicated to the preservation of railroad history in the Pittsburgh area. For hours and events, visit the museum's website at wpmrm.org.

TrainController also operates all of the turnouts to route trains correctly based on their schedules. The dispatcher can override the computer by bringing a virtual throttle up on the computer screen and change a train from being automatically operated to being operated from the virtual screen throttle. This

feature is useful if a train is running slower than expected and starting to cause backups.

To enhance the visitor's experience, the yards at Glenwood and Dickerson Run were designed to allow for independent operators to perform switching duties using handheld throttles, without interfering with the trains being automatically operated by TrainController. This way the public can watch engine terminal and freight car switching operations, and the yard operators can take the time to explain to the visitors what they're doing.

Fun for the membership

Operating sessions for members and invited guests are held from February through October. Members may request a specific M-V and B&O train to operate, or they may bring their own Digital Command Control-equipped locomotives to run.

The model railroad can be operated with a relatively small crew. In addition to train crews, there needs to be a dispatcher, Glenwood yardmaster, Glenwood hostler, and Dickerson Run yardmaster. Two-person crews (engineer and conductor/brakeman) are usually





assigned to locals and turns. A single member or guest is all that's needed for passenger trains and through freights, as there is no switching involved.

The dispatcher has complete control of the model railroad. Trains are operated at realistic speeds whenever possible, usually at a scale 30 to 40 mph for freights and 50 to 60 mph for passenger trains. The superelevated main lines are capable of handling train speeds up to 75 scale mph.

JMRI software is used to manage the operating sessions, with no fast clock. Operators are presented their train orders or yard orders, and it's up to them to complete the tasks. For some operating sessions, train orders are kept simple. If a crew is to pick up two boxcars at Meyersdale and set off two boxcars, the train crew can select from their train which cars they set off.

All of the rolling stock has unique car numbers. When operating sessions are held with car cards and waybills, JMRI is used to generate the switch lists to provide a more detailed and realistic operating experience.

Individuals and train crews can operate trains and turnouts with tethered and wireless handheld throttles or with mobile phones and iPads running the Engine Driver or WiThrottle app interfaced to JMRI. The dispatcher also has the ability to operate any train or turnout through TrainController or JMRI.

Continued upgrades

Beginning in 2020, members began enhancing and upgrading the layout. Aging puffball trees were replaced with Scenic Express SuperTrees. Bridge, structure, rolling stock, and motive power weathering projects have been ongoing. An airbrush is used for items that can be removed from the layout. PanPastel products and drybrushing have been the go-to weathering methods for permanently attached items.

Members have also been adding details to scenes, including figures and vehicles. Mailboxes, stop signs, telephone booths, and road markings are correct for the steam-to-diesel transition era through the summer of 1953.

7 The ground is trembling as Baltimore & Ohio Electro-Motive Division F3 No. 1404 meets class EM-1 2-8-8-4 No. 7627 by the station at Meyersdale. Members have been enhancing scenes with figures, vehicles, and details, as seen here.

Room for growth

As of 2022, a two-story addition to the museum is being designed, which will add between 2,000 and 3,000 square feet to the model railroad on the upper floor. The proposed expansion includes a workshop area for club members and more interactive operation opportunities for visitors on the lower level.

The area west of Pittsburgh, including PRR trains that serviced the local industries and passed through Carnegie, Pa., will be part of the expanded layout. Rook Yard, which is currently represented by a hidden, multi-track staging area, will be re-created as a visible yard with scenery. The coal washing plant at Adelaide, Pa., will also be added.

Two divisions will be present on the expanded layout. Twelve more operators and a second dispatcher will be needed to support the increased traffic.

Membership growth is always being evaluated to ensure the wide variety of skills, knowledge, and interests of potential, new, and existing members is being addressed. The WPMRM strives to be an organization for all to feel welcome and appreciated for promoting model railroading. [MR](#)

Forrest Nace lives in Butler, Pa., and owns Nace's Videography LLC. His story on Howard Zane's HO scale Piermont Division layout appeared in the February 2020 issue of Model Railroader.





The Penn Central in Bellefonte, Pa.

This HO scale plan was inspired by a contest

By **Bob Sprague**

It was irresistible. Noted craftsman structure builder and model railroad podcaster Scotty Mason announced a track planning contest for a room in his new home. This was my chance to finally be interviewed on Scotty's popular show. I had to enter.

Reality set in when I looked at the footprint: an L shape, 9'-8" x 11'-6", with a bite taken out of one corner. There would be no room for a multi-deck masterpiece. Instead, to set my entry apart, I designed a plan closely based on a prototype location. I included significant operating possibilities to keep one or two people busy. I also provided ample room for Scotty to showcase his structures.

Scotty's only specifications for the track plan were HO scale and a Penn Central theme, preferably in Pennsylvania. I logged on to Google Maps and started to explore. There, just about dead center of the commonwealth, lies Bellefonte, Pa. [pronounced bell-font - Ed.], a small town bursting with railroad history. I had my subject. Now it was time to get started on the plan.

All about Bellefonte

Railroads came to Bellefonte in the days after the Civil War, originally to transport iron ore from mines along Buffalo Run to blast furnaces in town.

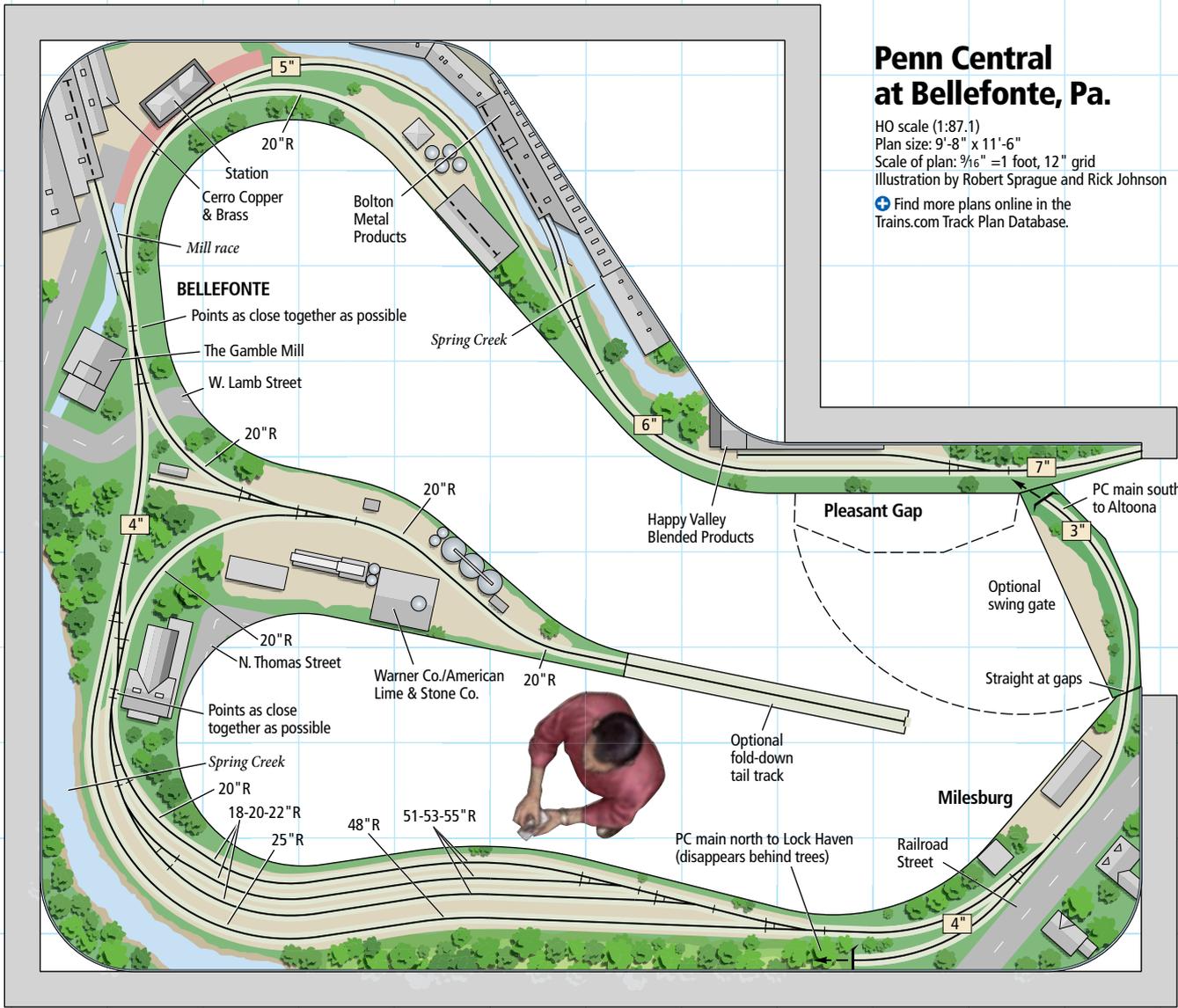
Penn Central Electro-Motive Division GP9 7161 leads the Spring Grove Local through York, Pa., in this undated photo. A scene similar to this could have played out in Bellefonte, Pa., the subject of Bob Sprague's latest HO scale track plan. Glenn E. Dietz photo

Small railroads were chartered, built, merged, and abandoned based upon financial booms and busts. Commodities including lime, lumber, and coal were handled by rail, along with the majority of the construction material used to expand Penn State University in nearby State College, Pa.

By the time of the Pennsylvania RR and New York Central merger in 1968, the town was served by the Bellefonte Central RR (BFC), which connected to the Pennsy's Bald Eagle Branch in nearby Milesburg. The BFC was struggling but was still shipping lime from the National Gypsum plant to steel producers in Pennsylvania and Ohio.

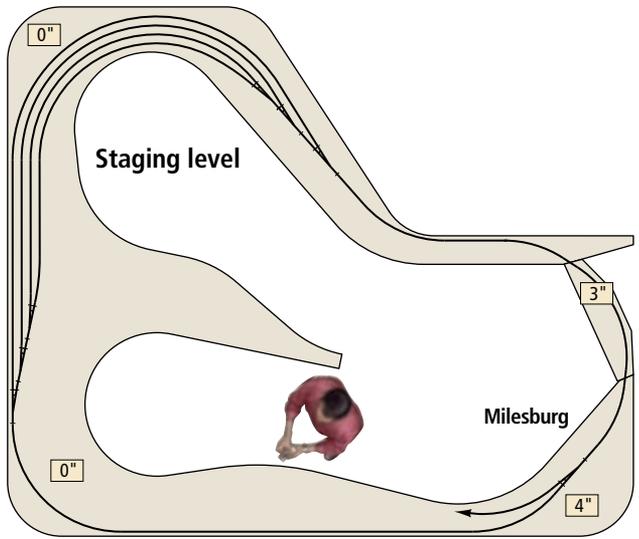
Penn Central at Bellefonte, Pa.

HO scale (1:87.1)
 Plan size: 9'-8" x 11'-6"
 Scale of plan: 3/16" = 1 foot, 12" grid
 Illustration by Robert Sprague and Rick Johnson
 Find more plans online in the Trains.com Track Plan Database.



The track plan at a glance

Name: Penn Central at Bellefonte, Pa.
Scale: HO (1:87.1)
Size: 9'-8" x 11'-6"
Prototype: Penn Central
Locale: Bellefonte, Pa.
Mainline run: 36 feet
Minimum radius: 24" (main), 18" (siding)
Minimum turnout: No. 6
Maximum grade: 4%





Two Nittany & Bald Eagle GP8s bring a train past the Federal Match Corp. complex in Bellefonte, Pa., on May 18, 2005. Historic buildings influenced Bob's decision to base the track plan on the central Pennsylvania community. Kenneth Lehman photo



Nittany & Bald Eagle GP10 1804 prepares to work a lime plant in Pleasant Gap, Pa. Bob included American Lime & Stone Co. as one of the rail-served customers on his HO scale Bellefonte track plan. Mike Zollitsch photo

In 1984, PC successor Conrail abandoned its Bald Eagle Branch, but the story has a happy ending. The Nittany & Bald Eagle was formed to maintain operations on the line. Today the route is seeing increased traffic from Norfolk Southern, which is using it for coal and other commodities.

When I spotted Bellefonte on the satellite maps, I was fascinated. It has a tiny yard, a wye, tight curves, and an assortment of industrial spurs. I could tell even from the aerial views that "Central Pennsylvania's Victorian Secret" was full of historical buildings that would be

great fodder for a craftsman structure enthusiast like Scotty.

The plan

Mainline operations were limited because of the available space. I wanted to capture enough of the town of Bellefonte to make it recognizable.

Even on small railroads it's advantageous to have staging. Without it, operators are restricted to a small number of cars or are forced to switch them on and off the railroad manually to get any variety. Therefore, I included a hidden

staging yard as part of a loop representing the Bald Eagle Branch.

The loop is only visible for five or six feet as it crosses the doorway and extends through Milesburg. Still, the yard can store 35 to 40 cars that can be brought onto the layout to simulate traffic coming from Lock Haven to the north or Altoona to the south. The thin bridge across the doorway can be built as a swing gate or, particularly if the layout is built high, as a permanent nod-under.

In Bellefonte I was able to include the curved yard west of town, the wye serving the lime operation, the historic station, and several of the industries that overhang Spring Creek. The mill race and old mill (decrepit in the Penn Central days, now a restaurant) are also in their proper places.

The tail track on the wye is designed to be a fold-down leaf. It will aid operations, but will be in the way during layout construction.

And the winner is...

My plan for Bellefonte is small, but there are some challenges to its construction. The staging yard is below the main deck. Grades of near 4% are required on each end to bring Milesburg up high enough so that Bellefonte, in turn, can clear the staging tracks below. Having a method of accessing the staging yard turnouts for maintenance is highly advisable.

Several curved turnouts are required to accommodate the yard and spurs. Walthers offers 20"/24" No. 7 turnouts. In two places, turnouts directly abut one another; this is a reliable arrangement if the switch points are kept as close together as possible.

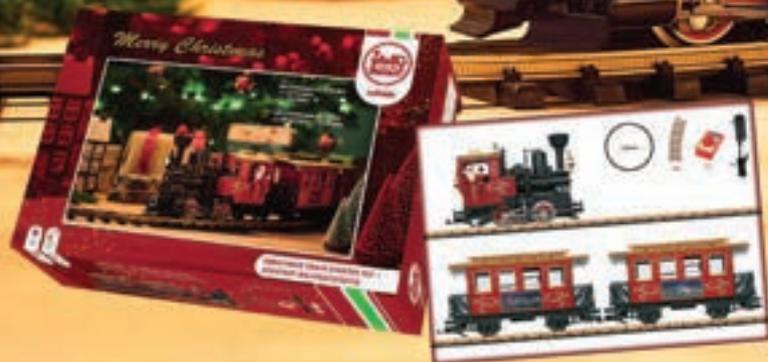
So how did I do in the contest? A mixed result. I won and received a full set of signed craftsman kit building instructional CDs. However, Scotty moved again and never started construction on his version of Bellefonte. And, like Dr. Hook trying to get his picture on the cover of *Rolling Stone*, I never got my interview on the Scotty Mason podcast.

No matter. I had fun with this design, and perhaps it will inspire someone with a similar space to bring Bellefonte to life in miniature. [MIR](#)

Bob Sprague is an enthusiastic track planner and frequent contributor to Model Railroader. He lives in Baltimore and is building a prototypically accurate double-deck version of the Maryland & Pennsylvania RR as it existed in 1924.

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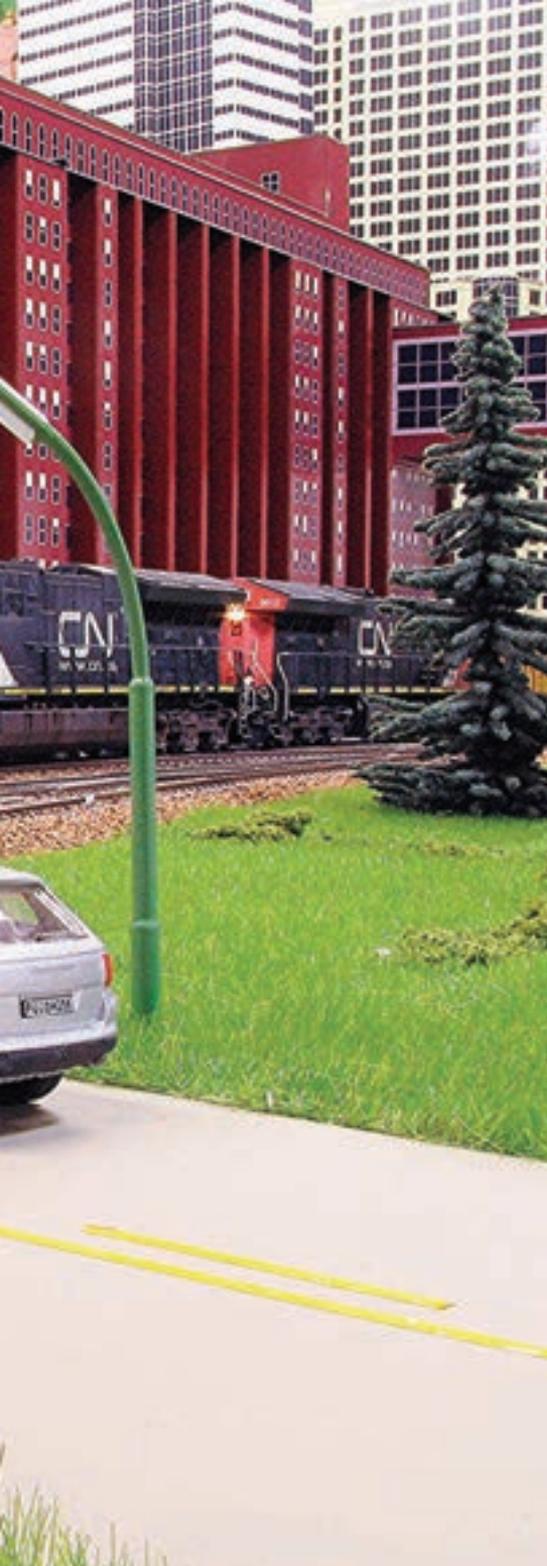
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An architectural Paradise Island

The Soo Line Central showcases scratchbuilt replicas of skyscrapers from around the world

By **Dave Rickaby** • Photos by the author



1 Northbound Canadian National ET44AC 3150 shows off its new paint job honoring the railroad's centennial on Matt Gelling's HO scale Soo Line Central model railroad. Designed for railfanning, the layout features towering scratchbuilt skyscrapers.



2 A trio of patched-out former Milwaukee Road GP38-2s in the "Bandit" paint scheme is heading south over the South River, passing the Daily Gellings News Building. Matt scratchbuilt many of the bridges and overpasses from mat board.

Have you ever walked on a sidewalk in downtown New York or Chicago, looked up at the immense skyscrapers, and felt a little dizzy? Have you looked at how high they are and wondered what went into the design of these unique pieces of architecture? Matt Gellings has. That's why he sought to bring these amazing buildings to a place he could admire them in miniature, his HO scale Soo Line Central RR.

Matt's journey

Matt grew up in Lomira, Wis., where his grandfather was a farmer. Spending time on his grandfather's farm as a young boy introduced Matt to all sorts of machinery. Matt's father worked as a mechanic, so Matt's interest naturally turned to things mechanical, especially tractors and other farm equipment. This love of big machines led him to become a mechanical designer and, later, to modeling railroads.

As a curious 12-year old, Matt asked his mom and dad for a train set for Christmas. His wish was granted, as he received a Bachmann locomotive, three cars, and a caboose. He was pretty excited, and of course wanted to add more track. A couple of trips to Kay Bee Toys took care of that. Grandma Gellings would take him to a hobby shop

in nearby Oshkosh, Wis., for additional motive power and rolling stock.

As Matt grew into adulthood, he built several layouts. One was featured in a local Lomira newspaper. As time went on, he progressed to more intricate layouts, including a snow-covered N scale Chicago & North Western layout, a direct result of living in a condo with marginal available space.

The January, February, and March 1988 issues of *Model Railroader* carried articles about Malcolm Furlow's HO scale Carbondale Central project layout. The layout was a very detailed and weathered urban cityscape. This was a game changer for Matt. From that moment, the only constant theme for his model railroading was a layout built around a large city. He migrated back to HO scale and started to expand in dimensions and theme.

The layout

Matt started building the Soo Line Central layout in his house in Milwaukee in 2012. He temporarily moved it to his parents' house in Lomira when he moved in with them in 2015.

Matt didn't want to settle for the ordinary in this layout. The concept was to showcase trains running through the urban canyons of a Chicago-like city, complete with tall skyscrapers. Most of



3 A FedEx tractor-trailer is driving over the Boedeker Drive Bridge as two tugs steam by on the South River. In the distance a Soo Line freight can be seen. Matt modeled the water with Woodland Scenics products.

the structures are modeled after ones that are actually in Chicago. However, Matt has taken some modeler's license to include buildings located elsewhere, such as Cosco Tower in Hong Kong and Chifley Tower in Sydney, Australia.

Although he models the Soo Line in a familiar but fictional setting, Matt wanted to represent what happened to the Wisconsin Soo Line trackage that he was familiar with over a span of years. The Canadian Pacific absorbed the merged Soo Line/Milwaukee Road system and now uses the former Milwaukee Road main line across the state. He instead chose to represent the trackage that was spun off to the Wisconsin Central and now Canadian National. By changing the era of the layout between the 1980s and the present, he can run whichever of these railroads he chooses, and it works for him.

With a footprint of 8 x 20 feet, Matt's layout was built as a freestanding island design. The layout stands on an array of metal legs usually used for folding tables. The benchwork is an open grid of 1 x 4s topped with 1/2" particle board. On top of this is 5" of extruded-foam insulation board. The fascia was made using 1/8" tempered hardboard, painted black. A black skirting to the floor completes the finished look. The riverbed is 33" off the

floor, while the bases of the structures sit at 34" and 38".

Trains run in a continuous loop with two mainlines totaling 98 feet long. The track is Atlas code 83 flextrack laid on Midwest Products cork roadbed, with a minimum radius of 24" and no grade. The turnouts are Atlas No. 8s lined using Caboose Industry ground throws. All the track and turnouts are weathered first with a dark brown spray paint, then with airbrushed Grimy Black hobby paint. The ballast is from Woodland Scenics.

The layout is lit using 4000K LED tube fixtures, which will be used on a future layout.

Scenery

Matt built his landforms using extruded foam. Most of the scenery is taken up by his massive skyscrapers, roadways, and rivers. To represent green areas, he used grass mats from Walthers. Based on the experience he had with those, he says he would switch to static grass on any future layouts.

The roadways on the layout are made out of a combination of different mat boards and mounting boards. The mounting boards can be spray-painted any color, and both types of board are easy to cut and glue in place. Matt had to weight them down while the glue dried to prevent them from curling because of the moisture in the glue.

Though there aren't many trees in this urban setting, the conifer and

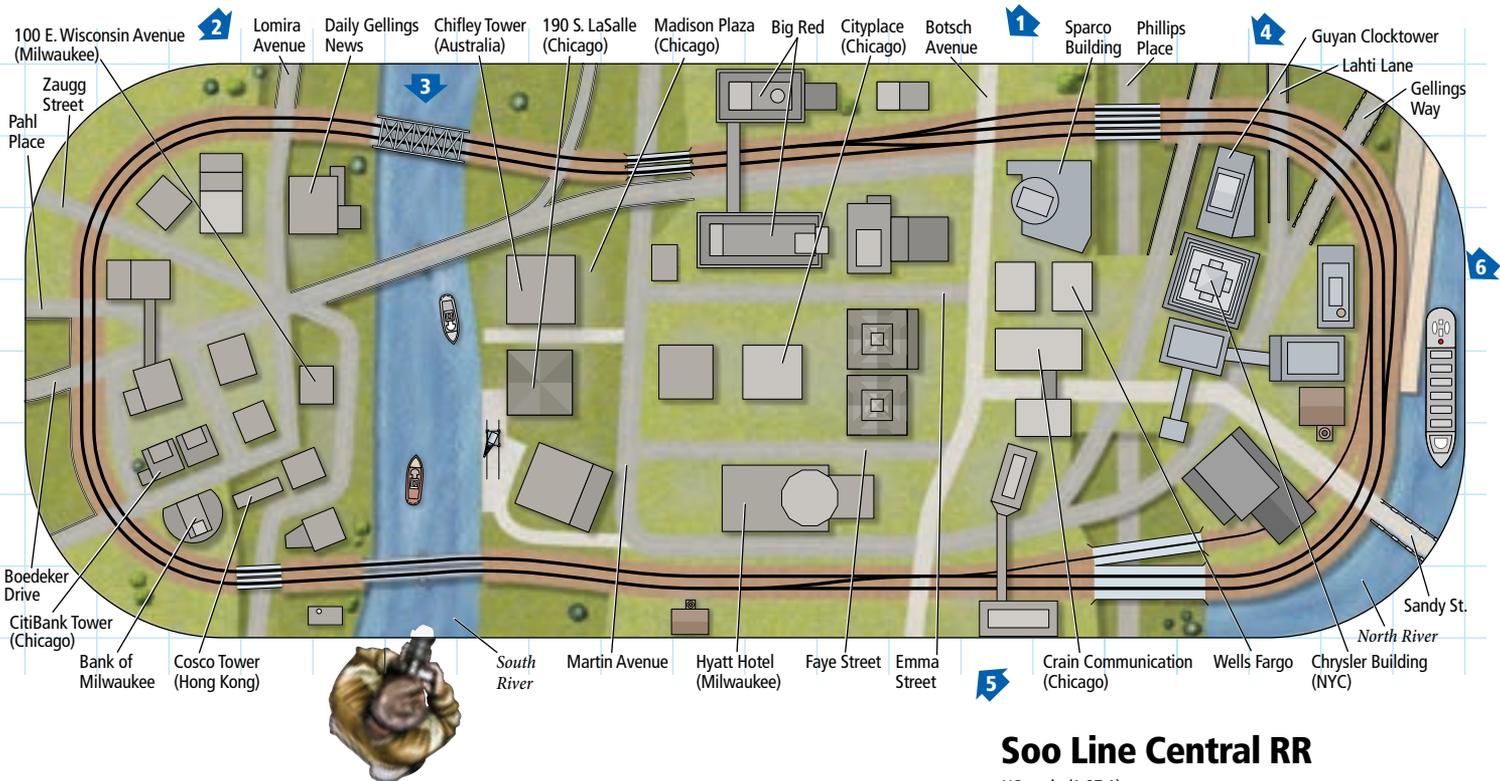
deciduous trees there are were provided by Grand Central Gems and Bachman.

To create the harbor scene and the North and South Rivers, Matt used Woodland Scenics Realistic Water. He painted the riverbed blue and added an 1/8" layer of Realistic Water. The ripple effect in these areas occurred naturally when the layer was setting up. To create the bow wake of the two tugboats in the South River, he used Woodland Scenics Water Effects. The substance goes on white and dries almost clear. Matt dry-brushed some white acrylic paint on the top of the wakes to create a frothy look.

There are a number of bridges on the layout, both railroad and roadways. Matt kitbashed several using supports from Rix Products, mat board, and O scale ladders mounted horizontally for the railings. The two bridges that carry trains across the South River are from Central Valley and Micro Engineering. The great lakes freighter seen in the harbor in the North River is a Sylvan Scale Models product. The wharf was scratch-built with stripwood.

Those amazing skyscrapers

Matt started to build scale skyscrapers out of Plexiglas in 2012. He originally used modeler's tape to make each line on the sides of the buildings, which he found to be very intricate and time-consuming work. He sold those structures for a profit, but realized that there had to be an easier way to make the lines and windows.



Soo Line Central RR

HO scale (1:87.1)
 Size: 8 x 20 feet
 Scale of plan: 1/2" = 1'-0", 12" grid
 Numbered arrows indicate photo locations
 Illustration by Kellie Jaeger

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

The layout at a glance

Name: Soo Line Central
Scale: HO (1:87.1)
Size: 8 x 20 feet
Prototype: Soo Line, Wisconsin Central, and Canadian National
Locale: Chicago
Era: 1980 to present
Style: island
Mainline run: 98 feet (double tracked)
Minimum radius: 24"
Minimum turnout: Atlas No. 8
Maximum grade: flat
Benchwork: open grid
Height: 38"
Roadbed: cork
Track: Atlas code 83 flextrack
Scenery: extruded-foam insulation board
Backdrop: none
Control: NCE ProCab DCC



4 Phillips Place runs in a canyon beneath the tracks and past the Sparco Building in this view of the west side of the layout. The model railroad was designed for continuous-run railfanning, with a double-tracked mainline loop.

Matt has a degree in mechanical design and was familiar with Computer Aided Design (CAD). He decided to draw the pieces of the structures in Turbo CAD and print them out in color on his HP Design Jet 24-inch printer.

The paper he uses is a high-grade gloss stock that comes in large rolls.

While some modelers would choose a flat finish, Matt thought he could represent the reflections from the windows with gloss paper.

Turning away from Plexiglas structures, he started creating the physical shape of each building from 1/2" foam core glued together with Loctite All

Purpose Power Grab adhesive caulk. He calls these structural cores "boxes."

The printed sides were glued to mounting board and then cut out with a large mat board cutter. The cutting process is very tedious, because the cuts have to be exactly on the line and the corners all have to be beveled.



5 Guests hoping for a good night's sleep in the Hyatt probably weren't counting on the hotel's proximity to a double grade crossing. Here, a northbound manifest freight meets a southbound at the Botsch Avenue crossing.

Matt started out building smaller structures to see if his new technique would work. After some trial and error, he realized that spraying the back of the printed side and the front of the mounting board with Scotch Photo Mount worked well. The sides of the mounting boards aren't measured and cut until after the printed building drawings are mounted. These pieces were then glued to the foam core substructure.

With the architecture of skyscrapers, the sky is the limit. In Matt's parents' basement, however, the ceiling was the limit, which caused him to build the structures to more of an N scale height.

Some of his buildings took months to build. His Chrysler Building has more than 80 pieces in its spire alone. Matt takes his time because he wants to get it right. He enjoys the intricate detail and loves the reactions from viewers who see the buildings for the first time.

Matt didn't feel the need to install a backdrop on the layout because the skyscrapers act as one. A visitor can't see a train on the other side of the layout except by looking down the streets and seeing one at a grade crossing. This forces operators to follow the trains. Even though the layout was built as a continuous run around the perimeter of the structures, it still provides the illusion of distance.

Rolling stock and operation

Matt's stable of locomotives are mostly from Athearn Genesis, plus others from Walthers Proto 2000, ScaleTrains, Kato, and Broadway Limited. They are painted for Soo Line, former Milwaukee Road "bandits," Wisconsin Central, Canadian National, and Metra.

All the locomotives are equipped with sound decoders from ESU, SoundTraxx, and QSI. The trains are controlled using North Coast Engineering ProCab wireless DCC throttles.

Matt's fleet of rolling stock includes models from Athearn Genesis, Atlas, Kato, and Fox Valley. He begins weathering his cars and locomotives by air-brushing them with a very light coat of a 50/50 mix of white acrylic paint and isopropyl alcohol. For rainwater effects, he uses a vertical wash of black acrylics, and for rust, he uses oil-based paints. He also uses chalks.

Matt never intended for his layout to be built for operation, but rather as a display. He wanted to just sit back and enjoy trains running through the scenery of his spectacular urban canyons and waterways.

With Matt's layout there are no industries to switch, nor are there any yards. There are only trains running in



opposite directions, which enables the viewer to sit back and enjoy the spectacle of this urban canyon layout.

Plans for the future

When Matt walks down into the basement and turns the lights on, the thing that always amazes him is how big this moderate-sized layout looks. The design forces you to look at it not only horizontally, but quite vertically as well. Matt was always good at art and visualizing things, but he views himself as more creative than artistic.

The main thing that really fuels Matt's passion for the hobby is realism. He loves the art of weathering and wants to go back and give everything a deeper coating of urban grime.



Part of what makes the hobby great for him is going to the train shows with his club, the West Bend Ballast Scorchers Model Railroad Club. This gives him the chance to run his equipment on a modular layout and look for new things to purchase. He also runs trains on the club layout during their open houses and operating sessions.

When Matt moves into his own home, he plans to tear down the layout, saving the buildings and bridges for a new, larger layout. The new model railroad is already under construction and will feature a bigger urban sprawl, a harbor scene with multiple docks and ships, and a large mountainous area with tunnels and five high bridges. He estimates that the footprint will be at least double the size of the present layout.

6 The *Vanessa R. Botsch* moves to dock at the North River port as a Soo Line freight rolls along the harbor embankment. The wharf is a busy place, and the fishing is pretty good, too.

After this article was written, Matt moved to a new home in Fond du Lac, Wis., and opened a model railroad museum in the basement. People are able to visit the layout for a small fee, by appointment only. For more information on how to visit the museum, go to <https://sites.google.com/view/soolinecentral/home>. **MR**

Dave Rickaby is a frequent contributor to Model Railroader and its special issues, including Great Model Railroads 2024, available now on newsstands and at KalmbachHobbyStore.com.

Meet Matt Gellings

Matt and his wife, Vanessa, live in Fond du Lac, Wis. They were married at the National Railroad Museum in Green Bay, Wis., aboard one of the museum's passenger cars. Matt is a 1998 graduate of Moraine Park Technical College in Fond du Lac, earning degrees in mechanical design and CNC (Computer Numeric Control). Matt is self-employed as a reupholsterer.





The author built operations drawers around his layout to serve as writing surfaces for paperwork, as well as for storing writing utensils, extra paperwork, and uncoupling picks.

Build an OPERATIONS DRAWER

A homemade fascia fixture adds a writing surface and storage for paperwork

By **Scott McLeod** • Photos by the author

One aspect of model railroading that I enjoy is hosting group operating sessions on my under-construction Rio Grande Southern. I try to run my layout like the real railroad operated in 1938 to 1942, using timetable and train orders (TTTO). For the tracking of individual cars, I use switch lists generated by Ship It! software. Collectively, I refer to the timetable, train orders, and switch lists as “paperwork.”

Using these methods to create an enjoyable operating session requires a crew member to carry multiple pieces of paperwork, a writing utensil, and their throttle as they operate across the layout. Experience has shown that this can be cumbersome and frustrating, especially when switching is involved. Using the throttle, lining switches, uncoupling cars, and handling paperwork usually

leaves a person shorthanded and searching for a place to set things down while they work.

Layout owners use different methods to give operators a place to set their paperwork. Over the years, I’ve seen everything from small shelves or a clipboard on the fascia at key locations, to use of the layout itself, and as a last resort, even the floor.

In searching of an acceptable solution, I thought of things that store out of the way when not in use to help keep my layout fascia looking clean. My thoughts turned to something like the kitchen bread board that could provide a surface for the operator to put paperwork and write on it. I also thought of a drawer as a common way to store things. Wouldn’t it be handy, I thought, if I could design a drawer that acted both as a writing surface and a place to store writing utensils,

blank forms, and small items like uncoupling picks? It certainly would make things easier on the operator.

The design I came up with was a drawer that has a small compartment in the front. The compartment would be covered by a work surface that slid back and forth within the drawer. I mounted the drawer in my model railroad so that when it’s closed, the front is flush with the layout fascia.

The design also allowed me to adapt the width, depth, and height of the drawer to fit to different locations and also adapt the materials readily available.

Scott McLeod is a retired software engineer who lives in Cottage Grove, Minn., with his wife of more than 45 years, Beth. He enjoys working on his layout and teaching his three grandchildren the art of prototypical railroad operation.

STEP 1: BUILDING THE FRAME

The first step is to determine the location that the drawer will be placed in your layout. There are multiple factors to consider, such as identifying where an operator would likely need to be writing, the proximity to a phone to communicate with the dispatcher, available space in the benchwork, the width of the aisle, and lack of obstructions beneath the layout (joists, wires, risers, etc.). Once this is done, you can determine the size of the drawer.

For my layout, I determined that the drawer frame itself could be made of 1 x 2 boards, which would allow for a 1"-deep compartment to hold writing utensils, uncoupling picks, and enough spare train order and clearance cards for an operating session ①. It would also be deep enough to allow for the slots for the sliding work surface to be made 1/4" from the top of the drawer, thus providing a lip around the work surface to keep items from sliding or rolling off when in use. In order to make it easy to slide the drawer out, the drawer face would be rounded at the top and include a finger pull.

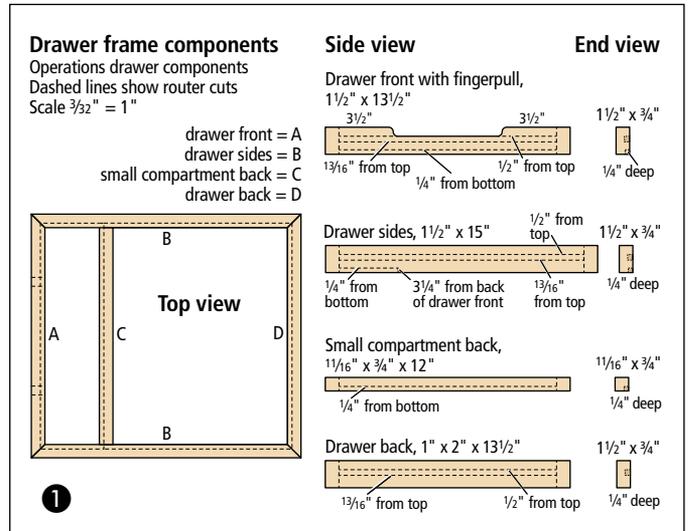
I then determined the size of the compartment from front to back. The drawer has to be long enough to accommodate the writing surface both when it's slid forward in the drawer and back to access the compartment ②.

To build the frame, I first determined the sizes of the drawer, compartment, and writing surface. I then cut the framing to size with 45-degree angles on the ends and cut the compartment back panel width and height to size.

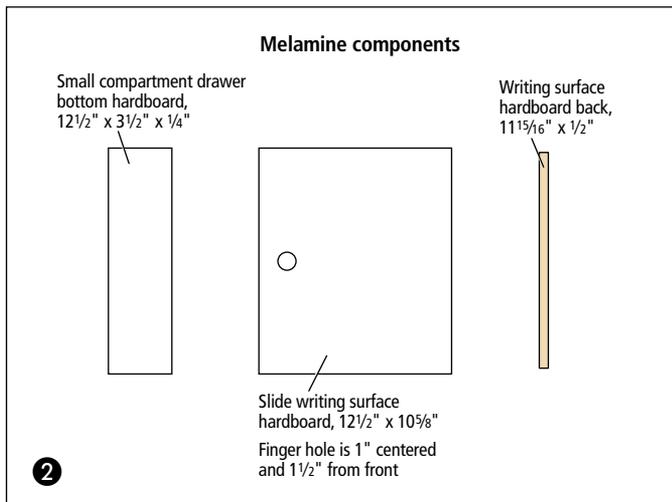
Using a router, I created the slots for the writing surface to slide in. Next, I cut the finger pull in the drawer front.

Using a table saw, I cut the bottom of the drawer front, drawer sides at the front, and the back of the compartment to allow the compartment bottom to be mounted flush with the bottom of the frame.

I used a sander to round off the top of the frame pieces. Finally, I assembled the drawer frame sides and rear and the rear of the compartment ③.



Kellie Jaeger illustrations



STEP 2: THE WRITING SURFACE

For the writing surface, I selected 1/4"-thick white Melamine. The material provides plenty of strength to support a pen writing on paper. Another benefit is that it doesn't need to be painted. You can find 1/4"-thick white Melamine and most well-stocked lumberyards and home-improvement centers. Some online retailers also carry the material.

To help the operator slide the work surface back and forth in the drawer, I added a 1"-diameter finger hole centered in

its front. To keep items from rolling off the back of the work surface, I glued a 7/16" high Melamine lip at the back, as shown in the photo on the next page.

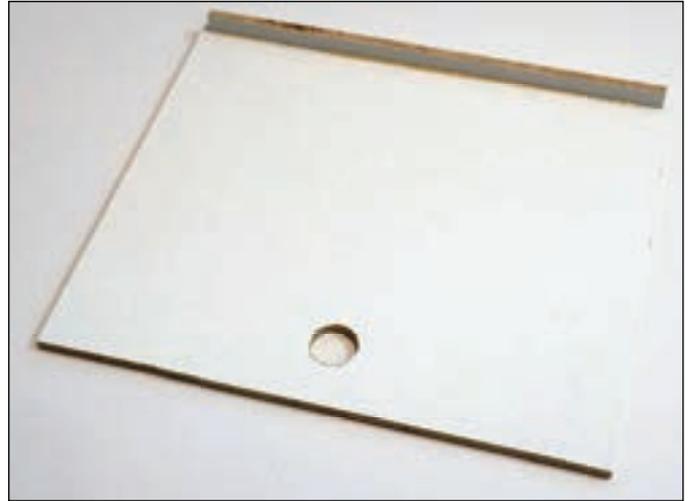
There are many brick-and-mortar and online retailers that carry drawer slides. For my project I chose white 14" Blum 230 epoxy-coated drawer slides from Woodworker's Hardware (wwhardware.com). These slides would support a drawer that was deep enough to write on.

STEP 2: THE WRITING SURFACE (CONT'D)

I first measured the width of the writing surface slots in the drawer sides. To let the writing surface easily slide back and forth in the slot, I cut Melamine $\frac{1}{16}$ " narrower than the space. I then drilled the finger hole to size.

Next, I slid the writing surface into the drawer, checked to see how freely it slid, and adjusted the width as necessary. I assembled the drawer front to the frame. Then I assembled the bottom of the compartment.

Once the drawer was assembled, I again checked that the writing surface would easily move back and forth. Finally, I moved the $\frac{1}{4}$ " white Melamine to the rear of the drawer and glued the lip to the rear of the writing surface, being careful not to get glue anywhere that would prevent the material from sliding freely.

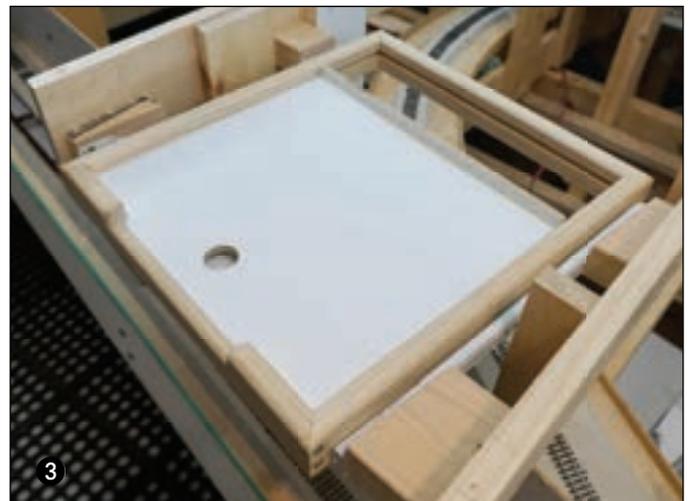
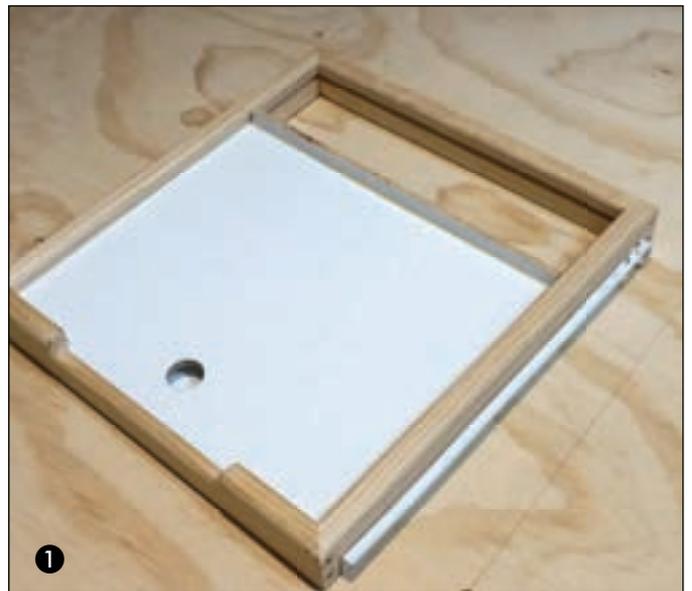


STEP 3: THE DRAWER SLIDES

Once the drawer was completed, it was time to mount the drawer slides on the drawer and in the benchwork. Each situation is unique, so you want to make sure that the drawer can move freely, is mounted level and square with the fascia at the desired height, and stops flush with the fascia. I created benchwork mounting pieces as needed.

I determined the location and attached the drawer slides to the bottom of the drawer sides, ①, and the benchwork ②. Next, I installed the drawer and double-checked that everything moved freely and lined up as desired ③. I then finished the front and sides to match the fascia.

Although my layout is in its beginning stages, building these operations drawers early in the construction phase gave me a clean-looking drawer in the fascia with a work surface and compartment that's ready to use when I start inviting guests over for op sessions. I'm hopeful that these drawers will contribute to operators having fun as they run trains across my model railroad. [IMR](#)



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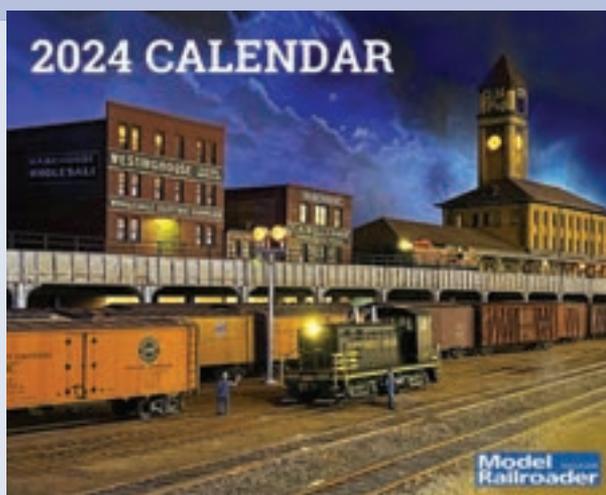
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A yellow wire springing up from between the rails keeps locomotives and cars from rolling off the edge when the lift bridge on Dave Fowler's HO scale model railroad is open. Dave got the idea from a *Model Railroader* article by Gary Hoover.

PROTECTING A LIFT GATE automatically

An electric plunger switch keeps trains from taking the plunge

By **Dave Fowler**

Photos by the author

My layout has a lift gate, so I worry when it's open that a sound-equipped locomotive with a stay-alive will run off the edge or push rolling stock over the cliff when I'm not looking. In the April 2020 *Model Railroader*, author Gary Hoover talked about his solution using a mercury switch, switch machine, and music wire ["Celebrating Steam's Last Stand"]. I contacted Gary and was able to adapt his design, with a few changes.

Building the bridge blocker

I mounted a terminal block, relay socket, and Tortoise to a 3.25" x 5" piece of 1/4" medium-density fiberboard (MDF) with No. 4 screws. This module makes it easy to wire and to mount to the benchwork. ①

The terminal block makes a convenient way to attach to wires from the 12V DC power supply after the module is attached to the benchwork. Wires connecting to the terminal block should have terminal spades.

The relay switches the polarity of the Tortoise switch machine. I used a 12V DC, 8-pin ice cube relay with double-pole, double-throw pins installed in a relay socket. The coil pins on the relay are turned perpendicular to the other switch pins.

I wired the relay as shown in the diagram on the facing page. Note that the

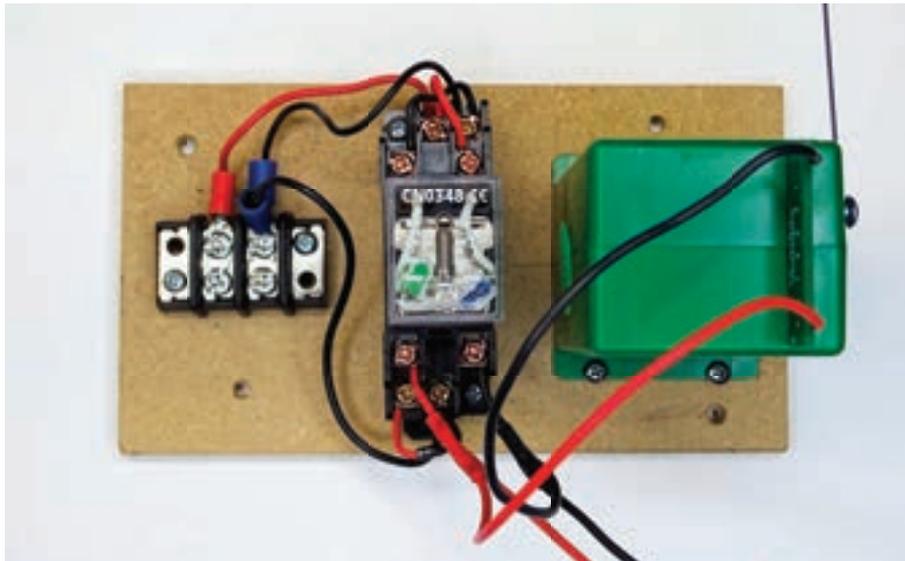
wires for the relay switch nodes cross over. This will reverse electrical polarity to the Tortoise when the relay is activated.

The relay socket provides a way to connect wires without soldering and mount the relay to a base, like the module board.

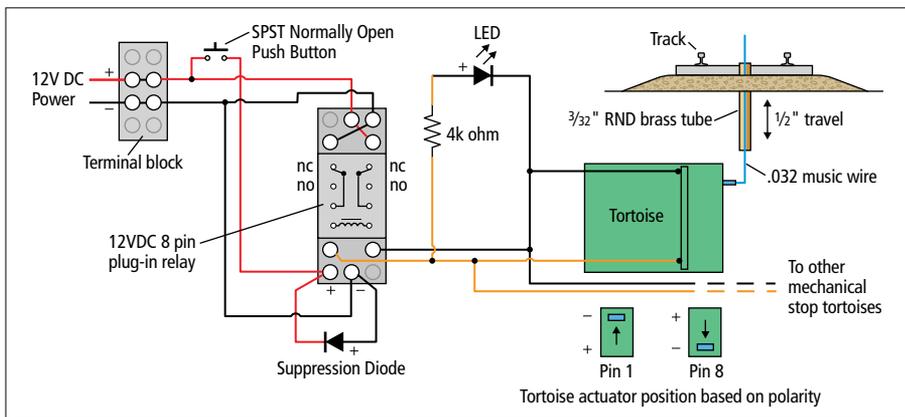
I connected a suppression diode (1N4007) with the (-) end (with a stripe) to the (+) side of the relay coil pin, and the (+) end of the diode to the (-) relay coil pin. Gary told me this diode is to protect the power supply when the coil in the relay loses power.

Instead of using a mercury switch to tell when the lift gate is open, I used a normally open plunger switch – the kind that controls the light inside a refrigerator. This removes the danger of mercury.

Wires were soldered to the switch. One wire with a terminal spade connects to the terminal block and the other wire is soldered to the coil side of the relay.



1 Mounting a terminal block, relay, and Tortoise by Circuitron switch motor on a plate of medium density fiberboard (MDF) makes it easy to assemble and wire at the workbench before attaching it to the layout benchwork.



The solder joints were covered with heat-shrink tubing.

I mounted this plunger switch on the lift gate stop block. Using a Forstner bit, I drilled an $\frac{1}{16}$ " hole so the switch would sit flush with the block's surface. I followed by drilling a $\frac{5}{8}$ " hole for the switch barrel and a $\frac{3}{8}$ " hole for wires **2**. I drilled another hole horizontally through the frame under the stop block for the wires to the terminal block and relay on the module.

When the lift gate is open, the power to the relay is off, thus changing polarity to the Tortoise switch and raising the music wire creating the mechanical stop.

I soldered wires to Tortoise pin 8 and pin 1 as shown in the diagram. I then cut a piece of .032" music wire longer than needed. I bent one end about $\frac{3}{16}$ " to a right-angle elbow. After using a No. 67 drill bit to slightly enlarge the hole in the Tortoise actuator arm, I inserted the music wire's elbow into the actuator and secured it with the retaining screw. I laid the music wire against the module board

and marked where they contacted. This would help with the alignment of the module later.

Mounting the module

The brass guide for the music wire was made by cutting a $\frac{3}{32}$ " brass tube $\frac{1}{8}$ " longer than the distance from bottom of subroadbed to the top of the ties.

I measured the distance from where the music wire enters the Tortoise black actuator to the module board surface (2"). Adding the thickness of the module board and frame gave me a total of 3". I used a small combination square to locate a point to the center between the rails from the layout edge. I drilled a $\frac{3}{32}$ " hole for the brass guide tube and inserted it.

I used a small square to draw a line under the benchwork from the music wire hole to the back side of the benchwork. I inserted the music wire rod through the brass guide and lined up the guiding marks on the module and



2 Dave used Forstner bits to countersink the normally open plunger switch into the lift bridge's stop block. When the bridge is down, the switch is closed, changing the polarity of the power to the Tortoise and retracting the wire.



3 Dave added a red light-emitting diode (LED), mounted in a dwarf signal housing, to the circuit to provide a more visible indication that the bridge was out and the blocking wire was raised.

subroadbed, then screwed the module to the benchwork.

I attached the plunger switch wires to the terminal block and the plus side of the relay coil terminal. Then I attached the power supply wires and tested the mechanical stop.

I painted the music wire yellow so it would be more visible to operators when activated. When the paint was dry, I lowered the lift gate and marked the music wire where it fell at the top of the ties with a marker. Then I raised the gate and cut the music wire at that mark so it would not stick up when retracted.

On the diagram, I show how a red LED could be added. This gives a more obvious indication that the lift gate is open and the mechanical stop is operational **3**. I put the LED in a dwarf signal housing to make it look like it belonged on the railroad. [MR](#)

Dave Fowler lives in Colorado, where he models HO scale. This is his first byline in Model Railroader.

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Wreckers and Western Union

Recent correspondence

with Tony Thompson and Tony Koester inspired me to revisit ways to bring non-revenue equipment to life in an operating session. “Moving work trains,” my On Operation column in April 2021, offered some suggestions. This month, let’s elaborate on those suggestions.

“Non-revenue” is just what the word means. It’s equipment that doesn’t produce revenue. Shippers pay for transportation of goods in boxcars and other types of freight rolling stock, producing revenue. Passengers pay fares for the use of sleepers and coaches.

By contrast, maintenance-of-way is an example of non-revenue service. There’s no income when a railroad moves its own employees or material, as when sending a track gang, ties, and other supplies to a worksite. This equipment makes very appealing prototypes, typically re-fitted from older cars, often of wood construction. Too often, unfortunately, a layout tucks it away on a little-used yard track where it’s easily overlooked. So, let’s get it in the spotlight!

“Moving work trains” described wrecking outfit movements. Bringing a session to a standstill by sending the wrecker is a peculiar form of cruelty, so most modelers depend on 0-5-0 power to clean up a derailment. However, an overhead move to an off-layout site is one way to put a big hook in motion. Here’s another. Stage the wreck train out on



Exploring Boston & Maine’s East Deerfield, Mass. yard on August 20, 1973, turned up this weatherworn gem, an interesting example of non-revenue equipment that Jerry wants to add to his roster. Jerry Dzedzic photo

the line between sessions, as if it had finished its work. Then, return it to its home terminal at the start of the new session. Most timetable special instructions placed speed limits on this equipment, so moving it at slow speed adds challenge. Another twist can be a temporary slow order over the affected track at the wreck site to allow for infrastructure inspection before releasing the track to full speed.

The same column described a Maine Central bridge and building gang I found tied down on a siding at Fabyan, N.H., in the early ’70s. A layout would be unusual without such a site. A nearby building might see an addition; even just a new roof and fresh paint could occupy a gang for several days. Retimbering a bridge or strengthening one of its spans could

take longer than this. The MOW equipment could then run to a nearby siding and remain there for several sessions. A lengthier project might justify construction of a temporary siding to hold the equipment. The track can remain in place, restricted to MOW use but handy to set out a hotbox or other car or locomotive with a defect.

Move cinders if you burn coal. I scolded both Tonys about this activity with “if you run steam, you handle cinders.” Tony Thompson gently corrected me, because he models Southern Pacific oil-burners, so I amended my statement to “if you burn coal” and directed my fire at Tony Koester. A steam engine sends most of the ash it produces up the stack. However, its ash pan collects heavier non-combustibles and cinders, which are dumped when the engine is serviced. A credible source estimates that a typical engine produced roughly a cubic yard of this waste per day, enough for a

modest terminal to fill plenty of cinder cars. A waybill in my collection describes a 10-car shipment, 300 tons in all, to a section foreman to spread as ballast.

Single-car non-revenue movements are common. A carload of ties appears in some of my sessions. It’s spotted on a siding near the supposed tie replacement site. Section gangs use kerosene, oil, rail, and other track supplies. These can be delivered as less-than-carload lots in a car stopped and immediately unloaded, without separating it from a train.

The correspondence behind this column prompted me to track down the Western Union material car pictured. It’s another eye-catcher that can appear almost anywhere. Ambroid featured it in their “1 in 5000” series so long ago I’ll be very lucky to add the kit to my stash. Happily, *Model Railroader* published plans in February 1957, so the day may come that the car adorns one of my station tracks. 



MOST TIME-TABLE SPECIAL INSTRUCTIONS PLACED SPEED LIMITS ON THIS EQUIPMENT.
-JERRY

More DCC electrical basics



1 For his final column, Allan Gartner will introduce you to diodes and capacitors and some of their Digital Command Control (DCC) applications, such as lighting passenger cars and cabooses. Photos by the author

This month I'll wrap up our discussion of electrical devices that are useful to the model railroader, culminating in ways to illuminate your passenger cars 1. As I mentioned last month, when you buy components, make sure you buy those with leads. Many components these days are leadless and are nearly impossible to hand solder.

A diode has a simple function of only allowing power to flow in one direction. There are a multitude of uses for a diode. However, I'll just cover those that you might encounter with Digital Command Control (DCC).

Before I get started, let me distinguish the difference between the diodes I will be discussing here and a light-emitting diode (LED). A typical diode has been fortified to prevent power flow in the reverse direction, while an LED is optimized to emit light. If more than a few volts of reverse power is applied to an LED, it will be damaged.

When using a diode, it's essential that you orient it correctly. The symbol has an arrow head pointing to a short line. Diodes themselves don't have the arrow head, but they do have a band around one end. The diode

must be installed with the band oriented with the line in the diagram you're following.

Relays are simply switches that are flipped with an electromagnet rather than a switch handle. I covered switches in the September 2023 column. Modelers use relays when some other switch they are using doesn't have enough poles or they don't have enough current-carrying capability.

If the relay is being controlled by a non-electronic means, such as a small switch or a set of contacts on a switch machine, you're all set. But if you're using any solid-state output device, you must protect that output device with a diode across the coil of the relay or you will quickly fry your solid-state device. A few have built-in protection, but most do not. Orient the diode as shown in 2.

If you connect the four diodes as shown in 3, you'll get more than just preventing power flow in the reverse direction. In the forward direction, everything is fine. In reverse, two of the diodes flip the power around. The power flows through the LEDs in the right direction 100 percent of the time. This

arrangement is called a full wave bridge rectifier and is the heart of any basic DC power supply.

Now you have a choice to make: Save some pennies or save some space. Building your own bridge rectifier is easy to do, and diodes are only a few cents. You can use the common 1N4001 diode for this application.

On the other hand, if you want to minimize the space taken up inside a passenger car and want something that is as unobtrusive as possible, maybe spend a little and buy a bridge rectifier. If you really dislike soldering, there's less soldering involved with a pre-manufactured bridge rectifier.

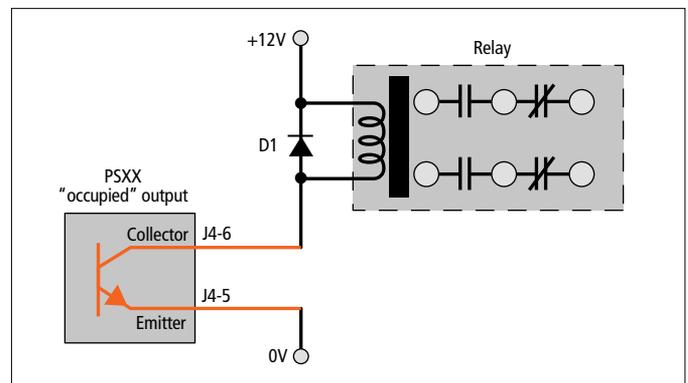
Earlier I warned you about buying components without

leads. Some bridge rectifiers come with short leads that are about 1/4" long. This is OK, but use a 15W soldering iron, or 25W at most, and work quickly when soldering.

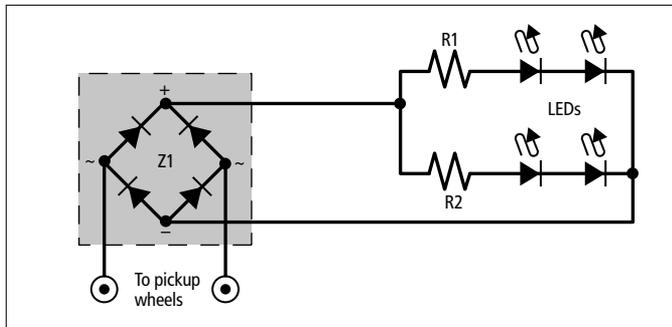
Since DCC is a square wave when rectified, it's a decent DC output that can drive LEDs in your passenger cars or cabooses with just a current-limiting resistor. This means you don't have much to hide in your coach. But if you're worried about dirty track and if you have unpowered frogs, you'll have to do more to avoid flickering lights in your passenger cars.

The basic purpose of a capacitor is to store power. A specialized capacitor, known as a super capacitor, is the heart of stay-alive circuits that keep your locomotives going over dirty track and unpowered frogs.

Another thing that capacitors do is only pass through changing voltages. I will not get deep into this, but this aspect of capacitors helps neutralize spikes that are present on DCC track voltages 4. The circuits that perform this function are often called snubbers or RC filters. NCE sells snubbers 5 or you can make your own.



2 Diode D1 protects solid state outputs, such as the DCC Specialties PSXX open collector outputs. Use a 1N4001 diode for this application. Illustrations by Kellie Jaeger



3 Here's a basic passenger car lighting circuit using either four 1N4001 diodes or a single DF01M bridge rectifier for Z1. For R1 and R2, use 750Ω, ¼W resistors when using two white LEDs in series in each leg.

Small-valued capacitors, like those used in snubbers, aren't polarized. That means you can wire them either way. Large-valued capacitors, like those in stay-alive circuits or power supply circuits that you might use to light a passenger car or a caboose, are polarized. They'll explode if hooked up wrong, which could cause an eye injury and burn your fingers if it's being held. There is a "+" sign on the symbol of those that are polarized. You'll notice this in the schematics provided.

I recommend wearing safety glasses when powering up circuits with capacitors in them, especially if you have any concern that you may have hooked them up incorrectly. Using a DC meter, measure the voltage at the wires where you intend to connect the capacitor to be sure the circuit is putting out the polarity you expect, then hook up the capacitor in the correct direction.

There are two things that make a capacitor big – the capacitance value (usually in micro farads or μF) and the voltage rating. Due to this, you don't want to use a capacitor in a passenger car that's

any larger than you need, because hiding it will be a challenge.

As far as the voltage rating goes, a small margin is desirable, since there are likely voltage spikes on the track. Voltage ratings are known as WVDC (working volts DC).

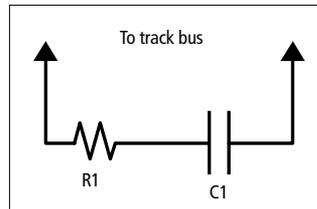
For N scale, squeezing in any capacitor may be tough. TCS has a Keep Alive product for N scale that will provide power for 1-2 seconds, called the KA-N1. It has a maximum input voltage of 16VDC and can output a maximum of 10VDC. Its capacitance rating is 1000 μF. Though it might appear that you could use this for HO scale, super capacitors have very limited margins on their voltage ratings. You'll need to ensure your input voltage doesn't exceed 16VDC.



I HOPE THAT I HAVE BEEN ABLE TO DEMYSTIFY THE EXCITING WORLD OF DCC ELECTRONICS FOR YOU. HAPPY RAILROADING!
—ALLAN

I've provided

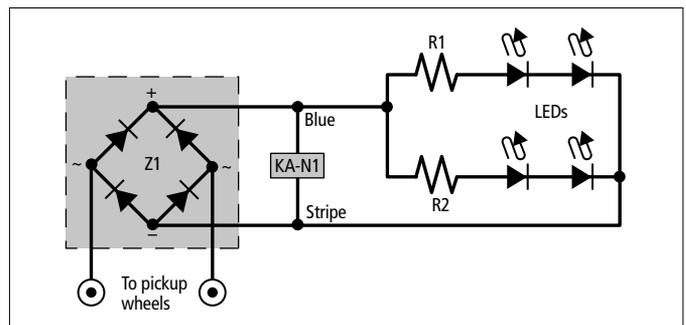
three wiring diagrams. The basic circuit has no charge storage 3. It's the most compact, least expensive, and easiest to build. However, it will be the most susceptible to flicker. If you have unpowered frogs and aren't using all-wheel pickup on your passenger cars, this probably won't work.



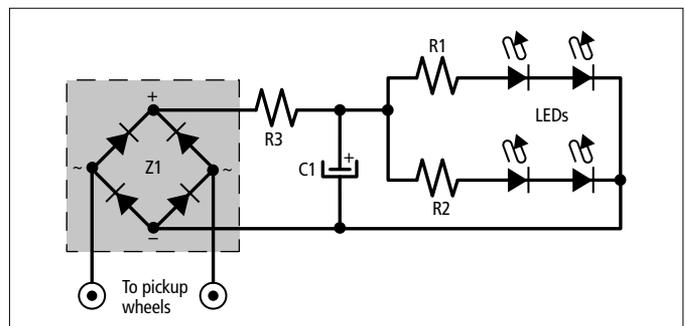
4 You can build your own track bus snubbers using a 100Ω, ½ watt resistor for HO scale and smaller or a 1W resistor for larger scales. C1 should be a 0.1μF, 50WVDC ceramic capacitor.



5 This NCE snubber is sold in two-packs. They are attached to the ends of the track bus.



6 This passenger car lighting circuit uses a TCS Keep Alive circuit. R1 and R2 are 750Ω.



7 A passenger car lighting circuit using an electrolytic capacitor for C1 rated at 1000 μF, 25WVDC. R3 is a 100Ω, ¼W resistor or larger. R1 and R2 are 470 ohm, ¼W resistors.

The next choice is the circuit using the TCS KA-N1

6. This is the next easiest to build and hide within your passenger car. The only drawback is that it may be the most expensive way to go. It can't be used above HO scale without limiting the voltage.

The last choice uses a conventional electrolytic capacitor 7. This is fairly inexpensive. It's not hard to hook up, but probably does take up the most space. The few passenger cars I have are already lighted, so I just built this

circuit on the bench and tried it out on my layout. The resistor R3 limits the charging of the capacitor C1. Be sure to hook up the "+" on C1 to the "+" output of the bridge rectifier if you don't want unexpected fireworks.

Try out the one that works best for your application.

Due to personal issues, this will be my last column for *Model Railroader*. I hope that I have been able to demystify the exciting world of DCC electronics for you. Happy railroading!



It's the autumn of 1948, and New York, New Haven & Hartford class J-1 Mikado No. 3016 idles in front of the East Berlin, Conn., depot while its crew takes lunch. Chris Adams of Old Saybrook, Conn., photographed the Key Imports brass locomotive on his HO scale layout, called The Valley Local. Chris' friend Dave Messer modeled the depot from the prototype, and Chris weathered it. The locomotive was painted and weathered by Don Mitchell.





As the local drill pulls an empty boxcar from the Peters Warehouse siding, Conrail GP9 No. 7565 leads its train around Horseshoe Bend in northeastern Pennsylvania. Mark E. Rabenold of Allentown, Pa., took the photo on his freelanced late 1976 HO scale layout. Peters Warehouse was custom built from photos of the prototype. Mark shot the backdrop photos in the Allentown area.

Send us your photos

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A lone boxcar awaits unloading on the siding at Wyatts Crossing while the track speeder waits nearby for its next assignment. Michael Decker of Altamont, N.Y., built and photographed the scene on his freelanced HO scale New York Central layout. The boxcar is by Branchline Trains, the speeder is a Durango Press kit, and the Model A Ford pickup is from a Jordan Highway Miniatures kit.



It's 1970, three years after the formation of the Penn Central, but here in the Allegheny Mountains of central Pennsylvania, the railroad is still working on updating its former Pennsylvania RR motive power to the new livery. Here a westbound freight pulled by two ex-Pennsy diesels rolls past the signals while a train led by PC SD35 No. 7421 waits in the hole. Kevin Connell of Dahlonega, Ga., took the photo on his two-rail O scale Penn Central layout.





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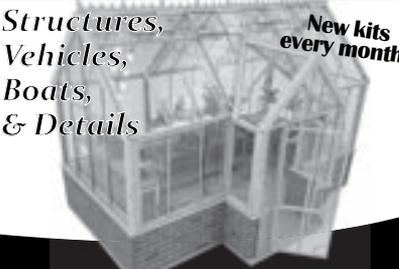
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Schedule of Events

AZ, GLENDALE: ARHS Model Train Swap Meet. Glendale Christian Church, 9661 North 59th Ave., Glendale, AZ 85302. Saturday, November 11, 2023, 9:00am-1:00pm. Everything Trains – Food – Fun. Admission \$5.00. Tables \$25.00 - to sign up send check or money order to: ARHS, PO Box 5816, Glendale, AZ 85312-5816. Contact: Craig Faris, 623-340-3529

CA, ANAHEIM: 2023 TTOS-SP Super Meet. December 15-16, 2023. Friday, 5-8pm; Saturday, Noon-6pm. Brookhurst Community Center, 2271 Crescent Ave. Buy-Sell-Trade Trains, Toys, and Railroad Memorabilia. Train races, auction, and more! FREE kids train set raffle Saturday. 2-day admission: \$5/ person, \$10/family. FREE parking. Vendors: 8-ft tables, \$25, \$30 after 12/01. Visit: TTOS-SP.ORG/THESUPERMEET/ to register. Questions: info@ttos-sp.org

CA, SACRAMENTO: 45th International Railfair. November 11-12, 2023. Cal Expo, Building C, 1600 Exposition Blvd., Sacramento, CA 95815. Saturday 10am-5pm and Sunday 10am-4pm. Layouts, Vendors, Clinics. Admission: \$12 on Saturday, \$10 on Sunday. Under 12 free. Info: tom.cirf@gmail.com or internationalrailfair.com

CA, TURLOCK: San Joaquin Valley Toy Train Operators, Inc. Model Train Show. December 2 & 3, 2023. Saturday 10am-5pm. Sunday 10am-3pm. Admission: \$10 (cash only), kids under 12 free with an adult. Operating layouts, vendor tables, free parking. Stanislaus County Fairgrounds, 900 N. Broadway. Information: Jack Smith 209-765-1354 or Vern Cowan 714-686-7165 www.sjvttoinc.com

CO, LONGMONT: Boulder Model Railroad Club 46th Annual Model Railroad Expo. December 8-10, 2023. 10am-5pm. Boulder County Fairgrounds Exposition Hall, 9595 Nelson Road, Longmont, CO 80501. Adults \$8, Seniors \$5, Kids 12 and under FREE. Multiple scales, layouts, and vendors. Additional information, visit: bmrconline.org or email: bmrexpo@gmail.com

CO, LOVELAND: Rocky Mountain Train Show, November 25 & 26, 2023. The Ranch Complex, 5280 Arena Circle, Loveland, CO 80538. Saturday, 10am-5pm, Sunday 9am-3pm. 200+ sales tables, 50+ vendors, operating layouts, model trains of all scales. Admission \$10.00, 12 and under free. Free parking. 303-364-0274 www.RockyMountainTrainShow.com Information@RockyMountainTrainShow.com

FL, CRYSTAL RIVER: Regal Railways presents a Toy Train, Collectible and Hobby Christmas Sale/Show. Florida National Guard Armory, 8551 W. Venable St., Crystal River, FL 34429. Saturday, December 2, 2023, 9:00am-2:00pm. Admission: \$6.00 adults, children under 12 free. Vendors and operating layout. Lunch items available. Contact Joe: 727-244-1341 or visit www.regalrailways.com for more information

FL, DUNNELLON/OCALA: "Trains for Christmas" Free train show Saturday and Sunday, December 2 & 3, 2023. Sat. 9am-3pm, Sun. 9am-3pm. Multiple layouts, no vendors, and a spectacular raffle. Collection site for Toys for Tots. This event is located at Holy Faith Episcopal Church, 19924 W. Blue Cove Dr., Dunnellon, FL 34432. Contact Bill Quast: 352-209-5422 or wqquast@gmail.com

FL, MELBOURNE: The Melbourne Train and Toy Show. Azan Shrine Center, 1591 West Eau Gallie Blvd, Melbourne, FL 32935. Saturday, December 2, 2023, 9am-2pm. Admission: \$5, kids under 10 FREE. Vendor tables \$25 each or 3 or more \$20 each. Join us for trains, toys, and fun! Lunch/snacks available. For more information: SchultzSpaceCoastTrains@aol.com or 321-805-1963

FL, PINELLAS PARK: Suncoast Model Railroad Club Train Show/Open House. Saturday, December 2, 2023. SHOW- New venue! Pinellas Performing Arts Center, 4951 78th Avenue N., Zip: 33781. 9am-3pm. Admission: \$7.00, Children \$2.00, under 11-free. Free parking. Food/snacks. Tables: Hugo Sacco: saccohugo459@gmail.com OPEN CLUB HOUSE- 12355 62nd Street North, Suite A, Largo, FL 33773. Admission: FREE. Visit: www.suncoastmrrcc.com

GA, SAVANNAH: Coastal Rail Buffs 34th Annual Model Railroad and Train Show at Cottonwood Suites, 301 Governor Treutlen Dr. Pooler, GA 31322. November 11-12, 2023, Saturday 10:00am-5:00pm, Sunday 10:00am-4:00pm. Adults 2-day admission \$7.00; Students/Seniors \$5.00, Active-Duty Military/under 12 FREE. Dealer tables, operating layouts in O, HO, N. Visit: www.coastalrailbuffs.com

IN, DANVILLE: Central Indiana Division-NMRA 16th annual Danville Train Show. Saturday, November 18, 2023, 10:00am-3:00pm, Hendricks County Fair Grounds, 1900 E. Main St., Danville, IN. Operating layouts, displays, door prizes, vendors, food. Free parking. Admission: \$3.00/ adult, 16 and under free. Dealer Tables \$16.00 each. Contact: Dave Mashino at danvilletrainshow@gmail.com or 765-860-1560. More info at <http://cidnmra.org>

IN, LA PORTE: Duneland Model RR Club Train Show and Swap Meet. La Porte County Fairgrounds Community Building, 2581 In-2, La Porte, IN 46350. Sunday, November 19, 2023, 9:30am-2:00pm (Chicago time). Adults \$5.00, youths 6-12 \$1.00, 5 and under free. Contact: Dave Novak at trains86@myyahoo.com or 219-778-3195. (Masks are optional.)

MA, MARLBOROUGH: Hub Division NER/NMRA. Royal Plaza Trade Center, 181 Boston Post Road West (Rte. 20 West), Marlborough, MA. Saturday December 2, 2023, 10am-4pm and Sunday December 3, 2023, 10am-4pm. Admission: \$15.00; Children under 12 and Scouts in Uniform FREE. Admission good both days. Information: Mark 508-528-8587; E-mail: TE.info@hubdiv.org; website: www.hubdiv.org

MO, JOPLIN: Joplin History & Mineral Museum Model Train Show and Swap Meet. Saturday, November 25, 2023, 9:00am-3:00pm. Schifferdecker Park, 504 South Schifferdecker Ave., Joplin, MO 64801. Admission: \$5 adult, 12 and under admitted free with paid adult. For swap tables contact Steve Gardner, 119 West Jefferson Street, Pittsburg, KS 66762; 620-230-9545 or email: sogardner1@att.net

NJ, BRICK: ECTP and Collectibles LLC presents The Brick Train Show. Elks Lodge, 2491 Hooper Avenue, Brick, NJ 08723. Sunday, December 3, 2023, 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.

NJ, WAYNE: ECTP and Collectibles LLC presents The Wayne Special Holiday Train Show. P.A.L. Hall, 1 Pal Drive, Wayne, NJ 07470. SATURDAY, December 16, 2023, 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 Wayne Show.

NY, ALBANY: December 3, 2023, "Great Train Extravaganza". Largest model train show in Capitol Region. Empire State Convention Center, underneath The Egg. 10am-4pm. \$10 adults, children free. Operating layouts, all scales, plus Lego. 300+ tables: model trains, train sets, craftsman kits, buildings/scenery, accessories/parts, books/DVDs, railroad memorabilia/prints, switching puzzle, test tracks, educational/NMRA displays. Door prizes. Refreshments. www.gtealbany.com, 518-668-9892, trains@gtealbany.com

OH, MASSILLON: CJ Trains Winter Train and Toy Show. Massillon Knights of Columbus Hall, 988 Cherry Road NW, 44647. Sunday, December 10, 2023, 10:00am-3:00pm. Admission: \$5.00, 12 and under FREE. \$25/dealer table, 152 - 8' dealer tables. Jon Ulbright, PO Box 446, Wooster, OH 44691, 330-262-7488, cathijon@sssnet.com or www.cjtrains.com

PA, MONACA: Beaver County Model RR Fall Train Show & Sale. Monaca Turners, 1700 Old Brodhead Road. Sunday, November 19, 2023, 10:00am-3:00pm. Adults \$5.00, under 12 free. All scales, 50/50 raffle, food, fun for the whole family! Sponsored by Beaver County Model RR & Historical Society. Contact: Walt Steiner 724-843-3783 or www.bcmmrailfan.net or beavercitymrr@gmail.com

SC, EASLEY: CRMHA MODEL TRAIN EXPO 2024. February 16-17, 2024. Friday, noon-6pm. Saturday, 9am-3pm. Impact Center at Rock Springs Church, 207 Rock Springs Road, Easley, SC 29642. Admission: \$8.00 Adult, good for both days. Children under 10 are FREE. Trains of all sizes, operating layouts, model train vendors, a Kids Zone and more! Visit: www.crmha.org

TX, HOUSTON: Greater Houston Train Show presented by the San Jacinto Model Railroad Club. Saturday, February 17, 2024, 10:00am-4:00pm. Pasadena Convention Center, 7902 Fairmont Parkway, Pasadena, TX 77504. Operating Layouts, Classes on Railroads and Modeling Subjects, NMRA Contests, and Vendors from across the Southwest. Admission: \$5, under 12 FREE, \$10 per family. Concessions, free parking. Info: <http://sanjacmodeltrains.org/>

VA, FREDERICKSBURG: Rappahannock Model Railroaders 26th Annual Christmas Model Train Show, December 9-10, 2023. Operating G, O, S, HO, N, and LEGO train layouts. Vendors, train set raffle, and kids area. Saturday 9am-5pm. Sunday 10am-4pm. Adults \$10. Youth 13-17 \$5. Under 13 free. Eagles Lodge #4123, 21 Cool Springs Road, Fredericksburg, VA 22405. Info: www.rmrrailroaders.com

WA, KENT: Boeing Employees Model Railroad Club Annual Swap Meet. Saturday, November 11, 2023, 9:30am-4:00pm. Kent Commons Community Center, 525 4th Avenue North, Kent, WA 98030. Admission: \$10.00, under 16 free. Ed Sherry, 550 SW Colewood Lane, Normandy Park, WA 98166; 206-244-3884; swapmeet@bemrcc.com

WI, LA CROSSE: The 32nd Annual Great Tri-State Rail Sale. La Crosse Center, 2nd & Pearl Streets, Saturday, January 27, 2024, 9:00am-3:00pm. Admission \$5.00, under 12 free. 300 vendor tables. All Scales; Model, Toy & Antique Trains & Memorabilia. Information: 4000 Foundation, PO Box 34, La Crosse, WI 54602, 608-781-9383. Visit: www.4000foundation.com

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Getting out and getting under



Seeing these railroaders pose in front of ET&WNC 4-6-0 No. 11 at Pardee Point (above) seemed a bit too distant to relate to personally until Tony rode a tourist train into the Doe River Gorge and saw the famous rock formation for himself (at right). B&W photo: Vince Ryan; color photo: Tony Koester



Many, perhaps most of us, model a time period several steps removed from the present. That usually means we must rely on secondhand evidence or memories to recreate a reasonable facsimile of a given time and place.

We're very fortunate to have access to many sources of information, most of them reasonably accurate, even about subjects that are surprisingly arcane. But we can also fall into a different form of the analysis-paralysis trap: spending too much time searching for information and not enough time applying it to our model railroads.

Having a virtual pipeline into vast treasure troves of information, helpful though that may be, falls short of Henry Ford's dictum: "Get out and get under!" No matter how many times I read about a long-gone railroad, I tend to view the entire scenario as something of a fairy tale – until I do what Henry said and go see it for myself.

How can I do that if the railroad was abandoned half

a century ago? Driving into a town and divining where the railroad must have been, making a few astute turns, and suddenly coming face-to-face with a preserved depot will do it.

Out in the boondocks, a hump in the highway that marks a former grade crossing may lead to a nearby steel bridge or a tunnel. Often, GPS maps still show rights-of-way that have vanished. U.S. Geological Survey topographic maps are also helpful, as are DeLorme railroad map books for each state.

I've long been a student of geology. It's hard to model scenery realistically unless one has some idea of the processes that shaped the land, built rock formations, and so on. So when a railroad of interest passes by a famous landform, I'm usually going to ferret it out.

Such was the case with Pardee Point in the rugged Doe River Gorge on the East Tennessee & Western North Carolina (ET&WNC, or "Tweetsie"), a 3-footer that at

long last is gaining the attention among modelers it has always deserved. That gorge is about as inaccessible as any place you'd care to mention, save for a ride on the ET&WNC, which ceased operations ca. 1950. But in recent years, tracks have been laid into the gorge again. As part of the ET&WNC Historical

Society's annual convention activities, I was able to see this locally famous rock formation for myself.

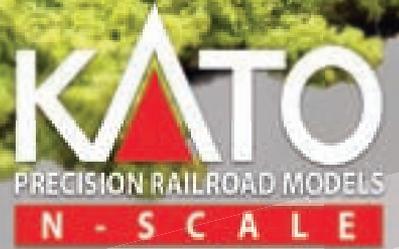
Much of the ET&WNC has faded onto the pages of history, but if you know where to look, you can find enough remnants to convert a mental construction into a physical reality. That's why the ET&WNC devo-

tees get together each year to reinforce those book-learned images with sights they can actually witness first hand.

And sounds, too! ET&WNC No. 12 performs at the Tweetsie Railroad family park in Blowing Rock, N.C., and steam may once again grace the cliffs of the Doe River Gorge before long.

THERE'S NOTHING QUITE LIKE PROVING TO ONESELF THAT A FABLED RAILROAD ACTUALLY EXISTED BY "GETTING OUT AND GETTING UNDER."
— TONY

I'm a guy who spends too much time at his computer. But there's nothing quite like proving to oneself that a fabled railroad actually existed by "getting out and getting under." Go see for yourself where it once ran. Touch the remnants with your eyes. Become a believer that what you read actually happened. **MR**



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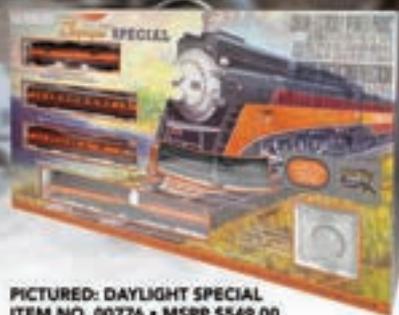


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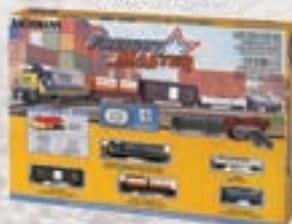


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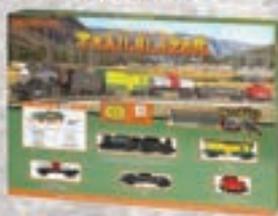


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