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Model Railroader[®]

September 2025

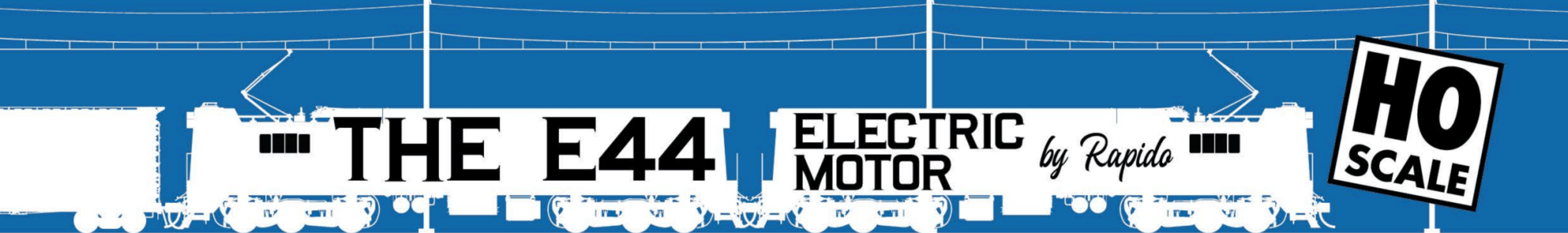
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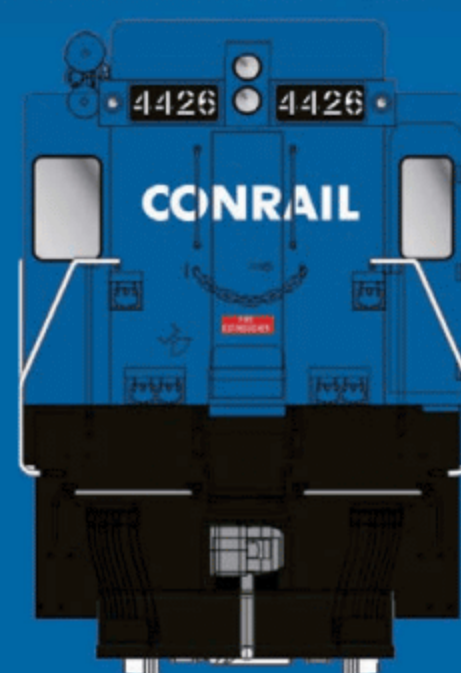
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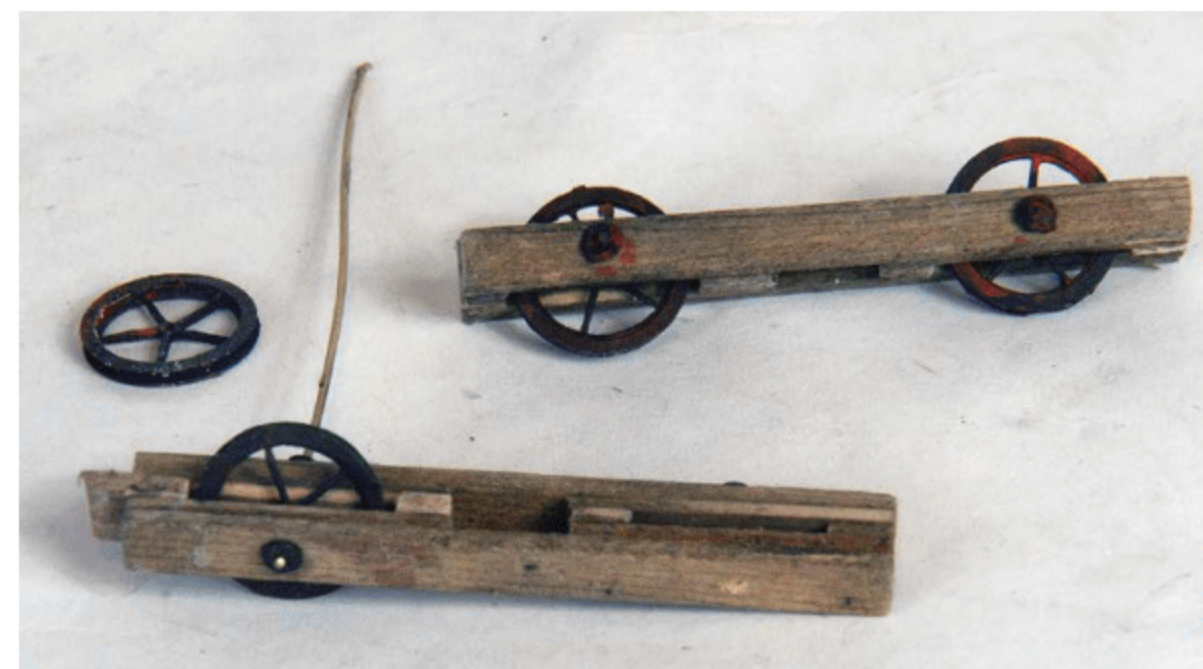


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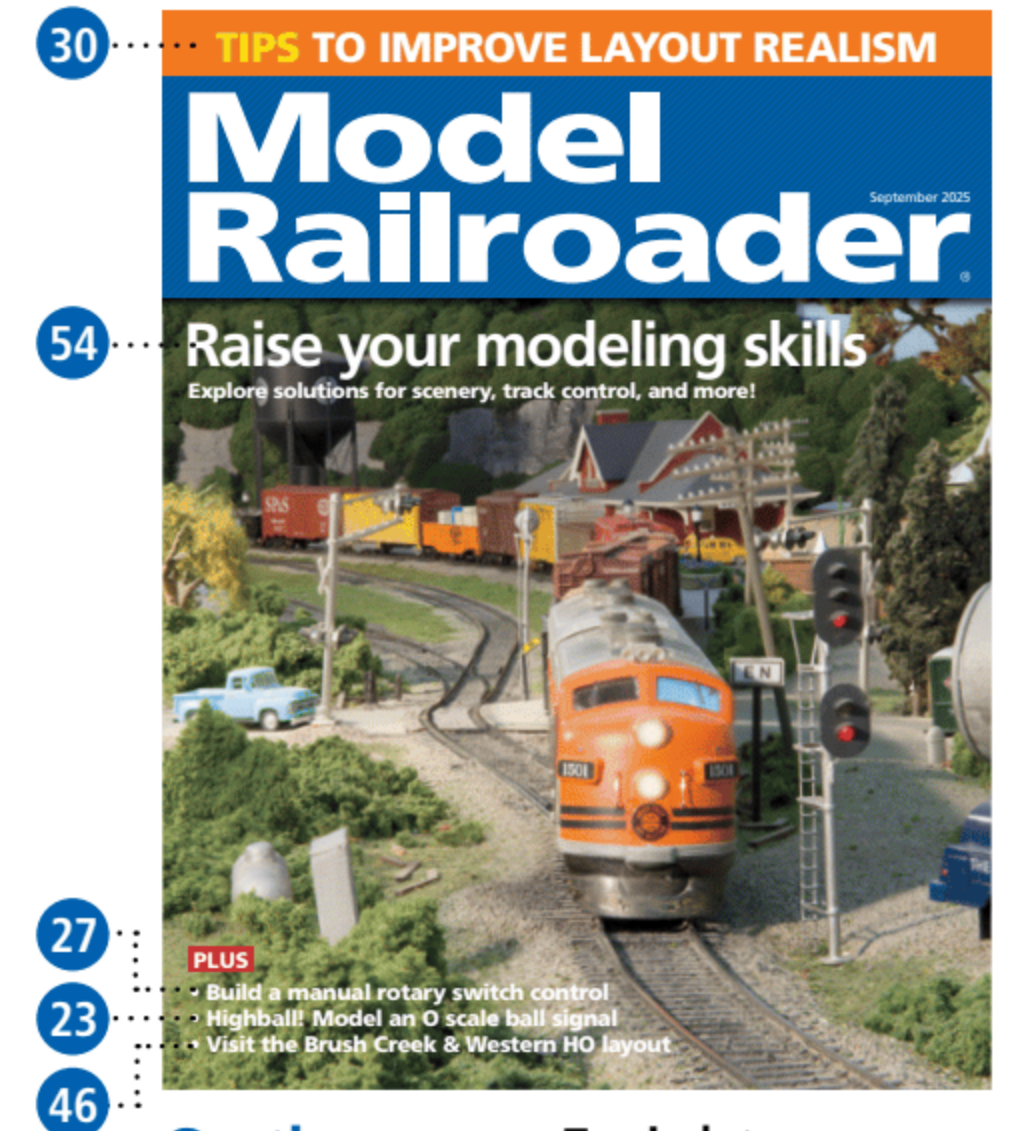
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On the cover: Freight moves on the Greater Kansas City Model Railroad Club's HO scale Brush Creek & Western layout. Dan Munson photo



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Magazine Editor Cinthia Priest shares her journey as a modeler, we visit two great layouts, learn how to add building interiors, and more!

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Saving a community gem

The Pacific Southern Railway Club (featured in the November 2023 MR) was faced with the loss of its longtime home when club president and homeowner Carl Pate passed away in 2024.

Coming to the rescue was James "Murr" Murray from the popular show "Impractical Jokers". Murr's love of trains and the club's needs all came together for a perfect story. Read all about it on Trains.com.



Check out Cody's Office

The popular show with Senior Editor Cody Grivno is now a monthly feature on Trains.com Video. In the most recent installment, Cody has three new products, including a freight car, a locomotive, and a new book from Firecrown, *Arduino Projects* by Paul and David Bradt. Plus, learn a modeling tip, and see what Cody has in the mail bag!



Get your daily dose

Check out *Model Railroader's* new Photo of the Day on Trains.com. Whether you're looking for inspiration, or just some pretty pictures, you can find something new every day on the *Model Railroader* section of Trains.com.

NMRA celebrates 90 years

The National Model Railroad Association has been

guiding the hobby with its standards and recommended practices since 1935. But while some may think the organization has done all it can, this interview with NMRA President Gordy Robinson shows the folks at the world's premiere model railroading group has plenty more to do, and lots to offer model railroaders of all interest levels. Check out the interview with Gordy and MR Editor Eric White on Trains.com.



Eric White



Gordy Robinson



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Adding skills adds to our enjoyment

A recent post on a Facebook model railroading page reminded me of part of the reason why I love this hobby. When explaining to others why we build model railroads, especially to people who participate in other building hobbies, we talk about how model railroading is really a collection of hobbies, and also a collection of skills.

We're model builders, of course, but not just one kind of model. The trains are the stars of the show, but we also model structures and landscapes, roads and vehicles.

We're also woodworkers. We need something to put our track and structure models on, something to support our scenery.

And we're electricians. Our models run on electricity. We have to wire our track, and we can add lighting and animation. And that might mean we're also

programmers. Writing code to direct an Arduino board, or creating logic for a signal system to operate.

Modeling structures requires similar skills to modeling trains — both are often made of plastic, so we learn how to handle that material. Whether it's shaping, gluing, or painting, plastic modeling helps us build a particular set of skills.

Many structure models are made of wood, and this requires different skills. Train models can have parts made of metal, whether photo-etched or more traditional shapes. We learn to work with those materials, and how to attach them with glues or soldering. As we try different types of modeling, we build on these skills.

But our environments need more than structures and trains. Landforms are an important part of the world

we're trying to re-create, so we learn to work with a variety of materials to create mountains and rivers, meadows and city streets.

We build forms from crumpled newspaper, woven cardboard strips, wrinkled screen wire, on which we slather plaster or Sculptamold, or we contour foam into mountains and valleys, learning how to make our model environments look like the ones we see our prototype trains running through.

Building the benchwork to support this all teaches us to measure twice and cut once, or how to fix the mistakes we've made. We learn what materials will support our trains, how to create a grade, and lay out a curve.

The post on Facebook talked about how the iterative nature of these skills — that they build on one another — makes this a hobby that



allows us to constantly grow and extend our enjoyment.

On the flip side, it means it takes time to acquire and develop all of these skills. Few people adopt model railroading and instantly produce the perfect model railroad.

But that means model railroading is the ideal hobby for a lifetime of growth, learning, and fun!

Model Railroader

Model railroading is fun!

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HO scale



Alco HO scale RS11 diesel locomotive. New paint schemes on this Atlas Classic model include Burlington Northern; Duluth, Winnipeg & Pacific; Genesee Valley; Norfolk & Western; Pacific RR; and Sonora Baja California. The HO scale model, which features a plastic body and die-cast metal chassis, is offered in one to two road numbers per scheme.

Product features include golden-white light-emitting-diode headlights, factory-installed and painted wire grab irons, and two painted crew figures. Direct-current models are priced at **\$174.95**, and versions with an ESU LokSound V5 sound decoder retail for **\$289.95**. Atlas Model Railroad Co., 908-687-0880, shop.atlasrr.com

Club offerings



- **Chesapeake & Ohio wood train order platform.** Unpainted 3D printed kit with platform, lampshade, and length of wire for goose-neck. Minor cleanup may be necessary. Measures 5 x 10 scale feet. N scale, \$14.95; HO scale, \$15.95. Chesapeake & Ohio Historical Society, 312 E. Ridgeway St., Clifton Forge, VA 24422; 540-862-2210; chessieshop.com

HO scale locomotives

- **Electro-Motive Division SD45 diesel locomotive.** Erie Lackawanna, Great Northern, Helm Financial Corp., Louisville & Indiana, Montana Rail Link, Motive Power International, Southern Pacific, and Wisconsin Central. ABS body with die-cast metal chassis; factory-applied handrails, grab irons, horn, bell, wipers, and etched-metal grills; individually controllable lights; and metal Kadee-compatible couplers. Direct-current model, \$249.99; with dual-mode Paragon4 sound decoder featuring Rolling Thunder, \$374.99. Broadway Limited Imports, 386-673-8900, broadway-limited.com



- **VIA Rail rebuilt RDC-1 and RDC-2.** VIA Rail Canada (RDC-1 No. 6105 and RDC-2 Nos. 6217 and 6219). Stainless steel finish, etched-metal roof grills and fan covers, illuminated number boxes and class lights, operating VIA-style xenon light and ditch lights, underframe

pipings, fabricated or cast truck side-frames as appropriate, and MoPower capacitor. Suggested minimum radius, 22". Without sound, \$249.95; with sound, \$359.95. Rapido Trains Inc., 905-474-3314, rapidotrains.com

HO scale rolling stock

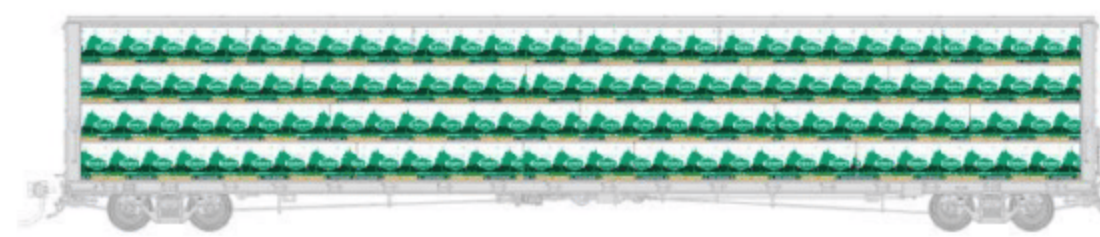


- **Atchison, Topeka & Santa Fe peaked-roof caboose.** 500-599 and 2201-2300 classes and CE-3 rebuilds. Prototype-specific details, see-through etched-metal end steps, and wire grab irons and ladder rungs. Magnetically controlled operating lighting. \$149.99. ClassOneModelWorks, 816-243-0044, ClassOneModelWorks.com
- **Pullman-Standard 60-foot flatcar.** Alaska RR; Atchison, Topeka & Santa Fe; BNSF Ry.; Southern Ry.; Trailer Train; TTX; and Union Pacific. Multiple road numbers per scheme. InterMountain metal wheelsets and body-mounted metal knuckle couplers. \$46.95. InterMountain Railway Co., 800-472-2530, intermountain-railway.com



- **40-foot wood refrigerator car with steel ends.** Agar Packing Co., Burlington Refrigerator Express, Hormel, Libby, Pacific Fruit Express, and Patrick Cudahy. Four road numbers per scheme; also available undecorated. Metal wheels on plastic axles and Proto-Max metal couplers. \$35.98. Wm. K. Walther's Inc., 414-527-0770, walther's.com

HO scale details and accessories



- **Wrapped lumber load for 73-foot center-beam flatcar.** Canfor, Domtar, Georgia Pacific, Idaho Forest Group, Irving, Sierra Pacific, Tembec, and Tolko. Each package contains four differently configured rows (each package completes one car). Loads feature see-through gaps between rows and are held together by mini magnets. \$24.95. Rapido Trains Inc., 905-474-3314, rapidotrains.com

N scale rolling stock

- **American Car & Foundry two-bay Center Flow covered hopper.** BNSF Ry., Chicago & North Western, DuPont, GATX Leasing, Montana Rail Link, Norfolk Southern, Union Pacific, and Winchester & Western. Multiple road numbers per scheme. Etched-metal running boards and metal wheelsets. \$38.95. InterMountain Railway Co., 800-472-2530, intermountain-railway.com



- **National Steel Car 73-foot center-beam flatcar.** Trailer Train, BC Rail, BNSF Ry., Canadian National, Copper Basin Ry., Ontario Northland, Norfolk Southern, Union Pacific, and Wisconsin Central. Six road numbers per paint scheme. Two top truss, deck, and underbody configurations; multiple end cage, brake stand options, and truck types; and metal wheelsets. Rapido Trains Inc., 905-474-3314, rapidotrains.com

Koester receives NMRA Pioneer award

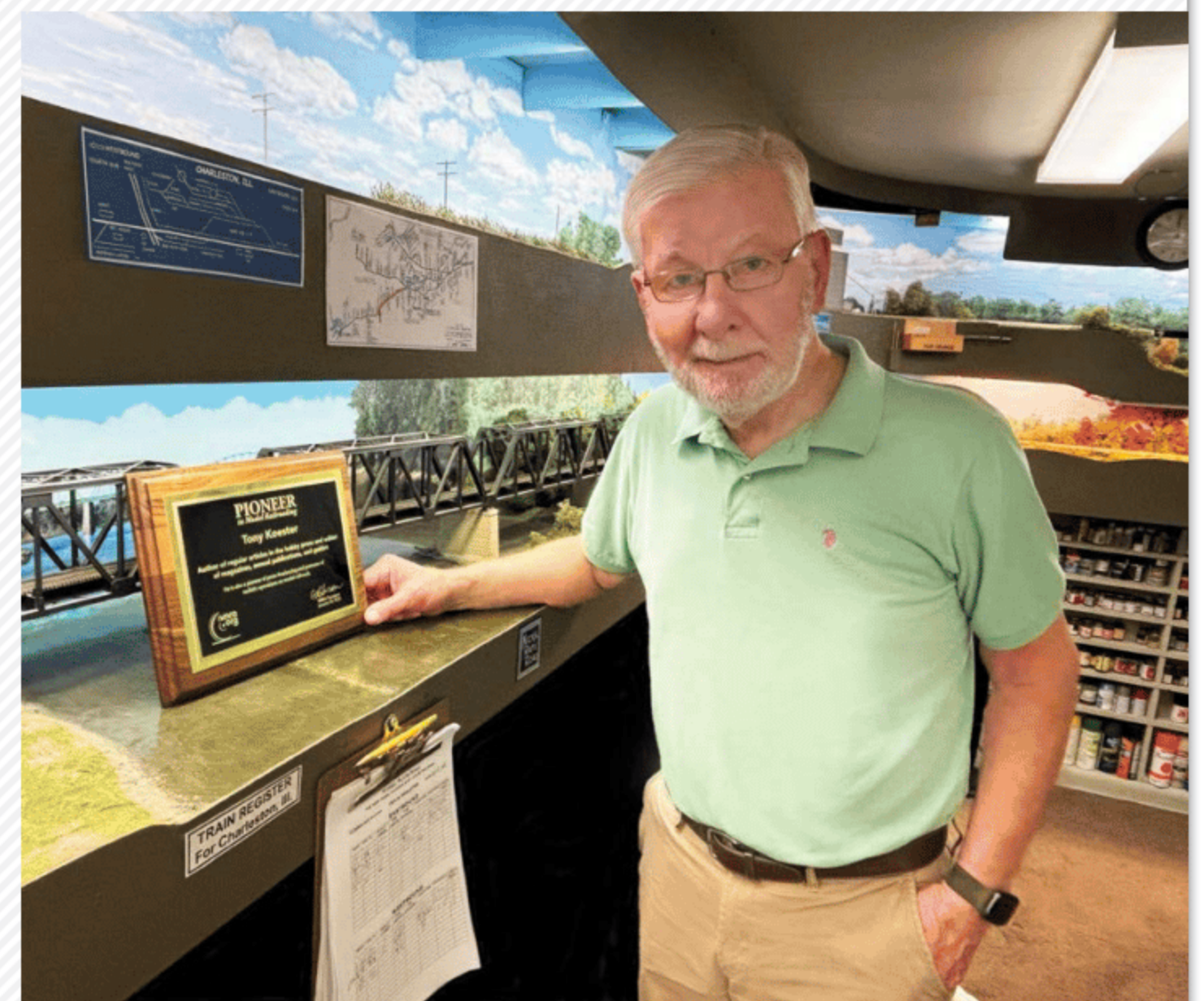
Tony Koester, author of the popular *Trains of Thought* column in *Model Railroader* magazine and editor of MR's annual publication *Model Railroad Planning*, was one of four recipients of the 2025 National Model Railroad Association Pioneer in Model Railroading award. The citation on his award read, "Author of regular articles in the hobby press and editor of magazines, annual publications, and guides. He is also a pioneer of proto-freelancing and a promoter of realistic operations on model railroads."

The Pioneer in Model Railroading award was developed by the Model Railroad Industry Association. The NMRA took over the award in the 1990s. It's one of seven NMRA Honors Awards.

"I've been fortunate to work directly or indirectly in the model railroad industry since 1969 and got to meet many of the true pioneers, including Al Kalmbach in my college years," Tony said. "To be included among them is quite an honor. I deeply appreciate receiving the NMRA's Pioneer award and the recognition of service to our great hobby that accompanies it."

This year's posthumous recipients included Minton Cronkhite, credited with developing O scale in the United States; Yuji Kato, founder of Kato Precision Railroad Models; and Sydney Pritchard, founder of Pritchard Patent Products Ltd. (Peco).

To see the all-time list of award recipients, visit nmra.org.



Model Railroad Planning Editor Tony Koester shares his National Model Railroad Association Pioneer in Model Railroading award. The *Trains of Thought* columnist was one of four recipients of the 2025 award. Bob Weinheimer photo

N scale



45-foot Freuhauf Z Van trailer. This newly tooled model from Athearn is decorated for Burlington Northern, Clipper Express, Transamerica Distribution Services, and XTRA Lease in two numbers per scheme. The N scale trailer is offered in two body styles (smooth- and ribbed-side) with two rear door styles. Additional details include a separate, factory-applied wire landing gear crank and positionable bogies. The 45-foot Freuhauf Z Van trailer, available now, is priced at **\$31.99**. Athearn Trains, 800-338-4639, athearn.com

Athearn Genesis HO EMD GP38-2



An upgraded HO scale Electro-Motive Division GP38-2 is available from Athearn. The Genesis-series model is now offered with illuminated number boxes and class lights, along with light-emitting-diode lighting and all-wheel drive and electrical pickup.

Electro-Motive Division produced the GP38-2 from January 1972 through July 1986. During the course of the production run, more than 2,200 units were built. The four-axle road switcher, rated at 2,000 hp, had a 16-cylinder, 645E3 diesel engine; an AR10 alternator; and D77B traction motors.

The sample we received is decorated as Milwaukee Road 363, part of the railroad's 350 through 365 series. The Milwaukee Road ordered its GP38-2s in two batches. Units 350 through 355 were built in June 1973 and didn't have dynamic brakes. Diesels 356 through 365, equipped with dynamic brakes, joined the roster in September 1974.

Similar to other Athearn Genesis models, the GP38-2 has a multi-piece plastic body and a die-cast metal chassis. The locomotive features a variety of factory-applied detail parts, including wire grab irons, m.u. hoses, and Celcon hand-rails and stanchions.

The Milwaukee Road unit has many prototype-specific details, including a

roof-mounted Prime electric bell, an all-weather cab window on the engineer's side of the cab, and a 1,700-gallon fuel tank. Of the three units Athearn offers decorated for Milwaukee Road, the 363 is the only one with dynamic brakes and billboard-style lettering.

I removed the front and rear draft-gear boxes to separate the chassis from the shell. Wires are tethered between the two, so use caution when lifting the shell from the chassis.

The motor and flywheels are centered in the chassis. The dual cube speakers are located above the rear truck.

Our review sample is decorated in Milwaukee Road's orange-and-black paint scheme. The lettering placement matches prototype images.

Drawings of the EMD GP38-2 were published in *Model Railroader Cyclopedia: Vol. 2, Diesel Locomotives* (out of print). The Athearn Genesis model matches printed dimensions.

The GP38-2 we received has a SoundTraxx Tsunami2 decoder. I tested the model at the workbench with an NCE Power Cab. At step 1, the model moved at just under 4 scale mph. At step 28, the locomotive achieved a top speed of 66 scale mph.

Next, I took the GP38-2 over to the Winston-Salem Southbound for further

testing. The model had no problem switching cars, easily navigating the No. 4 turnout and 30-degree crossing.

More than 50 years after the first GP38-2 was produced, many examples can still be found in service. The HO Athearn Genesis model faithfully captures the lines of the prototype. — *Cody Grivno, senior editor*

Facts & features

Price: Direct-current model with 21-pin NEM connector, \$229.99; with dual-mode SoundTraxx Tsunami2 sound decoder, \$329.99

Manufacturer

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

Era: January 1972 to present (varies based on paint scheme)

Road names: Milwaukee Road, BNSF Ry., Chehalis Western, EMD Lease, Norfolk Southern, and Union Pacific. Two to three road numbers per scheme

Features

- Body-mounted McHenry scale couplers, at correct height
- Metal wheels on plastic drive axle gears, properly gauged
- Minimum radius, 18"; recommended radius, 22"
- Weight: 13.2 ounces



Broadway Limited N scale EMD NW2



Broadway Limited has released a new run of its N scale Electro-Motive Division NW2 diesel locomotive. The end-cab switcher features a die-cast metal body and chassis, all-wheel electrical pickup, factory-applied detail parts, and body-mounted couplers.

Electro-Motive Division built the NW2 from February 1939 through December 1949. Production was paused from 1942 to 1945 by the War Production Board. By the time the last switcher came off the assembly line, more than 1,100 NW2s were built.

The sample we received is decorated as New York, Ontario & Western 123, one of 21 NW2 diesels delivered to the railroad in 1948. The full-size switcher was acquired by New York Central, becoming its 9508, after the NYO&W ceased operations. The switcher later went to Penn Central (8691) and Conrail (9269). The NW2 was retired in February 1981 and traded to EMD in June 1983 for credit on an SD50 order.

The Broadway Limited NW2 is based on a Phase V prototype. Spotting features include six louvered doors per side with a letterboard gap; larger gussets where the frame meets the stepwells; large, curved front cab windows that follow the roof line; and a straight transition from the hood to the cab.

The model has a mix of cast, formed wire, and plastic grab irons, handrails, and stanchions. Separate, factory-applied

details include the single-chime air horn, bell, and smokestacks. The front and rear windshield wipers are molded as part of the window glazing and picked in silver.

Our review sample is neatly painted in NYO&W's gray, yellow, and orange scheme. The separation lines between colors are crisp, but the bottom of the orange "bib" on the front of the hood should be round, not flat. The top quarter of the front and rear pilots should be painted the same gray as the body.

The biggest difference between the prototype and model is the locomotive phase. The full-size NYO&W units were Phase IV units. Spotting features included a frame that overhung the gussets and a two-step transition from the hood to the cab.

Since our sample has a dual-mode Paragon4 decoder, I tested it at the workbench using an NCE Power Cab. At step 1, the end-cab switcher moved at 3 scale mph. The locomotive hustled down the test track at 107 scale mph at step 28, well above the prototype's top speed. With a drawbar pull of .48 ounce, the model should be able to pull 12 free-rolling freight cars on straight and level track.

I then took the BLI NW2 over to our Milwaukee, Racine & Troy State Line Route for testing in a layout environment. The switcher did a great job working the yard at Rockford, Ill. It also muscled seven two-bay hoppers up the 1% grade between the quarry and Williams Bay, Wis., without difficulty.

The Electro-Motive Division NW2 holds the distinction of being the diesel manufacturer's best-selling switcher of all time. Thanks to the use of die-cast metal construction, the N scale version from Broadway Limited Imports should be able to handle a variety of tasks, such as yard and industrial switching or leading a train on a tourist line. — *Cody Grivno, senior editor*

Facts & features

Price: Stealth (no sound), \$189.99; with dual-mode Paragon4 sound decoder with Rolling Thunder, \$259.99

Manufacturer

Broadway Limited Imports
9 East Tower Circle
Ormond Beach, FL 32174
broadway-limited.com

Era: 1939 to 1980s (varies based on paint scheme)

Road names: New York, Ontario & Western; Atchison, Topeka & Santa Fe; Great Northern; Indiana Harbor Belt; Milwaukee Road; Reading Co.; Rock Island; and Union Pacific. Two road numbers per paint scheme.

Features

- Body-mounted Magne-Matic-compatible couplers, at correct height
- Metal wheel stubs mounted on plastic drive axle gears, properly gauged
- Minimum radius, 9"
- Weight: 2.1 ounces

Walthers HO ACF 5250 covered hopper



A newly tooled American Car & Foundry 5,250-cubic-foot capacity four-bay Center Flow covered hopper has joined the WalthersMainline product range. The injection-molded plastic HO scale model features prototype-specific hatches and outlet gates, 36" metal wheels on plastic axles, and body-mounted Proto-Max couplers.

American Car & Foundry introduced the 5250 Center Flow in 1964. By the end of the production run in the early 2000s, nearly 20,000 covered hoppers were built to this design. Grain and plastic resins were among the various products transported by these cars.

With a production run that spanned decades, there were naturally variations in the car design. In his electronic book *A History of the Center Flow* (2007), author Eric A. Neubauer notes there were short (November 1964 to May 1968) and long (May 1968 to end of production) 5250 covered hoppers. Though largely identical, the latter was 4" longer.

From 1964 to August 1971, the covered hoppers had a single horizontal stiffener on the side. Cars built after that have two horizontal ribs where the roof meets the sides (and some cars during the transition between styles lacked stiffeners). Other differences included the number of body panels, running board supports, and truck centers.

Our sample is decorated as ACFX 54362, part of the Shippers' Car Line Division of ACF Industries Inc. 54297 through 54381 series built between December 1969 and January 1970.

The WalthersMainline covered hopper features plastic construction. The roof and sides are a single piece with molded

pull plates and stirrup steps. On top, the car has a factory-installed see-through, slotted running board and eight round hatch covers.

The end cages have molded grab irons. The hand brake is part of the B end cage; the brake wheel and brake wheel chain are separate parts. A see-through plastic crossover platform is attached to the bottom of both end cages.

The underbody is a separate casting with molded shaker brackets and free-standing pneumatic chutes. Four screws hold the underbody to the body. The screws also keep the metal weight between the two parts in place.

The combined casting with the bolster, sill stubs, body bolsters, and draft-gear box has three pins that fit into holes in the underbody. The screws for the roller-bearing trucks further hold the castings in place. Screws are also used to secure the draft-gear box covers.

Our review model is neatly painted light gray with black and red graphics. I found a prototype photo of car 54362 online. For the most part, the graphics follow prototype placement. The LO and NEW 12-69 stencils should be closer to the capacity, load limit, and light weight data. The El Rexene logo is also a bit compressed. On the full-size car, the edges of lettering almost touch the vertical weld seams.

I compared the model to prototype drawings in Neubauer's DVD. The model's dimensions closely follow the short version of the ACF 5250.

To see how the car performed on a layout, I put the covered hopper in a train on our Winston-Salem South-bound. The Center Flow had no issues

navigating the tracks on our compact switching model railroad.

It's nice to see Walthers adding new models to its Mainline series. The American Car & Foundry 5250 Center Flow has a pleasing mix of freestanding and molded details, allowing it to withstand regular handling in an operating layout environment. — *Cody Grivno, senior editor*

Facts & features

Price: \$34.98

Manufacturer

Wm. K. Walthers Inc.

5601 W. Florist Ave.

Milwaukee, WI 53218

walthers.com

Era: 1960s to 2000s

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Rapido Trains HO PFE refrigerator car



Pacific Fruit Express class R-40-27 and R-40-28 ice cooled refrigerator cars are now available in HO scale from Rapido Trains. The models, offered for the first time in plastic, are scaled from prototype blueprints and field measurements. Product features include wire grab irons; prototype-specific brake wheel, running boards, and cooling fan housings; and body-mounted Lincoln-Washington semi-scale metal couplers.

The class R-40-27 cars, numbered 10001 through 11700, were built between January and August 1957. Construction of this 1,700-car lot was spread between PFE shops in Colton, Roseville, and Los Angeles, Calif.

The class R-40-28 refrigerator cars, part of the 11701 through 11800 series, were built in July 1957 by SP Equipment Co. in Los Angeles. The 100-car lot was the last group of PFE cars to use ice for refrigeration.

We received samples of the R-40-27 and R-40-28 cars. For the review, I'll focus on a car from the latter class, PFE No. 11725.

The Rapido Trains model has a one-piece injection-molded plastic body with many freestanding, factory-applied details. On top, the refrigerator car has an etched-metal running board and multi-piece hatch covers with formed-wire handles on top and latch hardware on the bottom. The covers can be opened. And you guessed it, Rapido included see-through metal ice grates inside the car. Pretty neat!

The sides of the car have crisp rivet and body panel detail. Molded details include the door stops for the 6-foot plug

door, hinges for the 2-foot door, and placard and route boards. Factory-applied details include plastic 7-rung ladders, stirrup steps, and door hardware (levers, rods, and tracks), as well as formed-wire grab irons.

The car ends have plastic ladders, wire grab irons, and factory-installed placard boards. Additional details on the brake, or B end, of the reefer include a plastic hand brake, Ajax brake wheel, retaining valve, and etched-metal brake platform.

The underbody is a separate plastic casting. Metal weights are attached to the top with a screw. The bottom has molded floor board and stringer detail. The center sills, crossbearers, crossties, body bolsters, and bolsters are cast as a single unit. The well-detailed AB brake system features a mix of plastic and formed wire parts. The draft-gear boxes have a separate, screw-mounted lid.

Engineering plastic was used for the American Steel Foundries solid-bearing trucks. The sideframes have raised foundry data. The refrigerator car rides on 33" insulated metal wheelsets.

The review sample we received is decorated in PFE's 1966 paint scheme with Gothic lettering, outline-style Southern Pacific and Union Pacific heralds, orange sides, black ends, and a white roof. The paint is smooth and evenly applied, and the separation lines between colors are crisp.

Graphic placement follows a prototype photo in *Pacific Fruit Express: Second Edition* by Anthony W. Thompson, Robert J. Church, and Bruce H. Jones (Signature Press, 2000). The model's dimensions closely follow

prototype drawings on page 189 in the same book.

I put the refrigerator car in a train on our Winston-Salem Southbound layout. The model performed without incident while being pushed and pulled on the Tar Branch, which has a No. 4 minimum turnout and 30-degree crossing.

Pacific Fruit Express refrigerator cars traveled throughout the nation's rail network. If your HO scale model railroad is set between 1957 and 1982, you'll want to add a few of the Rapido R-40-27 and R-40-28 models to your rolling stock fleet. — *Cody Grivno, senior editor*

Facts & features

Price: single car, \$59.95; six-pack, \$359.70

Manufacturer

Rapido Trains
382 High St.
Buffalo, NY 14204
rapidotrains.com

Era: 1957 to 1982 (varies based on paint scheme)

Road names: Pacific Fruit Express (R-40-27 — 1957, 1961, 1966, and 1970s Top Ice Ventilator service schemes. R-40-28 — 1957, 1961, and 1966 schemes).

Features

- 33" metal wheelsets, correctly gauged
- Body-mounted Lincoln-Washington semi-scale couplers, at proper height
- Minimum radius, 18"
- Weight: 4.4 ounces, .5 ounce too heavy per National Model Railroad Association Recommended Practice 20.1

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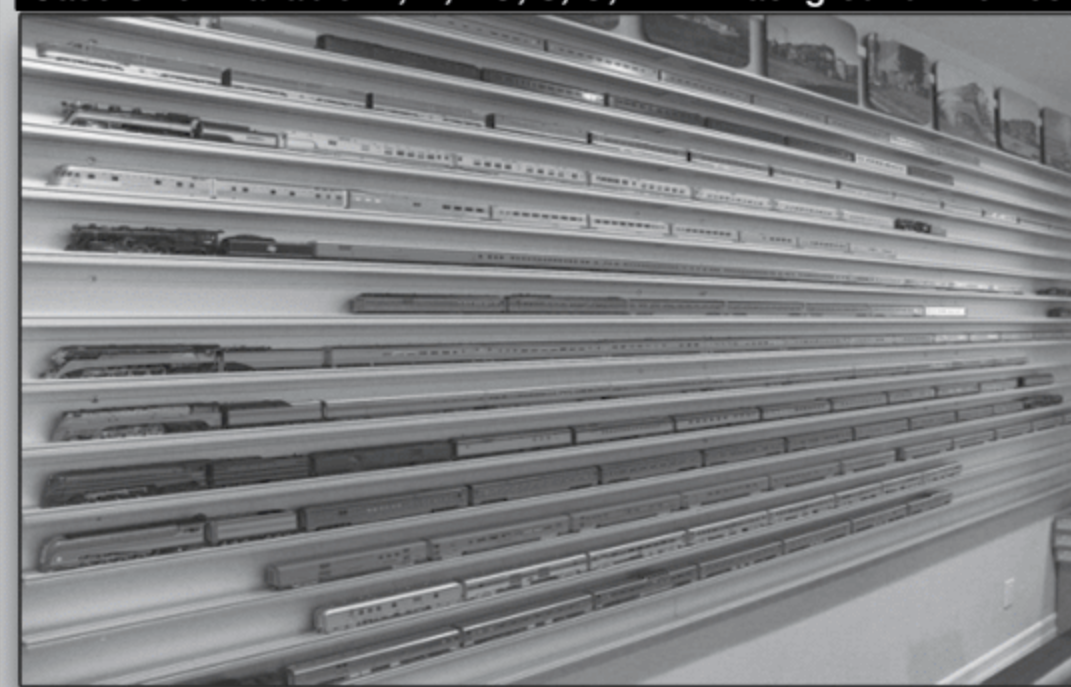
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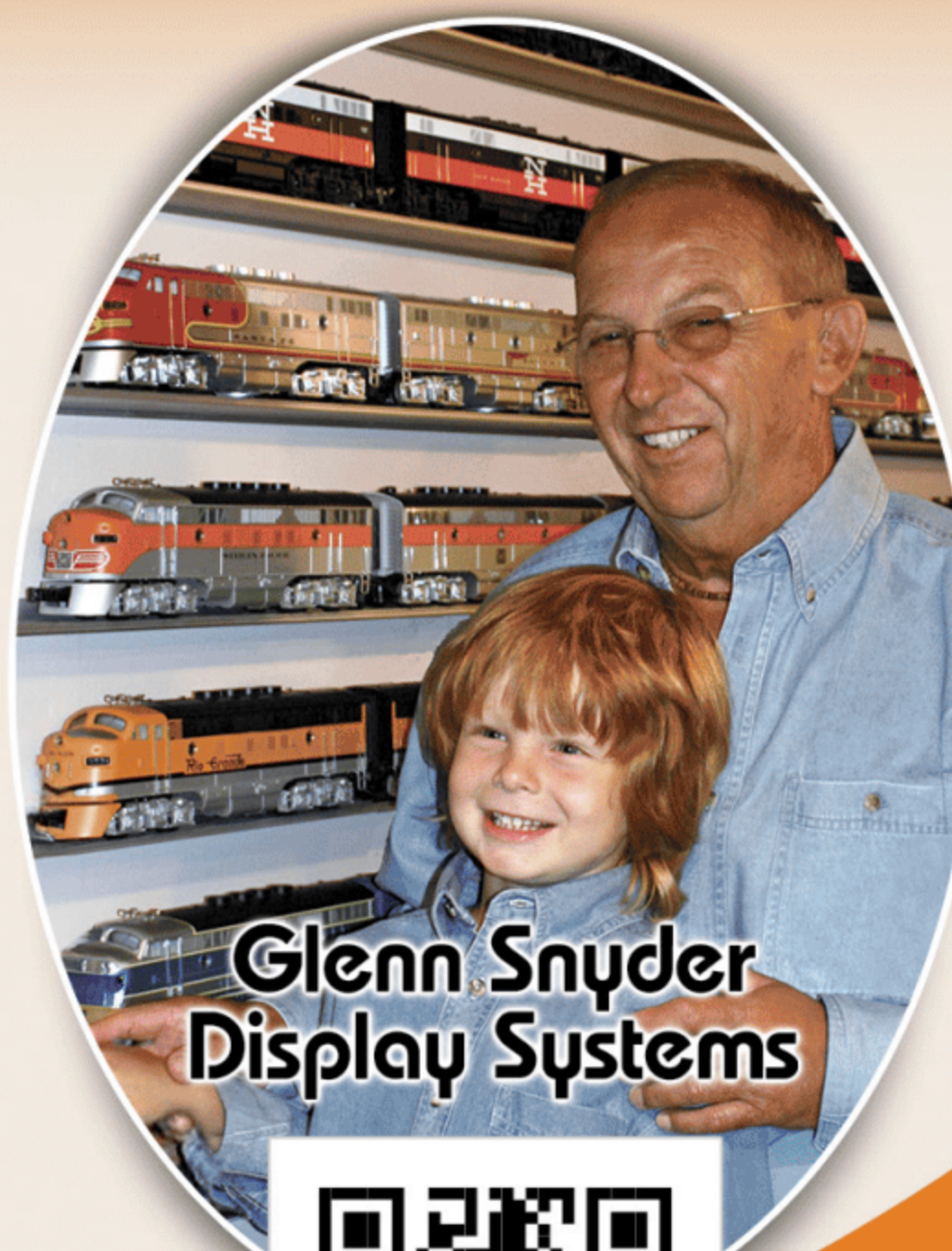


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Here's a sample of some of the N scale metal wheelsets that are available today. When replacing plastic wheelsets with aftermarket offerings, be sure to check the axle length and wheel diameter. Cody Grivno photo

Why won't my N scale freight cars roll?

Q I have some N scale cars from Micro-Trains. Recently, I swapped out the factory-installed plastic wheelsets with metal wheelsets, but now the cars don't roll freely. What can I do to fix this?

Kelly Walton-Harper

A Though metal wheelsets have been around since the early days of N scale, the initial offerings were pretty crude by today's standards. The flanges were oversized, and the face and back of the wheels didn't look much like what's found on prototype rolling stock.

Today's metal wheelsets are more prototypical in appearance. Many are chemically blackened, and some have shiny treads. Those that aren't darkened can easily be painted, a topic covered many times over the years in *Model Railroader* magazine.

However, metal wheelsets aren't one-size-fits all. The first thing you'll want to check is wheel size, as it's possible the flanges are rubbing on the bottom of the car. Here are the general rules for freight car wheel sizes:

- 28" diameter — modern auto racks
- 33" diameter — 70-ton capacity or less (and most cabooses)
- 36" diameter — 100- and 110-ton capacity cars
- 38" diameter — intermediate wheelsets on articulated 125-ton capacity well cars (end trucks have 33"-diameter wheels)

Wheel size is only part of the equation with metal wheelsets, though. The other is axle length. Most manufacturers specify the axle length on the packaging or list the brands of trucks the wheelsets are designed for (Fox Valley Models does both). If the axle length isn't specified, use calipers to measure the distance between the axle tips on the plastic wheelsets. Then replace them with appropriately sized metal wheelsets.

Here are some of the model railroad manufacturers that produce metal wheelsets in N scale: Athearn Trains, Atlas Model Railroad Co., Con-Cor, Eastern Seaboard Models Corp., Fox Valley Models (now ScaleTrains), InterMountain Railway Co., Micro-Trains Line Co., NorthWest Short Line, Rapido Trains, and Tangent Scale Models.



TTX 40-foot well car 451033 has two 20-foot containers in the well and a 40-foot container on top. Learn why railroads avoid placing four 20-foot containers in a single car. Cody Grivno photo

Q I'm curious why I've never seen four 20-foot intermodal containers in a single well car, stacked two on top and two on the bottom. I've only ever seen two 20-foot containers in the well and a 40-foot (or larger) container on top.

Benjamin Stewart

A David Lassen, senior editor at *Trains* magazine, put me in touch with Jason Hilsenbeck, founder of the websites Loadmatch.com and Drayage.com. Here's what he had to say on the topic: "I don't know if there is a specific Association of American Railroads rule on stacking a 20-foot container on top of another 20-foot container in a well car. My understanding is railroads don't place them on top of each other due to securement issues. Well cars sway back and forth when rolling down the track, twisting front to rear. With only 20 feet of length — half the length of a 40-foot well car — it's preferred to keep to the 20-foot containers on the bottom.

"Besides, there are always way more 40-foot containers to load compared to 20 footers. Of the 60-plus million ocean containers, approximately two-thirds are 40-feet; a third are 20 feet. There will always be 40-foot containers to load on the train.

"If you have four 20-foot containers, they will be on the bottom and a 40-foot container placed on top. Not every container you see has a load inside it — some containers are empty repositions. Hopefully the intermodal terminal placed the heaviest containers on the bottom."

Send questions on model, prototype, and toy trains to AskTrains@Trains.com.

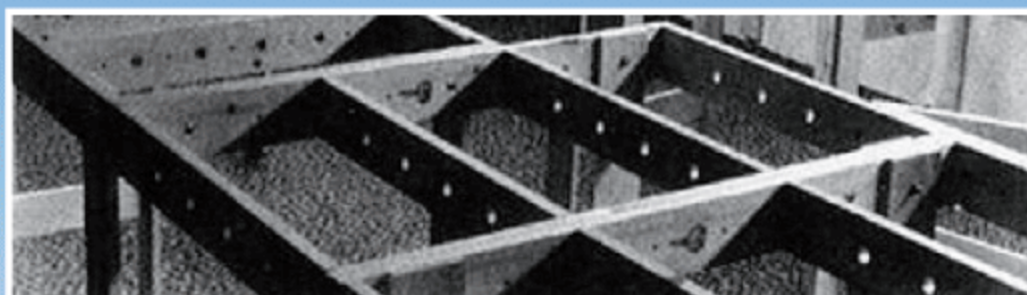


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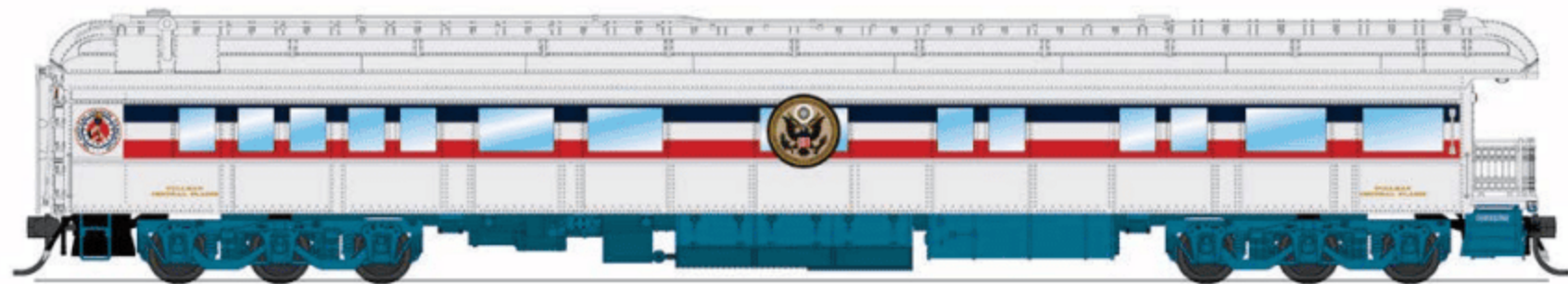
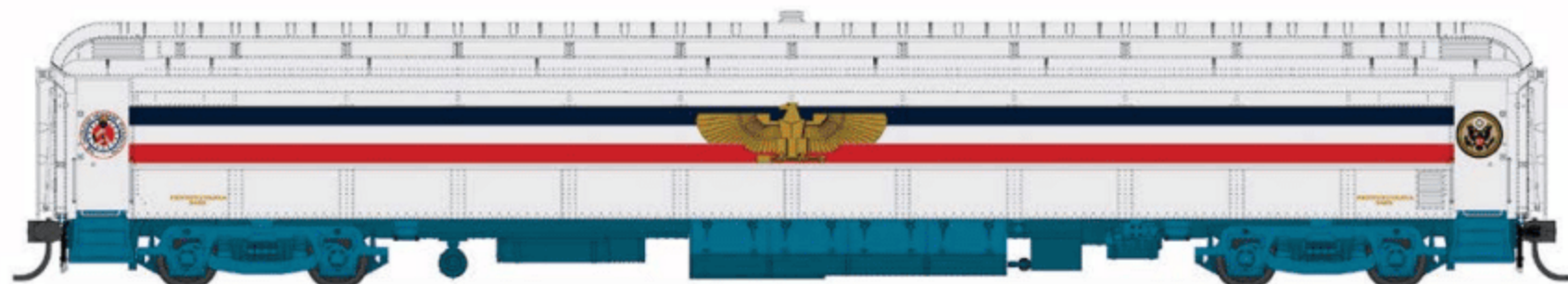
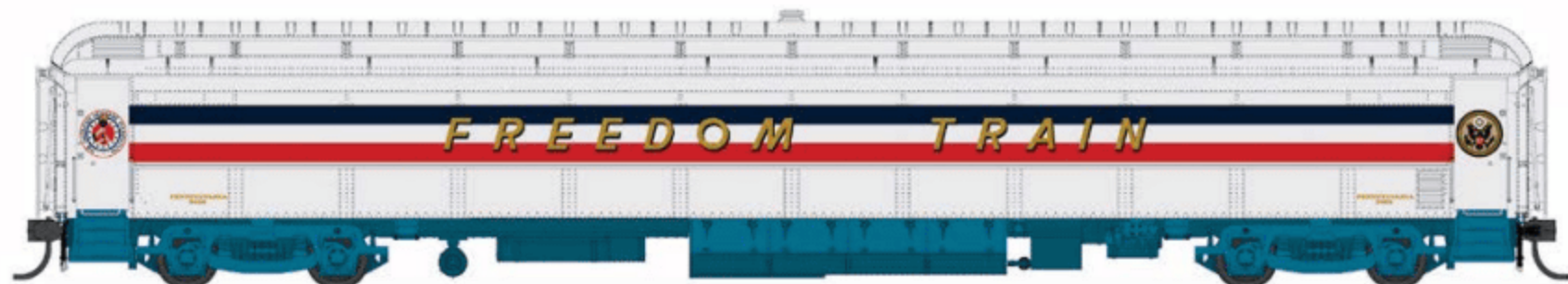
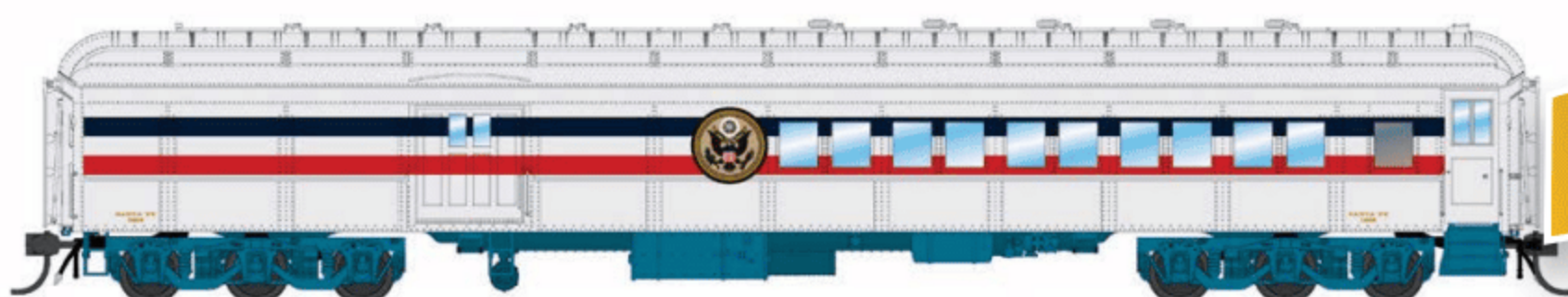
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Q In the September 2022 issue of *Model Railroader*, Mike Tylick wrote "Add a gated crossing to your layout." On page 36, there is an image of a gate that he built for the F scale Chester & Beckett RR. What is F scale?

via email

A The F scale Chester & Beckett RR was featured in *Great Model Railroads 2018*. The 16 x 20-foot sectional model railroad was built by Steve Morrill, John Sacerdote, Doug Scott, and Mike Tylick. In the article, it said, "F scale is the National Model Railroad Association's designation for 1:20.3-proportion trains on 45mm 'large scale' track."

Using that information as a lead, I visited the NMRA's General Standard Scales (S-1.2) website. It states that F scale is .591", or 15mm, to the foot. You may also see it referred to as 1:20.32 proportion. The minimum track gauge is 2.783" and the maximum gauge is 2.845". In the notes section of S-1.2, it states, "Proto:20.32 and F are the same other than flange depth."



Two-truck Shay No. 4 (left) and Porter 0-4-0 switcher No. 1 are Bachmann models that were detailed and custom decorated for the F scale Chester & Beckett, featured in *Great Model Railroads 2018*. The scale is sometimes referred to as 1:20.32 proportion. Photo by Doug Scott and Mike Tylick

Q I would like to install signals on my HO scale railroad. I've obtained dwarf signals with very fine plastic-insulated wire leads to the light-emitting diodes and searchlight signals that use magnet wire. How do I strip off the insulation to solder feeders to these delicate wires? I have no clue what to do with the coated magnet wire.

Paul Buckley

A Various companies, such as Xuron, make wire strippers for fine wire down to about 30AWG and that might be your best option.

As for the magnet wire, it's usually coated with a polymer and can be difficult to remove. I've had my best luck removing it by drawing it over fine sandpaper or an emery board. — Larry Puckett, contributing editor

Q How do tightlock couplers work?

Thor Clemens

A Longtime staff member Jim Hediger provided an explanation of the Type H, or Tightlock, coupler in a sidebar that appeared with his article "HO knuckle coupler guide" in the November 2007 *Model Railroader*. He wrote, "The need to reduce slack and improve passenger train safety led to the development of the Type H, or Tightlock, coupler. This coupler has interlocking wings on each side and machined mating surfaces that fit closely together to prevent vertical separation of the cars during a derailment."

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The Type H, or Tightlock, coupler was designed to improve passenger train safety. This style of coupler has been required on all new passenger cars since the mid-1950s. Jim Hediger photo

It was introduced as an Association of American Railroads alternate standard in 1937, became standard in 1947, and has been mandatory on new passenger cars since 1956.”

Q I'm researching methods to power turnout frogs on my N scale layout. I'm using Atlas code 55 flextrack and Digital Command Control. The majority of turnouts will have manual throws.

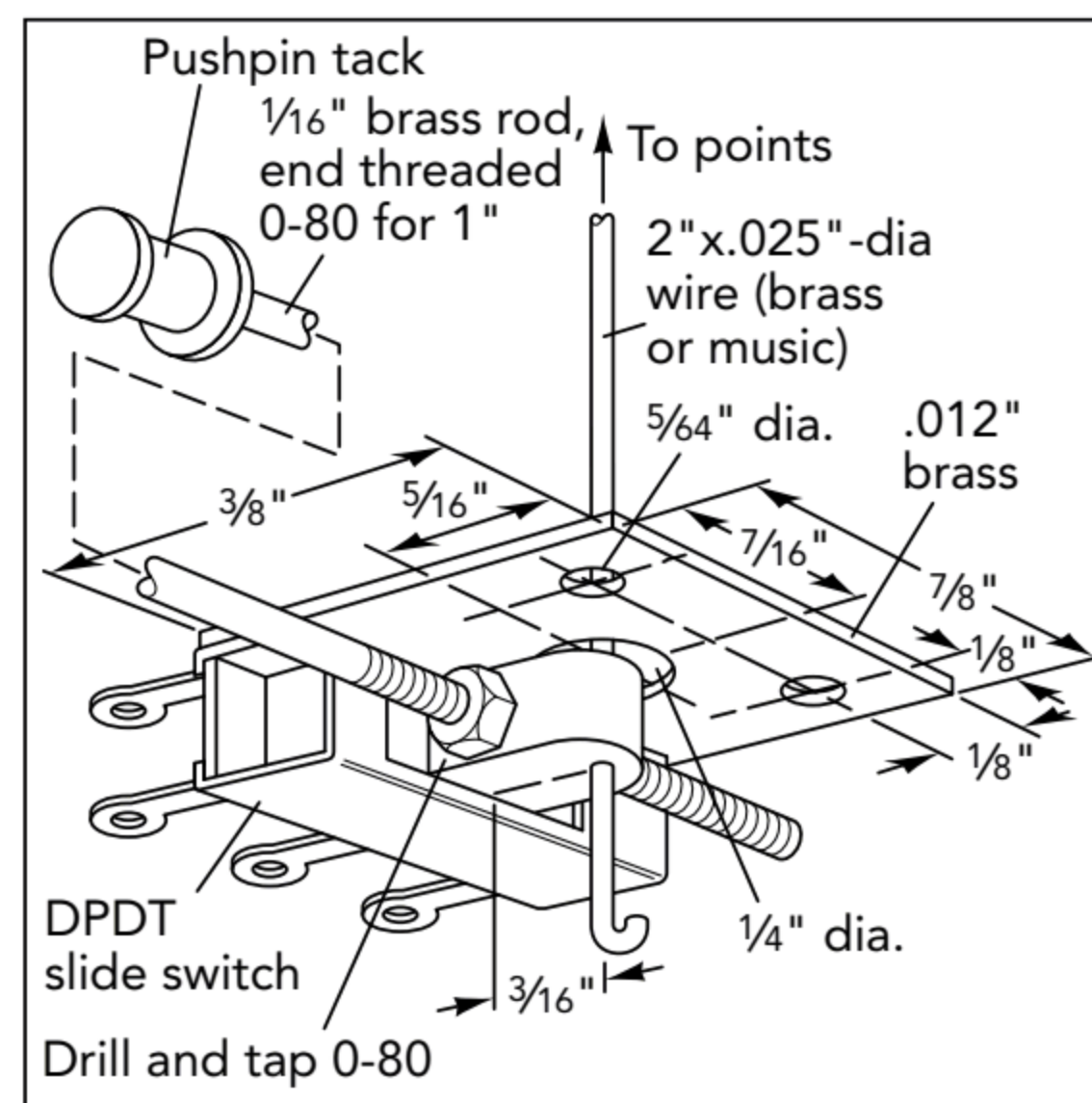
I've read that electronic frog juicers should be used judiciously as they place a continuous load on the power supply. I think single-pole double-throw (SPDT) switches connected to the switch rod are an economical solution. The July 2017 and February 2023 issues of MR refer to micro SPDT switches as both the throw device and the power router. Can you provide sources for these?

Joe Martin

A I wouldn't be concerned about the power consumption of frog juicer devices. It is minimal. The Tam Valley device draws only 17 milliamps, comparable to a single light-emitting diode.

You could use a Caboose Industries 119R ground throw which has a single-pole double-throw (SPDT) switch built into it. That way when you line your switch points it will also change the polarity (or phase) of the frog.

As you mentioned you can also use small SPDT slide switches to line the points and change polarity. This requires installing the switch near the points and



This illustration from Contributing Editor Larry Puckett's book *Wiring Your Model Railroad* shows how to install a slide switch under the layout to control turnouts. Rick Johnson illustration

using a piece of piano wire as a linkage. I discussed how to do this on page 62 of my book *Wiring Your Model Railroad* available at Shop.Trains.com and Fire-crown Media retailers. — Larry Puckett, contributing editor **MR**

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Marshfield & Old Colony No. 47 passes a ball signal on Mike Tylick's On30 layout. The longtime *Model Railroader* author shares how he scratchbuilt a pair of these lineside details commonly found in New England. Photos by the author

How to model ball signals

I've long been interested in signals on prototype and model railroads. These lineside devices play a vital role in safe operations on full-size railroads, keeping trains a sufficient distance apart, alerting crews to oncoming traffic, and indicating route alignment. On layouts, the red, amber, and green aspects add a pop of color and visual interest to scenes.

As much as I would have loved to install operating signals on my On30 Marshfield & Old Colony (M&OC), the narrow gauge short line and connecting trolley line are too lightly traveled to justify such expense. In the September 2022 issue of *Model Railroader*, I wrote "Add a

gated crossing to your model railroad." The manually operated gate, fashioned out of styrene, protected the at-grade crossing between the M&OC's Egypt Beach Branch and the Braintree Electric Ry.'s Scituate Pier line. This time around, I wanted to try something different.

Ball signals seemed a logical solution for my junctions. At least a few full-size examples were still in operation in the 1930s. I'm familiar with the still-extant Boston & Maine/Maine Central ball signal in Whitefield, N.H. [See "A brief history of ball signals" on page 26. — Ed.] I looked to see what information I could find in order to build my own.

Then I purchased HO scale ball signal kit No. 2021 from Bollinger Edgerly Scale Trains, but it proved far too small to adapt to O scale [The manufacturer also offers the Whitefield Junction ball signal, shanty, and section house as kit No. 1007. — Ed.] However, the kit's plans provided enough information to build my O scale version. The HO scale model made a good birthday gift for a friend.

Mike Tylick has been writing articles for Model Railroader magazine for more than 40 years. His how-to story "Paper people for any pay grade" appeared in the October 2022 issue.

STEP 1 CROSSARMS AND SHEDS



I built the 10-scale-foot wide crossarms from pieces of $\frac{1}{32}$ " and $\frac{1}{16}$ " stripwood ①. The carpentry is complex enough that I would have found it difficult to figure out the design on my own.

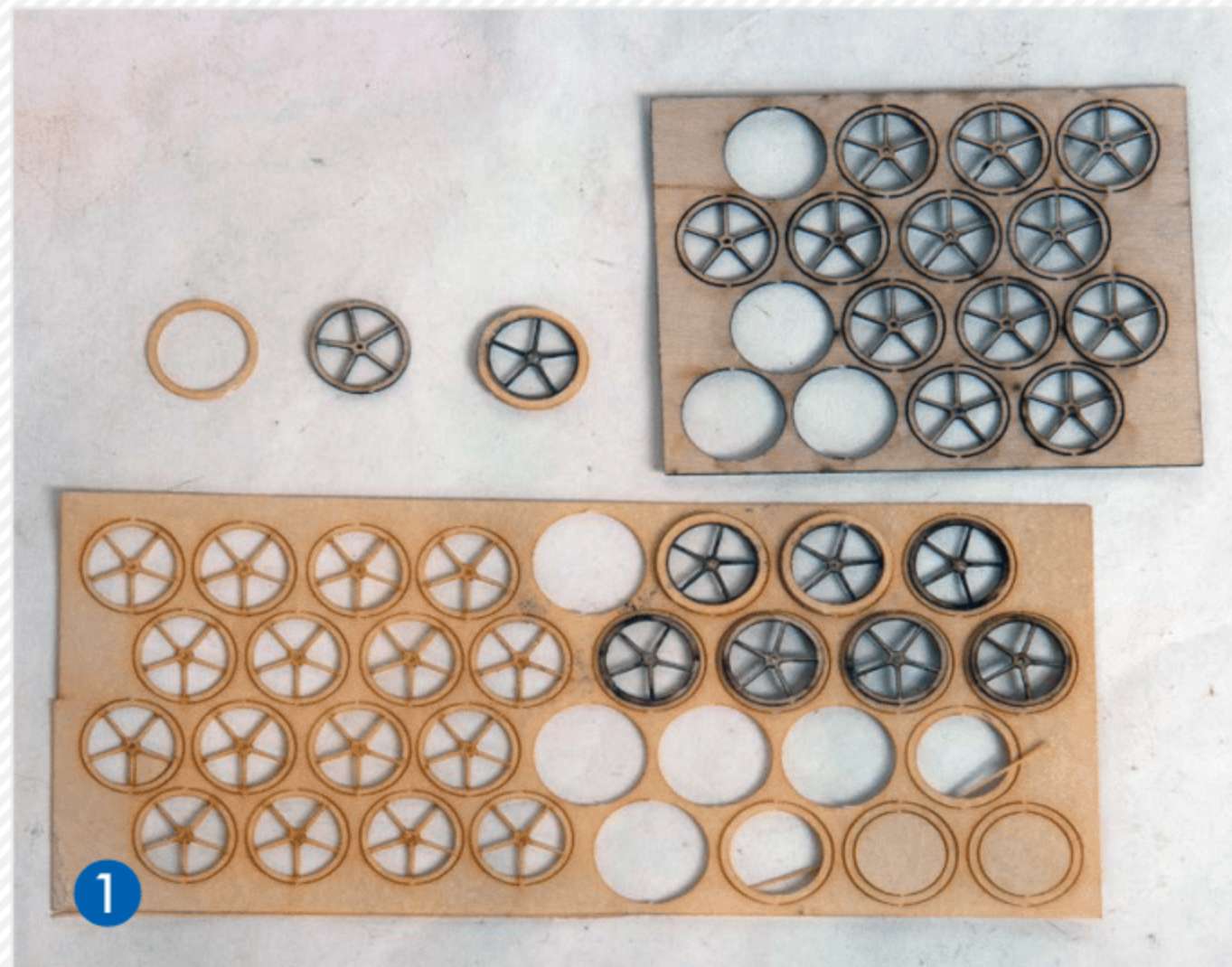
Prior to assembly, I stained the wood using a multi-step technique that I learned from well-known modeler George Sellios of Franklin & South Manchester fame. I first applied random, thin washes of raw sienna and burnt



umber acrylics to the wood. After that had dried, I applied an India ink and isopropyl alcohol wash.

Following prototype practice, I constructed an operator shanty for both ball signals ②. Since I wanted these line-side buildings to match other Marshfield & Old Colony structures on the layout, I copied the crossing shanty I wrote about in the February 2016 MR (pp. 44-47). Plans for the shanty can be found on Trains.com.

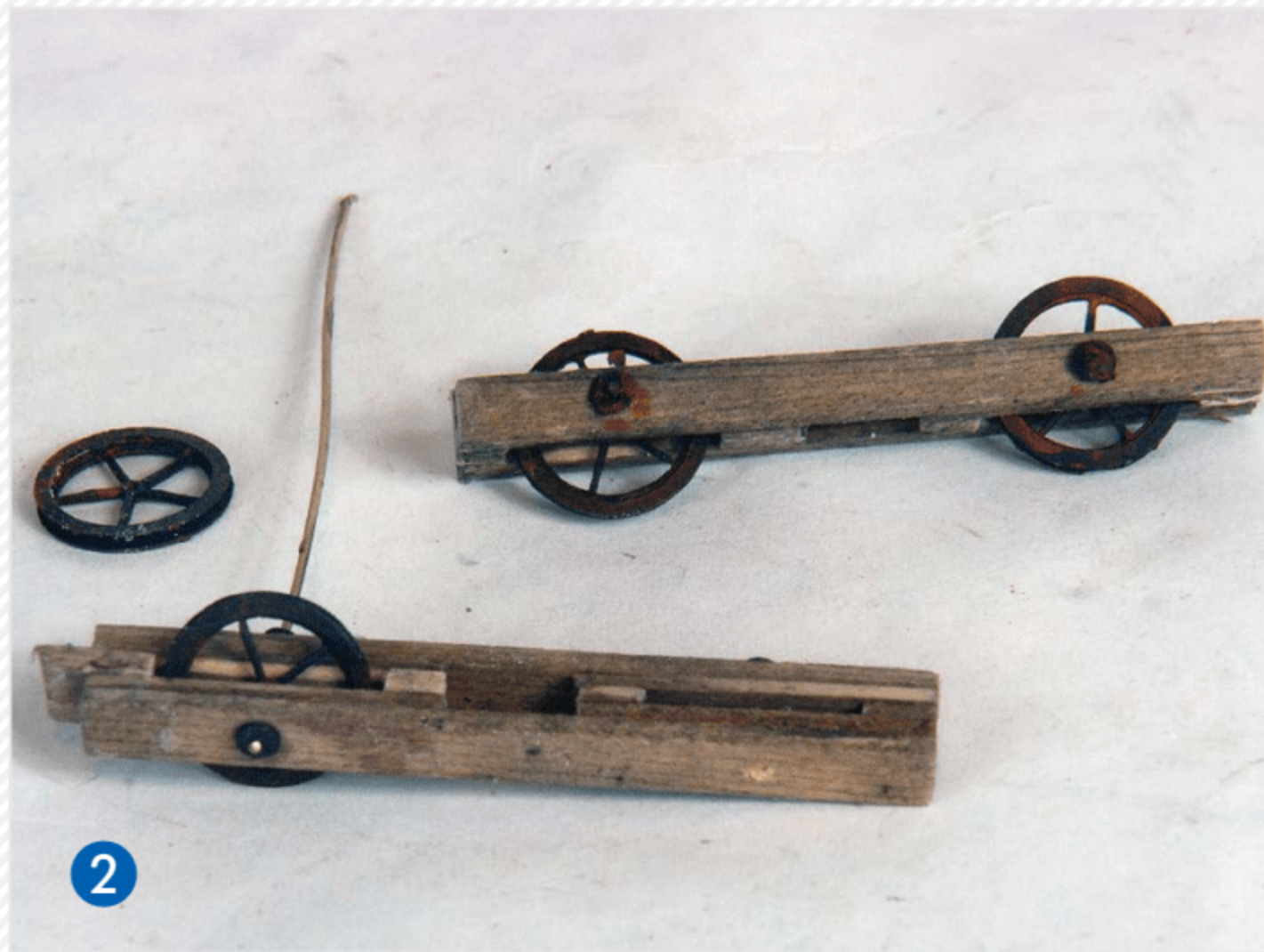
STEP 2 SOME FRIENDLY HELP



I was unable to find suitable pulleys for the O scale ball signals, so I had a friend cut the parts from $\frac{1}{64}$ " laserboard (craft paper soaked in resin) ①. Then I assembled the three-piece details — two outer rings and a spoke center — with white glue.

The inner core proved too wobbly using the laserboard parts. My friend then cut the spoke centers from $\frac{1}{32}$ " aircraft plywood for extra thickness and strength. When combined with laserboard outer rings, the pulleys were much stronger. Each signal requires four pulleys.

With the pulleys assembled, I spray-painted them with light gray primer. After that had dried, I brush-painted the pulleys with Delta Ceramcoat Charcoal craft paint, item 02436. A wash of Burnt Orange (DAO16) from DecoArt's Americana line of acrylic craft paint line added a hint of rust, as seen in ②.

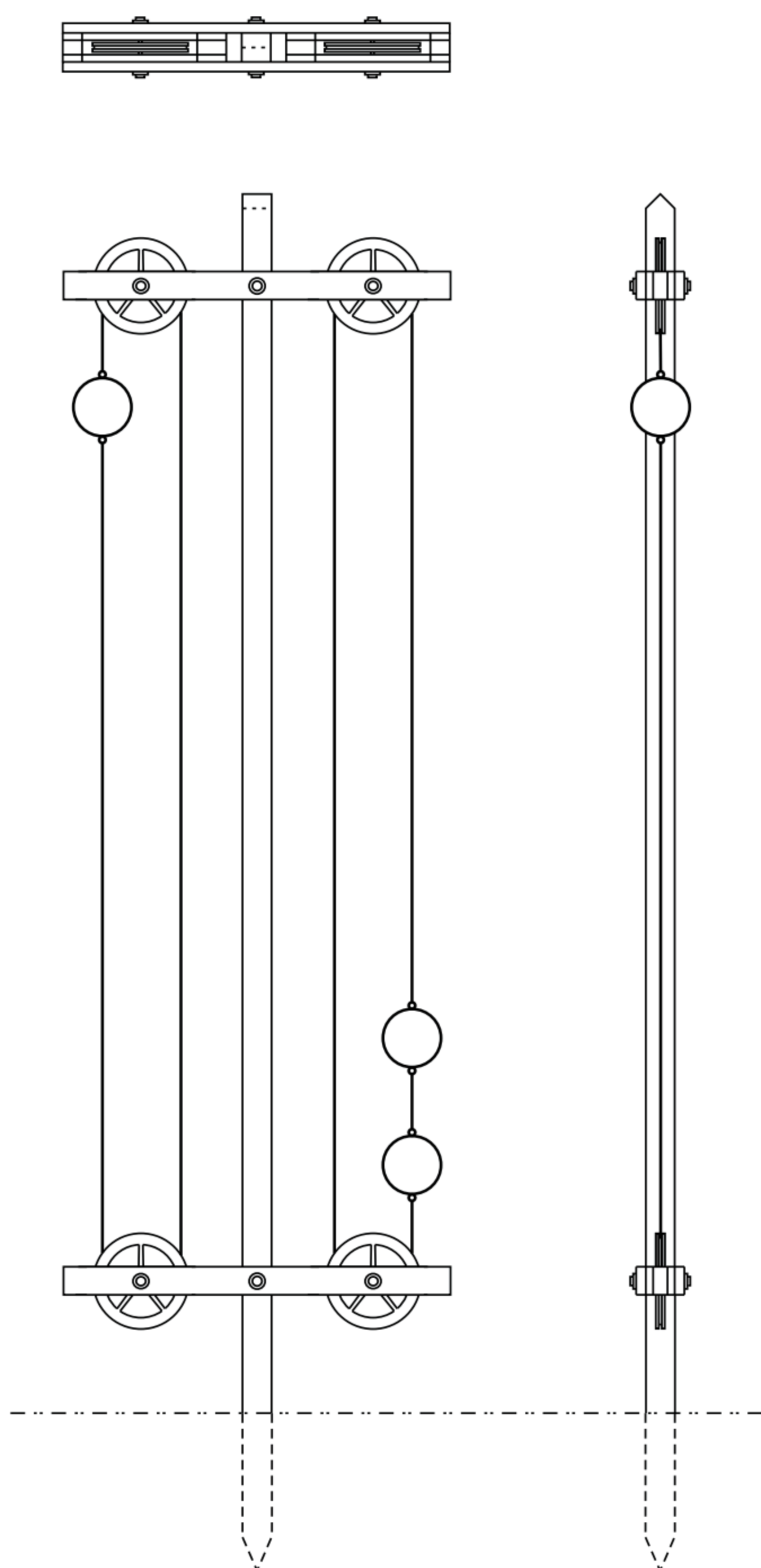


Then I used a No. 70 bit in a pin vise to drill holes in the crossarms. After setting each pulley in place, I ran an oversized length of Tichy Train Group .025" phosphor bronze wire (1104) through the crossarm, pulley, and out the other side. I installed nut-bolt-washer (n.b.w.) castings, which I made using .020" styrene sheet and an $\frac{1}{8}$ " hole punch, with cyanoacrylate adhesive (CA).

I trimmed the excess wire with a small pair of cutters, leaving a bit of "bolt" protruding. I painted the n.b.w. castings and wire with black paint ②.

Finally, I attached the crossarms to the $\frac{3}{16}$ " square basswood pole. Prior to assembly, I ran a razor saw along the pole in a vertical motion to add woodgrain detail; I sanded off the resulting fuzz ③. I stained the pole using the same techniques as before. I added n.b.w. castings where the crossarms and pole intersect.





Marshfield & Old Colony ball signal

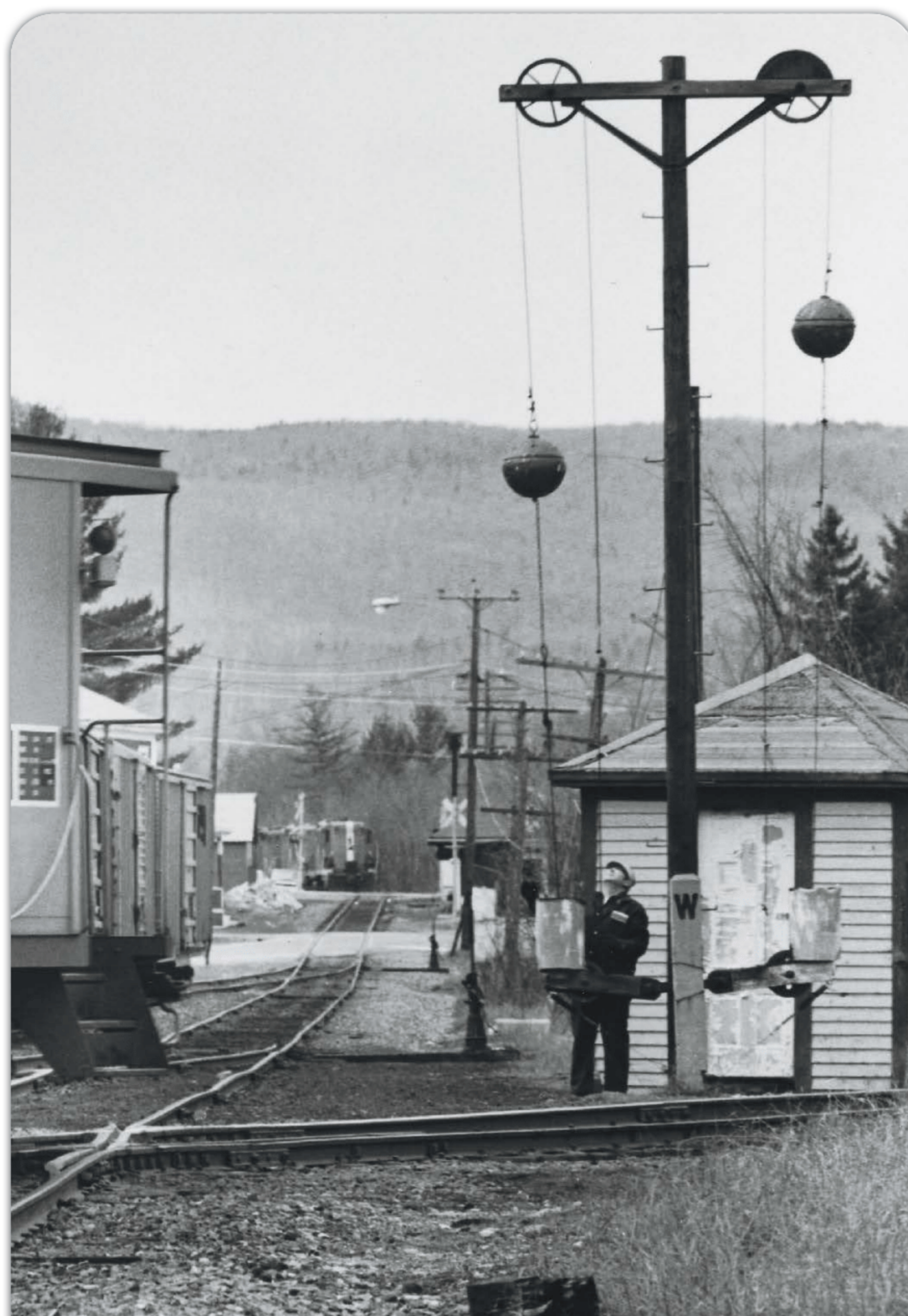
Ratio 1:87.1, HO scale

TO CONVERT HO SCALE
DRAWINGS TO YOUR SCALE
COPY AT THESE PERCENTAGES:

N 54.4 percent S 136.1 percent O 181.4 percent

Drawn for *Model Railroader* magazine by
MIKE TYLICK

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The operator at Whitefield, N.H., raises a signal ball into position at the Maine Central/Boston & Maine crossing in 1979. Ball signals were common in New England; this one lasted into the 2000s. Ben Bachman photo

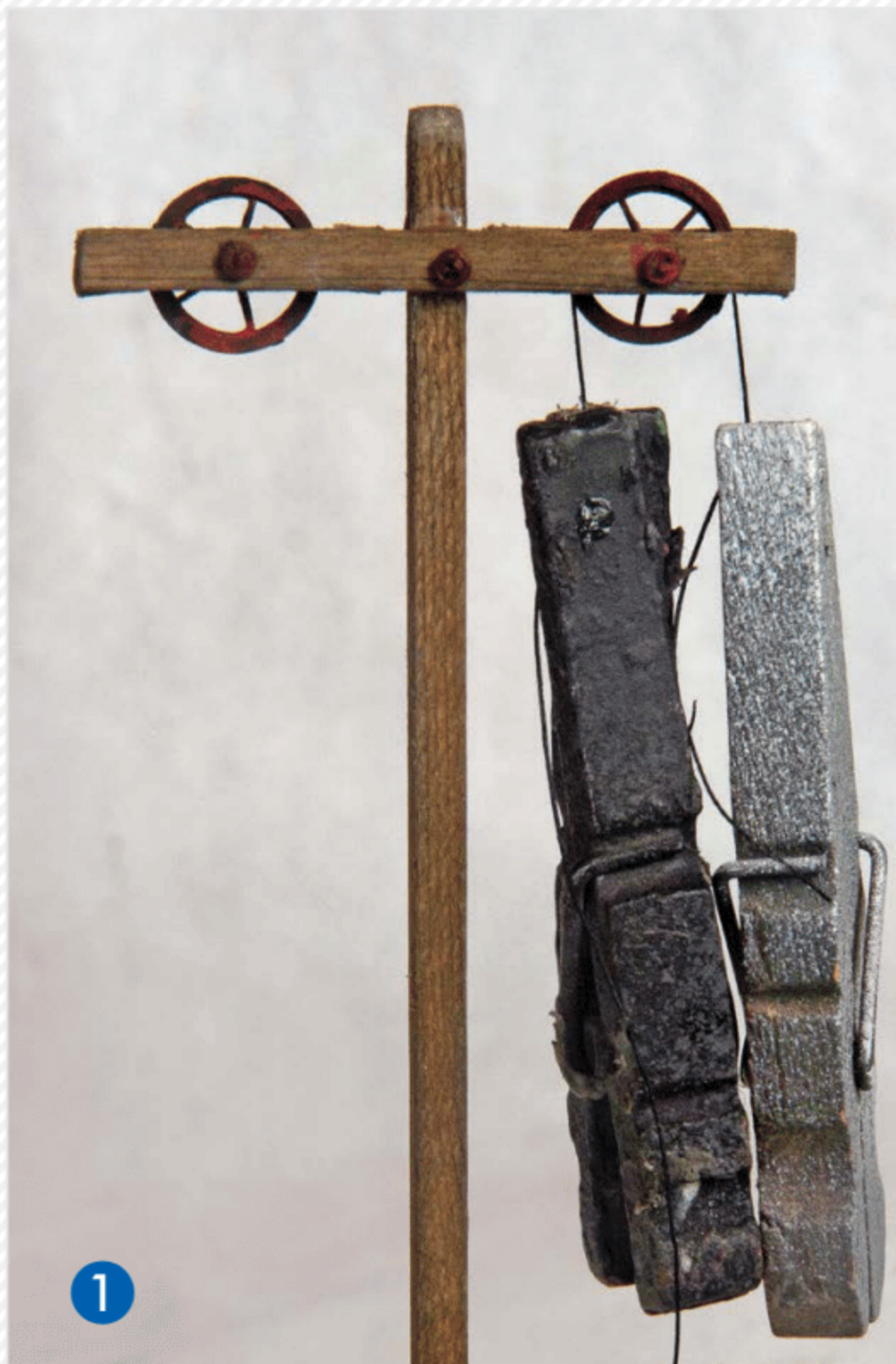
A brief history of ball signals

The earliest manual signals at junctions were baskets elevated on masts with pulleys. Their position on the mast (high, middle, or low) and color (black or white) conveyed information on train locations or permission to enter track. The baskets soon gave way to large cylinders or spheres, usually red, and eventually acquired the name "ball signals."

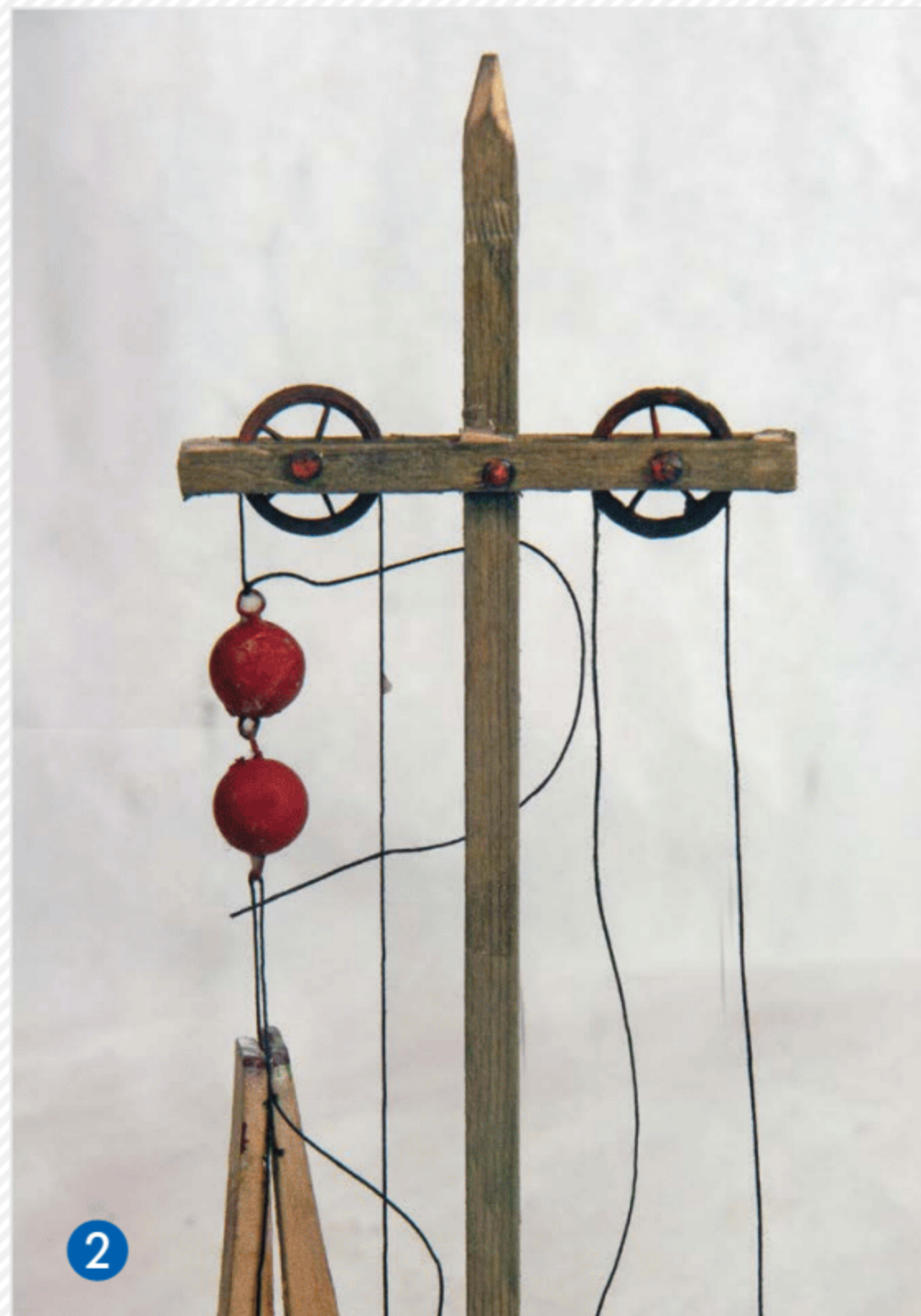
The number of balls on a mast varied by installation, depending on how many indications were needed. The number of balls visible, or raised, indicated which railroad had the right of way (these signals are where the term "highball" comes from). Lanterns were swapped for the balls for nighttime operation.

Ball signals were especially common in New England. Although many were converted to other signal types, some ball signals remained in service at junctions through the late 1900s, with at least one (at Whitefield, N.H.) serving into the 2010s. — *Jeff Wilson, from Modeler's Guide to the Right of Way* (Kalmbach Media, 2022)

STEP 3 ADDING SIGNALS



Next, I added the rope (old ship rigging line I had leftover from a kit) and signals. I found it difficult to install them without the pulleys moving. I settled for static signals by gluing the rope in place, which proved difficult enough. The clothespins acted as a weight to keep the rope taut while the glue dried around the pulley 1.



I made the signals from $\frac{3}{8}$ " beads. To those I attached .010" wire that I twisted into eyelets and attached in the bead stringing holes with CA 2.

Though it took some patience, the finished signals turned out well 3. Elastic thread, similar to Berkshire Junction EZ Line, could be used in place of the ship rigging.



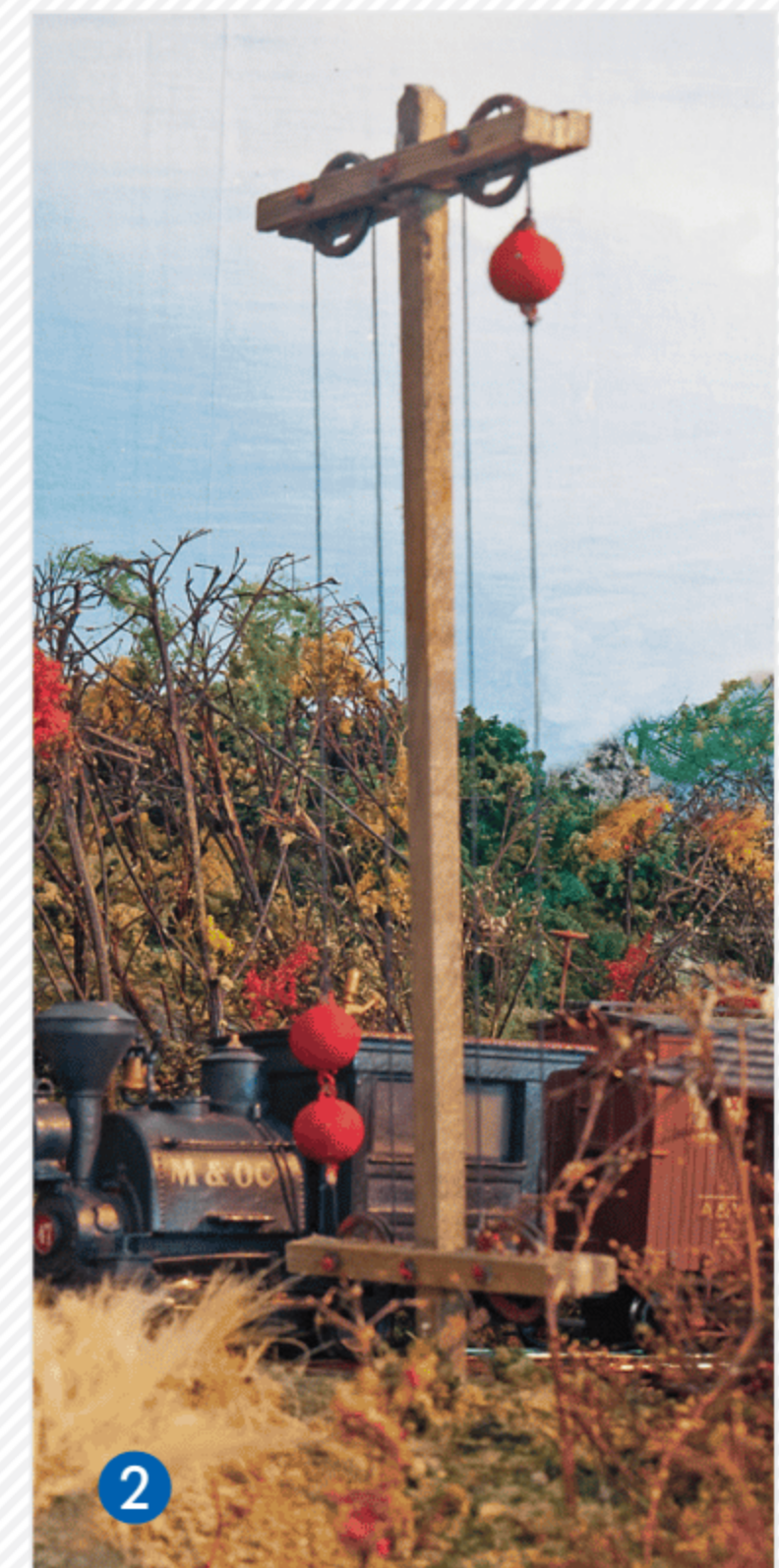
STEP 4 ON THE LAYOUT

I installed the first ball signal and shanty at Green Harbor Junction, a partially completed section on my On30 Marshfield & Old Colony 1. The branch line is to the left (single ball); the main is at right.

The wide crossarms required the signal and shanty to be set back quite a distance from the junction. Because of this, I had to place the signal further up the hill than I had planned.

To make the arrangement look plausible, I built a retaining wall from ties. I backfilled the wall with sawdust, white glue, and water. I added some ground foam while the glue was still wet.

I placed the second signal and shanty at Scituate Junction 2. The lineside details fit neatly along the right-of-way. MR





Instead of using the push-pull knobs with the Blue Point manual turnout controllers, Mike Hardwick made short-throw rotary controllers. He was able to complete the 13 he needed for his model railroad in one day.

How to build a ROTARY MANUAL TURNOUT CONTROLLER

By Mike Hardwick
Photos by the author

Convert push-pull Blue Point linkages to short-throw rotary controllers

When I replaced the staging area on my model railroad with a small yard, I installed Blue Point manual turnout controllers instead of Tortoise by Circuitron switch motors as used on the rest of the layout. I wasn't keen on the typical push-pull fascia knobs with the Blue Point controllers. Instead, I wanted slightly more elegant short-throw rotary controllers.

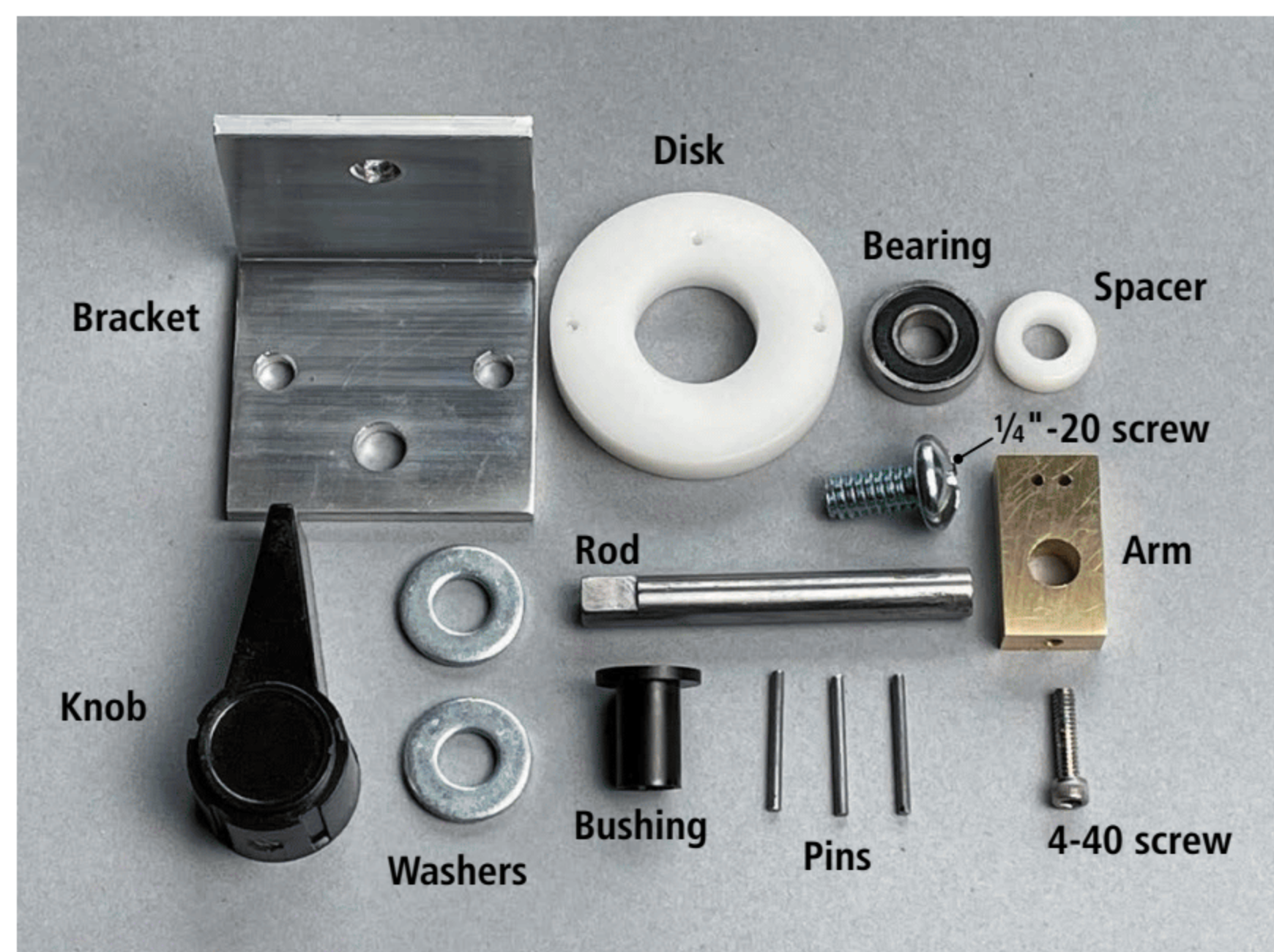
Finding no such mechanisms available commercially, I made my own. Admittedly, they were more work than drilling a hole through the front edge of the benchwork for the push-pull linkages, but

the result was worth the time investment for me.

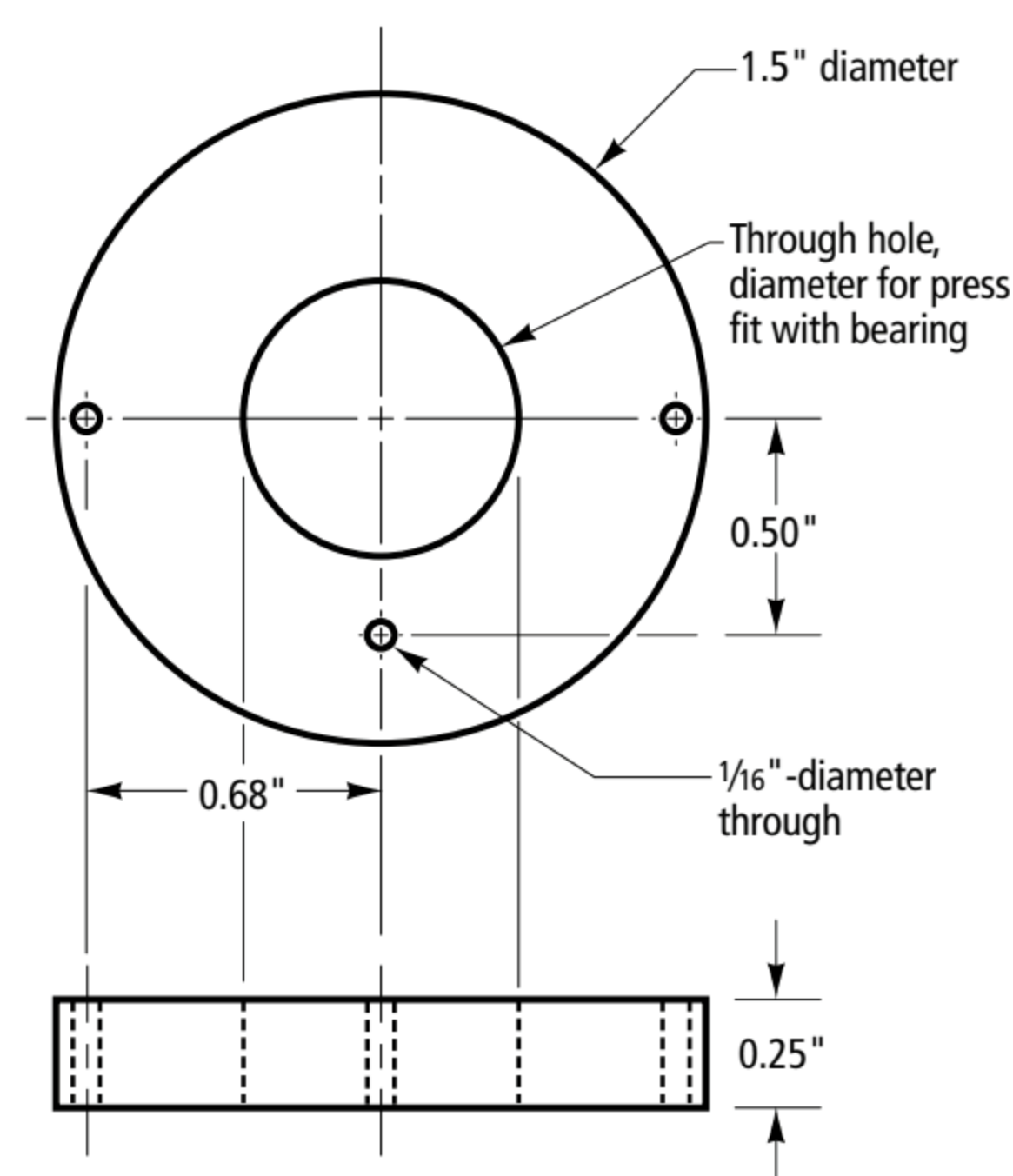
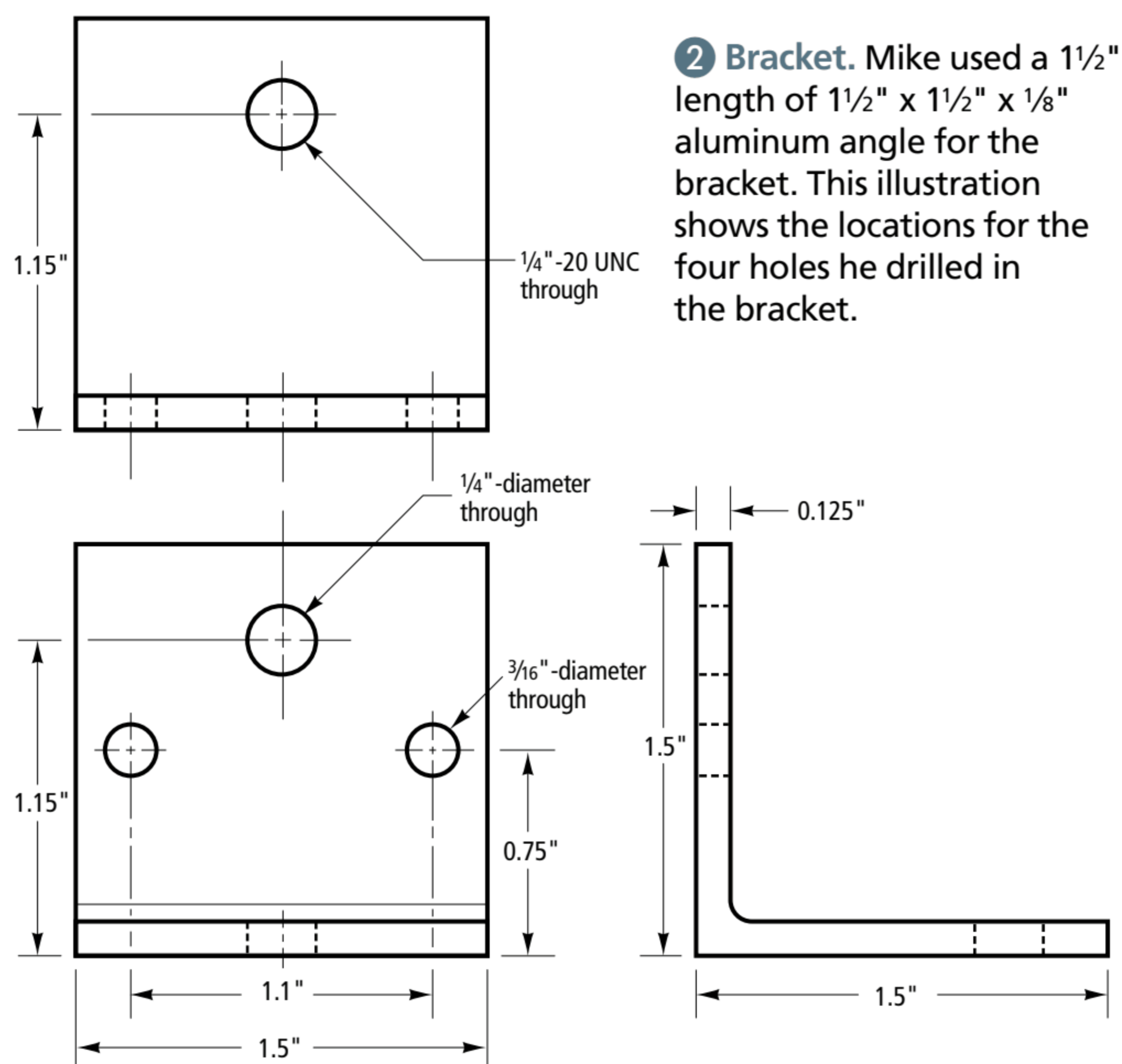
Making parts

Using 12 unique parts (15 in total), the mechanism converts knob rotation to push-pull motion **1**. Three of the parts require some fabrication; the rest can be purchased at a hardware store or online. The parts comprise a single assembly that's fastened to the benchwork with two screws.

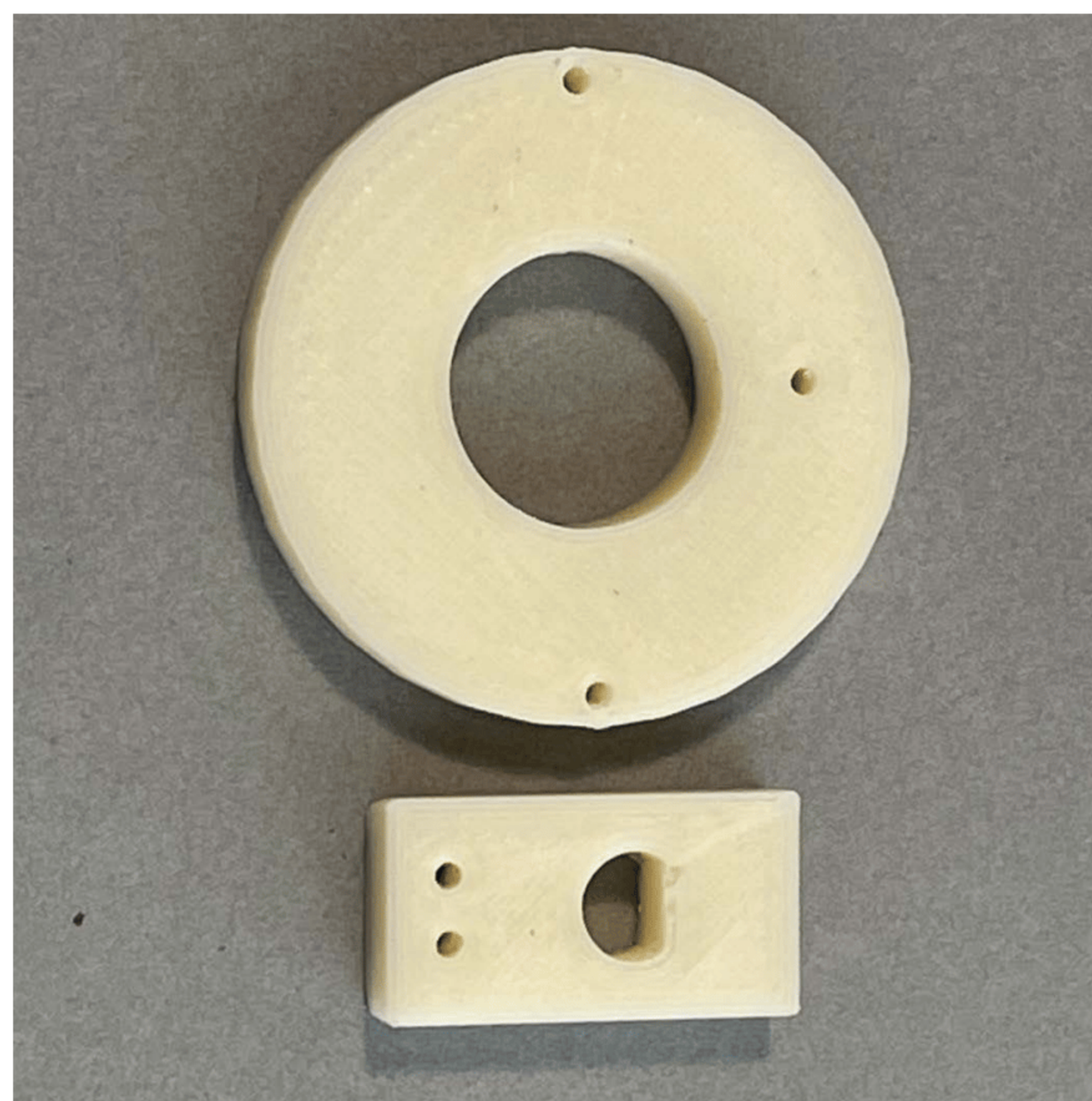
The parts that require fabrication are the bracket, disk, and arm. The dimensions aren't critical except where parts fit to one another.



1 The components. Here are the parts that Mike used to build the rotary manual turnout controller. He fabricated the arm, bracket, and disk. The rest of the parts can be found at hardware stores and online retailers.



4 Disk. Here are the hole locations and diameters for the $\frac{1}{4}$ "-thick disk Mike fashioned from acetyl rod. The diameter of the center hole is determined by the size of the bearing.



3 Proof of concept. Though Mike made the disk from $1\frac{1}{2}$ "-diameter acetyl rod, he also 3D printed the part with ABS plastic (top) to demonstrate it would work. He printed the arm (bottom) using the same material.

I made the bracket from a $1\frac{1}{2}$ " length of $1\frac{1}{2}$ " x $1\frac{1}{2}$ " x $\frac{1}{8}$ " aluminum angle. First, I drilled three holes through the face that attaches to the back of the benchwork — one for the $\frac{1}{4}$ "-diameter rod and two for the mounting screws. Then I drilled a hole in the opposite face and tapped it

for a $\frac{1}{4}$ "-20 screw **2**. Alternatively, you can drill a through hole and use a nut.

Next, I made the disk from $1\frac{1}{2}$ "-diameter acetyl rod as that's what I had on hand. Acetyl is an easy material to work with. It can be purchased online or at a plastics supply store.

Other options for the disk include $1\frac{1}{2}$ "-diameter hardwood dowel and a suitably sized washer from the hardware store. If you have a 3D printer, you can print the disk, which I did with ABS plastic to demonstrate it would work **3**.

Using a table saw or band saw (or other appropriate tool for the material you choose), slice off a $\frac{1}{4}$ "-thick piece of rod and drill a hole in the center sized for a light press fit with the bearing ($\frac{5}{8}$ "-diameter in my case). If you end up with an oversized center hole, a little tape around the outside of the bearing will help you recover the press fit. The three small holes are $\frac{1}{16}$ "-diameter to accept the same size music wire pins **4**.

I recommend using a drill press to ensure the holes are perpendicular to the disk surface, but this isn't a requirement. Slightly crimping the ends of the pins with heavy pliers will create a snug fit in the $\frac{1}{16}$ " holes.

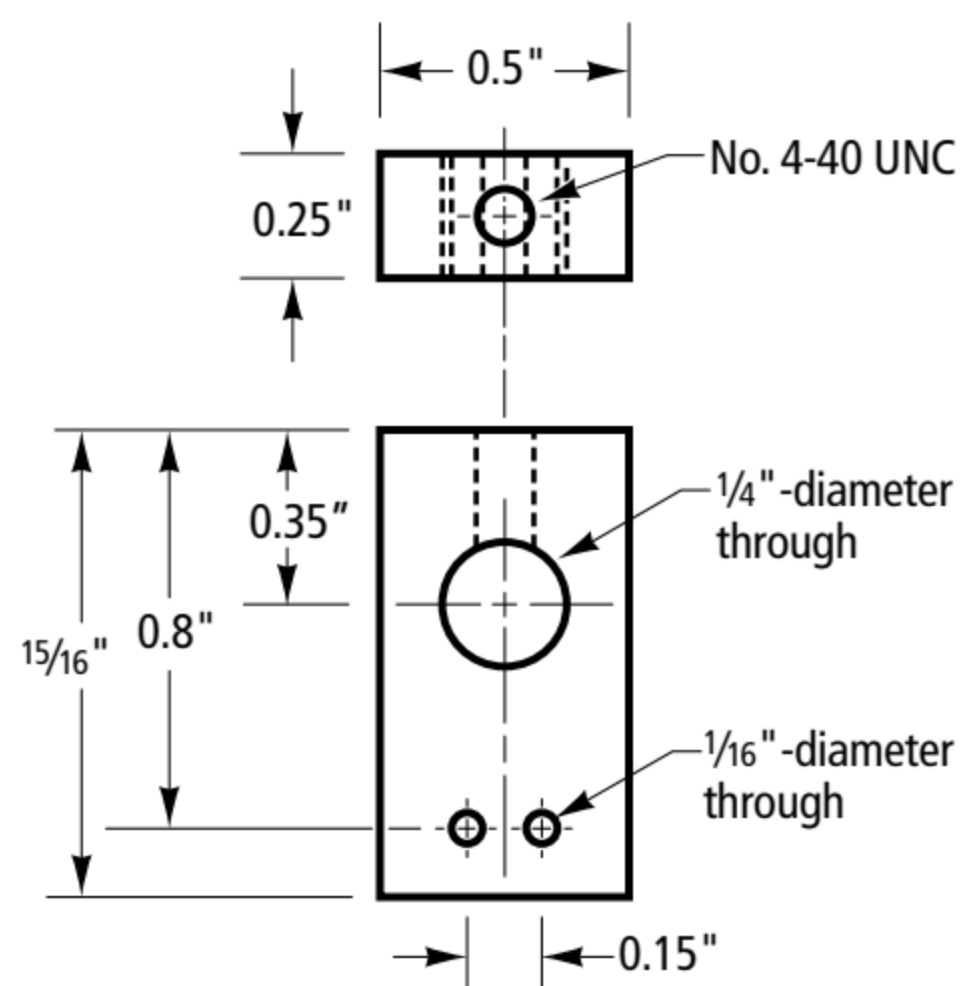
The bearing, which is inexpensive and available online in various quantities, ensures the mechanism is precise and operates freely. I selected a 12-pack of

$\frac{5}{8}$ " outside diameter by $\frac{1}{4}$ " inside diameter by $\frac{9}{32}$ "-thick bearings that cost less than \$9. Insert the bearing into the disk with light taps of a hammer or by squeezing them together in a vise.

If you fabricate your disk from a material other than acetyl, an alternative to the press fit is to use epoxy to hold the bearing in place (adhesives don't stick to acetyl well). The $\frac{1}{4}$ "-20 screw clamps the bearing's inner race to the spacer and bracket and enables the disk to turn with low friction. Be sure the spacer and screw head don't interfere with the bearing's outer race.

I made the arm from a length of $\frac{1}{2}$ " x $\frac{1}{4}$ " metal bar in my scrap box (brass or aluminum will work). The three holes in the large face are straightforward — a $\frac{1}{4}$ "-diameter hole for the rod and two $\frac{1}{16}$ "-diameter holes for the pins. I used a No. 43 drill bit to bore a hole in one end surface, ran it into the $\frac{1}{4}$ " hole, and tapped it for a No. 4-40 socket-head cap screw, which clamps the arm to the steel rod **5**.

An alternative to using metal bar stock for the arm is



5 Arm. Mike constructed the arm from $\frac{1}{2}$ " x $\frac{1}{4}$ " metal bar stock. The holes are for the rod, two pins, and a No. 4-40 socket-head cap screw.

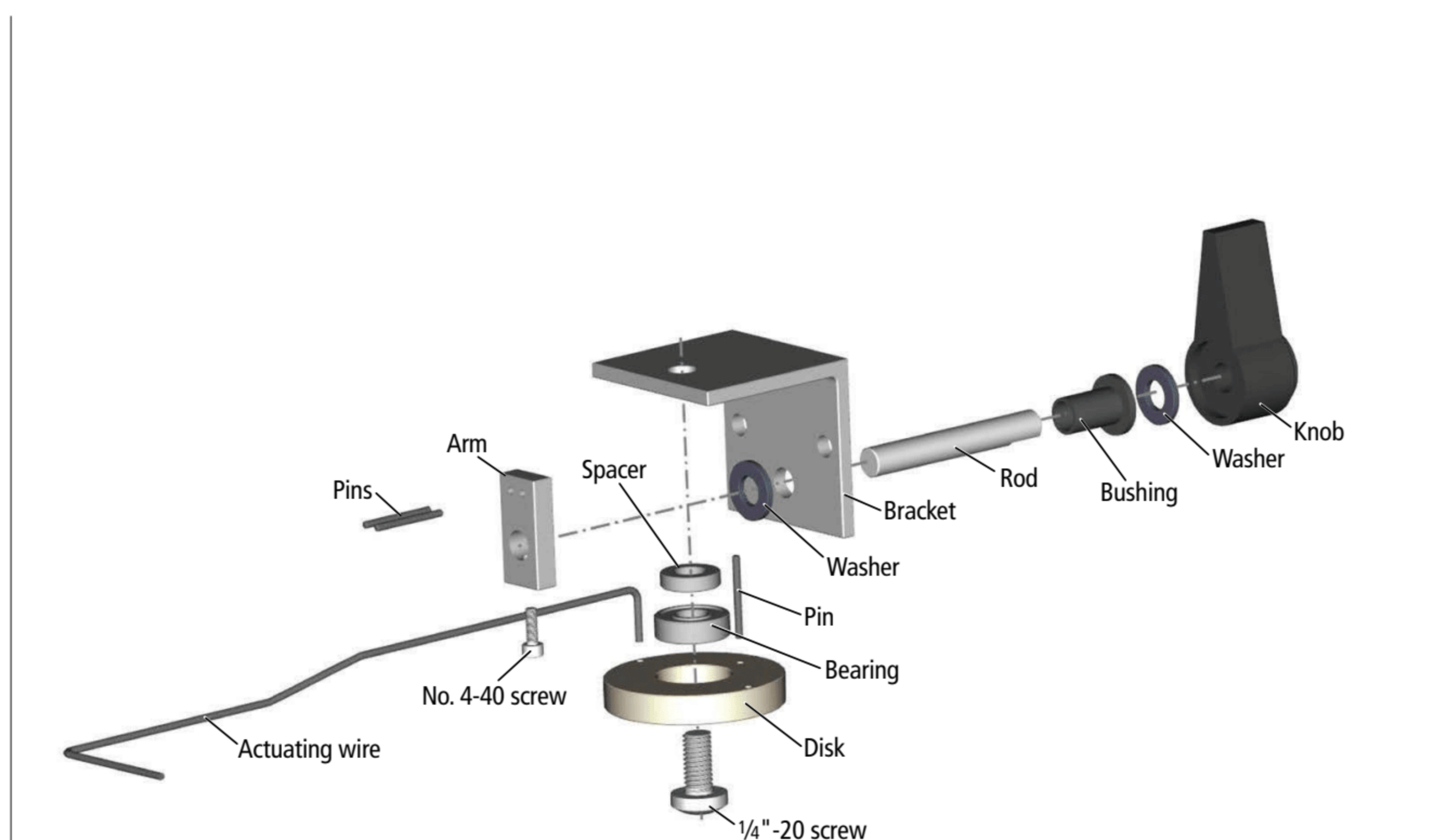
to 3D print the part **3**. This approach doesn't require the tapped hole because the ABS plastic accommodates a flat you can file on the steel rod onto which it slides with a light press fit.

The length of the $\frac{1}{4}$ " steel rod, which you can buy at a big box hardware store, depends on the thickness of your layout's benchwork. I added 1" to the $\frac{7}{8}$ " thickness of my layout support and cut a $1\frac{7}{8}$ " piece of rod. I filed small flat spots on the ends for the set screws on the arm and knob.

Installation time

To install the mechanism on the layout **6**, I drilled a hole sized for the bushing through the front edge of the benchwork at the desired controller location. The extra wiggle room for the rod provides for some positional adjustment without binding.

I then slid the mechanism, with the bushing and knob removed, through from the inside and marked the benchwork for the two mounting holes. After removing the mechanism, I drilled pilot holes and reinstalled it with



6 Putting it all together. This illustration shows how the parts (15 in total) go together to create the manual rotary turnout controller. Mike used $\frac{1}{16}$ " music wire for the actuating wire. Illustrations by the author and Kellie Jaeger



7 Ready to use. This under-the-layout view shows a manual rotary turnout controller connected to a Blue Point. Mike selected the hole that pushed the turnout points away from the front edge of the layout with a clockwise knob rotation.

two sheet metal screws. Using a nut driver on the hex heads made installing the screws in the cramped space much easier. Note that the heads of the mounting screws serve as stops that prevent the arm from being turned too far.

Next, I placed the bushing over the rod and into the hole in the front of the benchwork and installed the knob. In my installation the knob was recessed and needed an extra washer to clear the fascia.

Finally, I cut and bent a piece of $\frac{1}{16}$ " music wire to connect one of the side holes in the disk with the Blue Point controller **7**. I chose the hole that pushed the

turnout points away from the front edge of the layout with clockwise knob rotation. If you're visualizing the mechanism moving, remember that the Blue Point controller inverts the wire motion to set the points.

The length of the music wire needs to be right, and I was able to size mine accurately enough to work well. You can place a U-bend in the wire for simple length adjustment if desired. Squeeze the bend closed for a shorter reach or open it for a longer reach. Since the wire is stiff, you can route it around obstructions — at least to a degree.

With the Blue Point machines, these mechanisms produce a satisfyingly smooth snap to each turnout position with about 20 degrees of knob rotation. Though they're more work than a push-pull knob, I completed the 13 I needed in one day — a modest investment in time. [MR](#)

Mike Hardwick lives in Pleasanton, Calif., and models the last $1\frac{1}{2}$ miles of the Western Pacific's branch from Niles to San Jose, Calif., in the 1960s. His article "Push-button staging solution" was published in the August 2018 issue of Model Railroader magazine.

Achieving realism on your layout



The use of prototypically accurate bridges for the railroad being modeled is essential. Neal Schorr's PRR Middle Division models the stone arch bridges that were used when the PRR rebuilt the Middle Division to four tracks around the turn of the 20th century.

One modeler's advice on how you can make your layout look prototypical

By Neal Schorr • Photos by the author

All of us have different goals when we build our model railroads, but one of the most universal is the desire to achieve realism. A common misconception about realism is that you can achieve it by placing contest quality trains and structures all around your layout. Nothing could be further from the truth.

The reality is that a modeler should have a clear understanding of the railroad they are re-creating. This includes not just the motive power and rolling stock it used, but the geology and topography of the area it ran through. Knowledge of a railroad's physical plant and a basic understanding of its civil engineering are important as well.

In my own case, I have a unique modeling challenge, since I am building a layout using O scale three-rail trains. My layout replicates the Middle Division of the Pennsylvania RR, and I wanted to be able to portray different eras on the layout. The earliest is Pennsy steam in the 1920s. The latest is how the railroad looks today as operated by Norfolk Southern. I also wanted to run trains from Pennsy's diesel era, as well as both Penn Central and Conrail, just by changing the trains and a few details.

Because I've chosen to model a stretch of railroad with a long history, this approach is ideal for someone like me who admires the beautiful Pennsylvania scenery and wants to railfan the layout using any of the trains that have operated on it over the past century.

First considerations

The first consideration is the basic design of the layout. I strongly prefer a shelf layout which avoids the visual problems of an island style railroad on which the train can be seen looping around itself. A shelf layout also prevents the need to build excessively deep scenes, which in turn tempts the placement of an unnecessary number of structures. My railroad consists of a shelf around the perimeter of the layout room with a center peninsula turned back on itself.



You may wish to consider painting your own backdrop to portray precisely the area that you're attempting to model. In Neal's case, he found photographs of the Appalachians and made practice paintings of them on cardboard canvases.

Reverse curves should be separated by a tangent section of track to enhance not just appearance and realism, but to improve operation. The straight section prevents the ends of coupled rolling stock from moving in opposite directions, thereby decreasing the risk of a derailment.

If your room is not large enough for the desired layout but the clearance is available, I suggest building a double-deck railroad to avoid needing to run the main line through the same scene multiple times. By doing this you avoid unrealistic retaining walls and cliffs, an excessive number of tunnels and bridges, and the appearance of a continuous metropolitan area rather than small towns scattered along the right-of-way.

When developing a track plan for the railroad, adhering as closely as possible to prototype practices is essential to achieve realism. Use the broadest curves you can fit in your layout room, and place tangent (straight track) between S curves, sections of track that curve in different directions. Broad curves also permit tighter track centers like those found on the prototype.

Thought should also be given to breaking up large stretches of straight track with gentle curves. And the transition from tangent to curve needs to include an easement, which is a section of track with gradually increasing curvature. An easement should be at least twice as long as the longest piece of rolling stock that will be operating on the layout. Finally, when placing ballast, avoid including strips of vegetation growing between closely spaced tracks.

Backdrop first

Before any of the risers or subroadbed were installed, I first installed the backdrop. It's easy to convince yourself that you can come back later and put one in, but it's physically difficult to do behind finished track and scenery.

My initial step is to study the area I'm modeling, either by viewing photographs or preferably visiting it myself. Having railfanned the Middle Division many times prior to designing the layout, I followed the latter. I also read about the geology of the area. Central Pennsylvania consists of repeated flat topped ridges many miles in length with beautiful broad farm valleys in between. Generally the only major breaks in the ridges were where waterways flowed through the gaps.

I have been painting my own backdrops for years. As I painted the long, flat topped ridges of the area, I was careful not to make the mountains look like a row of chocolate candies. You can also use commercial backdrops, and having one custom printed for you that looks like the area you're modeling may be your best choice.

Risers, roadbed, and fills

With the backdrop in place, it was time to start installing the risers, roadbed, and track. This is when a knowledge of the basics of the civil engineering used by the railroad you are modeling comes into play. On my layout, I used open-frame benchwork and elevated all of the track 32 scale feet above the top of the framing. This allowed me to easily place scenery below track level. It also let me construct natural looking waterways, where the ground drops slowly down to the surface of the water.

By elevating the roadbed above the benchwork, I was also able to model fills, places where a railroad adds dirt and rock to fill in dips along the right-of-way. When building a real railroad, the goal



Many railroad cuts are through soft overburden, not rock. As with earthen fills, the slope must be no steeper than the angle of repose, the steepest angle at which a sloping surface formed of loose material is stable.

is to balance the rock excavated from cuts with the amount of material needed to create a fill where the ground level falls below the level of the tracks.

On my layout, roughly half the railroad is built on fills, which makes it look like the Pennsylvania. When modeling a fill, be sure to construct it with the correct slope. The term "angle of repose" refers to how steep a slope of excavated material can be without the material sliding down upon itself. In general, railroad fills in the past were built with a slope of 1½ to 1 (approximately 30 degrees), which means that for every foot of height of the fill, the excavated material must extend out 1½ feet at its base.

I construct my scenery from sheets of 2" extruded-foam insulation board, which I carve to shape. I use cardstock profile boards cut to a 1½:1 slope to repeatedly check the angle as I carve the foam. I made a final check with a protractor to confirm that the angle was about 30 degrees. This prevented the creation of unrealistically steep slopes.

The top of the slope should not end abruptly at the ballast edge along the tracks. It should be gradually rounded into a flat plane extending a few feet beyond the ballast. This is referred to as the shoulder of the slope. In the steam era, the ballast's edge was razor sharp, with the subroadbed often being constructed of cinders. In the diesel age, there is no defined ballast edge, reflective of the mechanized ballasting practices which came into use around 1960. Ballast is often found spilling down the side of the slope on modern railroads.

The bottom of each depression in the earth that is traversed by a fill needs to be able to carry water, either as a stream or as a wash during periods of heavy rain. As such, all of my fills have a culvert at the deepest part. On my layout the culverts are usually stone, which is consistent with practices on the Pennsylvania RR.

Cuts have similar issues as fills. If the cut passes through overburden, the soft material on top of the bedrock, it should be built to the angle of repose. Again, 1½:1 is generally acceptable to achieve a realistic appearance. Cuts through rock can be much steeper depending on the type of rock the railroad is passing through. In central Pennsylvania, the layers of rock are folded, accounting for repeated ridges in the region with angled rock strata. West of the Eastern Continental Divide the rock tends to be flat with alternating layers of hard sandstone overhanging layers of crumbling shale. The the angles of exposed rock strata in a modeled cut matters.

Civil engineering

Accurate bridges are another civil engineering feature to pay attention to, and it's important to know what the railroad you are modeling used. With almost no exceptions, all bridges crossing waterways on the Pennsy Middle Division were stone arch bridges. This was true of road overpasses as well, though many have been replaced over the years due to clearance issues. I avoided spectacular wooden trestles and



The Conrail era introduced many changes to the appearance of the right-of-way. Unlike the razor-sharp ballast edges of the steam era, mechanized ballasting led to irregular if not outright messy edges with ballast rolling down the sides of slopes. Signal bridges were often replaced with post mounted bi-directional signals.

steel arch and truss bridges as they were not used on the Middle Division.

Most of the railroad was a four-track line with signaled interlocking plants every few miles, and intermediate signals in between. There were no interchanges with any class one railroads, and compared to most PRR routes, not many industries or branch lines. My layout models three interlockings with intermediate signals in between.

The railroad's physical plant changes as the line proceeds from east to west to depict different eras. West of Mifflin interlocking, the railroad resembles the line as it looked in the Conrail era, with two tracks built on a right-of-way wide enough for at least three tracks. The extra width has been converted into use as a maintenance-of-way right-of-way. The appearance of an unused right-of-way is commonly seen on the prototype today but rarely modeled.

Additional examples of PRR engineering include the use of curves of exceptional radius at several locations on the railroad. My widest calculated curve on my O scale layout has a radius of 156". That is the equivalent of 86" in HO scale. The broader radius allows me to keep the track centers quite narrow (as close as 15 scale feet), which is only 2 feet more than the PRR used. All my curves are super-elevated, a feature often mentioned by visitors to the layout.

The signals are essential to portraying the prototypical appearance of a model of a Pennsy main line. All of the signals on my layout function realistically, and on the two-track section of the railroad, they are bi-directional.

Structures and highways

Rather than having structures and towns cover the layout, I compressed

them into small, rural communities. This leaves long stretches of forest and farmland with just a scattered buildings, such as a house or a barn. This is how rural areas look in the real world, and having these spaces on the layout makes it seem as though the trains are actually traveling somewhere.

Structure selection is important, too. I didn't want buildings covered with signs or painted in odd colors. I also avoided installing flashing light-emitting diode (LED) signs on rooftops. Many of my structures are placed on rolling terrain and are built on foundations set into the slope, which also adds to the realism.

Another thing I like to model are highways. Modelers use a variety of techniques to build them, but my favorite is to use 1/8"-thick tempered hardboard. Its smooth surface can be used to represent pavement in good condition, and it can easily be distressed. The cut edges can be fitted with curbs in towns or beveled with a rasp to represent asphalt roads without a curb. I paint concrete roads with flat sandstone- or khaki-colored paint. For asphalt roads, I use various shades of gray automotive primer. When modeling hilly central Pennsylvania, roads are seldom flat. Thin hardboard can be easily bent into highly realistic vertical curves.

I'm careful to model roads correctly for the era represented. For example, highways should have nothing more than a single white center stripe into the 1950s, then a white double line as well as pavement edge striping through the mid 1960s. Thereafter, the center line would be a double yellow stripe.

Lanes were about 10 feet wide until the 1950s and as much as 11 to 12 feet thereafter, depending on whether the road was a secondary or primary route. In Pennsylvania, guardrails on interstate highways were primarily built of cables mounted on posts until the 1970s. W-beam steel panel guardrail was in use after that. Not having W-beam guardrail available in O scale, my son Steven designed and 3D printed them for me.

Finally, keep in mind when building your scenery that highways can cross the tracks at angles other than 90 degrees, and most do.

All of the bridges on my layout, both rail and highway, are scratchbuilt. I am careful to use the correct type of bridge for the era represented on the railroad. In the early 20th century, most of the highway overpasses on the Middle Division were built by the PRR itself, and were usually narrow pony truss



Photographing and measuring a prototype highway underpass helps replicate what's really there. Neal took his time to model this typical Pennsylvania RR concrete beam overpass built on stone abutments.

structures. Many of these reached the end of their useful lives by the 1960s and were replaced. There are many variations in the type of replacement structure used, but I-beam stringer bridges were the most common. These are bridges with parallel steel I beams and a concrete deck. Later, prestressed concrete beams were also used.

The defining feature of the replacement bridges were the shape of the piers, the design of the parapets, and the railings. When building a particular structure, I'm careful to obtain photos of the prototype if it's no longer standing, and if still in service, I photograph and measure the structure myself if I can. Steven then designs and 3D prints them for me, resulting in highly realistic model highway bridges.

A final type of bridge built by the hundreds in rural parts of Pennsylvania was the short span concrete T-beam bridge. These were constructed in the 1930s through the 1950s and carried



Neal uses 1/8"-thick tempered hardboard to model roads and highways. Here the color of the road matches the backdrop for a seamless transition, creating the illusion of depth and making the road look like it goes on for miles.

secondary roads over small streams throughout the commonwealth. Many are still in service today. They had distinctive parapets which just begged to be modeled, as they scream "rural Pennsylvania." As such, I included one along my depiction of Route 103 in the hamlet of Longfellow. And as already mentioned, the use of cable guardrail mounted on steel I-beam posts painted white is typical of Pennsylvania highways well into the 1970s.

There are many more things I do to achieve realism on my layout, but too many to include in a single article. Should realism be your goal too, I hope you can use some of my suggestions, regardless of what scale you model and how many rails your track has! [MR](#)

Neal Schorr's PRR Middle Division appeared in Model Railroad Planning 2017 and is the cover story of the Summer 2025 issue of Classic Toy Trains.



The dyeing is complete in Duluth Yard on Bob Wundrock's Rice Lake, Dallas & Menomonie HO scale layout. He also ballasted tracks near the edge of the yard and scenicked the outer edges.

Dyeing your track

How to weather ties, rail, and roadbed without an airbrush

By **Bob Wundrock** • Photos by the author

The idea for this technique came as a result of my disability (see Bob's "Modeling with a disability" article on Trains.com). I have a hard time handling an airbrush and need to use two hands.

A few decades ago, I read an article by Wayne Wesolowski titled: "Dr. Weso's Weathering Goop" (*Railroad Model Craftsman*, September 1977). His technique used a mixture of black leather dye and isopropyl alcohol to weather wood for models. I've used that mix since then. Some prefer to use India ink with alcohol with similar results. The dye I use is less expensive than model paint.

I was faced with a daunting task of coloring some 125 lineal feet of track and 21 turnouts in a 30-square-foot Duluth Terminal Yard on my HO scale Rice

Lake, Dallas & Menomonie RR. Since I had not painted the underlying Homasote, that would also need to be covered ①, opposite.

Though I ballasted the track on the rest of my layout, I was not excited about doing the yard tracks. My thought was to find something that would cover both painting the track and making it seem like it was ballasted, even if it wasn't.

Through multiple test applications on short pieces of leftover track, I found an acceptable technique that would color the rails, as well as the roadbed.

Instead of an airbrush, I used inexpensive 16-ounce spray bottles that I purchased at a pharmacy. Other clean spray bottles could also be used.

I used Fiebing's black leather dye, which is available in 4- and 32-ounce

bottles through Amazon and other retailers. I combined this in a 50/50 mixture with 70% isopropyl alcohol. Other combinations may be suitable as well, but the half-and-half mixture worked for me, so that's what I use.

When mixing and spraying the dye, I highly recommend using disposable gloves. Though the dye can be removed from skin with alcohol, it may take days of washing for it to totally disappear.

Also, I recommend wearing old clothes, an apron, and use proper ventilation. Alcohol isn't as noxious as some solvents, but it does smell.

Application steps

Some of the steps I use are based upon several years of laying and



① Bob had a whole yard to paint and ballast. Since reaching is difficult for him, he needed a simple solution.



② This is the finished trackage in the Duluth Yard. The dyeing process will weather this space very quickly.



③ Bob used 91% isopropyl alcohol and an Oxo brush to clean the track and remove any oil from it prior to dyeing.



④ As shown here, Bob masked the turnout points and surrounding scenery with blue tape and newspaper.



⑤ Bob used a 16-ounce spray bottle to apply the dye. The pieces of cardboard protected the backdrop from overspray.



⑥ The finished yard, seen here next to the ballasted main line, looks great with its dyed track and roadbed.

ballasting track on two layouts, but the following is my procedure for laying and dyeing the track:

First, I tack down the track instead of relying on glue to hold it in place. I then solder all non-insulated rail joiners and remove all of the flux from those joints with 91% isopropyl alcohol. After that's complete, I replace any missing ties from the track work. I then run a test locomotive over all rails to ensure electrical continuity ②.

Once I'm satisfied everything works, I clean all rails and ties with 91% isopropyl alcohol. This removes any residue from the manufacturing process and greatly helps dye adhesion. Using a toothbrush may work for a while, but the bristles will gradually flatten and fail. I found (actually my wife gave it to me) a better brush to use, manufactured by Oxo and called a deep-clean brush. It looks like a large toothbrush but has highly resilient bristles ③.

Dye is difficult to control, so I mask turnout points and all other areas that need to be protected from overspray, such as finished scenery ④.

After mixing the dye and loading it into a spray bottle, I spray the track on both sides and let dry thoroughly ⑤. I then remove the masks from turnouts and touch up the rails using a Micro-brush dipped in more of the dye. I color in the undyed parts of the roadbed using a plastic pipette and any other missed areas with either more dye spray or with the pipette.

I clean the rail tops with a Bright Boy or other similar abrasive cleaning block. I've found that the dye is much easier to remove than paint, even after having several hours to dry. I then vacuum up the dye dust and wipe the top of the rails with alcohol on a rag to remove any other residue ⑥.

Finally, I make another locomotive test run to be sure the track still has electrical continuity in all places, particularly around the turnouts.

At this point, you can ballast the track if you choose. I ballasted only the tracks near the edge of the layout. My ballasting procedure, described in February 2014 MR, uses sifted sand. After grooming the sand with a small

12V vacuum, I use a wetting solution of 70% isopropyl alcohol tinted with black leather dye and affix the ballast with a 50/50 mixture of white glue and water.

Advantages and other colors

Using a spray bottle eliminates some of the complicating factors of airbrushing, including cleaning it. Also, the dye mixture can stay in the spray bottle for future use. I have not experienced any clogging of the spray nozzle.

If you don't like coloring the sides of the rails black, Fiebing's leather dyes come in multiple colors. I tried Chocolate and Dark Brown, but neither gave me the effect I wanted.

Dyeing track is now part of my regular scenery process. I'm hoping my technique may inspire others to use the dyes for other modeling purposes. **MR**

Bob Wundrock is a retired broadcast engineer and longtime member of the NMRA South Central Wisconsin Division. His previous layout appeared in the September 2019 issue of MR.



A layout in a freight house

This 13 x 34-foot HO scale model railroad is based on the Boston & Maine in eastern New Hampshire circa 1909

By Rich Breton

Photos by Lou Sassi

Located inside the restored 1875 Boston & Maine RR freight house in Union, N.H., is a meticulously constructed HO scale model railroad. The historically accurate layout depicts what life was like in September 1909, with emphasis on the five villages of Wakefield, N.H., on the east side of the Granite State.

The freight house is one of several historical buildings and exhibits on the grounds of the Heritage Park Railroad Museum. Exhibits include the restored 1911 B&M passenger station with an extensive collection of railroad artifacts, a restored B&M water tank, a 1902 Russell snowplow, and a late 1950s vintage B&M caboose. The Wakefield Heritage Commission is responsible for Heritage Park and several other historical preservation efforts in Wakefield.

An ideal home

The Conway Branch of the B&M included the division headquarters in Sanbornville, originally the Eastern RR

① A northbound express led by Boston & Maine 2-6-0 No. 588, a Bachmann model, stops at the Sanbornville, N.H., station. The action takes place on the 13 x 34-foot HO scale layout at the Heritage Park Railroad Museum Freight House in Union, N.H.

until it was acquired by the B&M in 1884. This section of the railroad was busy in 1909, hosting 26 trains per day, mostly carrying ice, lumber, and passengers.

When the freight house was acquired by the Town of Wakefield, Corry Fothergill, an engineer for the New Hampshire North Coast RR, suggested that a model railroad depicting the five villages of Wakefield be constructed in part of the building. A few model railroaders with significant hobby experience, Bill Gaver, Dave Sias, and I, set out to design a museum-quality layout that would operate well, be a pleasant experience for visitors, and show the history of the area in 1909.

More than 10 years have passed since work began on the model railroad, and many exciting features have been added, including fully automated train operation. The numerous detailed scenes are appreciated by visitors of all ages. Our older guests enjoy recounting their childhood or lifelong experiences.

Preserving history

A most appreciated comment from visitors is that through our work “We have brought history back to life.” We learn from our visitors and incorporate their stories and experiences into the layout. We’ve had numerous visitors who

had relatives that worked for the B&M as far back as the late 1800s.

How do we achieve this realism? Painstaking research; thousands of hours scratchbuilding models from historical photographs; and handmade, detailed scenes with period-appropriate figures, animals, wagons, and carriages. Our goal is to have a high scenery-to-track ratio as is typical in real life.

The extensive use of selective compression, forced perspective, and photo backdrops, along with models in various scales, all help enhance the realism of the layout. Some structures were intentionally constructed to 75% and 84% of HO scale.

Benchwork and track

We built the layout using engineered composite wood beams; Trus Joist TJI’s, to minimize the number of support legs required; and modified open-grid benchwork using ¾" plywood and ½" Homasote.

The track plan was designed using diagrams obtained from the B&M Railroad Historical Society in Lowell, Mass. The siding locations and number of turnouts follow those documents. We had to change distances to fit the space, maximize the visitor viewing experience, and allow access for maintenance.

The track is set mostly at one level for operational stability in a museum



2 This overall view shows how the around-the-walls layout fits in the freight house. The photo backdrops and skies painted by local artist Lee Gridley can also be seen.

Scenery and structures

A variety of materials were used to scenic the layout, including plaster cloth, Sculptamold, carved rocks, plaster castings, and “ground goop” [Contributing Editor Lou Sassi’s recipe for this can be found on page 35 of the June 2022 *Model Railroader*. — Ed.]

We used a multi-step process for water features. First, we detailed the area below the surface. Then we sprayed the center a darker color to suggest depth. Finally, we carefully poured Enviro-Tex two-part resin.

We applied various textures and colors of static grass to the layout. Hand-made trees, shrubs, and flowers reflect mid-September foliage. You can learn more about some of my scenery techniques in “Realistic shrubs” on page 43.

The photo backdrops were made using images taken in the area. We used photo-editing software to remove anachronistic details like vehicles and power lines. The digital images were then stitched together and sized to match each location.

We had the completed files printed on heavy poster paper by a local print shop using a wide-body continuous printer. The images are each 6- to 8-feet long and oriented to match the foreground scenery and details.



3 Boston & Maine 2-6-0 No. 1360 is in charge of a southbound express train at Mathews, N.H. The scratchbuilt combination station has a full interior, operating freight doors, and a manually operated butterfly train order/flag stop signal.

environment. However, the scenery around the rails creates the impression of significant grades.

The layout height is 54" to allow for eye-level views of the trains and scenery. Some provisions call for future use of Free-Mo modules, as well as a freestanding Intervale module to facilitate point-to-point operations.

The layout features Peco code 83 nickel silver track and turnouts from German manufacturer Tillig. We carefully installed the track to ensure reliable operation so we can concentrate on our docent duties without having to worry about keeping the trains running.

To give the track a realistic appearance, we spray-painted the rails Krylon Camouflage Brown and the ties Khaki from the same product line. Then we used paint pens and weathering solution to color individual ties. A mixture of products from Arizona Rock & Mineral was used to ballast the track.

The turnouts are controlled by DCC Concepts Cobalt iP switch motors with built-in DCC control cards. The frogs are equipped with Tam Valley Frog Juicers for polarity correction. We recently added stay-alive capacitors to our locomotives. If we were to do it over again, we would no longer power the frogs.

The layout at a glance

Name: Boston & Maine

Scale: HO (1:87.1)

Size: 13'-0" x 34'-9"

Prototype: Boston & Maine

Locale: Five villages of Wakefield, N.H.

Era: 1909

Style: around-the-walls

Mainline run: approximately 90 feet

Minimum radius: 18"

Minimum turnout: No. 4

Maximum grade: Less than 1%

Benchwork: manufactured truss joists with 1 x 4 L-girders and plywood top

Height: 54"

Roadbed: 1/2" Homasote

Track: Peco code 83 flextrack and Tillig Elite turnouts

Scenery: cardboard lattice and plaster gauze

Backdrop: photos and hand-painted

Control: NCE Digital Command Control

We carefully removed the skyline with a swivel knife. Then we used artist pencils to touch up the cut edges of the paper. The backdrop sections were then glued to the walls, which we had previously painted sky blue.

Though many of the backdrop sections aligned precisely, there were areas that weren't completely covered. Those locations were hand-painted to blend the sections together.

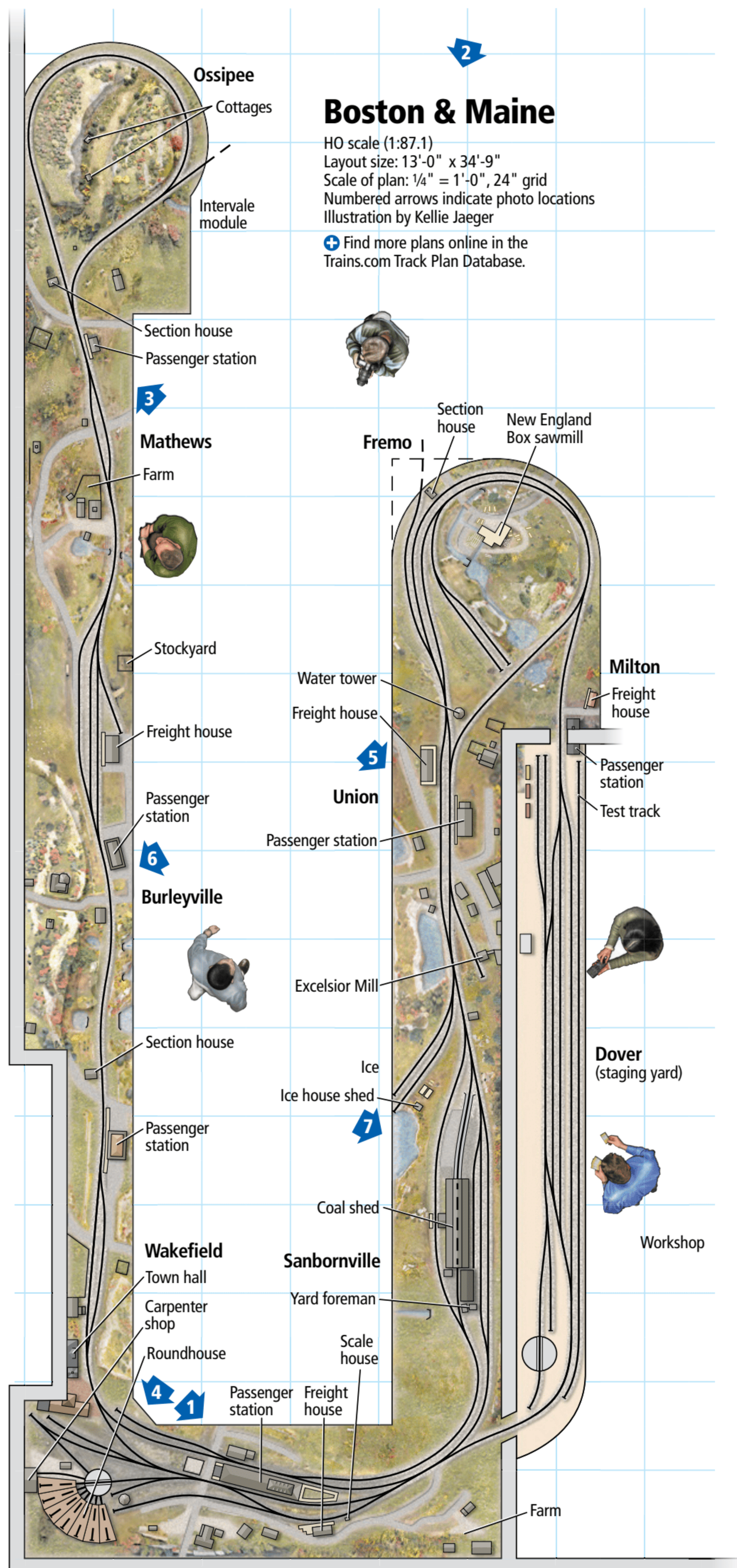
Local artist Lee Gridley painted the overall upper sky, including the impressive clouds. His work helped frame the layout room.

Structure showcase

The layout currently has more than 70 structures, most of them scratchbuilt using historic photographs and B&M plans from 1914. Jay Ehlen, an experienced model builder, scratchbuilt many of the larger structures, including the impressive Sanbornville station with full interior detail.

Over the years, six to eight additional members have also made various structures. For some it was their first attempt at model building. With guidance from experienced hobbyists, the structures turned out well.

My favorite part of the hobby is creating realistic details. I often get carried away with these items. Some of the details I've added include scratchbuilt pumpkins, watermelons, crates, and picnic fixings.





5 The platform at Union, N.H., stirs with activity as Boston & Maine Ten-Wheeler No. 2035 leads a passenger train up to the station. The attention to period-appropriate detail is evident in this scene.



4 Sanbornville, N.H., division headquarters in 1909, is home to a seven-stall roundhouse, turntable, maintenance supervisor's office, and car shop. All of the structures were scratch-built from Boston & Maine plans and period photos.

The layout is a perfect setting for other details, such as switch stands, grade crossing signs, stone walls, flowers, horses, cattle, wildlife, wagons, and carriages. These details are key to showing visitors what life was like in 1909.

At first, we had to modify the figures populating the layout with Milliput to add hats and clothes to match the period modeled. We've supplemented our existing population with pewter figures from Andrew C. Stadden in the United Kingdom. We've obtained numerous figure sets that we've painted to reflect the styles and fashion of the period.

Running trains

We use small, period-appropriate Bachmann steam locomotives with Digital Command Control (DCC), sound, and stay-alive capacitors to power trains. Rolling stock includes numerous scratchbuilt cars built to match B&M



Want to model realistic shrubs? Rich Breton shares his techniques using common materials and model railroad scenery products.

Realistic shrubs

Many people model realistic-looking trees, but shrubs and underbrush are often overlooked. Broken branches from model trees can be used, but they're often too thin. In recent years, European manufacturers have offered commercial bushes and ground cover, but these products can be expensive, especially if you're trying to cover large areas. Through experimentation I've found ways to make realistic bushes and tall ground cover using common materials.

First, I apply spots of tacky glue to a substrate sheet, such as thin styrene, foil pans, or cardstock. I space the dots based on the size of shrubs desired.

Though a variety of materials can be used, as shown above, I'll describe how I make shrubs using sisal rope fibers for the main trunk; thinner jute rope for branches; and model leaf flake, architectural model foam, or fine cellulose (sawdust) for the leaves.

First, I use scissors and bent tweezers to cut small groups of sisal rope fibers and stick them vertically in the glue dots. Then I set the trunks aside until the glue sets up.

Next, I attach finely cut jute rope fibers to the trunks using a wash of white glue. I apply the fibers generously and let the glue dry for a while. I gently tap the shrubs to remove any excess fibers. The fibers that fall off can be reused.

When dry, I lightly spray-paint the shrubs with camouflage tan or earth brown. This seals the completed trunks and gives them a realistic color.

After the paint has dried, I gently dab the shrubs with white glue or Woodland Scenics Hob-e-Tac adhesive. Then I sprinkle leaf flakes of the appropriate color for the bushes I'm creating. As before, I tap off the excess and collect it in a foil pan for reuse. A few flowers can be applied in a similar manner. Use a variety of colors to add to the realism. Some finished shrubs are visible along the fence line in **5**, opposite.

Shorter bushes and flower clumps can be made using the same process, but with short and tall static grass fibers. — *Rich Breton*

plans. The passenger cars were repainted and lettered to be correct for 1909.

Similarly, the steam locomotives were repainted and lettered to match prototype images.

The trains are computer controlled using Freiwald TrainController Gold software. Chris Oliver has been using this software on his large home layout,

and he did thorough designing and programming work for us, which currently allows six trains to realistically operate following a schedule typical of 1909.

The system works as a dispatcher and finds an alternate route if an obstruction is encountered. The trains operate with proper sounds, station stops, and varying speed based on track configuration.



7 The coal shed in Sanbornville kept the many locomotives on the Conway Branch fueled. As Boston & Maine 4-4-0 No. 365 spots a pair of hoppers, the last few shovel loads of coal are being added to the tender of fellow American No. 27.



Meet the crew

Most of the members of the Freight House Model Railroad Crew have home layouts and bring a variety of skills to the Boston & Maine model railroad. All are members of the National Model Railroad Association's Seacoast Division. Shown from left to right are Phil Twombly, Bill Gaver, Jay Ehlen, Rich Breton, and Paul Zayac. Other members include Larry Forkum, Chris Oliver, Bob Verdonck, and Tony Keegan.

live radio cameras is to enhance the visitor experience, especially for guests with mobility issues.

A group effort

Our members are all volunteers and attend Wednesday work sessions, but a fair amount of model building is also completed at individuals' homes.

Sharing the fun of the hobby is the goal of our group, as is learning new techniques and skills. We've also built a vintage Lionel layout that's enjoyed by members and is a hit with visitors of all ages. This model railroad is a bit less intimidating to work on.

Our summer season runs from July through September. The model railroad is open Saturdays and Sundays from noon to 4 p.m. We can also

accommodate large-group visits, such as classic car clubs, historical societies, and schools.

The HO scale Boston & Maine layout will be open during the Concord Flyer 2025 National Model Railroad Association Northeastern Region convention to be held September 11-14 in Concord, N.H. The convention will be hosted by the Seacoast Division NMRA, which the Freight House volunteers belong to. We look forward to seeing you! 

6 Burleyville, N.H., illustrates how forced perspective was used to make scenes look deeper than they really are. The two foreground buildings are HO scale, the blue Victorian house is 75% HO, and the schoolhouse is N scale.

The layout was rewired to add RR-CirKits CT coils in each block, and RR-CirKits WatchMan to detect the presence of a car or train in the blocks. We added 1.8K resistors to the rolling stock wheelsets for current detection. The interface uses RR-CirKits Loco Buffer-USB and SSB-Gateway interface (cards) to communicate with a laptop computer in the workshop staging area. The model railroad can also be monitored and operated using an iPhone, which is appealing for younger visitors.

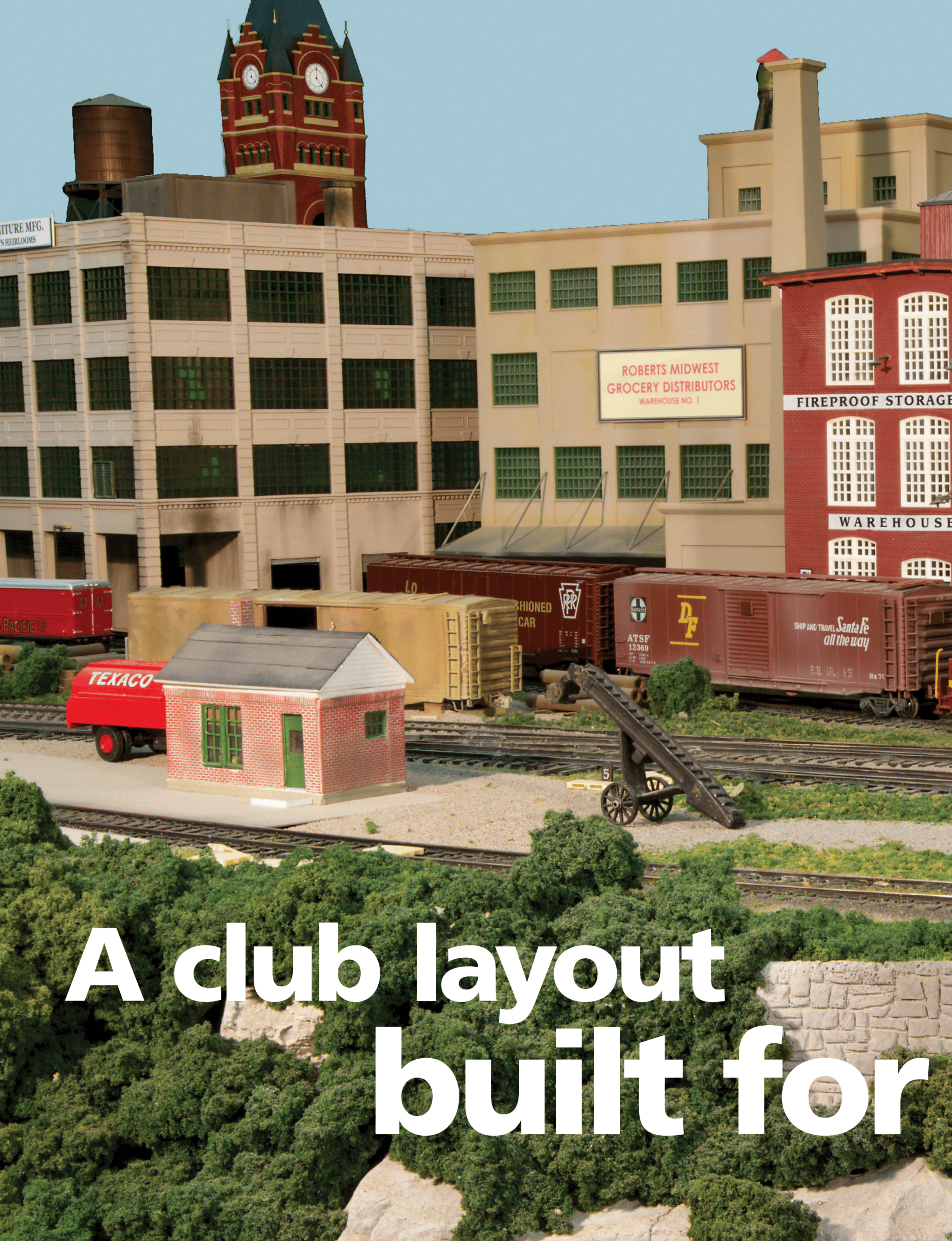
We use NCE's ProCab DCC operating system with separate isolated circuits for accessories (turnout motors) to maintain the high reliability required for our automated museum environment. This allows us to better interact with visitors

while the trains operate automatically per the schedule.

We've built TV monitors into the layout fascia and use several cameras, including a track-powered camera car, to provide a cab view for visitors. This camera was constructed using a radio-type baby monitor that was originally powered with a 9V battery. We built a circuit for the camera car that uses wheelset pickup wipers, a simple bridge rectifier, a stay-alive capacitor, and DC voltage trim. This provides a continuously clean image without having to worry about battery power.

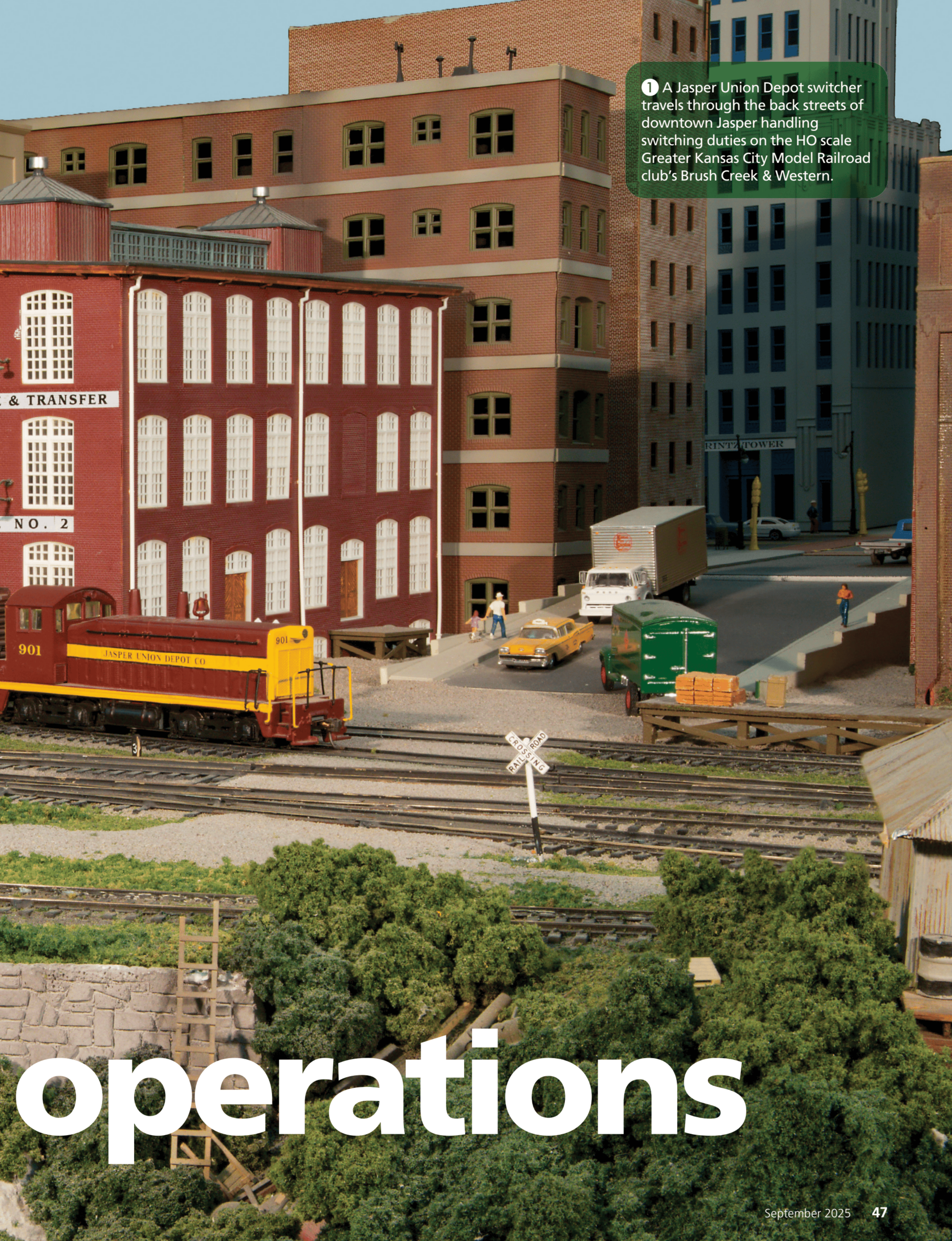
We also have multiple charge-coupled device (CCD) cameras hidden in the layout for close-up trackside views of passing trains. By using monitor switching boxes (A-B box), docents or visitors can select between the various cameras to follow the action. An additional benefit of these





A club layout
built for

① A Jasper Union Depot switcher travels through the back streets of downtown Jasper handling switching duties on the HO scale Greater Kansas City Model Railroad club's Brush Creek & Western.



operations



The Greater Kansas City Model Railroad Club has been honing its skills for nearly 60 years

By Dan Munson • Photos by the author

There are probably aren't many model railroad clubs in the country where you can step outside of the layout building and ride a 16" gauge scale railroad that loops around the adjoining park on nearly a half mile of track. The building the club occupies also serves as the covered storage for the 16" gauge railroad, as well as the backshop for repairs. Add in that part of the 16" gauge railroad runs on a former interurban right of way, and you have a unique club.

This is all part of the experience at the Greater Kansas City Model Railroad Club, which is just a few minutes north of downtown Kansas City, Mo., in the Line Creek Valley. The club is along the route of the former Kansas City, Clay County & St. Joseph Ry., an interurban line that ran between Kansas City and

St. Joseph, Mo. The interurban was abandoned in 1930. Up until just recently, you could still see decaying bridge embankments from the interurban across the field from the club layout.

The Greater Kansas City Model Railroad Club was formed back in the

2 A Brush Creek & Western RDC, set to make all the local stops (left), lines up with streamliners at Jasper Union Station, including a Union Pacific *City* train, the *Wabash Cannonball*, and a Chicago, Burlington & Quincy *Zephyr*.

1960s and has had several homes over the years. It moved into its current location in 1992 and built the railroad you see in this article. The club itself is approaching its 60th anniversary and is celebrating its 32nd year in its current location.

The layout at a glance

Name: Brush Creek & Western

Scale: HO (1:87.1)

Size: 21 x 45 feet

Prototype: freelance

Locale: St. Louis, Mo., to Oklahoma City, Okla.

Era: 1935 to 1975

Style: peninsula

Mainline run: 300 feet

Minimum radius: 28"

Minimum turnout: No. 5

Maximum grade: 2%

Benchwork: open grid

Height: 16" to 72"

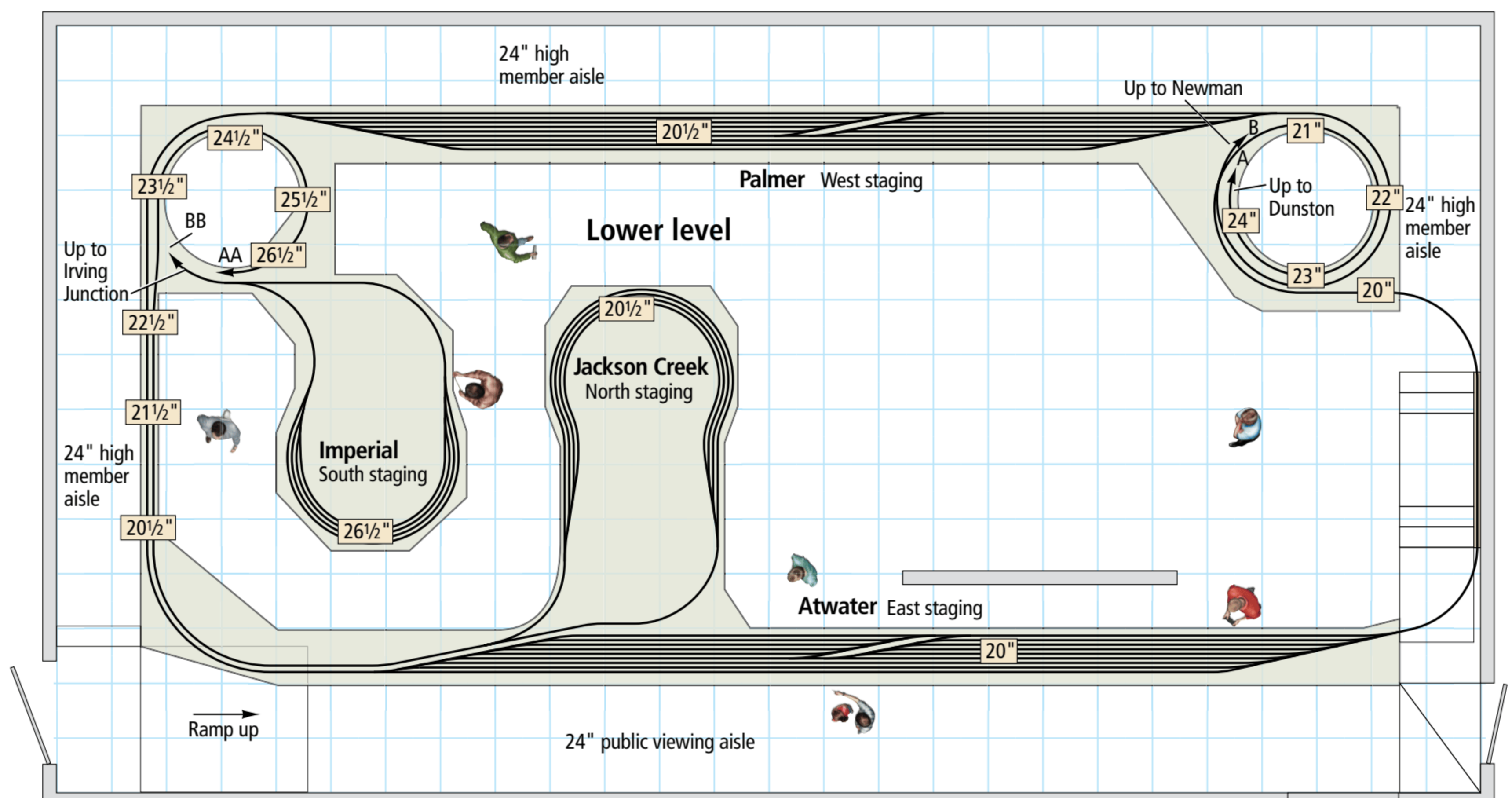
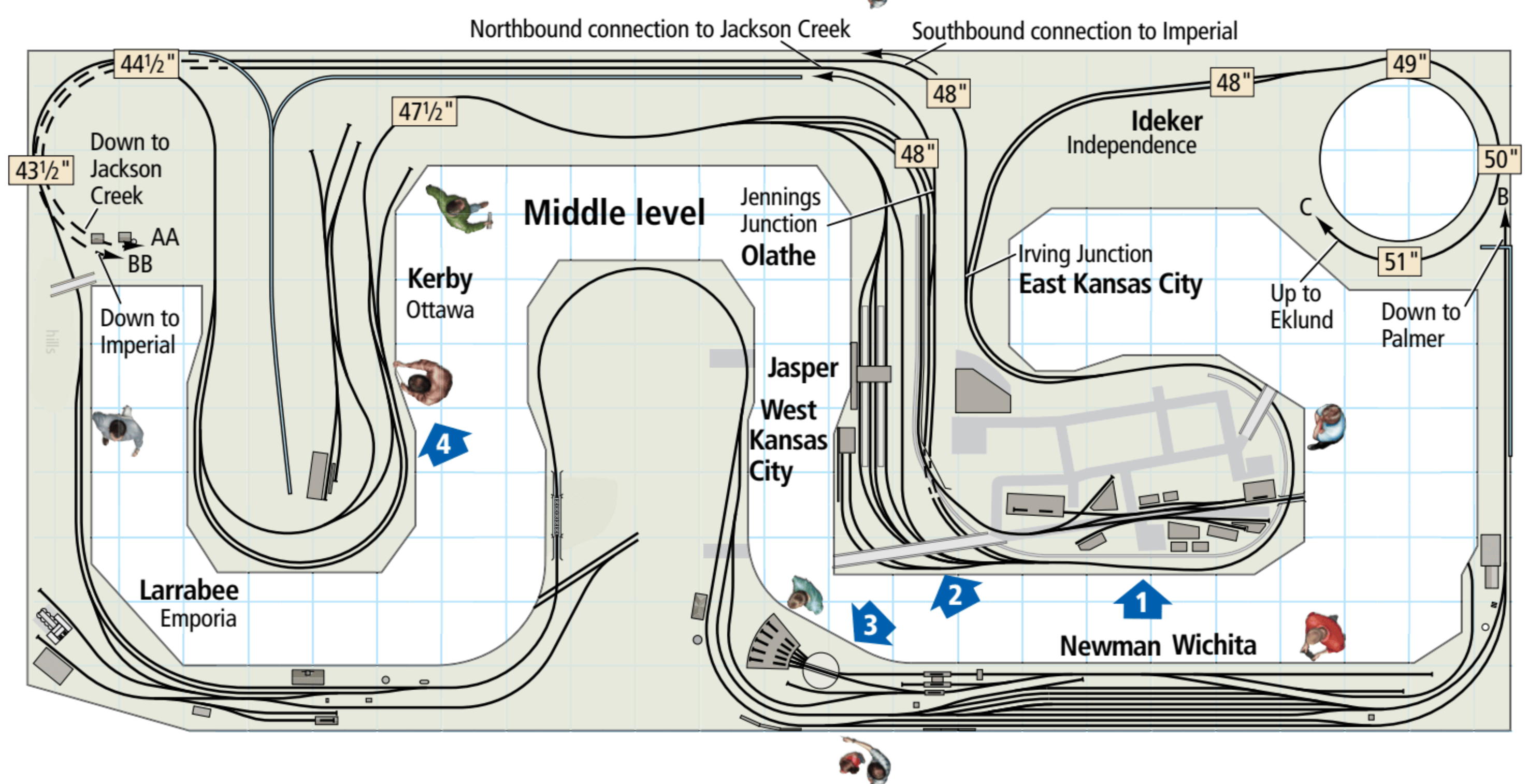
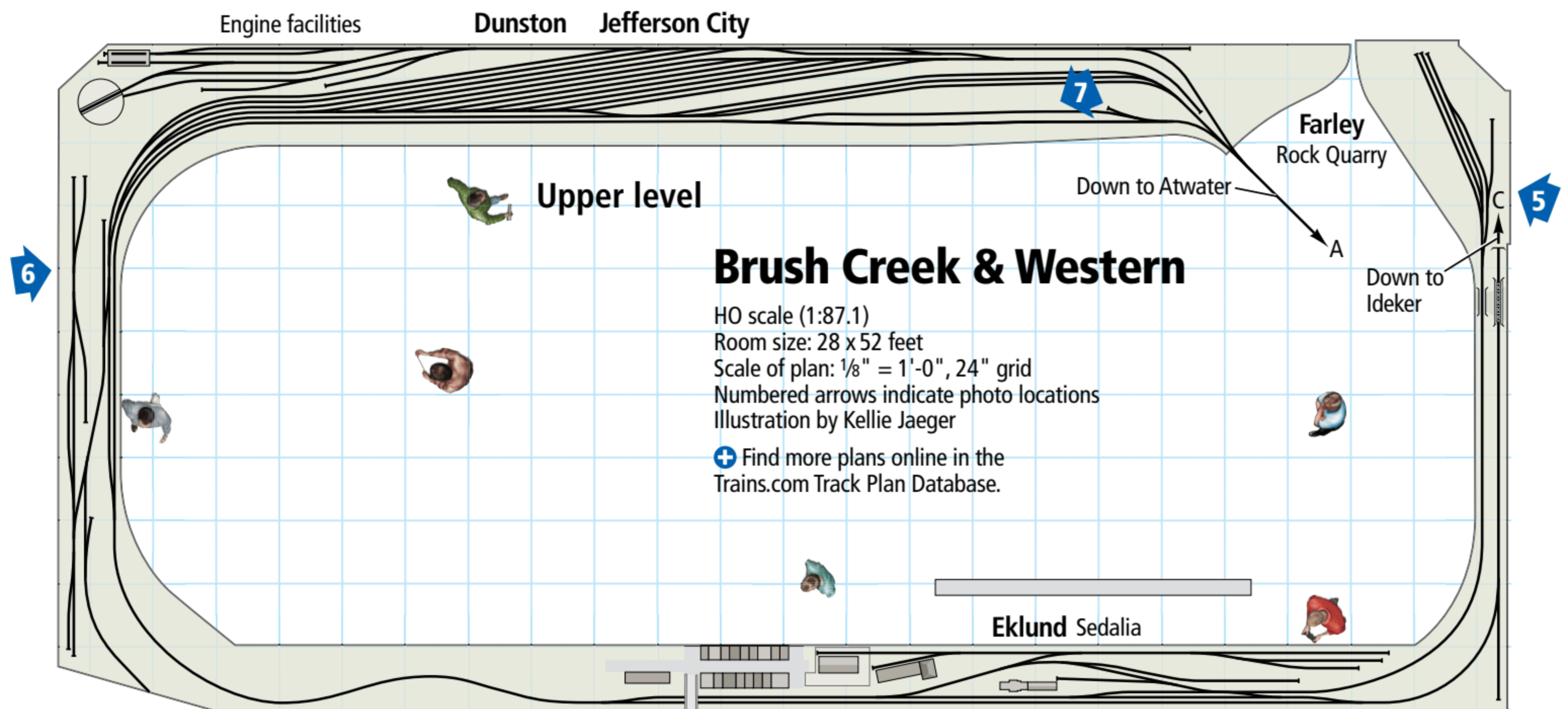
Roadbed: lauan and cork

Track: code 83 on mainline, code 100 in staging

Scenery: hardshell and foam

Backdrop: hardboard

Control: NCE DCC



The layout

The HO scale layout is a quasi-mush-room design with three levels and two helixes to travel between the levels and staging. The model railroad was built with aisles along the outside, which makes it easy for the public to observe most of the railroad. The building has also been rebuilt to accommodate visitors in wheelchairs. The layout occupies an area of 30 x 60 feet, plus an additional room for a workshop and dispatchers office, housing its large custom built CTC machine.

A club has a challenging job to balance the needs/wants of the membership. Some of the original, long-time members of The Greater Kansas City Model Railroad Club wanted to include operation as part of the railroad. This was a strong influence on the then-new design back in the early 1990s.

Club members used a variety of construction methods in building the benchwork for the railroad, along with a variety of different sizes of lumber. In the original construction, members used 1/4" lauan cut into strips, then bent them to create curves along the right of way for the roadbed. They used standard

3 A Brush Creek & Western Doodlebug takes a spin on the turntable at the Newman engine facility.





plywood for a subroadbed. Over the years as several areas have been rebuilt, such as Jasper Yard, members changed to cork for roadbed.

The club used Atlas code 100 flextrack in the staging areas and helixes, and Atlas code 83 for main line and sidings. During the rebuild of Jasper Yard, they installed Micro Engineering code 83 flextrack. The layout has handlaid turnouts, with No. 8s on the main No. 6s in the yards, except Jasper Yard, which uses No. 5s. There are very few commercial turnouts on the layout. The club uses Tortoise by Circuitron switch motors throughout, except for a few hand throws here and there.

All the original signals on the layout were scratchbuilt by club member Dean Clasby. He also built the CTC panel and all the electronics to run it. Over the years, some signals have been replaced and upgraded; these were scratchbuilt by member J.D. Spicher. Part of the upgrades involved adding extra signals to better manage traffic flow and improve visibility. In the case of the latter, several signal bridges were added to support the upgraded signals. To help improve

operations, four Atlas (formerly BLMA) searchlight signals were recently installed as repeaters in locations where the normal signals aren't easily visible.

The layout has three staging yards on the lowest level. The middle level is in the middle of the room, above the staging yards. The top level runs around the outside of the whole layout, with an aisle between it and the outside walls. Visitors have excellent views of the top level and most of the middle levels from this aisle; staging is mostly hidden. A large double-track helix connects all three levels, and there are more than 6 scale miles of track on the layout, including staging.

Equipment and operations

Most of the equipment on the railroad is a mix of club- and member-owned. The home road is the Brush Creek & Western. Brush Creek is a nearby body of water on the south side of Kansas City. It's a freelanced bridge line between St. Louis and Oklahoma City. The paint scheme is similar to Western Pacific's silver and orange, and

4 Having completed their work, the crew of Brush Creek & Western GP7 No. 1756, with a cabooses hop, comes off street running at Kerby heading back toward Newman. The layout can handle an operating crew of 13 during a regular session.

many of the locomotives and cabooses are re-lettered WP equipment. The club can operate over a wide range of eras, using straight steam power from the 1930s, through the steam-to-diesel transition era, and up until the mid-1970s.

The club holds regular operating sessions, once a month. It uses a JMRI program to manage traffic over the railroad. It takes 13 members to run the railroad during an operating session. Key positions include a CTC dispatcher and the yardmaster and switch crew at Jasper Yard, the main yard on the layout.

During a typical session, the railroad runs six scheduled passenger trains, eight scheduled freights, and four locals. There are more than 55 industry spots for the locals to serve. The operating crew handles more than 220 cars during a session.



5 Brush Creek & Western No. 1756 is working Farley Quarry. The club's paint scheme is reminiscent of the Western Pacific Railroad. In the foreground is Sam and Mickey's Tavern.

If needed, the club can operate with a smaller crew by reducing the volume of traffic and annulling non-critical positions. The CTC system can be switched to straight ABS (automatic block signals), allowing members to run without a dispatcher and having the train crews manage their own meets in the field. The main line is single track with passing sidings and a few short sections of double track.

Train crews use handheld radios to communicate with the dispatcher. The club is looking to replace these with a party line phone system, like railroads used between fixed locations and the dispatcher. The club runs the railroad with an NCE Digital Command Control system. Operators use a fast clock at 4:1

ratio and run a 12-hour schedule in a 3-hour session.

Club members recently held several operating sessions as part of Prairie Rail, a local operating group event. The club hosted several sessions for guests that came from out of town for the event. This is a big step for any operating model railroad, and the group received positive comments from guests.

Scenery and more

The club has worked hard on the scenery, which is why the railroad is more than 90% complete. Club members aren't afraid to make changes to the scenery and are open to trying new



techniques. Members “adopt” a section of the railroad, so different towns and trackside locations have slightly different scenic influences and techniques. What is fascinating is that the whole railroad still comes together very well.

Transitions between scenes are seamless.

The Greater Kansas City Model Railroad Club is open to visitors several days a month, and they welcome new members. Check its Facebook page for more details on membership and for open house dates/times. [MR](#)

Dan Munson is a professional rail-roader who enjoys model railroad construction and operations. He is a frequent contributor to Model Railroader.



6 A Brush Creek & Western SW1 spots a single boxcar to the BC&W Freight Station and Railway Express Agency at West Dunston.



7 Old meets new at the depot at Dunston on the Brush Creek & Western as a contemporary Budd RDC sits next to a veteran gas-electric doodlebug.

Meet the Greater Kansas City Model Railroad Club

From front to back and left to right: Greg White, Jud Harmetz, Jim “Mac” McCroskey, Lenny Ohrnell, Dale Shipman, Keith Mercer, Lester Lorhan, Mitch Houk, Phil Sifers, Brent Jefferis, Jim Schmidt, Bob Dewhirst, Mike “Red” Schmidt, Bill Norton, Jeff Burrell, and Stan Sims.





Though M.R. Snell's HO scale Conrail New Jersey Division layout is set in the present day, this Erie Lackawanna three-bay hopper is right at home in maintenance-of-way scrap tie service. The inset image, taken in 2015, shows the prototype car that inspired this project.



KEEP THOSE FALLEN FLAGS ROLLING

Maintenance-of-way cars are a great way to represent bygone railroads on your layout

By M.R. Snell • Photos by the author

Railroad and period are two of the biggest questions prototype modelers face when planning a layout. The modeling on my HO scale Conrail New Jersey Division has progressed with the railroad all the way through to the present day Shared Assets Operations.

Sometimes, though, a fondness for a predecessor road can creep in — maybe one even generations

removed. Fortunately, we can still have both without ruining era fidelity thanks to maintenance-of-way (MOW) equipment. Often, older cars are removed from revenue service and placed into company service, left in predecessor schemes until they're retired and scrapped.

When railfanning along the Norfolk Southern in 2015, I spotted a pair of Erie Lackawanna three-bay

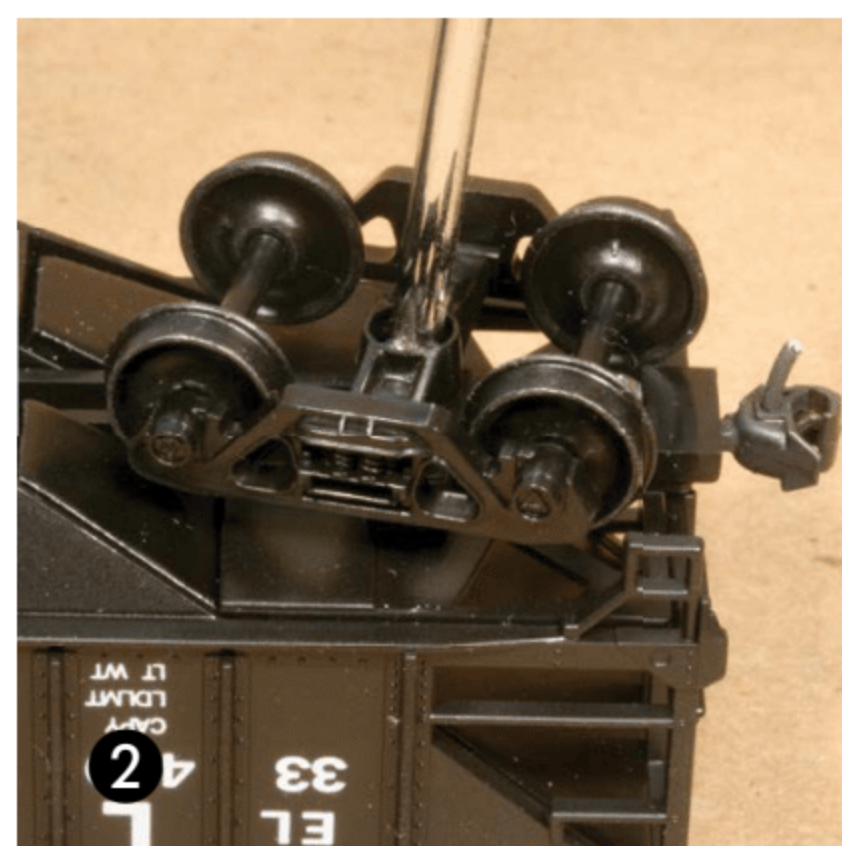
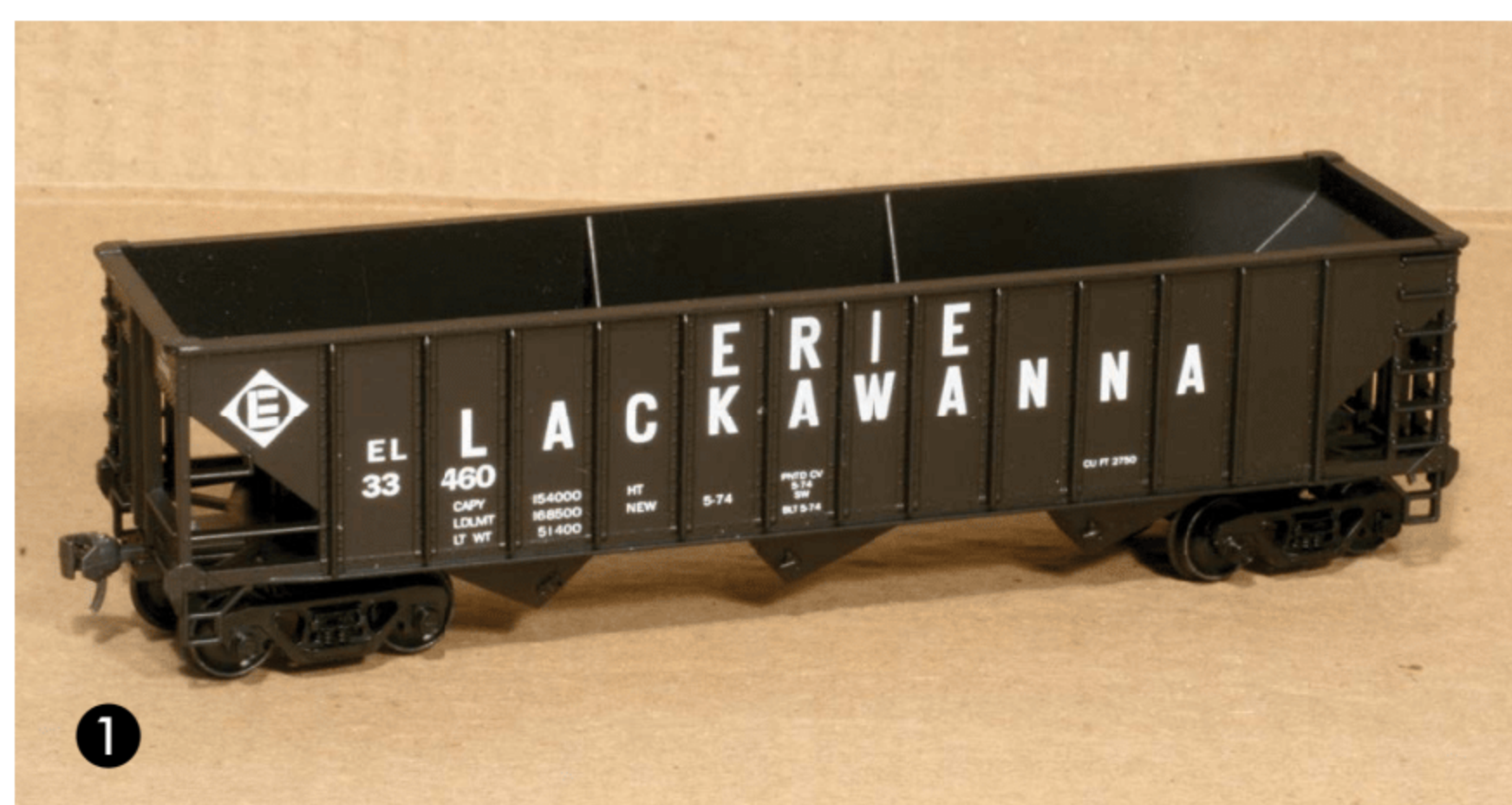
hoppers in MOW service, nearly 40 years after the EL was absorbed into Conrail. Having an affinity for the older roads, I immediately jumped at this modeling opportunity, allowing me to display one of Conrail's predecessor roads on my layout.

If you're looking to keep fallen flags waving on your model railroad, consider modeling some MOW equipment. Examples similar to

this hopper can be found on many railroads throughout North America.

M.R. Snell is a popular contributor to the pages of Model Railroader magazine. His article "Scratchbuilding demystified" appeared in the June 2024 issue. An exclusive tour of his HO scale Conrail New Jersey Division model railroad can be found on Trains.com Video.

/// GETTING STARTED



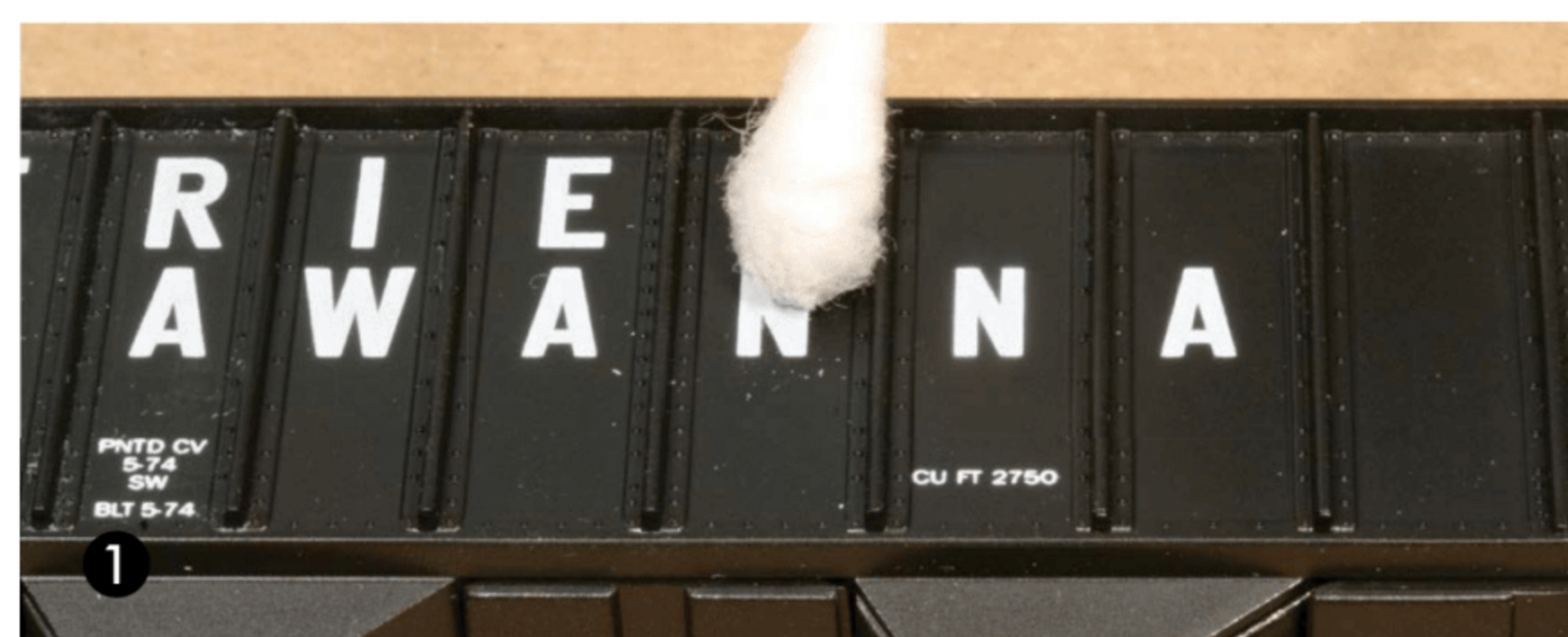
To re-create the car I spotted while railfanning along on the NS, I purchased a Stewart Hobbies HO scale 70-ton, 12-panel triple hopper decorated for EL ① [This car is now available from Bowser Trains. Visit the manufacturer's website, bowser-trains.com, to see the list of item numbers. Used Stewart Hobbies cars can be found at model railroad swap meets and online auction websites. — Ed.]

Before I could start weathering the model, I needed to disassemble it. First, I removed the screws holding the plastic roller-bearing trucks in place ②. When disassembling cars, it's a good idea to place parts in a cup or resealable plastic sandwich bag so they're safely out of the way.

Then, using a screwdriver with a thin, flat blade, I carefully removed the one-piece casting with the center sills, bolsters, and draft-gear boxes ③. Since the couplers were already secured in the draft-gear boxes with screws, I decided not to remove them.

When I flipped the shell over, the two metal weights fell free, leaving me with a multi-piece kit ready to be weathered ④. Set these parts safely aside as well so they don't get misplaced during the project.

/// WELL-WORN MARKINGS



After studying the prototype photo it became obvious that applying heavy grime and rust to reflect years of coal service wouldn't be sufficient to capture the look of the full-size car. One of the signature features of EL No. 33599 is the worn billboard lettering and herald.

To replicate that look, I first applied 70% isopropyl alcohol to the graphics with a cotton swab ①. I ran the swab in a vertical motion over the printing on each body panel.

Next, I used a small, flat blade screwdriver to further remove the graphics. Holding the tool at a slight angle while applying moderate pressure, I carefully dragged the edge of the blade over the herald and lettering ②. For finer work, I used a chisel blade in a hobby knife ③. Before long, the white graphics were scratched and chipped and the body color was showing through underneath ④.

To finish up this part of the project, I added a Clean, Oil, Test, and Stencil panel to both sides of the hopper ⑤. I used the three-panel version from Microscale set MC-5004. I applied the decals using the manufacturer's Micro Set and Micro Sol setting solutions [You can order both setting solutions from Shop.Trains.com. — Ed.]

/// BRING ON THE BRUSHES



Since the full-size car had spent most of its life in coal service, I used an airbrush to apply a heavy coat of Floquil Grimy Black to the interior, bottom, and lower third of the hopper ①. I also weathered the underframe and weights that I'd removed earlier.

After the Grimy Black had dried, I switched gears and dry-brushed Model Master Rust to select areas of the car. [Testor Corp. discontinued the Floquil and Model Master lines. Similar colors are available from Humbrol, Rail Center, Revell, Tamiya, Vallejo, and other hobby paint manufacturers. — Ed.] After dipping the brush in paint, I wiped off all but a trace amount on a paper towel and applied the rust color to the corner and exterior posts, grab irons, and ladder stiles ②. If you're unsure on where to apply the rust, use prototype photos as a guide.

To tie the weathering together, I used a wide, flat brush to apply a wash of thinner to the hopper. I worked from top to bottom, keeping the brush parallel with the exterior posts ③. Notice how the wash helped tone down the rust, giving it a more realistic appearance. It also made the remaining white graphics less vibrant.

/// TIME FOR DECALS



Using the prototype images as inspiration, I added graffiti decals to the sides of the hopper. It would be pretty difficult to replicate the tags on the full-size car in HO scale, so I used Blair Line graffiti decals that were similar in size and style.

First, I applied a decal to the right side of the car. I left some slack along each exterior post. Then I applied Micro Sol over the decal to soften it ①.

After I'd applied the setting solution, I used a No. 11 blade in a hobby knife to make several small slits in the decal ②. Using a hardened cotton swab, I pressed the decal down along the exterior posts. Any trapped air was expelled through the slits, giving the decal a painted on look ③.

Once the first graffiti decal was fully dry, I added a second one to the left of it using the same technique. The two decals overlap slightly, similar to the tags found on the full-size Erie Lackawanna No. 33599.

The reporting marks on the sides of the prototype car were reapplied so they'd be easier to read. To capture that look, I used small pieces of Microscale Black Trim Film (TF-2) set in place with Micro Sol ④, opposite. Once dry, I added the reporting mark and road number using 8" letters and



numbers from Microscale's Stencil Gothic alphabet and number set (90251) ⑤. The 4 x 18-inch yellow FRA-224 stripes, two per bay, are from the same company's reflector stripe set (MC-4389). The stripes have been mandatory on new freight cars since 2005; all cars were to have them by 2015.

I skipped the black Trim Film under the end data. Instead, I applied 4" stencil decals directly over the printed lettering that I'd weathered earlier. This approach allowed bits of the factory-applied letters and numbers to show through under the decals ⑥.

/// FINISHING TOUCHES



With all of the decal work complete I now had a reasonable facsimile of the car I'd set out to model. However, the decals looked shiny and unnatural in contrast with the flat finish of the heavily weathered hopper. To remedy this, I applied some remedial weathering to blend everything together.

I first sprayed the hopper with Testor's Dullcote. This sealed the existing weathering and added some tooth to the decals. Then, working in a vertical motion, I applied a light coat of flat black powder makeup with a wide brush ①.

Like most contemporary rolling stock models, the trucks on the Stewart model were molded in a shiny engineering plastic. The wheelsets, though chemically blackened, also had a slight shine.

To tone these parts down, I brush-painted the face, axle, and back of each wheelset and both trucks with a mix of Floquil Roof Brown and Grimy Black ②. I weathered the couplers in the same fashion.

Before putting the hopper on the layout, I added a load of loose scrap ties ③. Though the EL has been gone since 1976, its weather-beaten banner will still be found on my Conrail New Jersey Division layout thanks to this hopper. **MR**

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20493 Amtrak AMD 103 "Genesis" Diesel Locomotive; Road No. 160 (right)



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The *Southern Crescent* emerges from the tunnel as it pulls into Salisbury, N.C., on the Northern Virginia Model Railroaders Inc. club layout. Doug Kirkpatrick modified a Woodland Scenics plaster two-track tunnel to span three tracks.

Modifying a tunnel portal

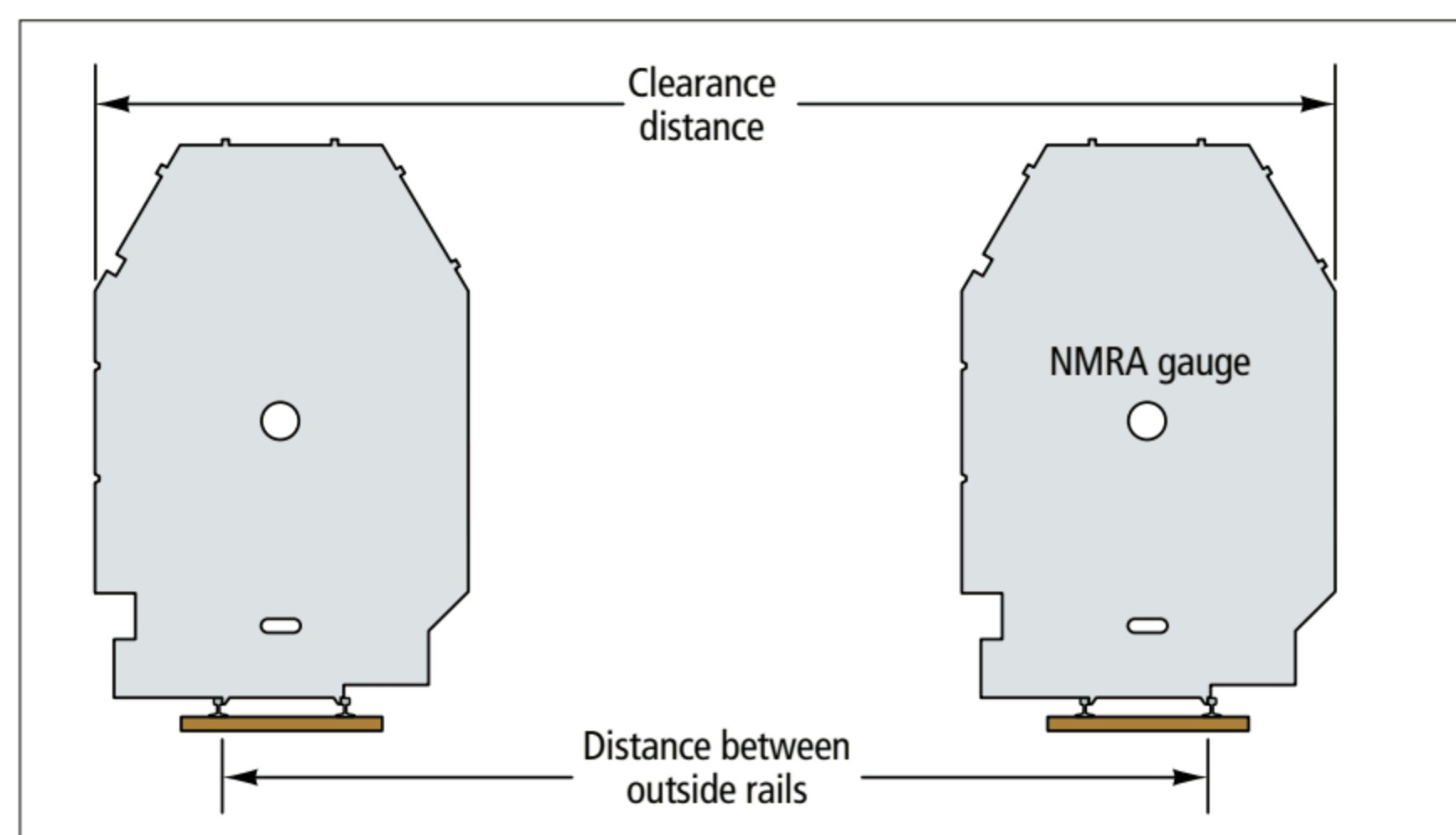
A technique for expanding plaster tunnel portal castings.

By Douglas Kirkpatrick • Photos by the author

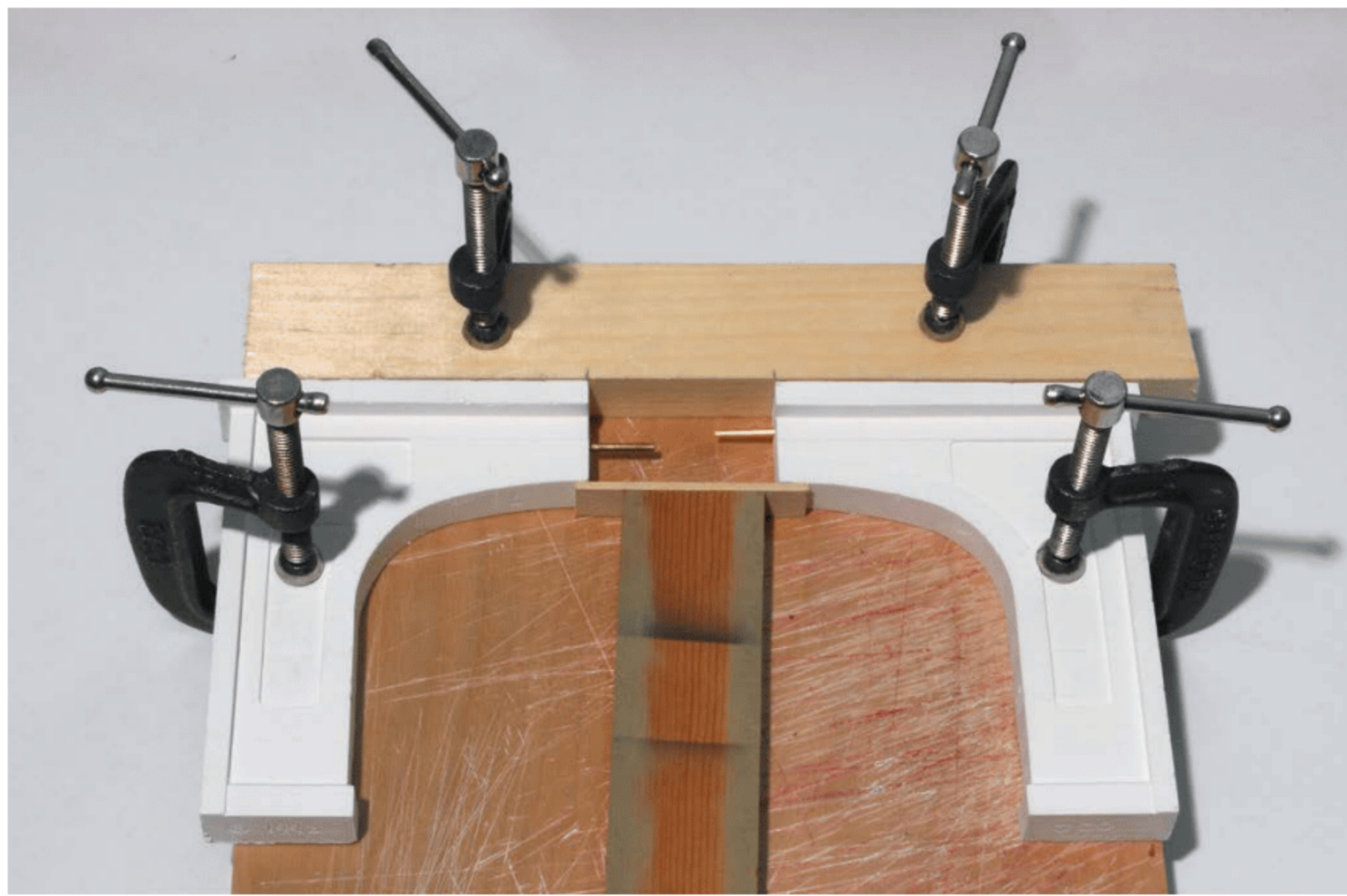
No matter how well we plan our model railroad, there may come a need for a tunnel portal that is greater than two tracks wide. There are numerous finely detailed, two-track tunnel portals available from commercial manufacturers. Most of these products are cast from a plaster base and allow easy modification. In my case, I needed a three-track portal for the local club layout.

Calculating the portal dimensions

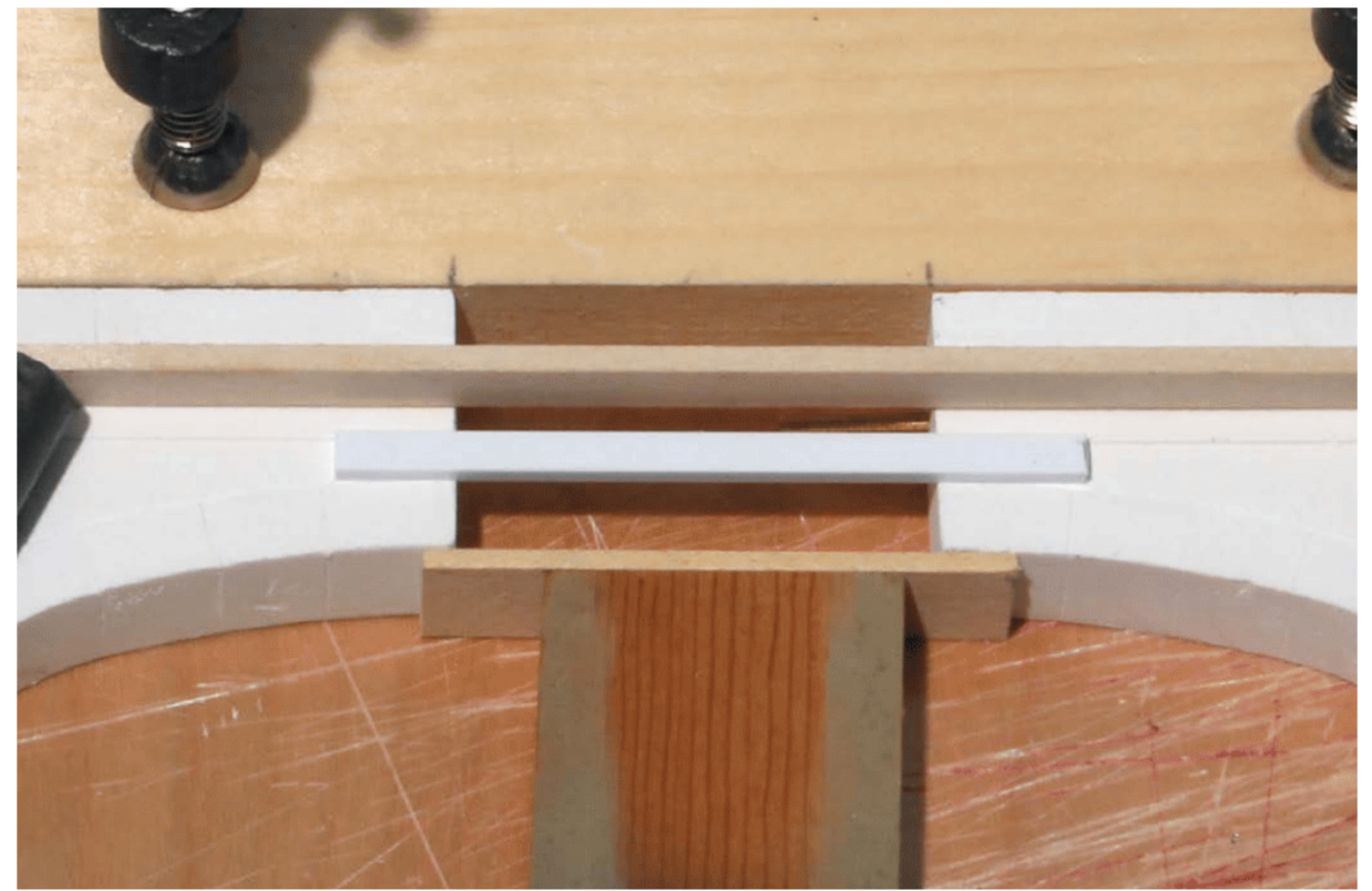
I selected the concrete version of the tunnel portal from Woodland Scenics since it's the easiest to modify. The first step was to measure the distance across the three tracks from outside rail to outside rail. I drew a line on a piece of paper marking the distance between the rails. Next, I placed a National



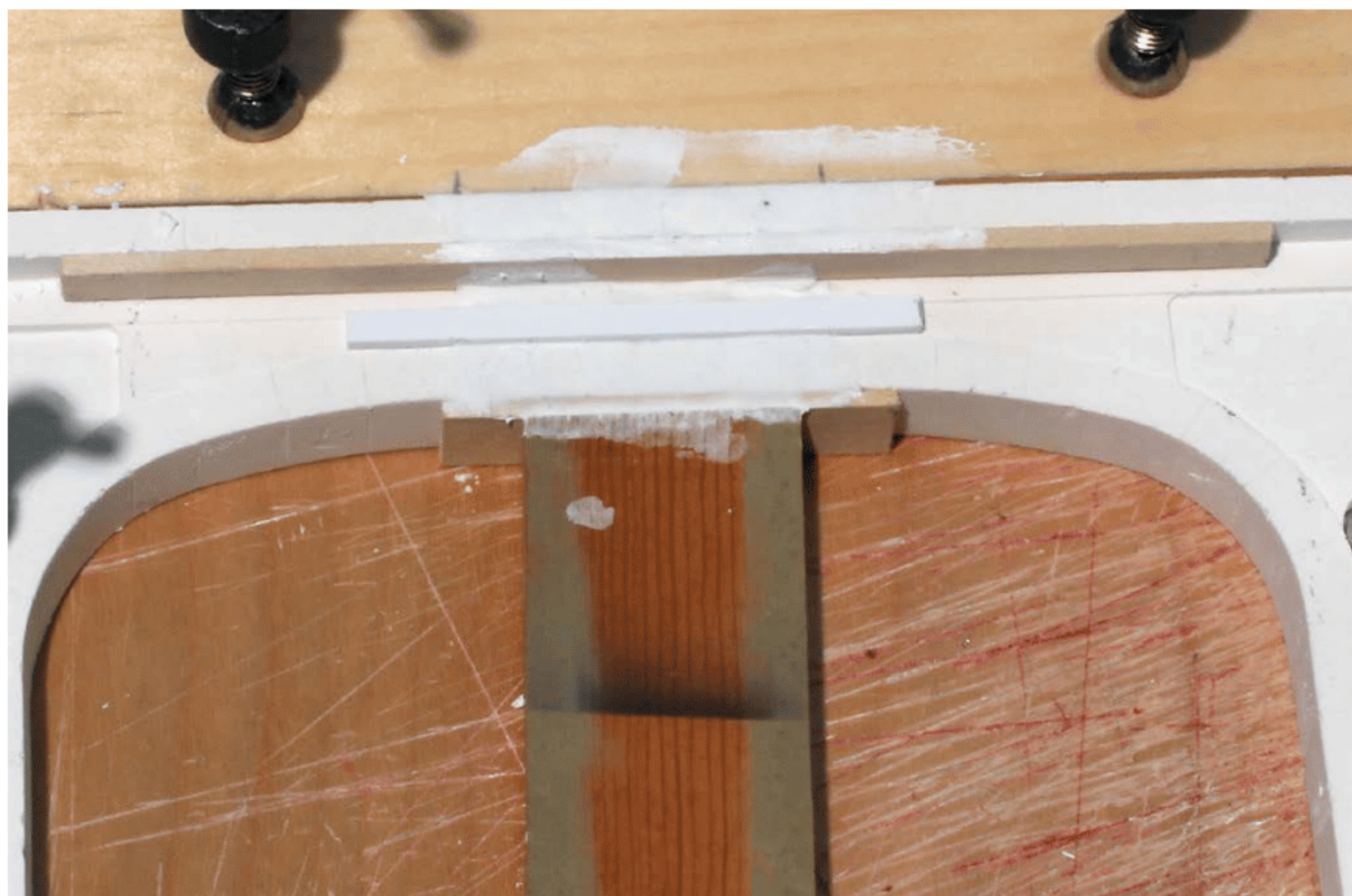
1 Using an NMRA gauge, the clearance measurements for the new portal can be determined. Kellie Jaeger illustration



2 Small rods are added to form reinforcement bars to secure the new section of plaster.



3 Blocks of wood and styrene are used to develop a form to replicate the additional segment of the tunnel portal.



4 The form is then filled with plaster and leveled. It needs time to set completely before handling.



5 The new tunnel portal is ready for installation on the Northern Virginia Model Railroaders Inc. club layout.

Model Railroad Association gauge on the paper, aligning it with the outside rail marks **1**. Then I drew a line down the outside of the gauge to determine the clearance needed between the portal wall and the rail. I repeated this same procedure for the opposite side.

The distance between the two clearance lines determines how far the walls of the new tunnel portal must be separated. If the portal is on a curve, an additional clearance must be incorporated into the new portal so trains can pass one another without colliding.

Portal modification

I used a fine-tooth razor saw to cut the two-track plaster casting in half. I drew a line completely around the casting, making shallow cuts on all four sides. Plaster castings are fragile, and they also tend to cause the saw blade to bind when cutting thick pieces. By making shallow cuts on all sides, it greatly reduces any chipping of the casting's surface that might occur.

Once the casting was split, I drilled a hole in both cut edges to accommodate a small brass rod that protrudes from the plaster and acts as a reinforcement bar for the new section **2**.

Next, I created a form for the new plaster section needed to extend the portal. I located a scrap of plywood to use as the base. Plaster adheres to wood well, so you either need to seal the surface of the plywood or lay a sheet of wax paper over it.

I attached a 1 x 2 inch board with C-clamps to the top of the plywood to make the top of the form. I then placed the top of

the two portal sections against this board the correct distance apart for the triple-track opening. I locked the two halves of the Woodland Scenics' portal in place with C-clamps. The clamps should be tightened just enough to hold the castings, but not so tight that they will shatter.

To make the rest of the form, I carefully studied the various surface details and used wood and styrene pieces to re-create them. I added a strip of wood to form the upper ledge and a small piece of styrene to produce the slight recess along the front surface **3**.

Casting the new section

Once the form was ready, I wet both ends of the original portal with water using a paintbrush. Then, working carefully, I poured a soupy mix of plaster a little at a time into the form, making sure it flowed into all areas. Once the form was full, I leveled off the top with a screed **4**.

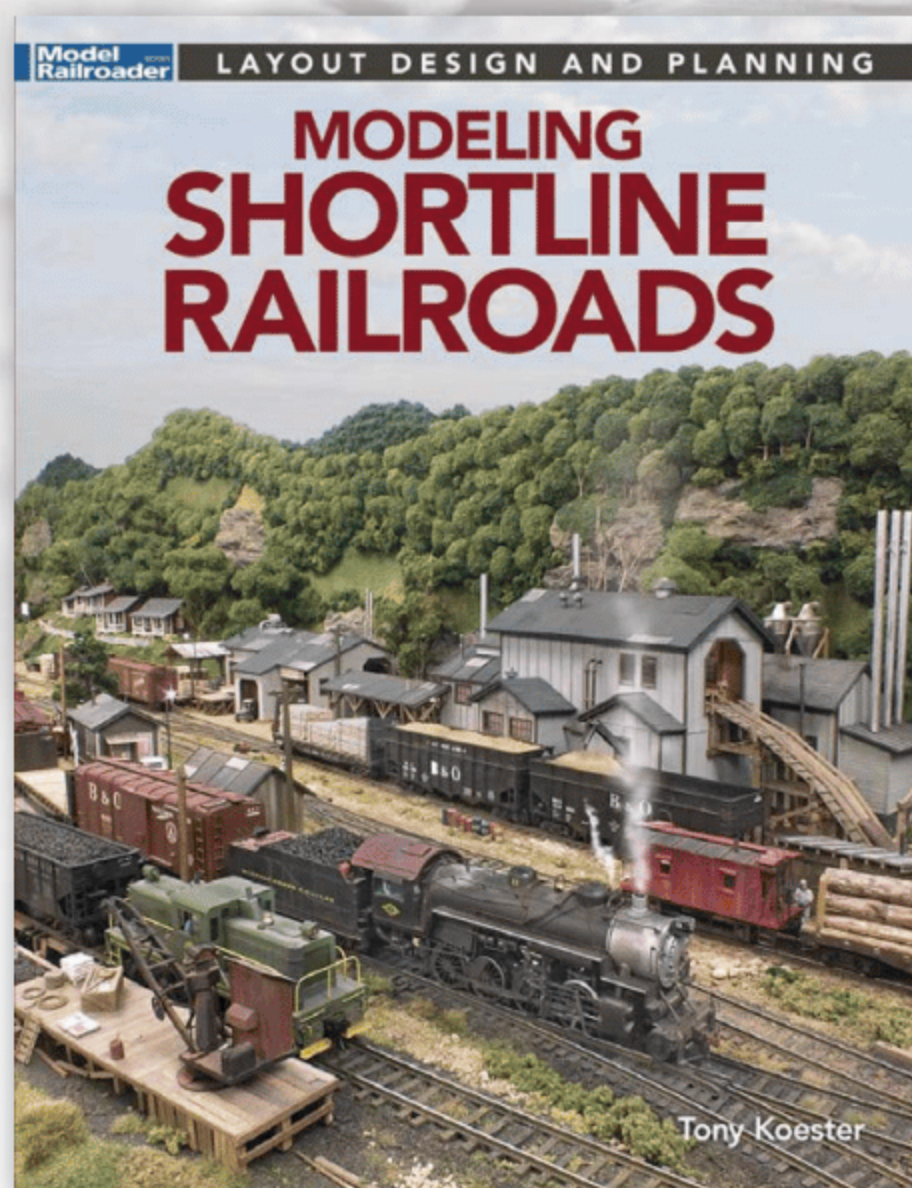
I let the new plaster set overnight before removing the forms. I then used fine sandpaper wrapped around a block of wood to dress up the surface. If you find small air pockets, you can fix them by using a wet paintbrush with a dab of plaster on it. Once the piece was fully ready, I painted the casting **5**.

This was a fun project that will work with plaster castings in most any scale and could be used for concrete bridges, too. [MR](#)

Doug Kirkpatrick, a frequent contributor to Model Railroader and its special issues, lives in Falls Church, Va.

NEW

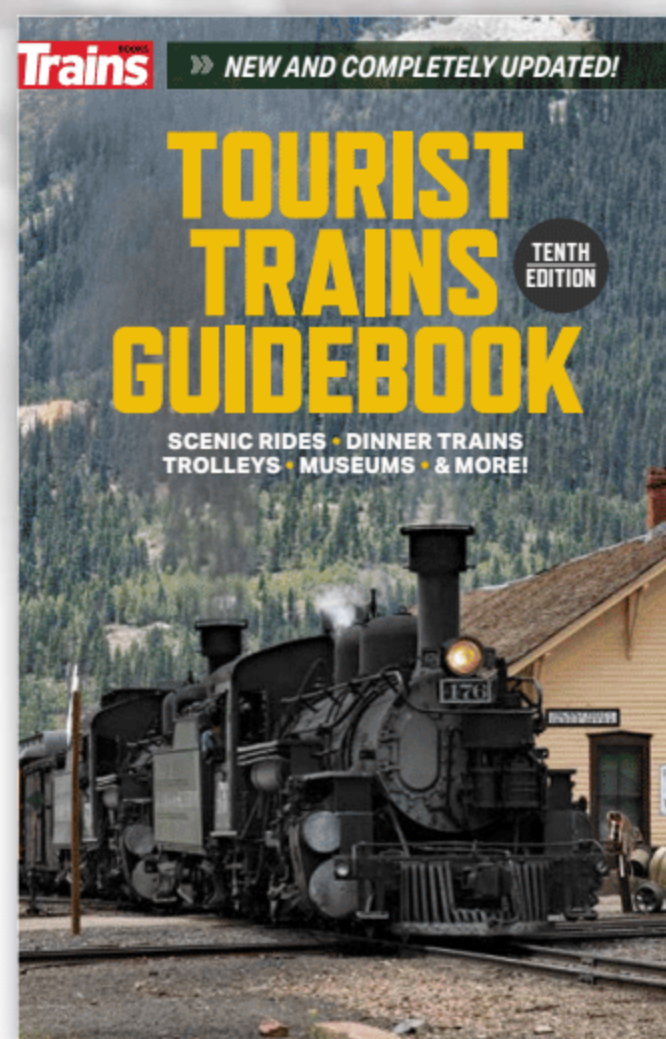
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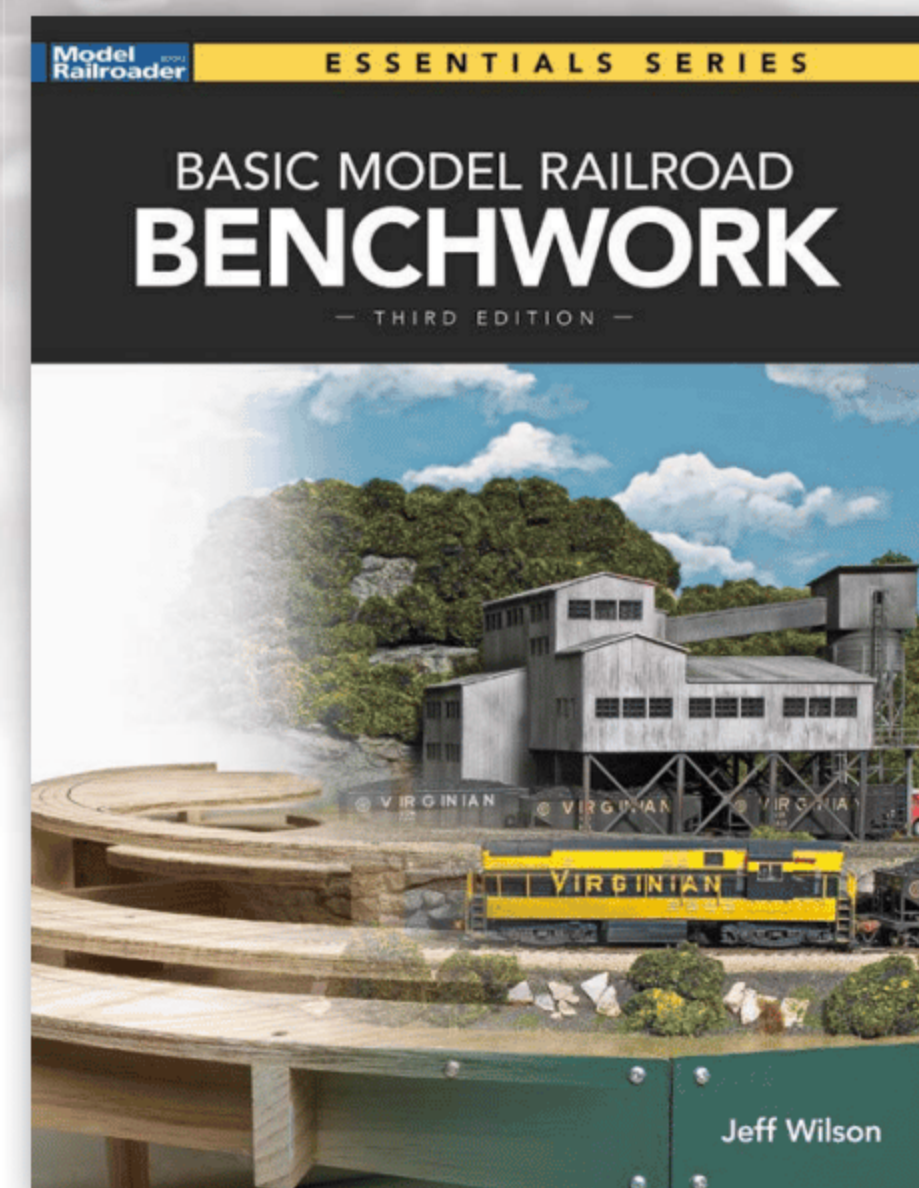
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One size doesn't fit all

There's no denying it: I'm a rules geek. This traces to my mid-teens, the kid hanging around the station who hounded crews for switch lists, employee timetables, and any other treasure they'd part with.

The rulebooks I've collected take me down memory lane. One is a Boston & Maine book I landed during a summer 1971 visit to Maine Central's headquarters in Portland, Maine. Another is a Jersey Central Lines edition a roundhouse foreman in Ashley, Pa., gave me, cleaning out his desk upon the eve of the railroad's abandonment in 1972. Seeds like these grew into a lifelong fascination.

Railroaders past and present obey rules to work safely. The two codes most widely used in the United States today are the Northeast Operating Rules Advisory Committee (NORAC) and the General Code of Operating Rules (GCOR). Both are direct descendants of the Standard Code, the basis for the timetable-and-train-order (TTTO) system. The same logic flows through all three: no two trains can occupy the same track at the same time. It's so orderly that I passed my first NORAC exam by applying TTTO logic that I knew well.

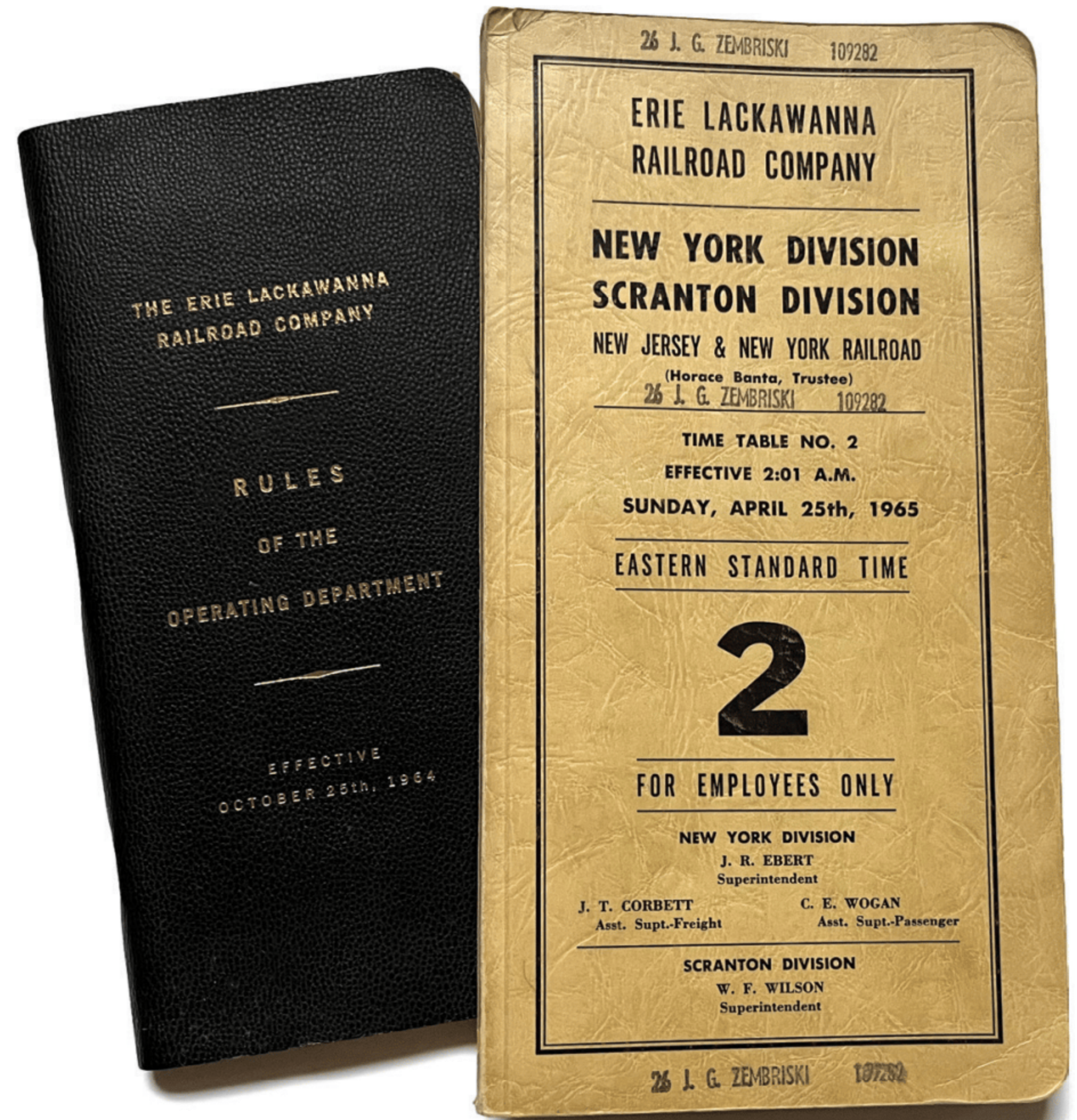
There's a hierarchy of rules as durable as an ancient pyramid. Federal regulations form a stable base. The best known of these may be the 1907 Hours of Service Act. Recent reinforcements include strict bans of cell phones and other electronic devices and

licensing of engineers and conductors. NORAC or GCOR make the next step; substitute the railroad's rulebook for the TTTO era. Their provisions can be more restrictive but not less. A railroad's employee timetable stacks atop the first two. Its special instructions can further restrict, for example, giving lower speed limits. Bulletin orders and track bulletins, the fourth step, have similar effect; once again, more restrictive but not less. Train orders, Form Ds, track warrants, and signals sit atop the pyramid.

Rules varied from railroad to railroad without weakening this structure. Conventional train order dictation required saying and then spelling stations and numerals. Erie, however, reversed this, spelling them first: A-U-R-O-R-A AURORA and T-E-N TEN¹. Nickel Plate followed saying and spelling convention but demanded that a written order include the letters of spoken numerals, as NO 10 T-E-N MEET EXTRA 759 S-E-V-E-N F-I-V-E N-I-N-E WEST AT LINDEN¹.

Another tangled mess surrounds the requirement that a train not depart a station before its schedule leaving time. Many rulebooks placed this in Rule 92, like Santa Fe; others, such as Missouri Pacific, in Rule 5². There's also variation in the rule itself. Some, like Boston & Maine, add "must not arrive in advance of its schedule arriving time."³

Curiously, there's little variation in Rule 93 yard limits, but it



Erie Lackawanna's employee timetable No. 2 of April 25, 1965, and the company's Oct. 26, 1964, rules frame operation, but final authority comes from bulletins and train orders.

Photo by Jerry Dziedzic

sees more debate than any other I know. Who has authority over movement on the main track within yard limits, the dispatcher or the yardmaster?

Peter Josseland's *Rights of Trains* gives the most eloquent answer I've found: The rule governs. It frees the main track for use if movements clear for first class trains and requires Rule 99 flagging against them if not. It relieves movements of flagging against other trains and engines by requiring restricted speed of all except first class.

A recent discussion pointed out this revealing nuance in a Santa Fe version: "The responsibility for accident with respect to second class and extra trains or engines rests with the approaching train or engine."⁴ Voila! This makes restricted speed resemble a motor vehicle rear-end collision. A crew that doesn't stop in time carries the blame.

Dizzy? Here's more. Rules evolved over time. The venerable Standard Code saw many revisions during its life. NORAC is in its 12th edition; GCOR, its eighth. It's important to establish an era for reference because individual rulebooks also evolved. New York Central modelers who set their layouts in 1928 may use different rules than those in 1962. And remember that an employee timetable or bulletin order is always a higher authority.

One size doesn't fit all, you see. Prototype rulebooks and timetables are as valuable to layout operation as a photo to a good modeler.

Notes:

¹ Rule 206: 1930 and 1952 Erie, 1943 NKP

² Rule 5: 1950 Uniform Code (MP), 1967 Consolidated Code

³ Rule 92: 1961 Boston & Maine

⁴ Rule 93: 1953 ATSF **MR**



CURIOUSLY, THERE'S LITTLE VARIATION IN RULE 93 YARD LIMITS, BUT IT SEES MORE DEBATE THAN ANY OTHER I KNOW. — JERRY

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A New Hope & Ivyland excursion train performs a runaround move at Buckingham Valley, Pa., in preparation for the train's return to New Hope. The engine is a Bowser Baldwin DS-4-4-1000 painted in the McHugh Brothers New Hope & Ivyland livery. The semi-open car is a Bethlehem Car Works Reading commuter coach modified to represent the car used by the railroad in excursion service in the 1970s. The station is based on the Valley Forge Scenic RR structure, which was moved to Buckingham Valley.

William B. Harkins III photo



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It looks like Lakeside Lines GP9 2057, a Life-Like Proto 2000 model, and its crew have Riverside Yard in good order as the locomotive sits idling with its headlight dimmed. Soon, however, the break will be over, and the shifter's crew and 2057 will be off to pull cars from the local customers. The Lakeside Lines' main line is to the right of the signal made from Oregon Supply components; no high ballast pile here, it's 1979. Tom Harris' Lakeside Lines was featured in the November 2010 issue of *Model Railroader*. Tom Harris photo

Patrons in the cafe-parlor car are enjoying a bite while one of Great Northern's crack passenger trains makes a late-night station stop. Terry O'Kelly photographed the scene on his S scale layout. The passenger cars are from American Models to which Terry added constant light-emitting-diode lighting, seating, passengers, handrails, and grab irons. The station is a Leigh Valley kit with added interior details. Terry is an assistant editor for *The Dispatch*, the magazine of the National Association of S Gaugers.



A handsome Delaware & Hudson Alco PA pulling the *Adirondack* rolls south-bound past Sherwood Tower in the mid-1970s. The scene was photographed by Bill Lane on Stan Stokrocki's 24 x 32-foot S scale (1:64) layout. The locomotive is a heavily reworked American Flyer PA shell on an Omnicon chassis. The baggage car was scratch-built. For more photos of Stan's model railroad and information on modeling in S scale, visit the website of the National Association of S Gaugers (nasg.org).



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Schedule of Events Rate: \$45 per issue (55 word maximum). Ads will contain the following information about the event: state, city, sponsoring organization and name of event, meet, auction or show, dates, location, times, admission fee, name and/or telephone number and/or email of person to contact for information. Name, daytime telephone number and street address of the person providing the information is also required but need not be included in the ad. Unless otherwise requested, ads will be published in the issue month that the event occurs in. Please specify issue date(s). **Word Ad Rates;** per issue: 1 insertion — \$2.03 per word, 6 insertions — \$1.89 per word, 12 insertions — \$1.77 per word. \$40.00 MINIMUM per ad. To receive the discount you must order and prepay for all ads at one time. Count all initials, single numbers, groups of numbers (i.e. 4-6-0 or K-27), names, address number, street number, street name, city, state, zip, phone numbers each as one word. Example: John A. Jones, 2102 South Post St., Waukesha, WI 53187 would count as 10 words. For MR's private records, please furnish: a telephone number and, when using a P.O. Box in your ad, a street address. **Model Railroader** reserves the right to refuse listing. **All Copy:** Set in standard 6 point type. First several words only set in bold face. If possible, ads should be sent typewritten and categorized to ensure accuracy.

Send your submissions to: Model Railroader — Classifieds, 18650 W. Corporate Dr., Ste. 103, Brookfield, WI 53045. Phone: 414-600-9285, E-mail: classads@firecrown.com

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

Schedule of Events

FL, BROOKSVILLE: Regal Railways presents Toy Trains & Hobby Show. Hernando Fairgrounds, 6436 Broad St., Brooksville, FL 34601. Saturday, September 13, 2025. 9:00am-2:00pm. Admission: \$6.00 adults, children under 12 free. Vendors and model train layout. Lunch available. Contact: Joe at 727-244-1341 or visit: www.regalrailways.com for more information.

IA, DELMAR: Delmar Train Show & Swap Meet. October 11-12, 2025. Saturday 10am-4pm and Sunday 10am-2pm. Delwood School Gym, 311 Delmar Avenue, Delmar, IA 52037. Admission: Free Will Donation. Free tours of Delmar Railroad Museum. Vendor tables: \$25 each (limit 10 tables per vendor). Food & drink available. Free parking/handicap accessible. Information: bradgeneralcontractors@gmail.com

ID, CALDWELL: Southwest Idaho Train Show. O'Conner Fieldhouse, 2207 Blaine St., Caldwell, ID. September 20-21, 2025. Saturday, 10AM-5PM; Sunday, 10AM-5PM. Admission \$5.00, \$6.00 w/card. Under 12 free w/adult. Clinics, operating layouts, exhibits, rides, vendors, all scales. Concessions available & free parking. Sponsored by Caldwell Model Railroad Club & Historical Society. Contact Dave 208-936-5730 or visit www.cmrchs.org

KS, TOPEKA: TMRR Club Show & Swap Meet. October 4-5, 2025. Saturday 9am-5pm; Sunday 9am-3pm. Great Overland Historic Station, 701 N. Kansas Ave., Topeka, KS 66608. Admission: \$5; kids 12 and under FREE with paid adult. 10,000 sq.ft. of operational layouts, railroad histories and vendors. Free parking. Contact: Stan Spice 704-450-7929

MA, TAUNTON: OLD COLONY MODEL RAILROAD CLUB ANNUAL MODEL RAILROAD SHOW. Sunday, September 21, 2025, 10:00am-3:30pm. Taunton Inn & Conference Center, 700 Myles Standish Blvd., Taunton, MA 02780. Route 495, Exit 25. Adults \$5.00, children under 12 (accompanied by an adult) & scouts in uniform FREE. For more information visit: www.oldcolonyrailroadclub.com

MI, BATTLE CREEK: Battle Creek Train Show & Swap Meet. Calhoun County Fairgrounds, 720 Fair St., Marshall, MI 49068. Saturday, September 20, 2025, 10am-3pm. Admission: \$5 adults, under 12 free. Operating layouts, hands-on displays, door prizes. Refreshments available. Dealers welcome, \$30 per table. For information: contact Shawn Rhoades 269-758-3477, Andy Buck 269-268-0910.

MS, GULFPORT: Mississippi Coast Model Railroad Club: 1st Annual Train Show, November 15-16. Saturday, 9am-5pm & Sunday, 9am-3pm. CTA Hub & Event Center...on the beach! (Corner of 20th Ave and Hwy 90, next to the MS Aquarium). Admission: \$10 Adults, \$2 Children (5 & under FREE). \$8 Active 1st Responders-Military-Seniors. Show Chairman: W. Michael Barry, 5411mbma@gmail.com, 228-381-0665

OH, BERE: The 51st Annual Great Berea Train Show hosted by the NMRA. Saturday, October 4th and Sunday, October 5th. 10:00am to 4:00pm both days. Cuyahoga County Fairgrounds in Berea, Ohio. Admission \$10.00. Under 16 free with an adult purchase. 70,000 square feet of model railroading. Show Contact: David James showmanager@thegreatbereatrainshow.org 440-785-9907. Visit: www.thegreatbereatrainshow.org

OH, VAN WERT: Van Wert Railroad Heritage Weekend Model Railroad Show & Swap. Van Wert County Historical Society, Van Wert County Fairgrounds, 1055 S. Washington St., Zip: 45891. August 16-17, 2025. Saturday 10am-4pm & Sunday 10am-3pm. Adults \$7. Children 12 & under/ Scouts in Uniform: FREE. Early Bird 9am admission: \$10. Info: Chuck White, railcarman@frontier.com, 260-760-1666, www.vwrrhw.com

TX, AUSTIN: Austin Train Show. Over 25,000 sq.ft. of railroading fun for the whole family! Palmer Events Center, 900 Barton Springs Road, Austin, TX. August 23-24, 2025. Saturday 10am-5pm, Sunday 10am-4pm. Admission: \$8 online, \$10 at the door (includes both days), 12 and under FREE w/adult. Kids train ride, vendors, model/Lego railroads, tour, clinics. Visit: austintrainshow.org

TX, TEMPLE: 43rd Annual Temple Model Train & RPM Show by CentraMod Inc. Central Texas Area Model Railroaders. Frank W. Mayborn Convention Center, 3303 North 3rd St., Temple, TX 76501. September 20-21, 2025. Saturday 10am-5pm and Sunday 10am-4pm. Admission: \$10, Seniors & Military w/ID \$9, 12 and under free w/adult. FREE Parking! Additional information: 254-760-3761 or www.centramodrr.com

WA, BATTLE GROUND: Southwest Washington Model Railroaders, Great Train Swap Meet. Saturday, September 27, 2025. 9:00am, Beat-the-Crowd, \$10 admission. 9:30am-2:30pm. Adults \$5, Students \$3, under 6 FREE w/adult. Battle Ground High School Gymnasium, 300 W. Main St., Battle Ground, WA 98604. Take N. Parkway Avenue to Free Parking. Vendor tables \$25.00. Info: Larry Sprenkel, 360-619-8899, Larry.sprenkel@gmail.com

WA, SPOKANE: River City Modelers Fall Model Train Show, Spokane Fairgrounds, 404 N. Havana. Sunday, October 12, 2025, 9:30am-3:30pm. Admission: adults \$8, 12 & under free. 200+ tables of Railroad-related items for sale, operating layouts, Free-MO, Operation Lifesaver & more. Free Parking. For table rental or general info, contact: Shirley Sample, 509-991-2317 or email: shirleysample13@gmail.com

WI, MONROE: Green County Model Railroaders 47th Annual Model Train Show & Swap Meet. The Steline Ice and Community Expo, 1632 4th Avenue West, Monroe, WI 53566. September 27-28, 2025. Saturday & Sunday, 10am-4pm. For information contact Kevin Johnson, 608-558-9332, or visit: www.gcmrrinc.org

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

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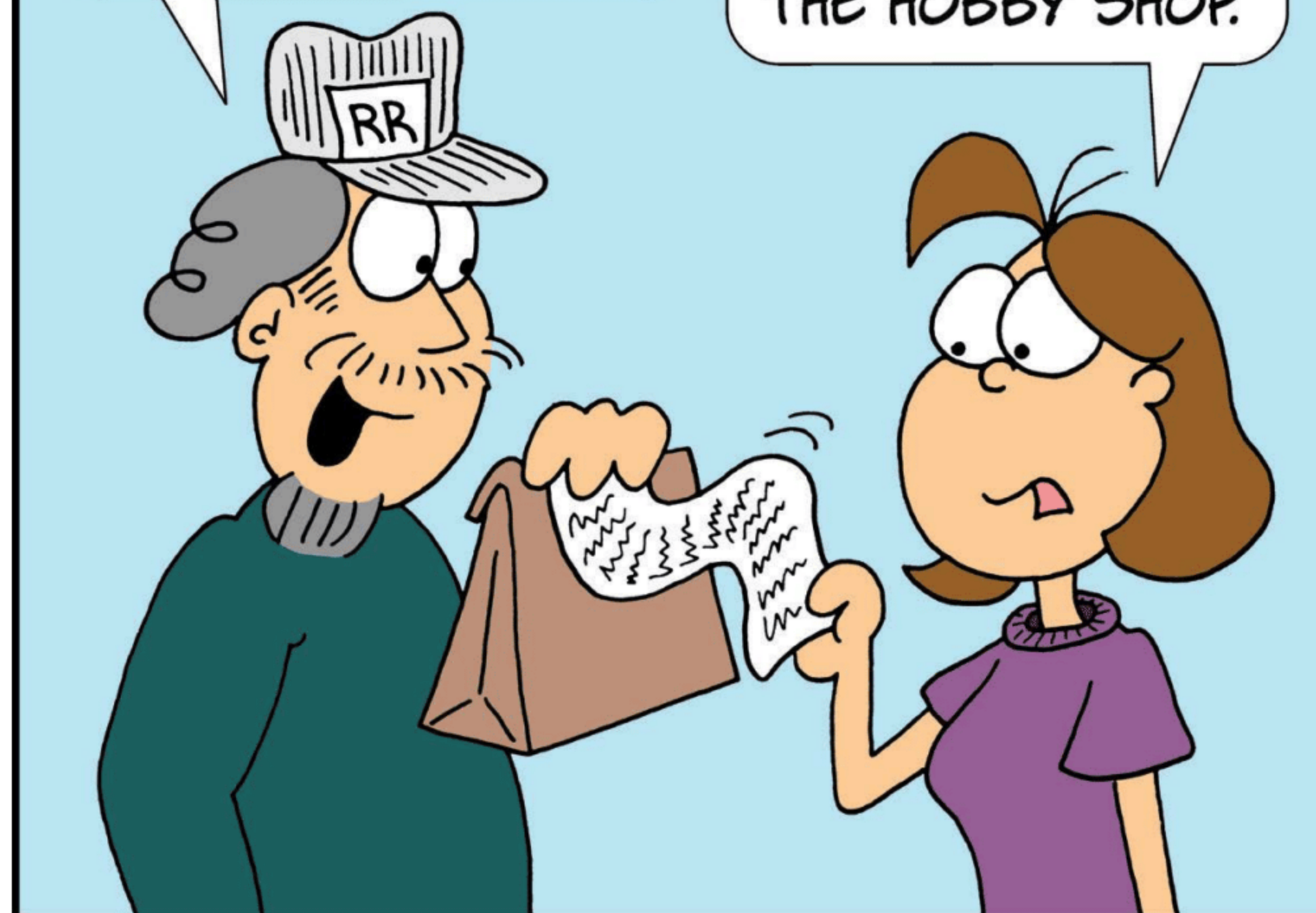
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When ugly becomes cool



Brooks Stover's S scale Western Maryland chopped-nose GP9 6414 shows off both its ungainly appearance following the nose job but also its appeal as a model. That's Bobby Caruthers standing on the Geep, which he ran over a derail while showing off the engine. Brooks Stover photo

There are examples of prototype locomotives that make one wonder whether the term "utilitarian" masquerades for bone ugly. Some of this can be accounted for by taste. For example, I've previously written about my admiration for EMD's downright homely BL2, although I certainly won't nominate it for recognition as one of EMD's 10 best-looking locomotives.

But in other cases, it's clear that whoever styled or modified a locomotive made no pretense about its aesthetic merits. They, and the locomotive, had a job to do, and how the sheet metal was formed was just not of great concern.

Which brings us to first-generation chopped-nose Geeps. That lowering the short hood and adding a windshield can be done gracefully is evident in EMD's treatment of the GP20 and some GP18s. But most of the instances where a railroad took it upon themselves to lower the short hood in their

own shops were a visual disaster in terms of what rolled out after the conversion. And I doubt that anyone cared a whit.

What I find interesting is how a bad-looking full-size locomotive can turn into such a fascinating model.

Brooks Stover, whose S scale depiction of West Virginia short line Buffalo Creek & Gauley is nothing short of breathtaking, brought this to my attention when he sent me the accompanying photo of Western Maryland chopped-nose GP9 No. 6414.

Brooks says modeling a plain-vanilla GP9 in 1:64 doesn't present a challenge, since they are available from American Models. "But," he added, "no chopped-nose GP9 has been produced in plastic in S, and as far as I know, no diesel of any type has ever been produced in S in the red-and-black 'circus' scheme." [Walthers recently announced an HO scale

chopped-nose GP9 in this WM scheme. — Ed.]

He notes that one advantage of modeling a small railroad is that you can model every piece of equipment they had in your era. "But the disadvantage," he quickly added, "is what do you do when you've done that? What do you model next?"

Brooks decided to model pieces of equipment that appeared on the railroad in other eras, even though they don't fit "cleanly" into his operating scheme. Steam ended on the BC&G in 1965, and a little Plymouth ran for a couple of years before the railroad closed for good.

"But in 1971," he discovered, "Majestic Mining opened a small coal loadout facility near the

original mine served by the BC&G and hauled coal on BC&G track behind a series of first-generation diesels leased from the Baltimore & Ohio: Alco S2 9023, GP9 6472, Alco RS1s 9185 and 9186, Baldwin switcher 9271, and WM GP9 6414.

But what really drew

Brooks to the engine was the story of when Bobby Caruthers ran the engine over a derail while showing it off to visitor Bob Slavy and his wife. "I met Bobby on two occasions at BC&G reunion events in the Mountain State and felt I had a personal relationship with the engine!"

Brooks started collecting parts for this build a decade ago, but wasn't sure he would model it. As he researched more about 6414, however, decided to build it.

"I started with an American Models GP9 and literally did what the WM did: cut a 30" section out of the bottom of the short hood. I then made a new cab front out of a flat piece of styrene. There's great debate on what color red this scheme had; I picked one (Tamiya Dull Red) that looked good to me.

Now that it's done, Brooks loves it! "It has its own character, a face only the modeler who built it could love. With a new can motor and

Tsunami II decoder, it runs and sounds great. I use the engine on the B&O train that serves the BC&G interchange. Who knows, maybe it did that a time or two before being leased to Majestic Mining." **MR**



WHAT I FIND INTERESTING IS HOW A BAD-LOOKING FULL-SIZE LOCOMOTIVE CAN TURN INTO SUCH A FASCINATING MODEL.
— TONY



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