

GIVE A BUDGET DIESEL A \$50 FACELIFT p.24



**New UP turbine
in N scale** p.56

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A scenic HO layout fueled by imagination

Prototype railroads inspired this freelanced bridge line p.38

George Campbell
based his HO scale
layout on Cincinnati's
railroads. See page 38

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rail-marine
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Mix custom static grass colors p.34

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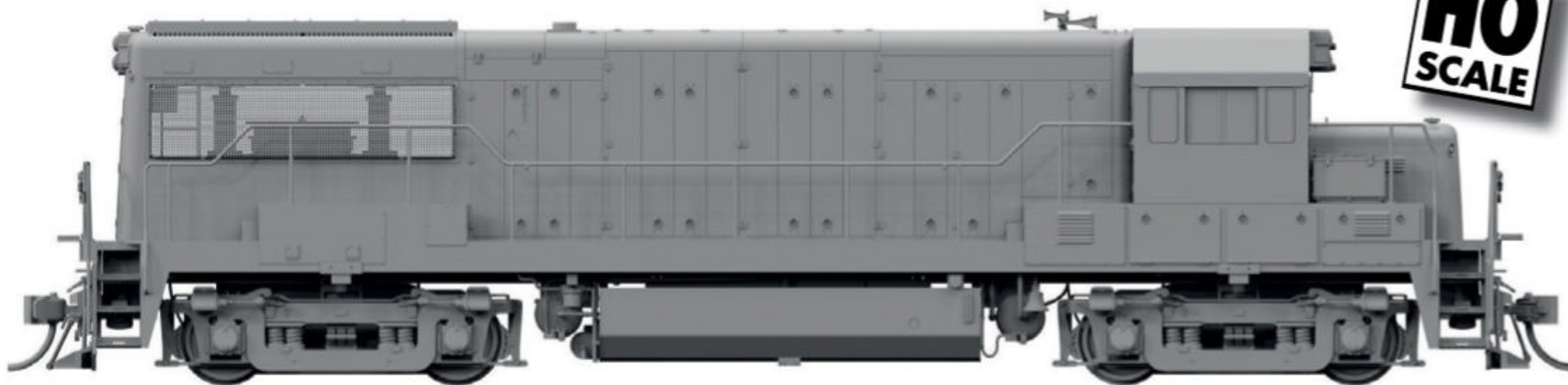




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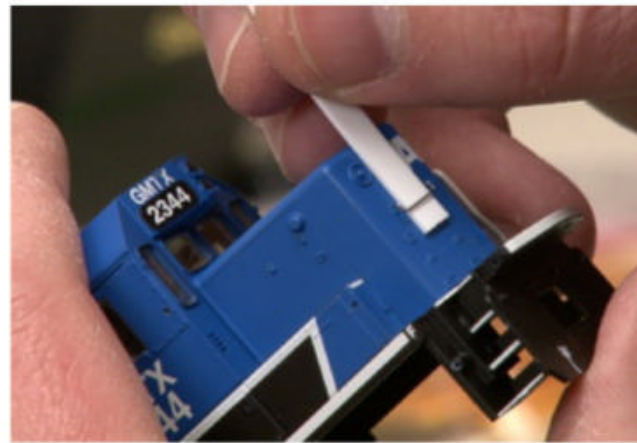
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On the cover: A passenger train pulls up to Winchester station on George Campbell's freelanced HO scale layout.

Lou Sassi photo



Next issue

In **October**, see how Lance Mindheim filled a space with an N scale port railroad. Plus, make fast forests, protect track workers, see a compact ATSF layout, and more!

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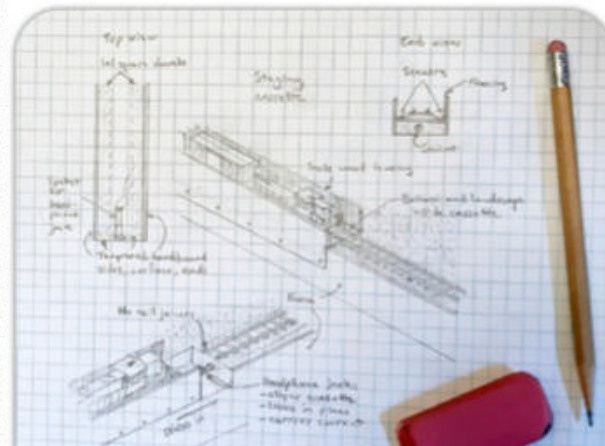
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Meet the Modeler

In our new Trains.com article series, *Meet the Modeler*, we speak to some of the hobby's best, asking them questions ranging from their favorite philosophies to their biggest modeling mistakes! Check out the first interview of many conducted by our production editor Rene Schweitzer, as she dives into the life of *Model Railroader* contributing editor Pelle Søeborg and hears about his time working in the hobby.



Sketching with Steve

Looking to add staging but don't have the space for a full yard? Head on over to Trains.com to read the latest from *Sketching with Steve*. This time on the drawing board, Associate Editor Steven Otte is here to teach you all about the space-saving benefits of building a fiddle staging cassette. Follow along as Steven walks you through the construction process, offering helpful tips and tricks to ensure your layout's success.



Modeling from Postcards

Books, magazines, and maps are just a few examples of resources model railroaders turn to when researching a prototype. But have you ever considered using postcards as modeling references? In the first installment of his three-part series *Modeling from Postcards*, Group Technical Editor Cody Grivno presents two aerial views of his hometown, Crookston, Minn., and shares the types of information that can be gleaned from postcards.



Replacing turnouts

The *Milwaukee, Racine & Troy* is in need of a tuneup, and Senior Editor Eric White has come to its rescue. In this instructional product review video, join Eric trackside as he works on replacing some of the MR staff layout's decades-old turnouts with new ones from Walther's. To see more videos from our staff, become a Trains.com member for unlimited access to all the *Model Railroader* videos.



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Finding inspiration in unexpected places

A **freelanced layout** is a very tricky thing to get right. The railroad is a figment of the modeler's imagination but it still needs to look as though it plausibly could exist.

That's why many successful freelanced layouts are set in a real place at a specific point in history. Like any good work of fiction, it's the element of truth that makes it come to life.

Childhood memories of days spent watching trains in the Cincinnati area with his dad inspired George Campbell's freelanced HO scale Campbell Road, which is this month's cover feature.

Inspiration is the key word. That strong feeling of connection for a place or time will help keep you happily working on the railroad.

Based on the real-life railroads of Cincinnati in the 1950s, especially the Norfolk & Western Ry. and the Louisville & Nashville RR, the trains of the Campbell Road seem to be fit right in, as you'll see in the story starting on page 38.

George Campbell's trips with his dad provided him with a lifetime of inspiration. Many of us find early memories to be equally rich sources of modeling inspiration.

Everything about railroading was new and fascinating when we were young. After all, we had never seen anything like it before.

I sometimes think present-day railroading is not quite as good as it used to be. But is that really true – or am I no longer capable of seeing it with the clarity of a child?

Being a careful observer of the railroad and its surroundings paid off recently for long-



time contributor Mike Tylick.

As he explains in his story "Scratchbuild a timber cribbing loading dock" on page 51, a glimpse of a distinctive freight transfer loading dock seen in the course of a train ride resulted in an eye-catching project for his Marshfield & Old Colony On30 layout.

Inspiration is everywhere. We just need to pay attention.



Memories of Cincinnati's railroads provided plenty of ideas for George Campbell's freelanced HO scale layout. Lou Sassi photo

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Model railroading is fun!

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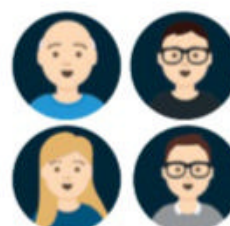
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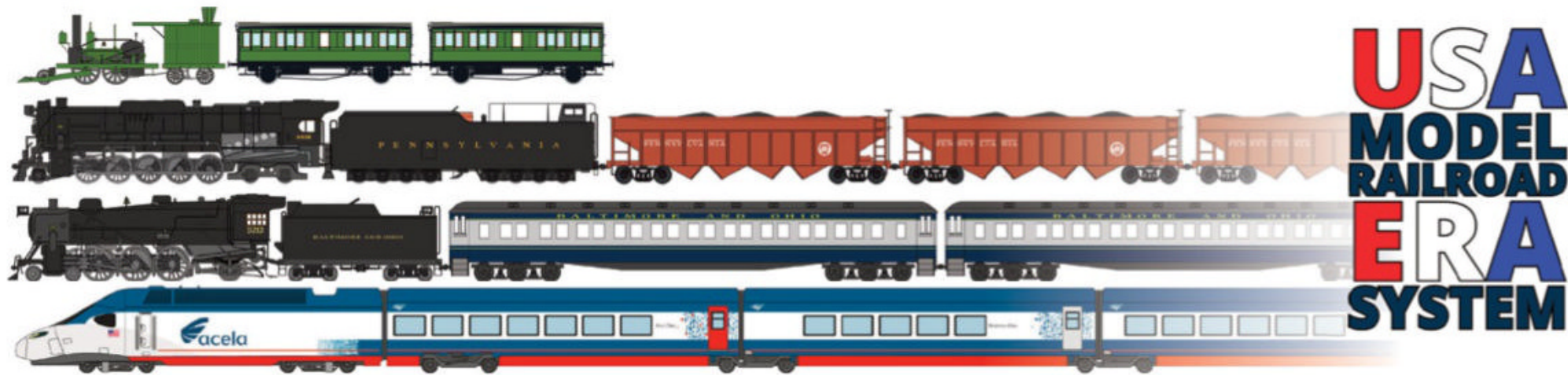
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Many thanks for the warm welcome you have given us. We have successfully negotiated hundreds of deals and we are ready for more. We apologize for the slight delay in processing some of your lists: we are now working on a **24-48 hour** response time to make you an offer.

Our era system has also a great response. Thank you for the applause and criticism, we understand this method of categorization is not to everyone’s liking. We are reviewing all your suggestions and hope to improve it further.

I hope you are well and I look forward to getting the opportunity to meet with you, if you are at any of the events I hope for Hattons to attend over the next year.

Richard Davies
CEO

Shouldn't America have its own Era System?
Please join us at hattonsmodelmoney.com/US-Eras and give us your thoughts and opinions.
We'd love your assistance in developing one!

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

Era	Date	Name	Steam	Alco	EMD	GE	Passenger
1	1827-1880	Old Time	American 4-4-0s				Open vestibule wood cars <60ft
2	1880-1916	Turn of the Century	Atlantics, Moguls, Consolidations, Camelbacks				Closed vestibule wood cars 80ft
3	1917-1928	Golden Age	USRA to Superpower and Modern Steam				Steel Clerestory/Early streamliners
4	1929-1949	Superpower	4-6-4s, 2-8-4s, 4-8-4s, 2-10-4s and 2-6-6-4s	Small switchers HH, S and DL series	NW Series/Streamline Trainsets/Early E Series		
5	1949-1960	Steam/Diesel Transition	Steam Decline	FA/PA/S Series Early RS Series	E/F/SW Series Early GP/SD Series	U Series launched	Rise of the post-war streamliner
6	1960-1972	1st Gen	End of steam	RS27-36/Century Series	SW1000/1500, GP20 to SD45	U Series	Decline of the post-war streamliner
7	1972-1979	2nd Gen			GP/MP15, GP/SD50, GP/SD60, Dash 2 Series	Dash 7	Amtrak Heritage/Amfleet
8	1980-1989	Eighties			GP50/60 SD50/60	Dash 8	Amtrak Superliners/Amfleet II
9	1990-2010	Nineties and noughties			SD70 Early AC traction	Dash 9, Early AC	Amtrak Viewliner/Superliner 2
10	2010 to Present	Current			SD70 ACe-T4	AC Series, GEVO	Avelia Liberty (Amtrak Acela II)

Thank you to **Mr H. Fuller, Mr R. Shirey, Mr J. Agneta** and many others for their help in progressing the eras we proposed in our previous advertisements.

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

N scale



Electro-Motive Division GP40 diesel locomotive. New paint schemes on this Atlas four-axle road locomotive include Montana Rail Link (one road number); Detroit, Toledo & Ironton (orange and black); Baltimore & Ohio (blue and yellow); Helm Leasing (red, white, and black, one number); and Richmond, Fredericksburg & Potomac (blue, gray, and white). The N scale Master Line model is offered in two

numbers per scheme unless noted; undecorated models (with and without dynamic brakes) are also available. The GP40 has light-emitting-diode headlights and Accumate couplers. Direct-current models are priced at **\$129.95** (undecorated, **\$114.95**). Versions with an ESU LokSound Digital Command Control decoder sell for **\$239.95** (undecorated, **\$224.95**). Atlas Model Railroad Co., 908-687-0880, atlasrr.com

Milwaukee's 2021 Trainfest cancelled

The Board of Directors of the Wisconsin Southeastern Division of the National Model Railroad Association announced via its Facebook page that Trainfest 2021 is cancelled.

"We really wanted to have Trainfest this year, however we think the risks are too great to hold the show," the Facebook announcement said.

The posting added the organization is facing cost and volunteer challenges with the event, and having the function this year could put future events at risk.

"We are at a point where we should start spending money to put on the 2021 show. Money we cannot recover if the show has to be cancelled. Such a loss would place the 2022 show at risk.

"It is too early to tell where the direction of the show will be 12 months from now."

This is the second year in a row the two-day show, held the second weekend in November, has been cancelled due to pandemic-related complications. For the latest information on Trainfest, visit trainfest.com.

H0 scale locomotives



• Electro-Motive Division GP40-2 and GP40-2L diesel locomotives.

GP40-2: Chessie System (with Chesapeake & Ohio reporting marks and Baltimore & Ohio marks with a CSX number in one number each, with B&O marks and CSX patchout in two numbers each), Chihuahua Pacific RR (gray and blue, one number), Ferromex (gray and red, two numbers), and Seaboard System (gray and yellow). GP40-2L: Canadian National (zebra stripes); Indiana Harbor

Belt (black and orange); and Toledo, Peoria & Western (RailAmerica scheme). Three numbers per scheme unless noted. Railroad-specific details and light-emitting-diode lighting. Direct-current model with 21-pin NEM connector, \$219.99; with dual-mode SoundTraxx Tsunami 2 sound decoder, \$309.99. May 2022. Genesis series. Athearn Trains, 800-338-4639, athearn.com



• Electro-Motive Division GP7 diesel locomotive.

New paint schemes:

Burlington Northern (green and black), Chicago & Eastern Illinois (black and orange), Conrail (blue and white with small or large lettering, one road number each), and Reading Co. (Pullman Green). New paint schemes: Florida East Coast (yellow and blue), Guilford Rail System (Springfield Terminal reporting marks, gray and orange), Maine Central (green and gold), Maryland & Pennsylvania (yellow and black, one road number), Missouri Pacific (black and orange with C&EI buzzsaw herald patch), Texas Mexican Ry. (green and orange), and Western Maryland (black and yellow). Two road numbers per scheme unless noted; also available undecorated (with and without dynamic

brakes). Directional light-emitting-diode headlights, Accumate knuckle couplers, and die-cast metal frame and sill. Direct-current model with factory-installed speaker, \$184.95; with dual-mode ESU LokSound decoder, \$294.95. Second quarter 2022. Atlas Classic line. Atlas Model Railroad Co., 908-687-0880, atlasrr.com



- **Milwaukee Road class S-3 steam locomotive.** As-built scheme in five road numbers and *Hiawatha* fantasy scheme (two versions, one number each). Also available painted black but unlettered. Dual-mode Paragon4 sound and control system; die-cast metal boiler, tender body, and chassis; and crew figures. \$599.99. Broadway Limited Imports, 386-673-8900, broadway-limited.com



- **General Electric ET44AH and ET44AC diesel locomotives.** ET44AH: CSX (dark blue and yellow with “boxcar” herald). ET44AC: Norfolk Southern (Thoroughbred scheme). Eight road numbers per scheme. Railroad-specific details, plastic handrails and stanchions, tinted side windows, and wire grab irons. With ESU LokPilot 5 Digital Command Control decoder, \$219.95; with ESU LokSound 5 DCC sound decoder, \$299.95. Intermountain Railway Co., 303-772-1901, intermountain-railway.com.

HO scale freight cars



- **Assorted freight car kits.** Clinchfield 50-foot boxcar with exterior posts, \$19.98. Canadian Pacific 36-foot Fowler boxcar, \$19.98. Erie Lackawanna American Car & Foundry two-bay Center Flow covered hopper, \$20.98. Rock Island 40-foot double-door boxcar,

HO scale



International Car Co.

cupola cabooses. Walther's offers these Mainline series models decorated for Great Northern (Vermillion Red), Norfolk & Western (dark blue), Boston & Maine (blue and black), Maine Central (yellow and green), Norfolk Southern (red), and Northern Pacific (brown) in two road numbers per scheme. The HO scale models (\$39.98) are offered in two cupola window styles and feature a Stanray overhanging diagonal-panel roof, see-through running boards, an underbody toolbox as appropriate, Barber Swingmaster roller-bearing trucks with 33" turned metal wheelsets, Proto-Max metal couplers, and molded drill starter points for grab irons. Wm. K. Walther's Inc., 414-527-0770, walther's.com

\$19.98. Union Pacific Pullman-Standard 4,750-cubic-foot capacity three-bay covered hopper (single car, \$21.98; three-pack, \$64.98). Injection-molded plastic kits with plastic wheelsets, trucks, and Accumate couplers. Accurail, 630-365-1173, accurail.com



- **40-foot boxcar with Superior door.** Boston & Maine (two-tone blue); Erie Lackawanna (Boxcar Red); Great Northern (dark green); Louisville & Nashville (blue); New York, New Haven & Hartford (orange); Rutland (yellow and green); and Southern Pacific (brown with Texas & New Orleans reporting marks). Three road numbers per scheme. Superior-style door, solid-bearing trucks with 33" metal wheels, and body-mounted McHenry scale couplers. \$34.99. May 2022. Ready-to-Roll. Athearn Trains, 800-338-4639, athearn.com



- **24- and 36-foot cabooses.** Kit includes stripwood decking, Tichy Train Group detail parts, and Conowingo RR decals but no trucks or couplers. 24-foot caboose, \$25; 36-foot caboose, \$30. Add \$5 for Kadee 148 couplers and Tichy Train Group archbar trucks. Conowingo Models, conowingomodels.com

- **Drop-bottom gondolas.** With steel sides: Denver & Rio Grande Western (black with white lettering), Great Northern (brown with white lettering), Southern Pacific (brown with white lettering), and Union Pacific (red with black interior and yellow lettering). Beet gondola (with board and plywood extensions): Southern Pacific (brown with

HO scale



General American Tank Car welded tank car. American Limited Models has released this car decorated for Northern Pacific (as delivered in four road numbers and “Assigned to Mtrl. Mgr. Interbay Wash.” stencil in three numbers); Spokane, Portland & Seattle (eight numbers); and Atchison, Topeka & Santa Fe with new lading bands (six numbers each): journal oil service (1970s lettering), reclaimed diesel fuel service (1970s lettering), solvent service (early lettering), diesel fuel service (early and 1970s lettering), and gasoline service (early lettering). The HO scale tank car, priced at **\$64.95**, features prototype-specific details and solid- or roller-bearing 70-ton trucks. American Limited Models, division of San Juan Model Co., sanjuanmodelco.com

white lettering). Wood-chip gondola (steel sides with board extensions): Spokane, Portland, & Seattle (brown with white lettering) and Western Pacific (black with yellow lettering and “Keep California Green” slogan). Solid-bearing trucks, body-mounted couplers, and 33" metal wheels. \$39.95. Inter Mountain Railway Co., 303-772-1901, intermountain-railway.com



• **Pullman-Standard 40-foot PS-1 boxcar.** Chicago, Indianapolis & Louisville (Monon, “The Hoosier Line” scheme). One road number. Separate, factory-applied grab irons, ladders, stirrup steps, and handrails; see-through running board and brake step; and Kadee couplers. \$41.95. Kadee, 541-826-3883, kadee.com



• **AutoFlood III coal hopper.** CIT Group (Indiana Rail Road with “2,000,000th carload” slogan [single car only] and red single rotary end), BNSF (orange-and-black with post-2005

herald; double [one road number] and single rotary ends painted Oxide Red), Carolina Power & Light Co. (PGNX reporting marks), General American Marks Co. (red rotary end, GATX lettering, and GGPX reporting marks), Gulf Power Co. (blue rotary end and reporting marks panel), Union Pacific (yellow rotary end, Union Pacific shield herald, and CMO reporting marks), and Western Resources Inc. (red rotary end and KPLX reporting marks). Separate, factory-installed grab irons; removable coal load; and die-cast metal frame and floor. Single hopper, \$59.95; six-pack, \$359.70. 2022 delivery. Rapido Trains, 905-474-3314, rapidotrains.com



• **Pullman-Standard 4,785-cubic-foot capacity three-bay covered hopper.** The Hubinger Co. (yellow and black with TLCX reporting marks), Boyll & Son Inc. (tan and black with TLDX reporting marks, two road numbers), Burlington Northern (1990s herald-over-three-lines paint scheme, five numbers), Conrail (gray, with “Conrail Quality” herald [one number] and without [three numbers]), CSX (NYC reporting marks with and without conspicuity stripes, six numbers), Monfort Feed Lots (tan and black with TLCX marks), Penn Central (Deepwater Green with PCB marks), and Staley (gray and black with TLCX

marks). Four numbers per scheme unless noted. Factory-applied metal grab irons, Barber S-2 100-ton trucks with rotating bearing caps, and see-through metal running boards. \$42.99. Rivet Counter line. ScaleTrains.com, 423-299-3689, scaletrains.com

HO scale details and accessories



• **Boxcar interiors.** For Atlas 60-foot single- and double-door auto parts boxcars and Athearn “blue box” 50-foot double-door Railbox boxcars. Laser cut cardstock kits. \$4.25 each; three-pack, \$11.95. The Electric Wallpaper Co., roometteslighting.com

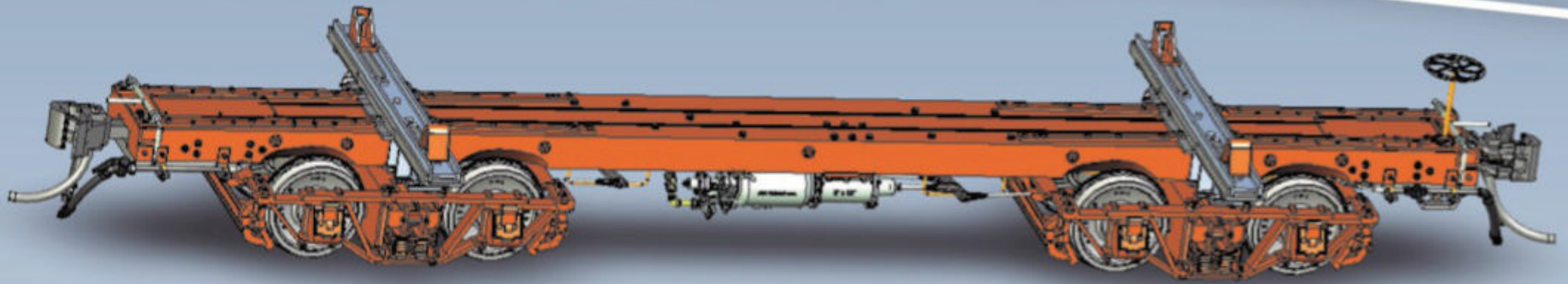
N scale locomotives

• **Electro-Motive Division GP38-2 diesel locomotive.** BNSF Ry. (Heritage I scheme), CSX (YN1 scheme), GATX Locomotive Group (blue and black), and Union Pacific (Armour Yellow and Harbor Mist Gray with Little Rock block lettering). One road number per scheme. Econami Sound Value dual-mode decoder, directional headlights with Rule 17 dimming, and E-Z Mate Mark II couplers. \$299. Bachmann Trains, 215-533-1600, bachmanntrains.com



• **Electro-Motive Division SD40-2 diesel locomotive.** BNSF Ry. (Heritage III scheme), BHP Iron Ore (bubbles scheme), Canadian Pacific (red with beaver herald scheme), CSX (YN2), Florida East Coast (*Champion* scheme), Milwaukee Road (billboard scheme), Missouri Pacific (“screaming eagle” scheme), and Union Pacific (Armour Yellow and Harbor Mist Gray with lighting stripe). Two road numbers per scheme; also available undecorated. ABS plastic body with die-cast metal chassis, dual-mode Paragon4 decoder featuring Rolling Thunder, and all-wheel electrical pickup (except for rubber traction tire). \$259.99. Broadway Limited Imports, 386-673-8900, broadway-limited.com

PRESS RELEASE



KR Models proudly announce that we will be producing a logging car to complement our model of **The Shay**.

Logging railways used three basic types of log cars, the disconnect, skeleton and the flatcar. Skeleton cars were the most common, basically consisting of a wooden reach between two freight car trucks. This arrangement allowed for the use of air brakes (unlike the disconnect), while maintaining its light weight and easy maintenance.

We will be producing **3 variants** each at **\$60.00**, which comes complete with logs. A single log or a three log configuration.



To register your interest in this model please go to

<https://www.krmodels.ca/products/expression-of-interest-ca>

We will announce further details as the project progresses.



HO scale

Patriot Lighting Supply. This factory-assembled and decorated low-relief structure is now available from Menards. Patriot Lighting Supply has more than 10 light-emitting diodes and a detailed loading dock. The HO scale structure (\$49.99) measures 6 1/8" x 5 1/4" x 1 1/2". The lighting requires a 4.5V power source, sold separately. Menards, menards.com/trains



- **Electro-Motive Diesel SD70ACe diesel locomotive.** Union Pacific (Chicago & North Western, Denver & Rio Grande Western, Missouri-Kansas-Texas, Missouri Pacific, and Southern Pacific heritage schemes and "Building America" scheme with cab headlight). One number each. Directional head-lights, illuminated ditch lights, and five-pole motor with dual brass flywheels. Direct-current model, \$135 to \$138; with Digitrax motor and light decoder, \$215 to \$218; and with Digital Command Control sound decoder, \$335 to \$338. Kato USA Inc., 847-781-9500, katousa.com

N scale freight cars



- **Thrall high-side gondola.** Wisconsin Electric (green and white); Burlington Northern (black and white); David J. Joseph Co. (black and red); Herzog (brown and red-and-white schemes); Lake Erie, Franklin & Clarion (black and yellow); and Ziegler Coal Co. (black and yellow). Ten road numbers per scheme (single car and three three-packs). Injection-molded plastic body, machined metal wheels, screw-mounted 100-ton roller-bearing trucks, body-mounted McHenry scale couplers, and removable load. Single car, \$34.99; three-pack, \$94.99. May 2022. Athearn N. Athearn Trains, 800-338-4639, athearn.com



- **Cryogenic refrigerator car.** Cryo-Trans (orange and white in five road numbers, ex-Lamb Weston in six numbers, and Cornerstone scheme), GATX Arcticar (white and blue), JR Simplot (white), and Lamb Weston (white and blue). Three numbers per scheme unless noted; also available undecorated. Body mounted couplers and improved brake wheel, crossover platform, and stirrup steps. \$34.95; undecorated, \$29.95. Second quarter 2022. Master Line. Atlas Model Railroad Co., 908-687-0880, atlasrr.com

- **52'-6" corrugated-side gondolas.** Atchison, Topeka & Santa Fe (two "Quality" schemes, three road numbers each); Burlington Northern (Cascade Green); Norfolk Southern (ex-Penn Central cars assigned to coil steel loading in various repaint schemes and ex-Missouri Pacific cars in various patch and repaint schemes), and Union Pacific (brown with white billboard lettering). Six numbers per scheme unless noted. \$33.95. Second quarter 2022. Trainworx, 970-874-9747, train-worx.com

N scale structures

- **Fire tower.** Photo-etched stainless steel kit with hip and flat roof options, see-through stairways with wood-textured platforms, scale 10 x 10 foot cabin with rivet and panel details, window visors, roof vent, radio antenna, and laser-cut base. Selectable height up to 100 scale feet. No soldering or special tools required. 2" x 2" base; up to 8" tall. \$69.95. The N Scale Architect, 607-746-8416, thenarch.com

N scale details and accessories



- **53-foot CIMC intermodal container.** J.B. Hunt Intermodal (white), CSX Intermodal (blue), HUB Group (green), Railpool (tan), and XPO (white). Two three-packs per scheme. Three-pack, \$44.99. May 2022. Athearn Trains, 800-338-4639, athearn.com

Large scale locomotives



- **Denver & Rio Grande Western 2-6-0 Mini Mogul steam locomotive.** 5-pole can-type ball-bearing motor, hook-and-loop couplers, and engineer figure. Direct-current model. Analog and digital sound and smoke units available separately. \$369.99. PIKO America, 619-280-2800, piko-america.com

Z scale locomotives



- **Electro-Motive Division E7A and E7B diesel locomotives.** Seaboard Air Line. Two A-B sets. Direct-current model with 7mm motor, dual flywheels, metal steps, light-emitting-diode lighting, and optional front truck with mounted coupler. American Z Line, 614-764-1703, americanzline.com

Books

- **Plymouth Locomotives Vol. 1.** Reprints of ads and brochures for Plymouth Locomotive Works. Includes Plymouth Mine-O-Motives, Plymouth Torqomotive, Plymouth bulletins, and MDT four- and six-wheel locomotives. Softcover, 86 pages. \$35. Manufacturers' Catalog Archive series. SilverLake Images LLC and Ron's Books, 914-967-7541, ronsbooks.com 

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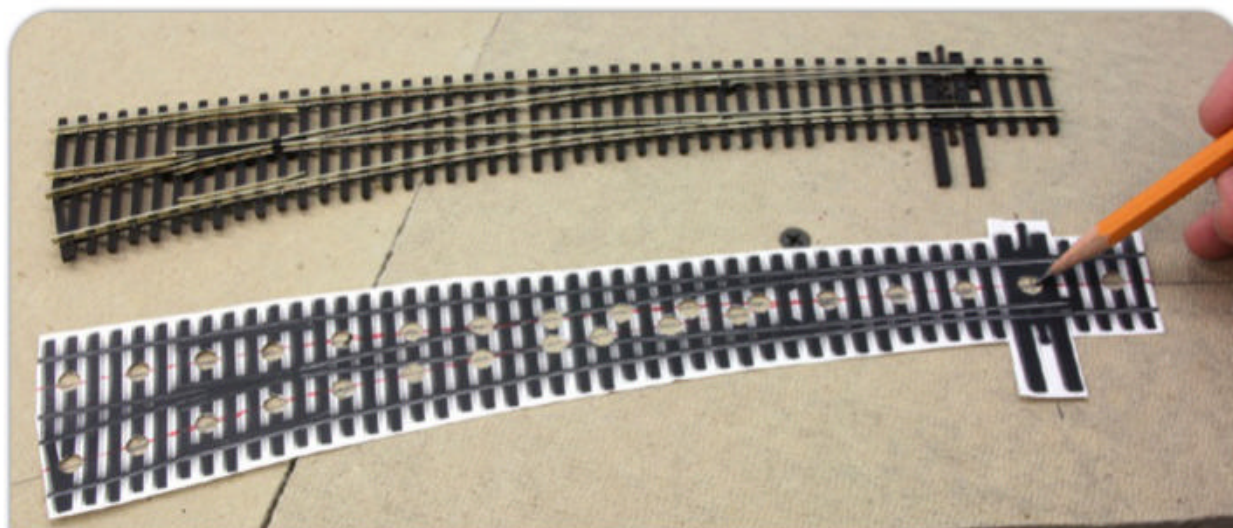
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In the March 2011 "Workshop Tips," modeler David Durr explained how he used photocopies of track components like this curved turnout to help in both track planning and track laying. David Durr photo

How do I use paper turnout templates?

Q I'm looking to get back into model railroading and I'm having a hard time deciding on a layout. I've confused myself by looking at hundreds of plans, drawing possible layouts and trying design software. I would like to be able to use paper track templates, but I can't find too much info on them. Could you give me some direction?

Warren Peterson, Kansas City, Mo.

A You definitely want to know whether what you've designed on paper or with track planning software will work in your space. Using paper track templates is a great way to check complex track arrangements before spending a lot of money on turnouts. Buy one of each type of turnout you plan to use, make full-size photocopies of them, cut them out, and tape them together to test things like yard ladders, crossovers, and industrial spurs on your benchwork. If you think you'll have to shorten a turnout to make a particular track arrangement work, trying first on paper is a lot cheaper than finding out you can't make it work only after you've already cut up a real turnout. Some copiers may have an option to flip an image, making right-hand templates from left-hand turnouts and vice-versa.

In his contribution to senior editor Jim Hediger's "Workshop Tips" column in our March 2011 issue, modeler Dave Durr shared some ways he makes his templates even more useful. By adhering them to thin cardboard or styrene backings, he makes them more durable so they'll last longer. He also uses a paper punch to punch a row of holes down the centerlines of the turnouts, which allows him to mark the track centerlines on the benchwork with a pencil or marker. Writing the manufacturer's name and model number of each track component on the back of the templates will help you buy the parts you need when you're ready to build.

Now if what you were talking about is a drawing template – those thin plastic cards with slots and holes in the shape of track components – I use those to draw track plans myself. I'm planning an upcoming edition of my recurring Trains.com department, "Sketching with Steve," on how to use one. Keep an eye out for it in coming months.

on each. When a train reaches the station on the inner loop, it would trip an occupancy detector (either optical or electrical) that would trigger a relay that would turn off the voltage to that track and turn it on for the outer loop. The polarity of the rails on the outer loop would be reversed from the inner loop, so a train on the outer loop would travel in the other direction. When that train gets to the station, another detector would trigger the relay to switch power back to the inner loop.

It would be not much more complicated to have both trains running back and forth on a pair of stub-ended tracks. Both trains should be double-ended, such as a trolley or a commuter train, so they wouldn't look odd running backward. There are commercial DC auto-reversing modules that could handle switching polarity to keep the trains bouncing back and forth. Just make sure you don't accidentally purchase a Digital Command Control auto-reverser circuit, which is an entirely different thing.

The most complicated arrangement would be to have two trains going back and forth on a stub-ended single track. You would need at least two tracks at your two stations, and you would have to set up detectors and relays to cut power to one station track when the train arrives, line a turnout to the track where the second train sits, turn on power to that track, then do the reverse when it arrives at the second station. Power routing turnouts could simplify wiring for this option; all your occupancy detector would have to do is line the turnouts and reverse the track polarity. A switch motor with internal accessory contacts, like a Tortoise by Circuitron, could handle both tasks.

Q I was on hiatus for 20 years and am getting back to doing things, little by little. I had plans to go DCC and still wish to go that route. I have engines from the pre-"plug and play" era and am wondering who out there offers frame milling services?

Lionel Colon, Joshua Creek, Wis.

A I'm afraid nobody we know of does that kind of work any more. Since locomotives have been sold with built-in space for decoders for a decade or more,

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

Q Next Christmas I'd like to build a small automatic direct-current layout to put in my wife's shop window. How is it possible to make sure that when a train arrives at the station and stops, a switch is triggered, and another train departs in the opposite direction?

Ferruccio Felletti, Italy

A First, I would need to clarify how your tracks would be arranged and how you want your trains to run, because the answer of how to wire and control those trains depends on those factors. If you want trains to run in both directions, the simplest arrangement would be to have two separate loops of track with a train

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the demand for milling frames has dropped. You can probably get a local machine shop to do the milling for you, but it might not be practical price-wise compared to the price of a DCC-ready locomotive. Check out the websites of decoder manufacturers; decoders are getting smaller all the time, and you might find one that will fit in your locomotives with little to no milling.

Q Regarding Joe Mizell's question about the placement of a passenger car in a mixed train [February 2020 – Ed.], one thing that affected the car's placement – at least in the winter – was how it was heated. Older passenger cars with their own coal- or oil-burning stove could go on the end of the train. A car with steam heating would need to be behind the engine, so it could get steam from the steam engine (or a diesel's steam generator) for heating.

William Stixrud, Cottage Grove, Minn.

A Good point. Since mixed trains were on the bottom of the passenger-service

food chain, so to speak, the cars used would most likely be the oldest the railroad owned. So the chance of a passenger car in mixed-train service having its own stove was probably fairly high. If the car you're using doesn't have a smoke-jack on the roof, place it on the head end in cold weather.

Q The axles stick in the journal boxes of some of my rolling stock. I tried scraping them out and lubricating them. Any help would be appreciated.

Christopher Kramer, Chicago

A Depending on what tool you're using, scraping them out might be making the bearing surfaces rougher, worsening your problem. And lubricating axle bearing points should never be necessary. Ideally, model train axles bear on points that rest in cone-shaped depressions in the truck sideframes. The contact area between the axles and the sideframes is so small that lubrication can only serve to gum up the works (literally). Get your hands on a truck tuner, a



A truck tuner is used to clean out, reshape, and smooth the axle sockets on a truck that might be too tight or rough, resulting in slow-rolling wheels.

Jim Forbes photo

double-ended reamer specifically sized to clean out and smooth the inside of the axle wells so the axles bear on their points again. And if you still feel you must add lubrication to your trucks, use a non-conductive powdered lubricant based on silicone, moly, or Teflon. Don't use graphite, as it conducts electricity



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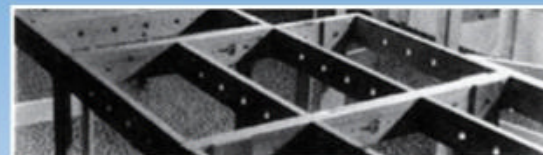
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and can cause all kinds of havoc if it gets into your locomotive motors.

Q Could you help me with a plan for an N scale trestle that will suit the one depicted in the Coalton & Silver Range track plan you published in March 2016? I've tried to conceptualize the trestle from the diagram, but I can't make it work in three dimensions.

Andrew Scott, Turramurra, NSW

A I designed that track plan, and I didn't do so with a particular trestle model in mind. A bridge like that would have to be scratchbuilt to fit the terrain and the track arrangements. Because of the angles at which the tracks cross, you may have to omit one or two trestle bents to clear the pair of lower tracks, replacing them with a wood box truss to span the gap between bents. For guidance on how to build such a trestle, I suggest you get a copy of our book *Model Railroad Bridges and Trestles Vol. 2*, available from the Kalmbach Hobby Store (Kalmbach-HobbyStore.com). **MR**

Reader Tip

Recent scratchbuilding efforts

prompted me to come up with a simple glue applicator that would put a small amount of adhesive precisely where I wanted it. I took a sewing needle, measured its diameter, and drilled a slightly smaller hole in the end of a 1/4" dowel. I inserted the point of the needle into the hole until it was secure. I then used my hard wire cutting pliers to cut off the end of the eye. [Wear eye protection for this step! – Ed.] This left a fork that will hold a small amount of glue or solvent until it touches the surface to be glued. Capillary action pulls the glue or solvent onto the surface where I want it. I have now made many different sized glue and solvent applicators from one package of assorted needles and one 36" long dowel. – *David Varholy, Mystic, Conn.*



David Varholy cut off the ends of the eyes of three sewing needles and inserted them into dowels to make precision applicators. David Varholy photo

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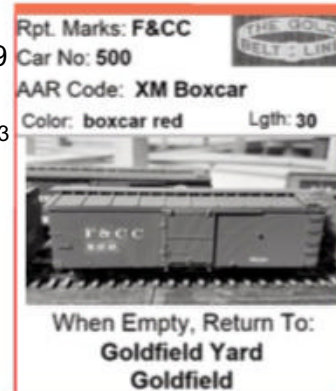
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Detail a diesel on a budget

A dedicated switcher was one of the items we wanted for the Jones Island section of our HO scale Milwaukee, Racine & Troy. Fortunately, we recently received an Electro-Motive Division GP38-2 from our friends at Atlas Model Railroad Co. that would look right at home working the industries on the harbor section of our model railroad.

The model, decorated for GATX Locomotive Group, is a fine model straight from the box. The four-axle road unit is part of the company's budget-friendly Trainman line. The locomotive features drill starter points for the grab irons, nubs where eyebolts would be located on top of the long hood, and molded details to simulate where the m.u. hoses and uncoupling levers would be on the pilots. The air horn and snowplow are separate, factory-applied parts.

When I had the model in the workshop, David Popp stopped by to take a look at the locomotive. Then I asked him, "What would you think if I gave this model a \$50 facelift?" I explained to David the details I would add if I had to follow a \$50 budget. [We didn't include paint as part of the budget. Brand preferences and color choices will vary between modelers, and some hobbyists may already have the correct paints on hand. – Ed.]

The images above show the locomotive before and after I added the details. Don't be fooled by the short materials list at right. My goal wasn't to wow visitors and operators with the quantity of parts I could add to a locomotive. Instead, I wanted to show how just a few key details can turn a budget-line model into a standout.

Cody Grivno shares how he detailed this HO scale Atlas Trainman series Electro-Motive Division GP38-2 diesel locomotive. The inset photo shows how the model looked straight from the box.

Materials list

Cal-Scale

190-528 Atlas Trainman GP38-2 detail kit (\$17.99)

190-564 Nathan P5 air horn (\$3.75)

CMR Products

416-2102 Norfolk Southern ditch lights (\$5.50)

Detail Associates

2217 curved fan grab iron (\$1.50)

101803 Sinclair antenna (\$2)

Kadee Quality Products Co.

119 Type SE shelf couplers (\$4.99)

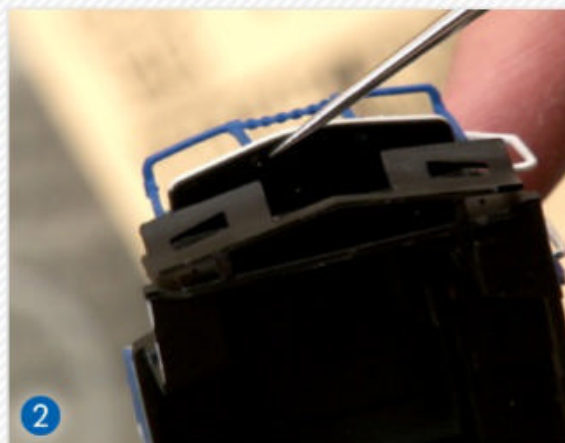
Shapeways (NS Proto Details)

Dayton-Phoenix cab-mounted air conditioner (\$12.60)

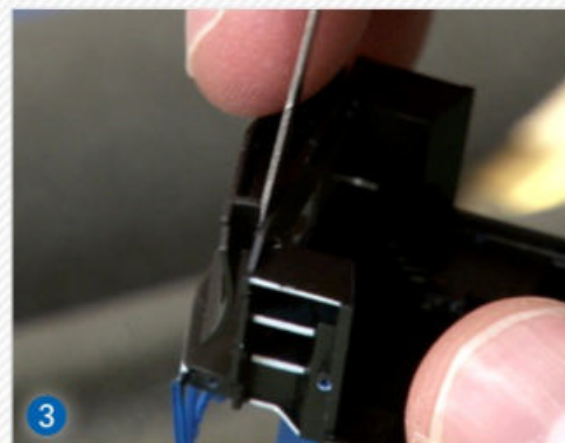
STEP 1 DISASSEMBLY



Before detailing the model, I separated the shell from the chassis. To do that, I unscrewed the front and rear draft gear boxes. After loosening the screws, I used a five-prong pen-style gripper to lift them out. Then I was able to slide the front and rear boxes out of the way and lift the shell off ①.



Next, I removed the handrails from the front and rear pilot, as well as the handrails that run from the engineer's side of the cab to the stepwell. The side and rear handrails were press-fit and came out easily. The middle two stanchions on the front handrails were attached with glue, requiring a chisel blade, small probe,



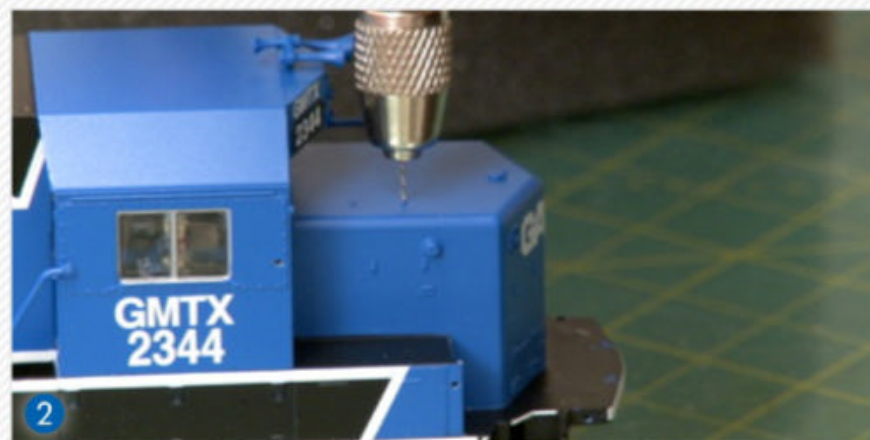
and pin vise with small bits to break the glue joints ②.

Finally, I removed the snowplow from the front pilot. It, too, was attached with glue and proved difficult to remove. I turned to the same tools I used on the front handrails to break the glue joints holding the plow to the pilot ③.

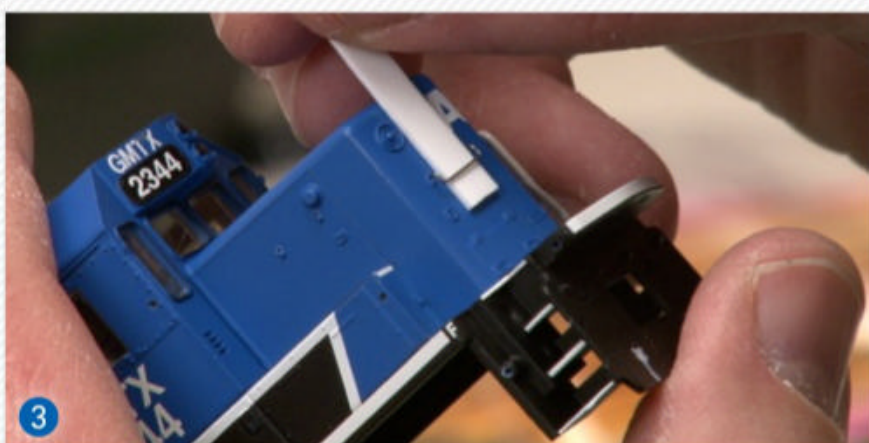
STEP 2 GRAB IRONS



①



②



③

The bulk of the parts for this project are found in Cal-Scale kit no. 190-528. The kit includes formed wire grab irons, eyebolts, and uncoupling levers; etched-brass windshield wipers; and cast metal m.u. clusters ①.

The first details I added were the grab irons. The shell has drill starter points on the nose and rear of the long hood for these parts. I used a

no. 80 bit in a pin vise to drill the holes ②. Let the bit do the work. If you press too hard, the bit may break.

I positioned the legs of the grab irons into the holes with a pair of non-magnetic tweezers. Then I used a piece of .030" x .156" styrene strip as a spacer so the grab irons would stand off the model at the correct distance ③.



④

While holding the grab iron and styrene spacer, I applied medium-viscosity cyanoacrylate adhesive (CA) with a Microbrush from inside the shell ④. Don't dip the legs in the glue and apply the grabs from the front. If you miss the holes, you'll wind up with glue streaks on the factory paint. I've learned this lesson the hard way in the past.

STEP 3 LONG HOOD DETAILS



Next, I turned my attention to the eyebolts. There aren't drill-starter points for these parts. Instead, they're represented by raised nubs. I started by removing the nubs with a pair of tweezer-style sprue cutters ①.

I then used a punch to put a small indentation in the center of where each nub had been ②. These served as drill-starter points for the eyebolts and helped prevent my drill bit from wandering off course. A pushpin could be used instead.

After I'd marked the center of each eyebolt location, I used a no. 80 bit in

a pin vise to drill through the plastic. Try to hold the pin vise as vertical as possible when drilling the holes ③.

Unlike the grab irons, I dipped the leg of each eyebolt in CA prior to installation. I used a pair of serrated-jaw tweezers to gently hold the eyebolts as I installed them ④. The formed-wire parts have a tendency to slip out of smooth-jaw tweezers and fly across the workbench. Don't ask me how I know this.

Bowser includes a straight grab iron that you have to bend before installing it behind the rear-most

radiator fan. After unsuccessful attempts at bending the part to a smooth radius, I gave up and used a Detail Associates fan grab – curved (no. 2217). The factory-bent grab worked well on the first try ⑤.

I finished up the long hood details by drilling a hole for the Cal-Scale Nathan P5 air horn (no. 190-564). After using a center punch to make a drill-starter point, I used a no. 65 bit in a pin vise to drill the hole. The horn didn't quite fit in the opening, so I enlarged the hole slightly with a reamer, a tapered cutting tool ⑥.

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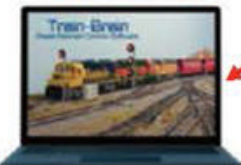
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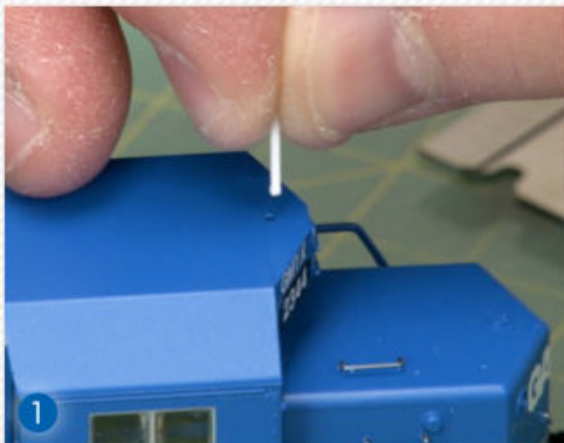
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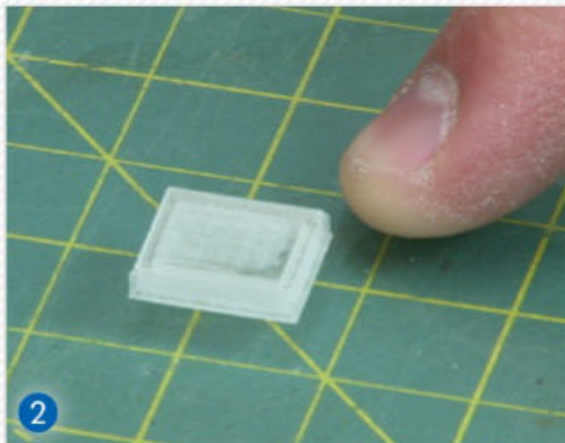
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STEP 4 CAB ROOF



I then shifted my focus to the cab. First, I plugged the hole where the factory-installed air horn had been with a piece of .030" x .030" styrene strip dipped in CA ①. After the adhesive cured, I trimmed the styrene flush with the roof using sprue cutters.

The Dayton-Phoenix air conditioner is a 3-D printed part I found on



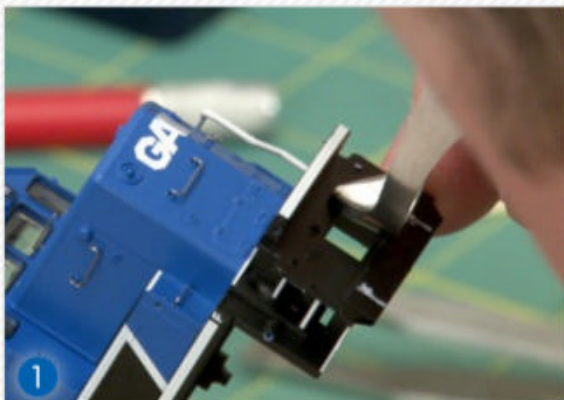
Shapeways. It was printed with smoothest fine detail plastic. Per instructions on the Shapeways site, I soaked the part in warm water with dish soap added for two hours. Then I scrubbed the part with a toothbrush and waited for it to turn white ②.

On the full-size unit there's a Sinclair antenna on the brakeman's



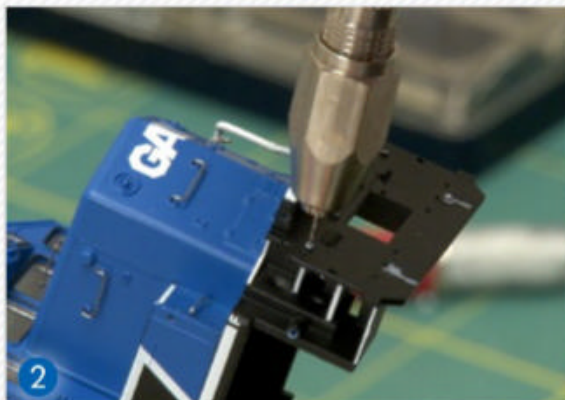
side of the cab. I used Detail Associates part no. 101803, a cast-brass part, to add this detail. After using a center punch to make a drill starter point, I used a no. 74 bit to drill the hole. The mounting pin on the casting has a slight taper, so you may need to use a reamer to get the part to seat properly ③.

STEP 5 PILOTS



I started work on the pilots by removing the raised nubs in the middle of the uncoupling lever brackets with sprue cutters. I preserved the rivet detail on each side of the nub, as those served as alignment guides for the center punch ①.

I used a no. 80 bit in a pin vise to drill the holes for the eyebolts, which are used as brackets for the uncoupling levers. You may need to extend the bit slightly when drilling the holes



under the anticlimber on the front pilot ②.

The pilots have molded brackets to indicate where the m.u. hoses should be positioned. In a fortunate turn of events, the mounting pins for the brass m.u. clusters fit on neatly on either side of the brackets. I aligned my center punch on the bracket and made drill starter points ③.

Then I put a no. 65 bit in a pin vise and drilled the holes for the brass

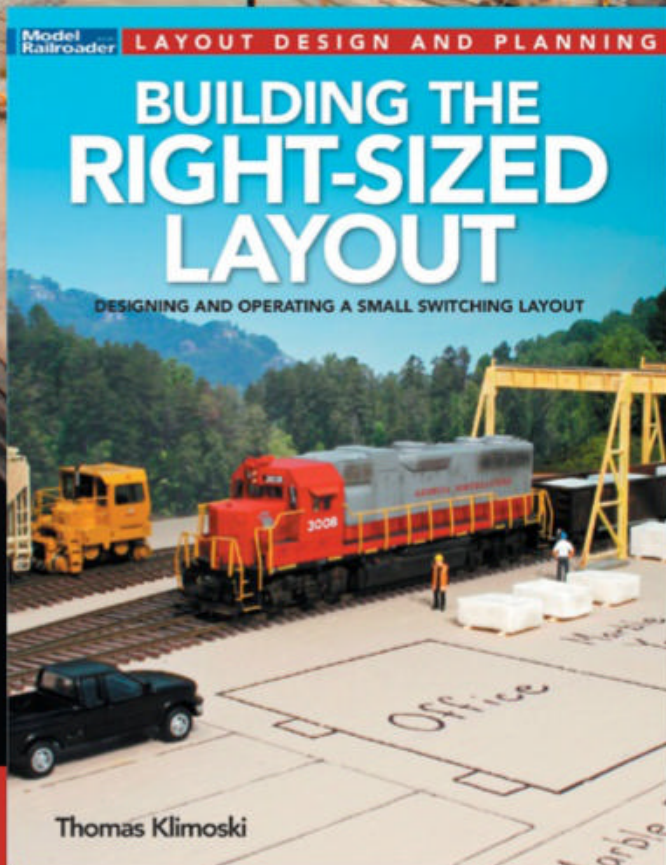


castings. After I drilled the holes, I used a micro chisel to remove the raised details ④. The castings will cover most of the bare plastic. Any other spots can be touched up with a Microbrush and flat black paint.

I installed four eyebolts, two on each side of the bump-out where the locking pin would be located, on the uncoupling levers ⑤. To secure the eyebolts to the pilots, I again turned to medium viscosity CA.



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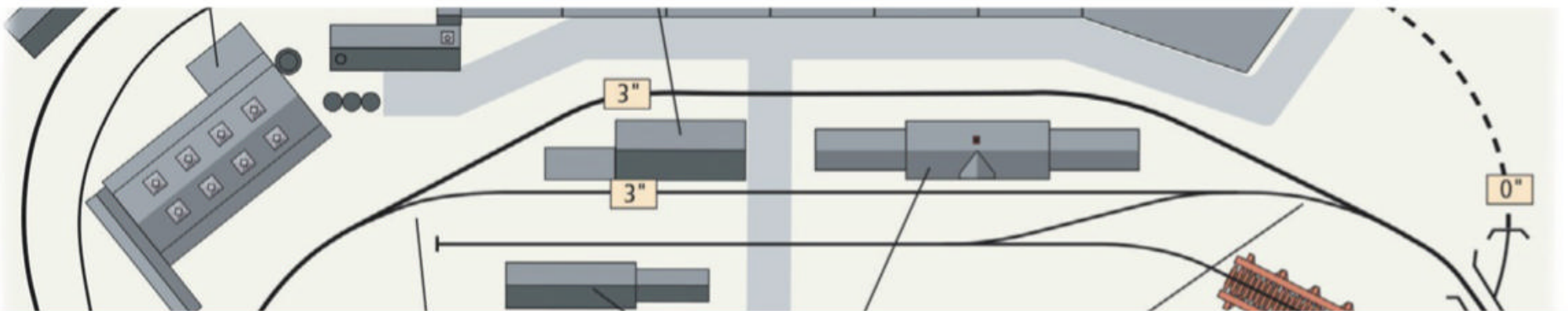
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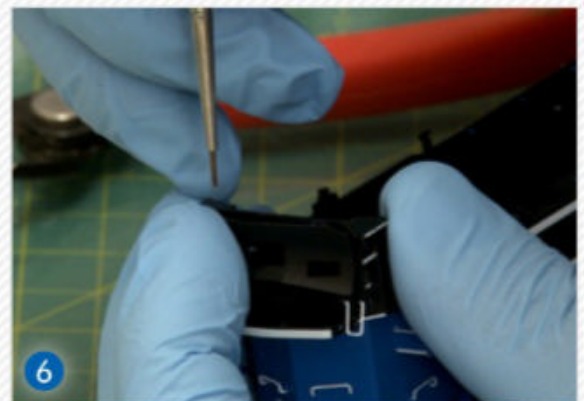
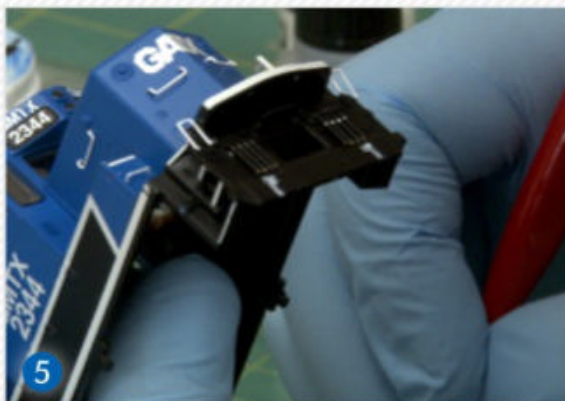
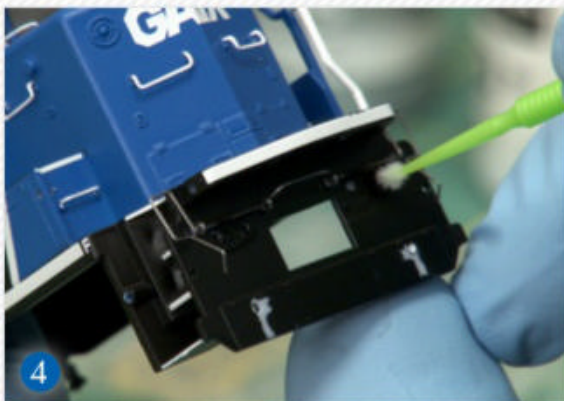
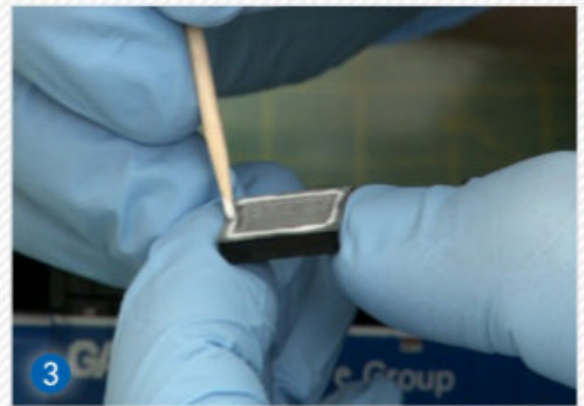
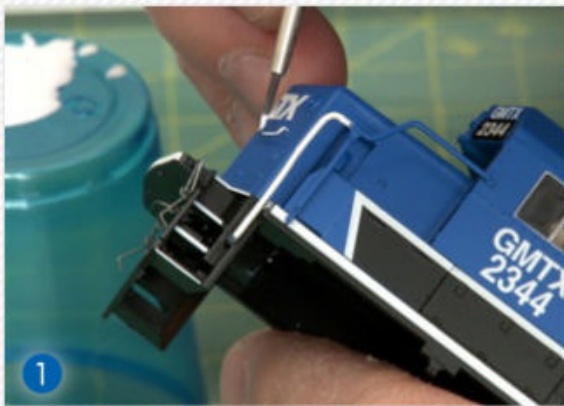


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STEP 6 PAINTING THE PARTS



With the project on the home stretch, I started brush-painting the formed wire parts. I used Vallejo Model Color White (no. 70.951) on the grab irons, Black (no. 70.950) on the eyebolts, and both colors on the uncoupling levers ①. I selected Royal Blue (70.809) for the antenna.

I primed the m.u. clusters, air horn, and air conditioner with Tamiya Light Gray Fine Surface Primer. Then I sprayed the parts with the same company's Flat Black (TS-6). Once dry, I began attaching the parts ②.

Then I installed the 3-D printed air conditioner. I removed the two mounting pins from the bottom and touched up any rough spots with a sanding stick. I used canopy glue to secure the part to the cab ③.

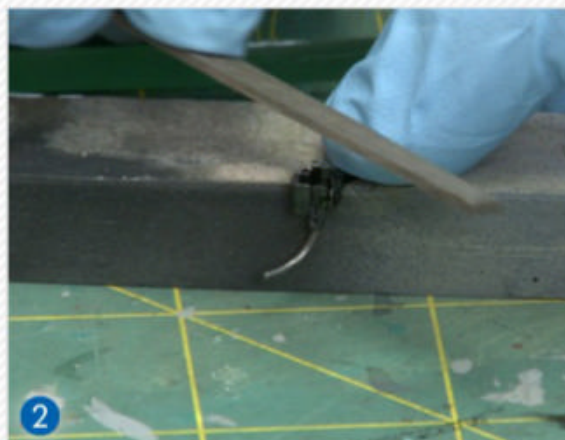
I then revisited the pilots. I used a Microbrush and Vallejo Black to touch up the areas where I'd removed the molded details ④.

Before installing the m.u. clusters, I painted the glad hands Vallejo Model Air Aluminum (no. 71.062). It turns out the m.u. hoses on the front

pilot interfered with the plastic plow. In order for the part to seat properly, I needed to trim the hoses. To add interest to the visible portion of the hoses, I painted the raised fittings Aluminum ⑤. The m.u. clusters for the rear pilot weren't modified.

Finally, I reattached the plow. One of the two mounting pins remained intact, so I applied glue to it and the hole in the pilot. On the other side, I used a paintbrush to apply glue where the back of the plow contacted the face of the pilot ⑥.

STEP 7 COUPLERS



The full-size locomotive has Type E lower-shelf couplers. Kadee doesn't offer these in HO scale, but it does have a Type SE double-shelf coupler that's easy to modify. First, I used a pair of cutters to remove the upper shelf ①.

Though the cutter removed most of the upper shelf, I needed to use a jeweler's file to smooth a few rough spots. I braced the coupler against a strip of wood when filing ②.

I finished the couplers by spray-painting them with Tamiya NATO

Brown (no. TS-62). [Do all painting in a well-ventilated area and wear appropriate personal protective equipment. – Ed.] I built up the color in light layers to avoid gumming up the springs. Then I brush-painted the trip pin to look like an air hose ③.



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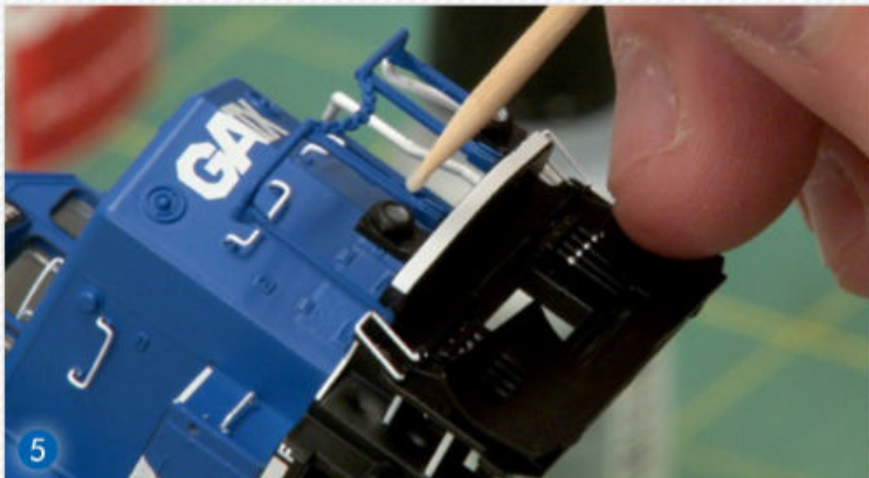
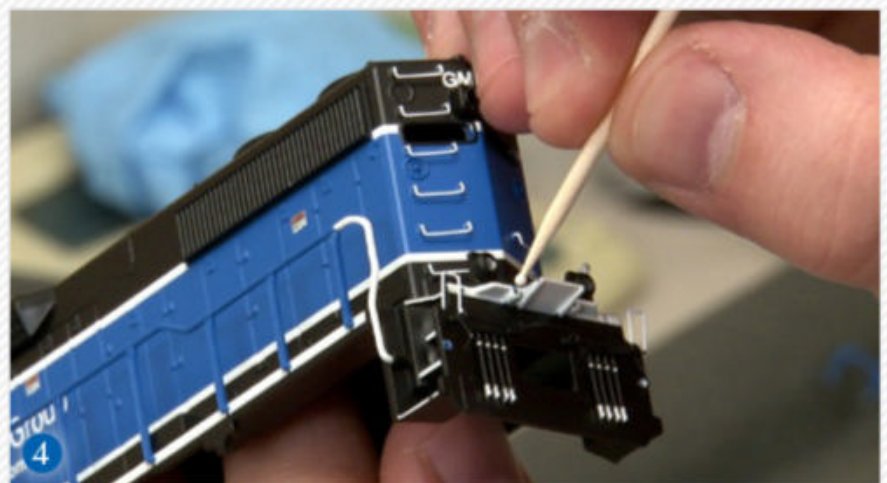
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STEP 8 DITCH LIGHTS AND FINAL ASSEMBLY



The **prototype engine** started life as a Norfolk Southern unit and had the railroad's deck-mounted ditch lights with a tapered base. CMR Products offers this detail as a 3-D printed part, no. 416-2102. After separating the parts from the frets, I did some touch-up sanding. I primed and painted the ditch lights with the Tamiya colors I used earlier **1**.

I didn't have lenses or jewels that would fit the openings, and adding light-emitting diodes or bulbs would push me over the \$50 budget. Instead, I painted the inside of each light casting Aluminum using a Microbrush **2**. Some touch-up work with black paint may be necessary on the front of the lights.

Similar to the air conditioner, I used canopy glue to attach the 3-D printed ditch lights. I used a strip of styrene to keep the parts in alignment as I positioned them **3**.

Next, I reinstalled the front and rear handrails and stanchions. Though the stanchions have pins that are friction fit, I added a dot of canopy glue to each hole to make sure the parts wouldn't wiggle loose over time **4**.

I used Testor's Clear Parts Cement and Window Maker to simulate the ditch light lenses. First, I picked up a dot of glue with a toothpick. Then I carefully stretched the glue across the opening. Once I'd formed a "lens," I gently removed the

toothpick and let the glue turn clear **5**. The window maker is water based, so if you make a mistake, it's easy to clean up and try again.

I wrapped up the \$50 facelift project by putting the shell on the chassis, reinstalling the fuel tank, placing the new couplers in the draft gear boxes, and securing the boxes with screws **6**. I'll save the weathering for another day.

The Atlas Trainman GP38-2 served as a great starting point for our project. With some simple additions like grab irons, lift rings, and a 3-D printed rooftop air conditioner, I was able to make the four-axle road switcher look even more like the prototype. **MR**



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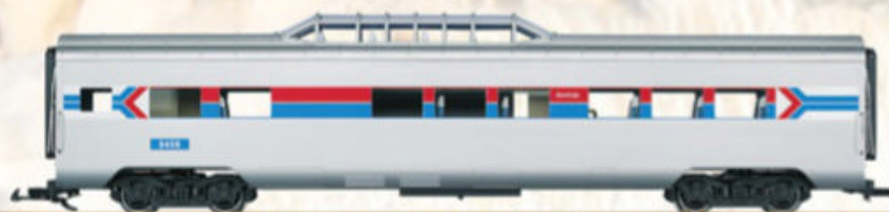
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CUSTOM COLORS for static grass

Are off-the-shelf options not working for you? Try dyeing fibers

By Lance Mindheim

The importance of a model railroad scenic feature can often be measured by the layout surface area it covers. By that standard, grass falls at the top of the list. Given its importance, it generally doesn't get the attention it deserves, often getting a passing "sprinkle and go" treatment at best.

In the past decade there's been a welcome influx of high-quality static grass products to work with. Applying the fiber-based products is a vast improvement over the previously used gold standard of ground foam.

As great as the new products are, they're all either in a shade of green or, in a few cases, a uniform blonde. The commonly found dead grass earth tones of dirty brown, muddy brown, nutmeg, or a combination of the above aren't available ①, opposite.

However, you can use commercial static grass as the starting point for

creating an endless variety of colors. Envisioning a long, complicated, and chemical-intensive process, the do-it-yourself approach to dyeing earth-toned grass was something I'd been putting off for years. However, once I got into it, I discovered the process is actually quite simple and inexpensive.

Fibers and dyes

A friend of mine referred me to a few how-to videos on YouTube that explained how to dye static grass fibers. Although the videos dealt with the more common green hues, experimentation on my part showed the process worked.

As I began experimenting, I quickly found that not all brands of fibers react the same to the dyeing process. Some accepted the dyes well, others not at all. Even within the same manufacturer I found differences. After much trial and error, I got the best results with

Woodland Scenics 4mm and 7mm straw static grass (nos. FS620 and FS624, respectively). I tried the firm's 2mm fibers with less successful results.

I used Jacquard's Procion MX line of dyes to color the fibers. These are inexpensive and easily obtained through Dick Blick or a well-stocked art supply store ②. The dyes are much different than working with paints. First, they're powerful – a little pinch goes a long way.

Second, the color of the dry powder in the bottle isn't representative of what the final color will be.

Finally, creating common brown is incredibly tricky. Procion's Chocolate Brown has a reddish/pinkish cast to it. An e-mail to Jacquard's tech support provided the remedy. To neutralize red you need to mix in the opposite of the color spectrum, in this case green. However, the reddish cast was so strong I had to add an enormous amount of a green to get a neutral brown.



Earth-toned grass is one of the most common scenic features found along the railroad right-of-way. Lance Mindheim shares how he dyed static grass fibers to get colors not offered commercially.



1 Earth tones on the right-of-way. This image taken along the Baltimore & Ohio's Georgetown Branch illustrates the abundance of dead grass earth tones found along a typical railroad right-of-way.

Through experimentation I finally got a hue that worked. For our purposes we'll call it Make Your Own Brown, or MYOB **3**. I created the color by mixing two parts Procion MX Chocolate Brown (no. 119) and three parts Procion MX Olive Green (no. 105). You'll need a fair amount of MYOB, so mix it up, put it in a plastic container, and label it.

The only other color I used was Procion MX Neutral Grey (no. 211), which is very forgiving to work with **4**.

The dyeing technique

The technique in the YouTube video I watched was simple but effective. I found it's much easier to keep track of



2 What you'll need. The supplies you'll need to dye your own static grass include a cooking thermometer, measuring spoons, non-iodized salt, Synthrapol liquid detergent, Jacquard Procion MX dyes, Woodland Scenics 4mm and 7mm straw static grass (nos. FS620 and FS624, respectively), and soda ash. The Synthrapol, dyes, and soda ash can be found at Dick Blick or well-stocked art supply stores.



3 Custom colors. Lance discovered that using a straight mix of Procion's Chocolate Brown results in a noticeable pinkish-red cast. He achieved a more realistic brown by mixing 3 parts Olive Green to 2 parts brown. He calls this color Make Your Own Brown, or MYOB for short.



4 Additional dyes. Lance recommends adding Neutral Gray (no. 211), Olive Green (no. 105), and Chocolate Brown (no. 119) to your stash of Jacquard Procion MX dyes. He reports the Neutral Gray is quite forgiving.



5 Recipe for success. After heating three cups of water in a pan to 105 degrees Fahrenheit, Lance mixed in three tablespoons of non-iodized salt and stirred in the dye. Then he added Woodland Scenics static grass to the mixture and let it soak for 20 minutes. Finally, he added a ½ tablespoon of soda ash and let everything soak for an additional 20 minutes.



6 A quick rinse. Lance poured the dyed fibers into a strainer and rinsed them back and forth into a pan until the water ran clear. He added a drop of Synthrapol, a pH neutral liquid detergent designed for dyed and painted fabrics, to aid the rinsing process. The detergent is available in three different sizes.



7 Classic stains. Lance further varied the appearance of his dyed fibers by soaking them in India ink mixes. He added ¼, 1, and 2 teaspoons of ink to 1 pint of 70 percent isopropyl alcohol. The numbers indicate how much ink was added to each bottle.

the proportions if you pick a standard and stick with it. Here's my formula:

- 3 cups of water
- 3 tablespoons of non-iodized salt
- ½ tablespoon of soda ash
- 20 grams (give or take) of static grass. This is roughly one ounce (half a bag) of the Woodland Scenics straw colored static grass.

- ⅛ to ½ teaspoon of dye depending on how dark you want the colors. It's important to use exact, level teaspoon measurements.

The dyeing process, **5**, is simple. Here's what to do:

- Put the 3 cups of water in a pan on your stove and mix in 3 tablespoons of the non-iodized salt until the salt is dissolved.
- Heat the water to roughly 105 degrees Fahrenheit.



8 Soaking it in. Lance poured some of the India ink wash into a plastic container similar to those used for yogurt and added the static grass. After letting the fibers soak for several hours, he poured off the alcohol and let the static grass dry.

- Add the dye and stir until it is dissolved.
- Mix in the static grass and stir.
- Let the grass soak for approximately 20 minutes.
- Add in ½ tablespoon of soda ash and let it soak for another 20 minutes.

Rinsing and drying

Once the dyeing process is finished, you'll need to rinse and dry the fibers. Pour the water, dye, and fibers through a strainer and rinse it back and forth into a pan until the water runs clear **6**. Add a drop of Synthrapol, a liquid detergent, to aid the process. Squeeze any excess water out of the clump of dyed static grass fibers by balling it up in your hand. Then place the static grass in an old pillow case, knot the top, and run it

through the dryer. Then put the dry fibers in a container and label it.

India ink and alcohol "bath"

Although I made liberal use of the colors I'd come up with to this point as is, in some cases they looked a too uniform. A little experimentation revealed that some nice results could be achieved by soaking the dyed fibers in a bath of India Ink and 70 percent rubbing alcohol. The ink-and-alcohol bath provided some deep, rich, and varied color contrasts. I made the ink-and-alcohol mix in three strengths: ¼, 1, and 2 teaspoons per pint of alcohol **7**.

I placed some fibers in a yogurt cup, poured in the ink-and-alcohol mix, let it soak for anywhere from five hours to overnight, drained off the ink, and let the fibers dry **8**. Experimenting with different soak times, mix strengths, and dye colors will lead to an almost limitless spectrum of hues.

Color mixes

As you experiment, you'll find that you can come up with a range of color combinations far beyond what's available commercially. You'll also find that not all the colors you come up with look believable and will need to be discarded. Be sure to label your finished work so you can re-create it later **9**, opposite.

Here's a few tones to get you started:

- ¼ teaspoon Neutral Gray ink.

No ink-and-alcohol bath.

- ¼ teaspoon of MYOB. Give it an ink-and-alcohol bath of 1 teaspoon ink/ pint of alcohol.



9 Sorting fibers. Lance pours his dyed static grass into plastic containers. He labels the containers with the mixing ratio he used so he can make more later.



10 Base coat. Before applying his custom-dyed static grass, Lance first puts down a layer of Heki's Prairie Grass. He uses the Noch GrasMaster to apply the fibers.

- Make a 50/50 mix of MYOB and Neutral Gray. Add ¼ teaspoon of the MYOB/Gray Mix to the 3 cups of water in your stovetop dyeing pan and dye as discussed. Once dry, give it a dye bath of 1 teaspoon ink per pint of alcohol.

Applying the grass to the layout

Since I was using standard static grass fibers, I applied them with a Noch GrasMaster. Before applying the fibers, I added a thin layer of white glue to the layout surface, wet it with a spray bottle, and sprinkled on the grass with the static grass applicator. Frequent spraying with hairspray as you work aids the process. Once satisfied, I sprayed on a sealing mist of dilute matte medium (1 part medium, 2½ parts water, and a drop of dish soap).



11 Realistic variety. This overhead shot shows how the earth-toned static grass fibers, each relatively close to one another on the color spectrum, look in a finished scene. Lance also included some green shades for further realism.

Before even applying my custom colors, I put on a base layer of Heki Prairie Grass (no. 3363) **10**. This neutral tone gives a foundation that will allow your dyed fibers to be more visible.

After the prairie grass was in place, I applied a variety of custom earth tones in patches roughly six inches wide. I further experimented with additional passes applied by taking small pinches of fibers and applying them by hand.

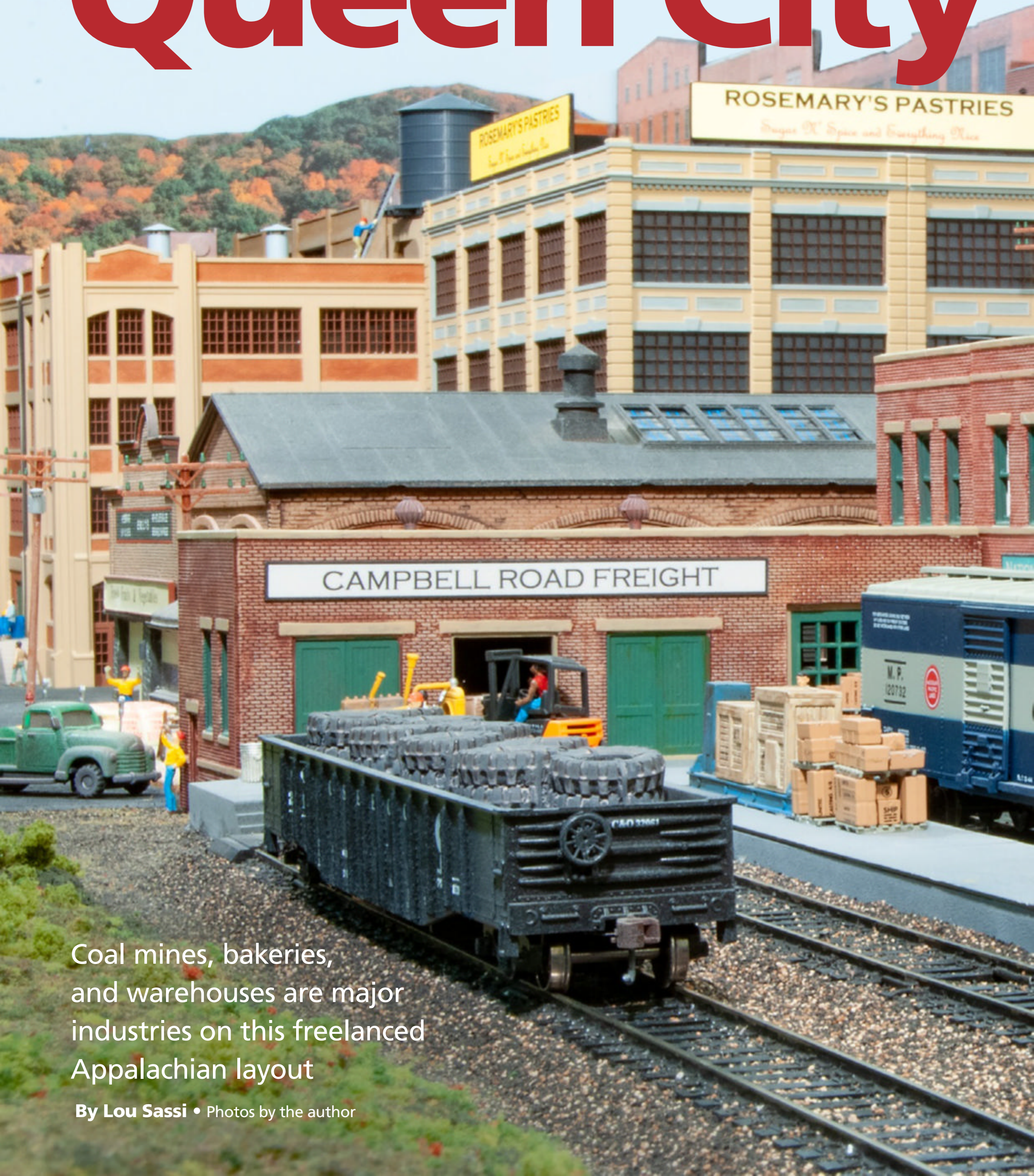
To avoid a lifeless, monotone look, be sure to add some splashes of color. Even in the winter months some green is still visible. Since green is a direct contrast to brown, add fibers here and there for additional snap **11**.

If you're looking to add some variety to the scenery on your model railroad, try dyeing static grass. Yes, some trial-and-error is involved, but that's part of

the process. The key things to remember are experiment, label your mixes, and have fun. **MR**

Lance Mindheim models urban industrial switching railroads and presently has three layouts. The "main" layout is based on CSX's Downtown Spur in Miami. He also has two smaller layouts, one based on the Los Angeles Junction and the other a proto freelance version of the Bush Terminal in Brooklyn. He writes frequently for the hobby press and is the owner of The Shelf Layouts Co. Inc. (shelflayouts.com), a custom layout building and design firm. Lance lives in Silver Spring, Md., and has one grown son, Zachary, who often accompanies him to model railroading events.

Rails to the Queen City



Coal mines, bakeries,
and warehouses are major
industries on this freelanced
Appalachian layout

By Lou Sassi • Photos by the author



① The freight house at Cincinnati bustles with activity on George Campbell's HO scale model railroad. The 11 x 30-foot shelf layout models a freelanced coal hauling and bridge line reaching southeast from Cincinnati into Appalachian coal mining country. Rosemary's Pastries, kitbashed from several Walthers kits, is one of the major industries on the railroad.

You might say that George Campbell's fascination for the railroads that ran into and out of Cincinnati started before he was born.

His father, who always loved trains, was at one time a cook for a Norfolk & Western (N&W) road maintenance crew. As a child, George would accompany his dad on visits to railroads in the area, including trips to Cincinnati's magnificent Union Terminal, where they would watch trains together.

George's interest in trains expanded to the world of model railroads at the age of 6, when his parents gave him an American Flyer set for Christmas. The pair of Alco PA locomotives pulled a fleet of passenger cars around an oval of track mounted to a sheet of plywood on the floor of the family apartment.

Because of his many railfan trips with his father, it was only natural that George chose to model the Cincinnati railroad scene, particularly the N&W and Louisville & Nashville (L&N).

His current layout is his third, each bigger and better than the one before,

but all with the same theme, a railroad running southeast from Cincinnati into the coal fields of eastern Kentucky and West Virginia in the early 1950s.

The freelanced layout was strongly influenced by the input of fellow modelers and real-life railroaders who George has met over the years. George says that listening to prototype railroaders taught him what really took place out on the road and the challenges they contended with daily. Talking to fellow modelers and operating their layouts showed him how to incorporate his knowledge of the prototype into his own model railroad.

The main features he wanted for the railroad were a long mainline run with passing sidings; a large passenger station; a yard that could handle both freight and intercity passenger operations by multiple railroads; and switching challenges.

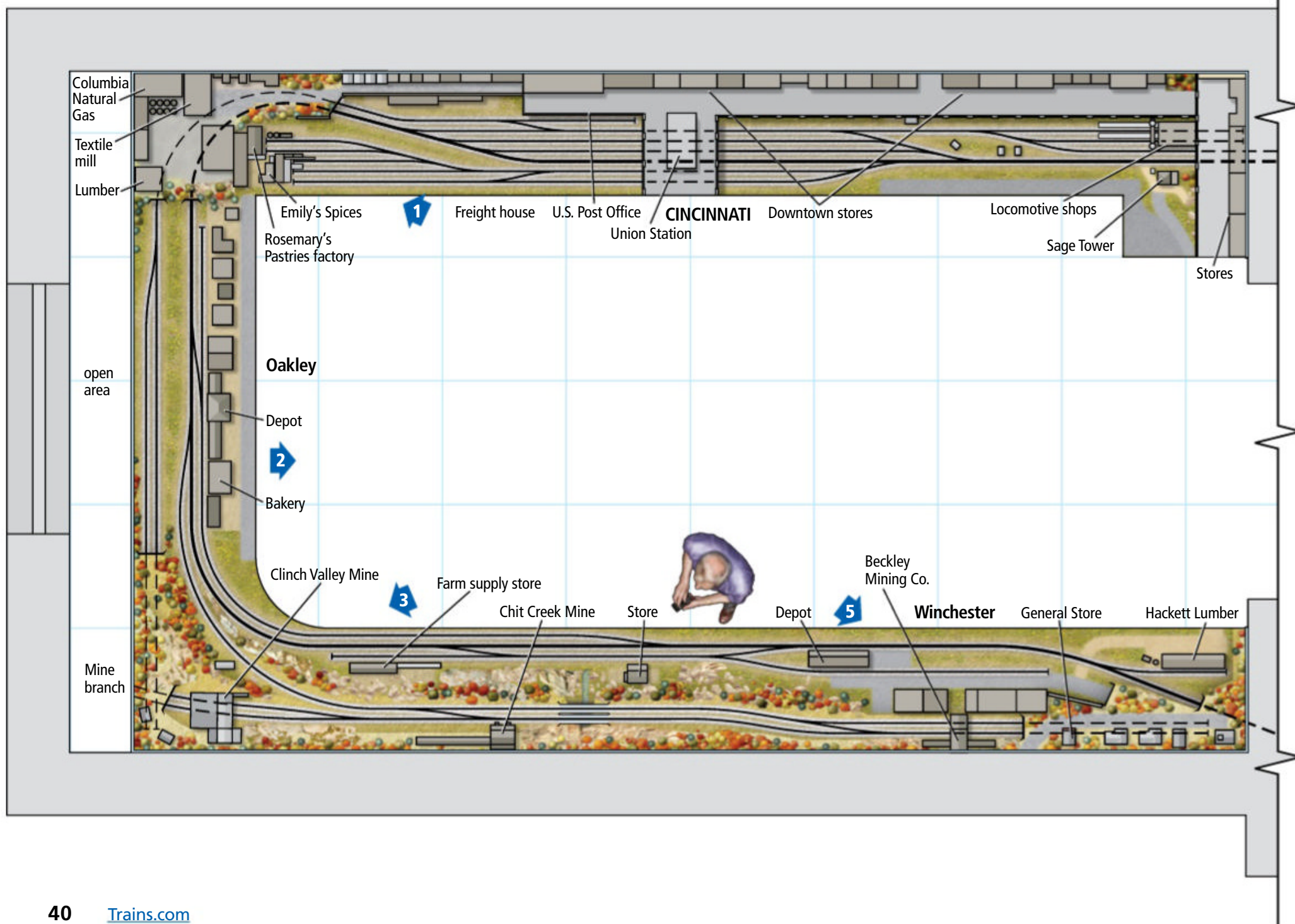
The railroad has three primary functions: hauling coal from the eastern Kentucky and West Virginia mines to the Tri-State Electrical Company in Cincinnati; bringing grain from the wheat silos and corn syrup from the refinery to Rosemary's Pastries bakery in

Basil Tower; and the movement of intercity passenger trains along the line.

Construction begins

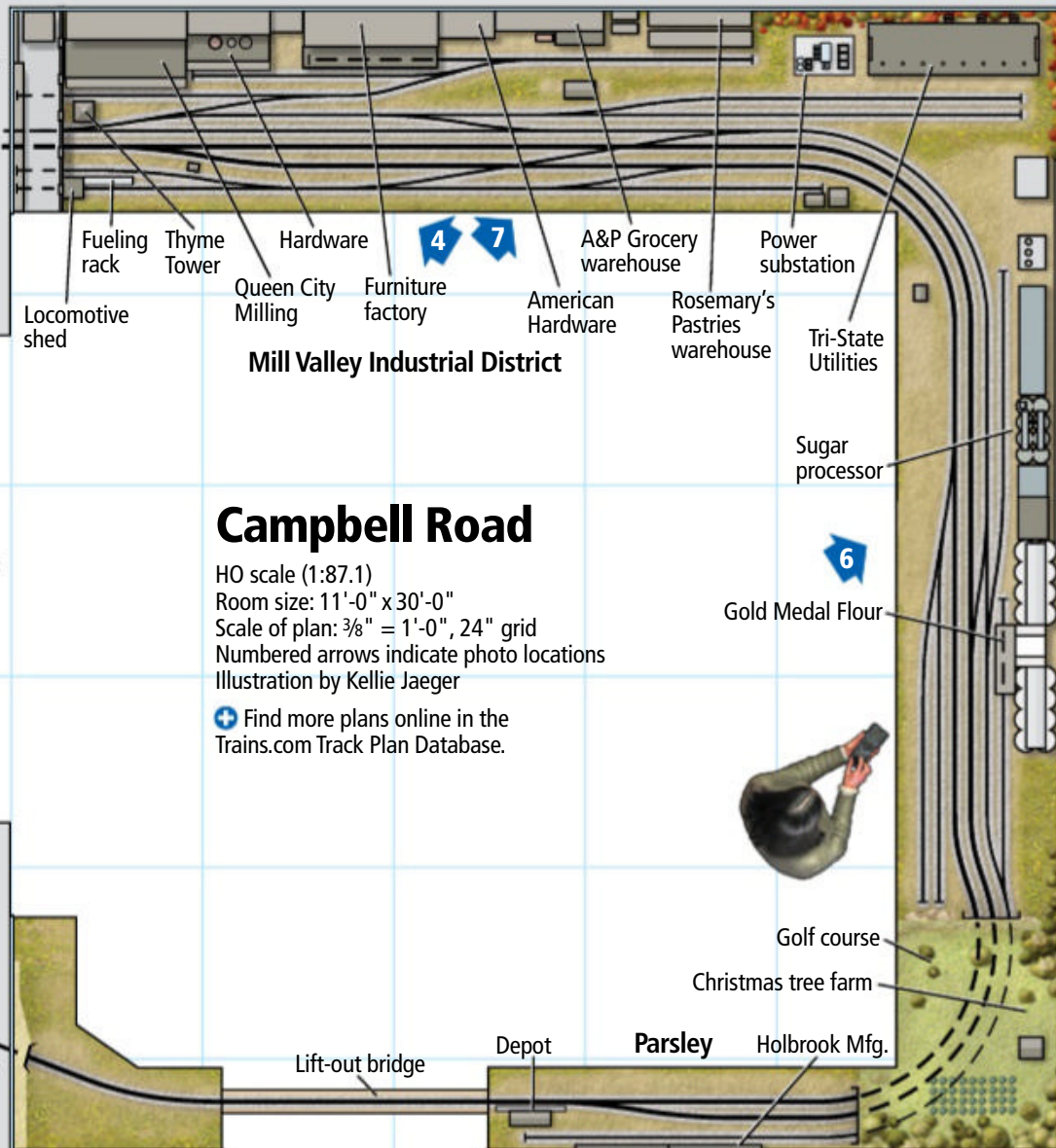
In the late 1970s, George began building structures for the layout while developing a paint scheme and logo for the locomotives, freight cars, and passenger equipment. In the 1990s, after a move to the family's present home, George started layout construction in a 12 x 12-foot room. Within a few months, a 12 x 20-foot room was added as an apartment for George's mother-in-law. Later, this became his oldest son's man-cave. Once he moved out, George's wife gave him the green light to expand the railroad into the larger room. The doorway between the rooms was enlarged to a five-foot opening.

George and his friend John Stokes installed three lighting circuits in both rooms. One has four-foot fluorescent fixtures with diffusers for general room lighting. The other two power compact fluorescent bulbs of various wattages, with different types of diffusers,





2 George runs a coal train bound for the Tri-State Utilities power plant through Winchester in this overall view of the layout. Cincinnati is on the left.



The layout at a glance

Name: Campbell Road
Scale: HO (1:87.1)
Size: 11 x 30 feet
Prototype: freelanced, Norfolk & Western, and Louisville & Nashville
Locale: Cincinnati, Ohio, to Appalachia
Era: autumn 1942-1945
Style: around-the-walls
Mainline run: 82 feet
Minimum radius: 22" (main), 18" (sidings)
Minimum turnout: no. 4
Maximum grade: 2.5 percent
Benchwork: open grid, cantilevered from walls
Height: 48" to 54"
Roadbed: cork
Track: Atlas code 100 Snap-Track
Scenery: extruded-foam insulation board
Backdrop: commercial photo backdrops on Gatorboard over blue-painted walls
Control: Digitrax Digital Command Control

③ Campbell Road no. 264, a custom-decorated Electro-Motive Division GP9 from Athearn, picks up a string of loaded coal hoppers from the Clinch Valley Coal tippie, one of three mines on the coal branch. The tippie is a kitbashed Walthers model, and the coal hoppers have all been relettered to have unique numbers.



④ An extra train headed by a pair of Electro-Motive Division F7s moves military cargo through the Mill Valley Industrial District. The locomotives are Stewart models and the military equipment is from Flames of War.



mounted every 12" along the ceiling to highlight certain areas of the railroad.

The walls of both rooms are painted sky blue. Backdrops are made from commercial photos from SceniKing and others that are mounted on Gatorboard and have the sky portion cut off. The photos are protected with a clear self-adhesive sheet and mounted in front of the blue wall "sky."

Benchwork consists of 2 x 4 supports cantilevered from the walls. An open grid of 1 x 4 lumber with 1 x 2 cross-members is mounted to them. The tabletop is 1" pine boards cut to specific contours for track alignment. This method of construction keeps the railroad level while eliminating the need for protruding legs below the railroad. Once the benchwork was completed, it was painted a dark blue. George's wife sewed dark blue skirting that attaches to the underside of the fascia with hook-and-loop fasteners.

The roadbed is cork, glued to the pine subroadbed with latex caulk. Track is glued down with white glue. All of the turnouts and the majority of the yards, mainline, and passing sidings are Atlas



5 A row of light-emitting-diode streetlights scratchbuilt from a string of discount-store Christmas lights bring life to downtown Winchester.

Streetlights at a discount

One night while standing in the layout room, my wife commented, "What you really need are some streetlights so the trains can run at night." What was perfectly obvious to her had totally escaped me. How would I go back and add wiring to install streetlights to an almost completely scened layout?

The solution came in a strand of white Christmas lights at our local Wal-Mart. The string of 21 3V light-emitting diodes, powered by two AA batteries, were priced at \$5.95 before Christmas, but only \$2 after. We cut $\frac{7}{32}$ " plastic tubing into $1\frac{1}{2}$ " pieces, spraypainted them black, put a $\frac{1}{2}$ " beveled washer on the bottom for a base, and added a $\frac{5}{16}$ " O-ring on the top for the LED to rest on. I covered the LED with frosted white globes salvaged from some Life-Like streetlights I already owned.

When all were done, I drilled small holes in the sidewalk at Winchester for the wires and hooked them up under the benchwork. The battery box has an on/off switch that I placed at an opening in our under-layout curtains. An approximately \$5 investment has given me a well-lit town for night trains to stop at. – *George Campbell*

code 100 Snap-Track. All the turnouts are lined using ground throws from Caboose Industries. Every rail joint is soldered, and electrical feeders are attached every 2 feet.

The sides of the rails are painted Floquil Engine Black. The main line is ballasted with Woodland Scenics medium gray ballast, while the yards and sidings are a blend of 90 percent black cinders, 5 percent fine buff ballast, and 5 percent fine medium gray ballast.

Scenery and structures

The basic landforms are constructed from extruded-foam insulation board glued together with foam-safe latex caulk and carved to the desired

contours. A thin layer of latex caulk is applied over the foam board and coated with brown latex paint. Hydrocal rocks from commercial molds are glued in place with latex caulk.

A mixture of diluted white glue, several grades and colors of Woodland Scenics ballast, ground foam, and various turf colors form the basic ground cover. While this is still wet, George lightly sprinkles the area with green turf.

Since the railroad is set in autumn, there's a variety of fall colors in the trees and surrounding countryside. George starts with plastic flowers he finds at the craft store, coats them with 3M Super 77 spray adhesive, and dips them into green and brown ground foam. Once the adhesive dries, he applies hair spray, then



6 Rosemary's Pastries has several locations on the layout. Here, a manifest freight led by EMD GP7s no. 275 and 278 passes the Rosemary's Pastries sugar refining facility, which is built from two Walthers refinery kits linked with extra piping.

lightly mists the foliage with various red, yellow, and orange spray paints. At last count, there were nearly 2,000 individual trees on the railroad.

The majority of the structures on the railroad are either kitbashed or

scratchbuilt to serve a specific purpose. For example, the industrial buildings in the North Thyme Tower area required loading docks or doors for railcar access. Above these docks and doors are storage, manufacturing, and office areas.

George created the illusion of a larger industrial area by stacking low-profile structures in layers above and behind the foreground buildings. These buildings, scratchbuilt based on reference photographs of industrial areas, were sized to blend with the photo backdrops in that area. This allows the viewer's eye to smoothly flow from the foreground to the background, creating an overall believable scene.

More than 2,000 hand-painted figures wander the city streets and countryside of the model railroad. The final piece completing the illusion is the sounds of a busy city playing on surround sound system located under the urban portion of the railroad.

Rolling stock and operations

Motive power consists of 47 diesels from Atlas, Stewart, and Athearn, along with five steamers. All are powered with Digitrax DCC and most have either SoundTraxx or Digitrax sound installed. There are also 12 dummy locomotives used to simulate double-heading.

There are 72 passenger cars from Athearn and Walthers, most with



detailed interiors. There are also more than 300 freight cars, including 130 hoppers custom-lettered for the Campbell Road and other Appalachian railroads, prototype and freelanced.

Other than the Walthers passenger cars, all freight and passenger equipment have InterMountain metal wheelsets installed. All equipment is weathered, especially the locomotives and freight cars. Most have a light coating of road grime on the trucks and lower sides. Hoppers have additional weathering on the tops and interiors.

George uses a train-order system to route bridge traffic, unit trains, local freights, and passenger movements over his railroad. Each train requires two operators, an engineer and brakeman.



Meet George Campbell

Retired after a 31-year career within the Department of Defense, George volunteers with Honor Flight Kentucky to fly veterans to their memorials in Washington, D.C. He and his wife, Rosemary, have two sons, two daughters-in-law, and three granddaughters who love to play with "Granddaddy's" trains. He enjoys helping with Bluegrass Railroad Club layouts at the annual Kentucky Horse Park Southern Lights during the Christmas season, as well as soundly striking trees with golf balls.



In a typical three- to four-hour operating session, there are usually four crews running, along with a dispatcher. George says it's amazing how the train crews are so faithful to the union rules of break times and meals during the course of their railroad day. That may be because the ladies running the mess hall make sure the crews are well fed. Some trainmen even volunteer for overtime to get an extra meal.

While George wanted the Campbell Road to be fun to operate, his ultimate goal was to create a believable miniature transportation system in a setting where people would recognize sights and sounds from their youth. Although he enjoys having other railroaders visit, his greatest joy comes when watching his

granddaughters ring the locomotive bells, blow the air horns, and wave to the passengers as the trains roll by.

His advice for other modelers: "Plan, plan, and plan some more. Don't be afraid to make mistakes. Part of the fun is learning what does and doesn't work. Don't be in a hurry to start laying track and don't ballast until you've run a variety of trains over the track for several weeks or even months."

George feels fortunate having met a group of modelers "up the road" who are now close friends. They've worked, laughed, and shared many wonderful days on their railroads. "It's all about relationships," George says. "Always remember the journey is the best part of the process!" 

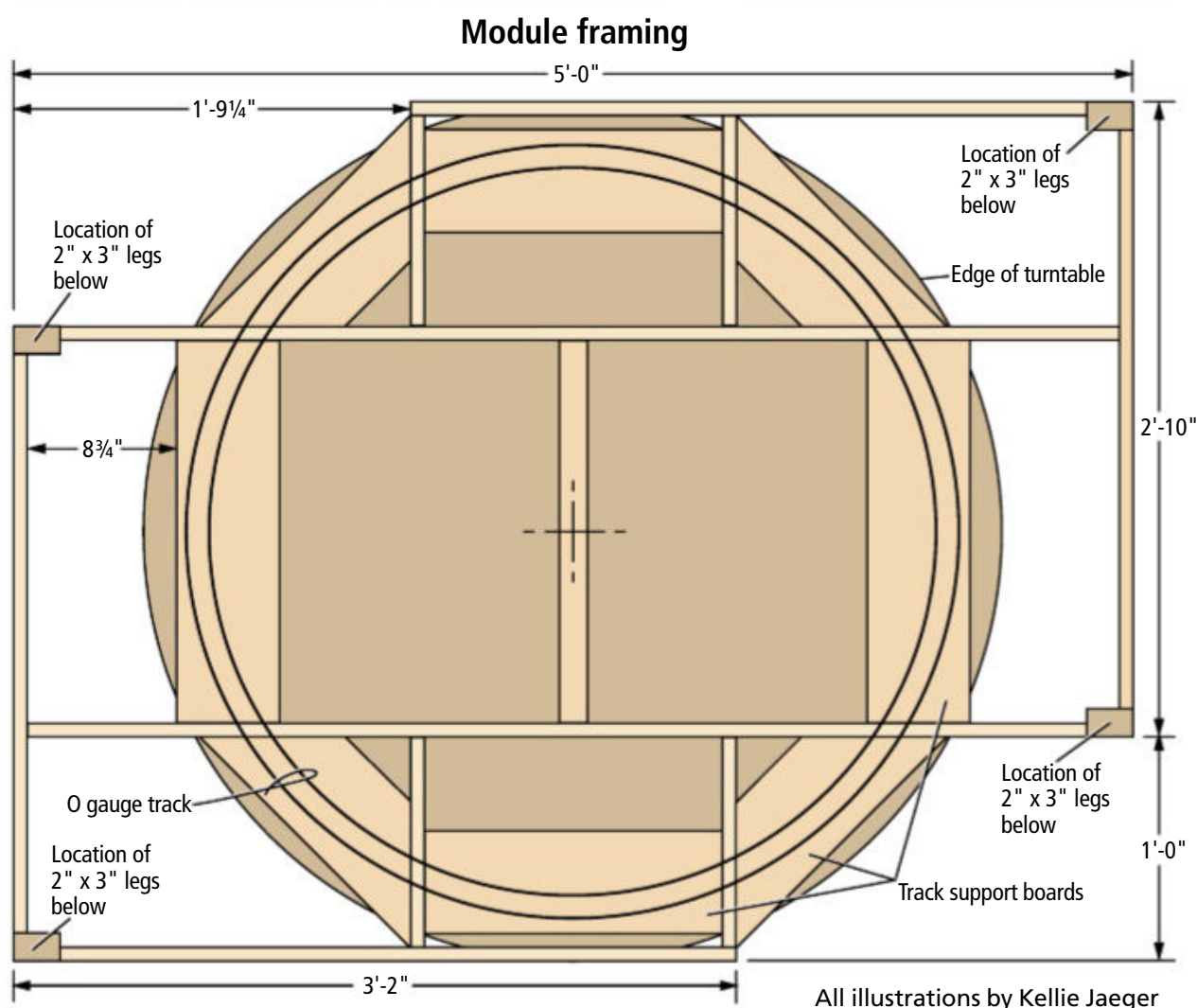
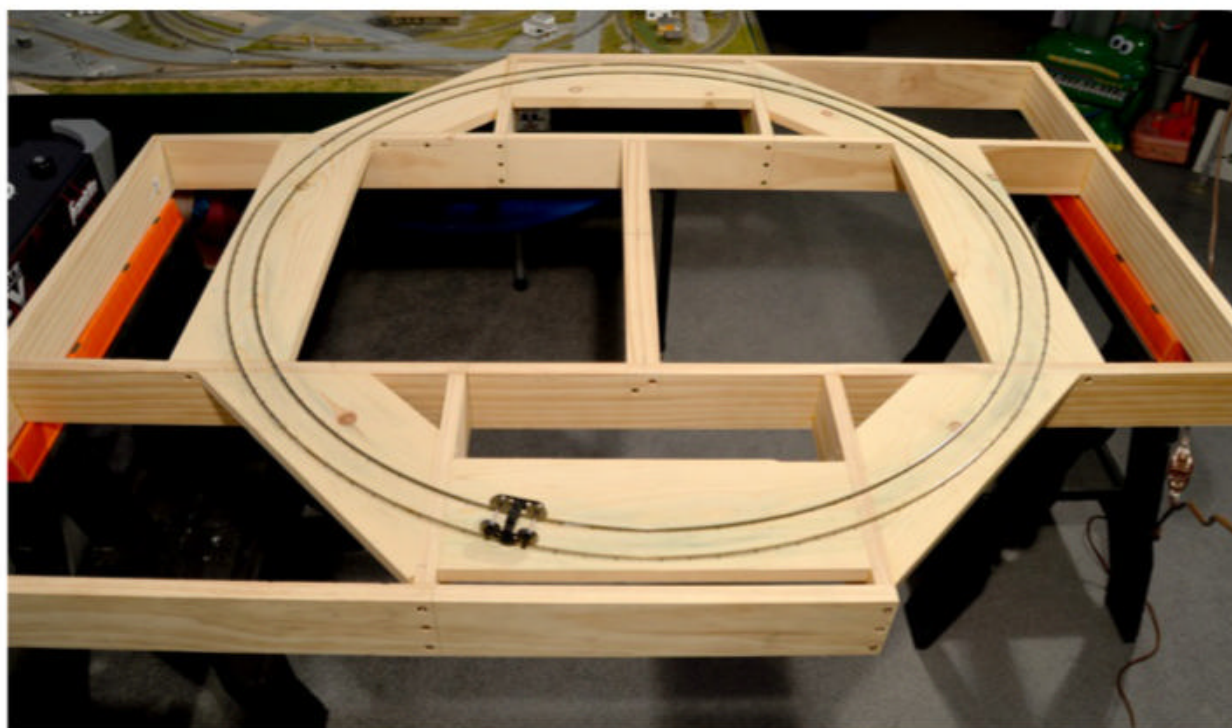
7 A northbound Louisville & Nashville manifest freight meets a Chesapeake & Ohio coal drag bound for the power plant in the background at Mill Valley. The A&P grocery warehouse was kit-bashed from Heljan brewery kits, while the Rosemary's Pastries warehouse was built from Design Preservation Models modular wall panels.



Add
**RAIL-MARINE
OPERATIONS**
to your layout



Mike Pagano built the Rail-Marine Interface Mechanism to allow him to move rail cars on a barge from one loading apron to another safely and reliably. Learn how he built the mechanism that you can add to your layout.



1 The RMIM's benchwork is an open-grid frame of 1" x 4" lumber. The 1" x 6" boards support an O gauge circle of track to carry the turntable. Mike used one of the Atlas O scale trucks to check the travel along the circle of track.

The Rail-Marine Interface Mechanism can be part of a modular or permanent model railroad

By Mike Pagano

Photos by the author

Modeling a rail-marine operation is one of the many fun switching opportunities on a model railroad.

But instead of a static scene where the barge doesn't move, what if a rail barge can be loaded from an apron at one location, then rotated with the water scene, simulating a trip across a body of water? As the scene rotates, the barge reaches its intended destination, where the loaded rail cars are ready to be offloaded at a different apron on the opposite side of a scenic turntable. This is what my

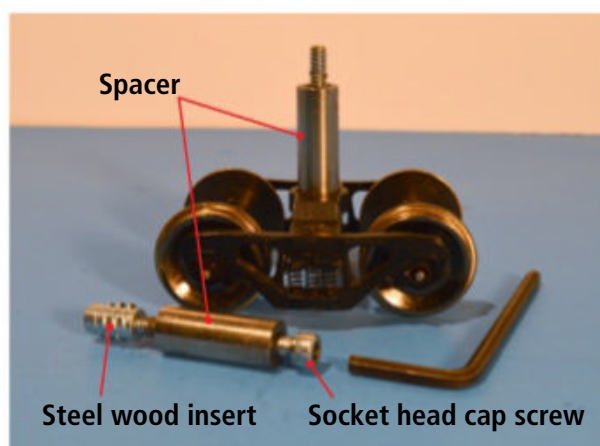
Rail-Marine Interface Mechanism (RMIM) is all about.

Starting with the turntable

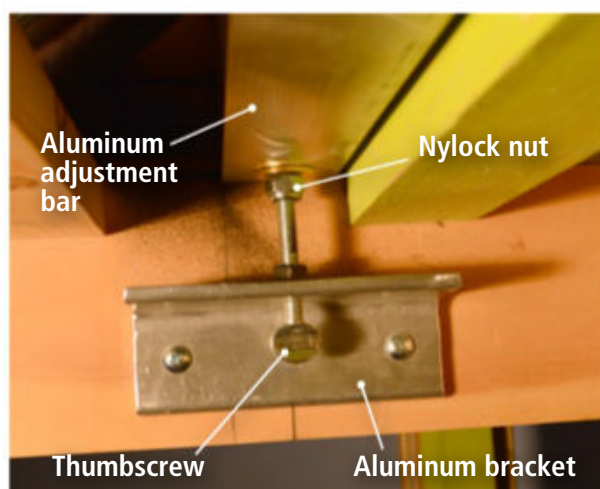
The RMIM has a removable turntable that rides along a circular piece of O scale track. I started designing the RMIM module based on a turntable made from a 3/4"-thick, 46" diameter piece of birch plywood to support the barge and water scene. This circular dimension ultimately determined how the benchwork would be designed.



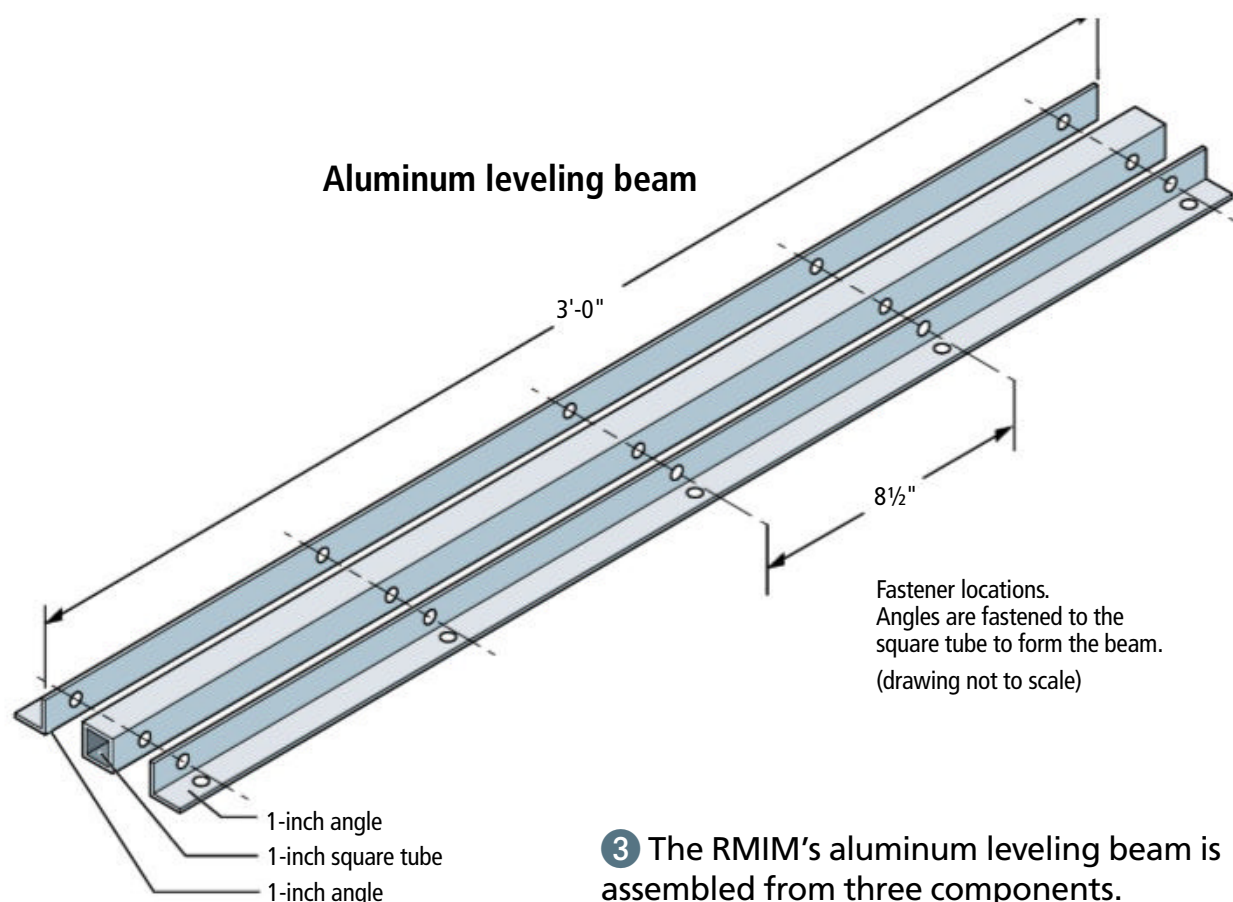
② The aluminum leveling beam should be aligned with one of the Atlas O scale trucks and the bullet latch located under the barge.



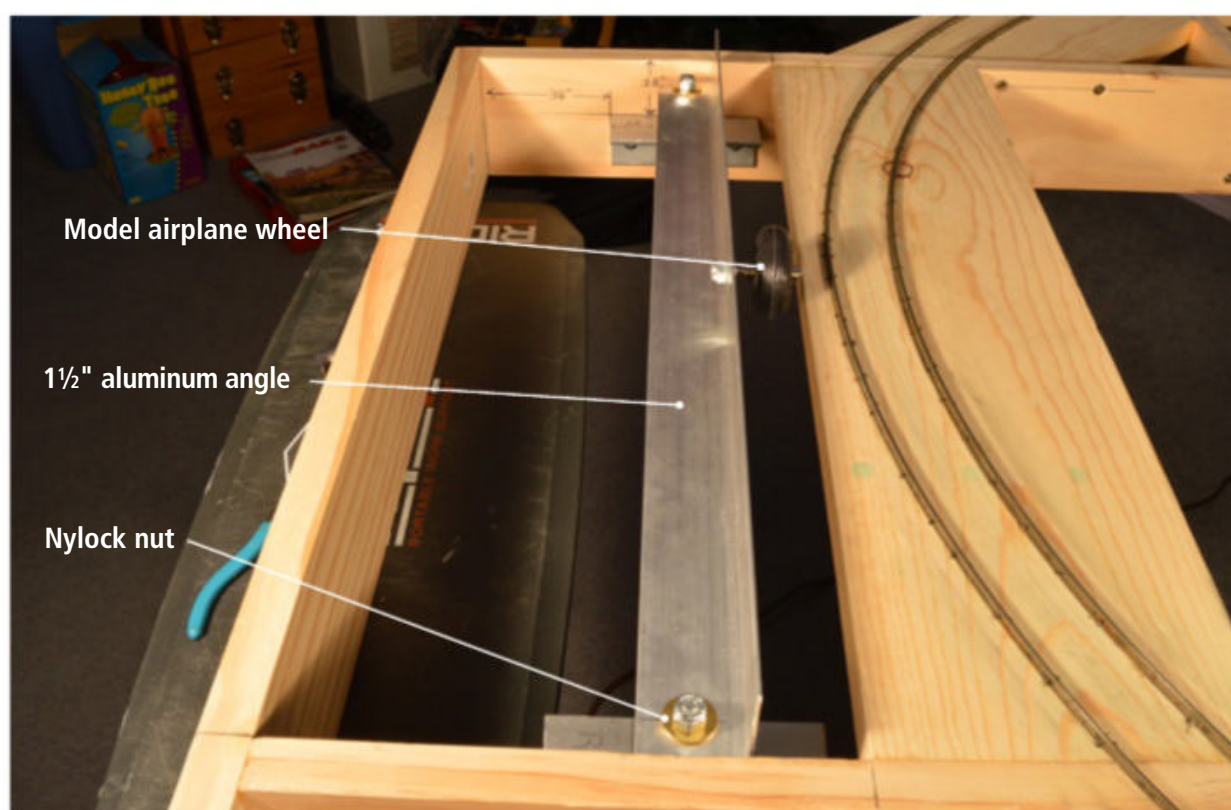
④ Each of the four Atlas O scale 100-ton roller bearing trucks should have its bearing caps and brake shoes removed prior to installing the assemblies under the turntable. Mike secured each truck using a socket head cap screw with a $\frac{5}{16}$ " x $\frac{13}{16}$ " spacer with a steel wood insert in the turntable.



⑥ Each end of the RMIM has a leveling adjustment assembly with a thumbscrew that can raise or lower the turntable to align the barge to match the rail height of the apron.



③ The RMIM's aluminum leveling beam is assembled from three components.



⑤ The RMIM uses pieces of 1 1/2" aluminum angle as brackets to allow for adjustment of the height of the model airplane wheel, which engages with a bullet latch plate located under the turntable.

I used a router mounted in a trammel jig to make several passes with the tool set to cut a 46" diameter from a 4 x 4-foot piece of $\frac{3}{4}$ " birch plywood. Online sources can show you how to make a simple router trammel.

The benchwork is open-grid construction using 1 x 4 dimensional lumber ① (previous page). I glued and screwed each joint. I built my RMIM as a standalone module to illustrate the idea; the RMIM can also be built as part of a layout.

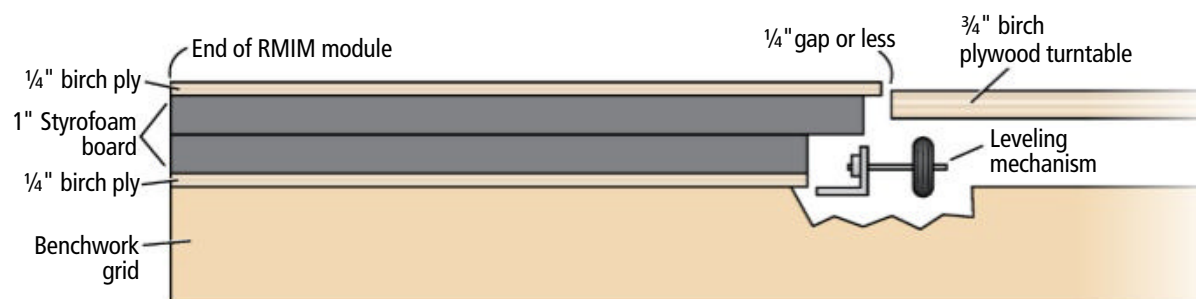
This frame doesn't incorporate a traditional plywood deck, but utilizes eight separate 1 x 6 pine boards placed to support a circle of O scale rail ①. The turntable rides on this track. The soft pine

boards make a great base to spike the O scale rails to and support the weight of the turntable.

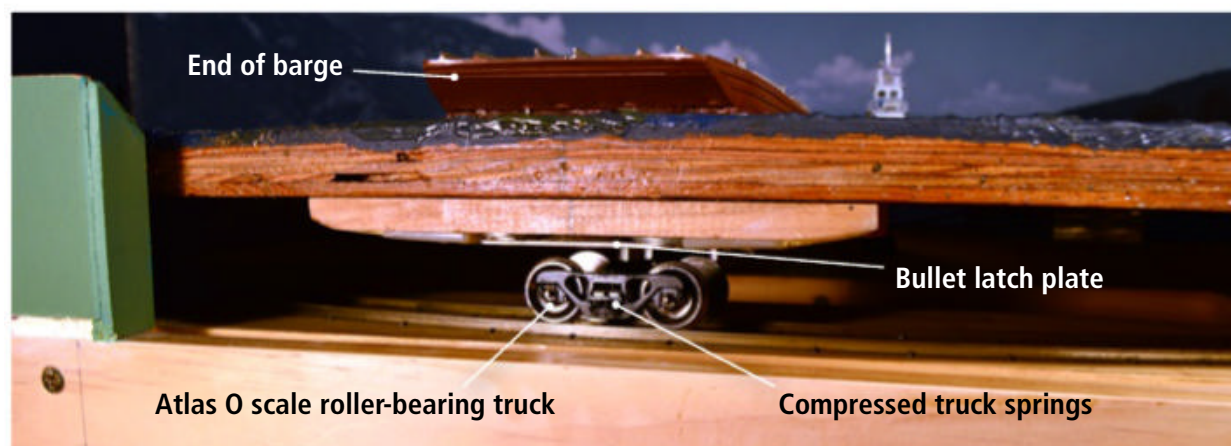
I installed a 2 x 2 crossmember so I could locate the center of the track circle to mount the trammel jig. I marked two circles, one at 19 3/4" and the other at 21" from the center, with the trammel jig. These reference diameters are used as a guide to hand-lay code 143 rail spiked directly to the pine boards.

I used medium rail spikes from Micro Engineering (no. 30-104) at 1 1/4" intervals on both sides of each rail. I checked the rolling characteristics using an Atlas O 100-ton roller-bearing truck (no. 7066) to make sure the O scale truck would

Typical landform design



7 The RMIM's scenery is built up in layers so it covers, but doesn't interfere with, the adjustment bar.



8 The barge is secured above the bullet latch plate that will contact the model airplane wheel once it reaches one of the two apron locations.

ride freely and didn't bind on any section of rail. I repositioned the spikes in any trouble areas. I made sure I maintained a minimum 1 1/4" spacing (O gauge) between the rails and checked my work with a homemade track gauge. Once my circle of O scale rail was spiked down and checked out, it was time to start preparing the turntable.

Leveling the turntable

To ensure the plywood turntable remains flat despite any seasonal shifts in humidity, I designed a system that self-levels using four O scale trucks with a spring suspension to support the scene. The turntable normally rides with the barge's rails just below the height of the apron rails while the springs are compressed on each truck due to the weight of the turntable.

As the barge rotates to the apron, the turntable is elevated slightly so the rails on the barge match up with the fixed rails on the apron as it approaches this area. This is accomplished by adjusting a fixed radio-control model airplane wheel to lift a bullet latch plate acting as a detent, located on the underside of the barge area 2, opposite. As the bullet latch plate rides up the wheel, it lifts the turntable, seating the wheel into the recess of the plate. This aligns the apron rails perfectly in position with the barge.

The bullet latch plate causes the turntable to lift just enough on the model

airplane wheel to take the weight off the O scale trucks and unload the springs without the wheels lifting from the rails. As the turntable rotates away from the apron, the springs in the truck will compress as it rides off the bullet latch plate.

To add a little support along the horizontal stress line under the barge, I assembled an aluminum leveling beam made from with two pieces of 1" angle bolted to a piece of 1" box tubing in the middle 3. This leveling beam is 3 feet long and is fastened under the turntable with wood screws between two opposing O scale trucks, as seen in 2. As the barge area rises up, the opposing O scale truck lowers as its springs compress. This leveling beam will strengthen this area and prevent any unwanted bending under the barge area that can create long-term warping.

Turntable construction details

The four Atlas O scale trucks are 90 degrees apart along a 20 3/8" radius from the center of the turntable. I used the same trammel technique to locate the trucks as I used to located the rails.

Each of the four O scale trucks is fastened to the underside of the turntable with a 6-32 x 1 1/4" socket head cap screw through a 5/16" x 1 3/16" long steel spacer bushing against a fender washer between the insert and the bushing 4. Each cap screw is threaded into a steel insert set in the turntable. I added cyanoacrylate

Materials list

Benchwork/turntable support

1 x 6 - 6 foot common board (soft pine, 3)
1 x 4 - 6 foot select pine board (kiln dried, 3)
1 x 4 - 8 foot select pine board (kiln dried, 2)
2 x 2 - 8 foot spruce-pine furring strip (1)
no. 8 x 1 1/4" steel wood screws
wood glue

Atlas

7066 two-rail 100-ton roller-bearing trucks (2 pairs)

Micro Engineering

17-148 code 148 rail, 3 foot sections (6)
26-148 code 148 rail joiners
30-104 medium rail spikes

Turntable

3/4" x 48" x 48" birch plywood
1/16" x 1" x 1" x 3 foot aluminum square tube (1)
1/16" x 1" x 1" x 3 foot aluminum angle (2)
1/4-20 x 1 1/2" slotted round head machine screw
1/4-20 nylock nut
no. 10 x 1/2" wood screw
1/4" fender washers
no. 6-32 steel wood inserts (brass wood inserts are not recommended)

McMaster-Carr

90128A160 no. 6-32 x 1 1/4" socket head cap screw
92320A776 5/16" x 1 3/16" steel spacer (you may need a different size bushing depending on your scenery construction method)

Leveling mechanism

1/16" x 1 1/2" x 3 foot aluminum angle (2)
3/16" x 1 1/2" x 6" aluminum angle (4)

Du-Bro

1.75 T-L aircraft wheels

Great Planes

GPMQ4304 1/8" brass wheel collar kit
3/8" x 2 1/4" x 6" basswood (bullet latch spacer)

bullet latch plate

1/4-20 x 2 1/2" thumb screw (4)

1/4-20 nylock nut (8)

1/4-20 star lock nut (4)

no. 16 brass flat washer (8)

no. 10 x 3/4" wood screw (8)

Backdrop

tempered hardboard 3'-0" x 7'-0" x 1/8" (white coated on one side preferred)

1" extruded-foam insulation board

2" x 2" x 3 foot oak backdrop stiffeners (4 recommended)

1/4" x 2" lag bolts

3M Super 77 multipurpose spray adhesive (for photo backdrop)

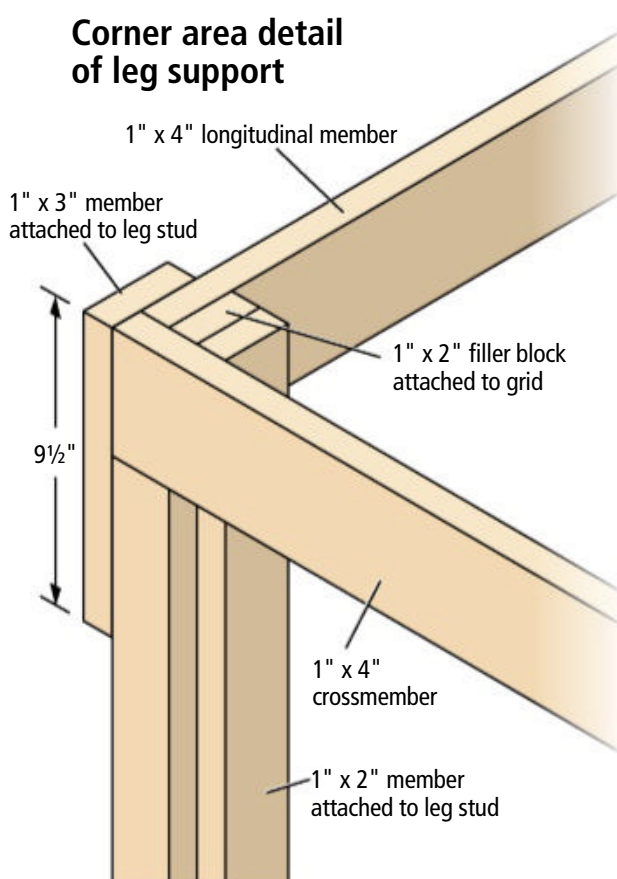
foam board adhesive



9 During his planning stage, Mike installed a backdrop behind his barge scene. He used four vertical 2 x 2s placed along an arc to curve the backdrop. The barge is placed as part of Mike's mockup procedure to design the scene.



10 Mike used a motor tool with a router bit to cut a slot for the tempered hardboard backdrop to seat down into foam board before securing it to the vertical supports.



11 Mike used this leg attachment. It allows the legs to be removed, and supports the weight of the entire scene.

adhesive to make sure the insert wouldn't loosen while supporting the turntable.

I mounted the model airplane wheel on an adjustable piece of aluminum angle 5 (on page 36). This device makes the turntable lifting mechanism easy to adjust from below to align the rail at each apron position.

The model airplane wheel at each apron location is mounted on an axle supported by a long piece of 1½" aluminum angle. Short pieces of 1½" angle are attached to the benchwork grid frame. A thumb screw with a nylock nut supports the long angle and allows height adjustment 6. I found this adjustment easy to

use and a necessity to line the railheads perfectly after the installation of the apron and scenery.

Adding scenery and a backdrop

At this point, I had the turntable mechanism working correctly with an index system operating in two positions 180 degrees apart. Before I added scenery, I built up a base to support the apron tracks at each end. My base is mounted on layers of plywood and Styrofoam positioned so it doesn't interfere with the leveling mechanism 7, previous page.

My RMIM module depicts the rail operation from Proctor to Kaslo, B.C., on the Canadian Pacific Nelson Subdivision, and features two different types of aprons. My RMIM design can easily accommodate any prototype apron and barge system.

I recommend installing the barge first, then designing your apron height to be 1/8" to 3/16" above the height of the barge railheads when the model airplane tire is not coming into contact with the bullet latch plate. The fine adjustment is accomplished through the thumbscrews when you're ready to match the height of the rails 8.

I also experimented with the addition of a backdrop to the RMIM module that can rotate with the water feature along the backside of the turntable. I installed four vertical 2 x 2 wood supports fastened from underneath the turntable to support a curved tempered hardboard backdrop 9.

I used a motor tool and a router jig to make a groove in an extruded-foam insulation board that matched along

the back of the water feature to help lock the bottom of the curved tempered hardboard to the bottom of the turntable 10.

Finishing up

I designed the frame of the RMIM module as an asymmetrical shape to make it easier for two people to lift the turntable off the frame if need be. There are two opposing cutouts where people can stand to handle the turntable and reduce the risk of damaging the aprons and other scenery details when installing or removing the turntable.

I coated the underside and outer perimeter edge of the turntable with a layer of varnish to seal the wood and reduce its ability to absorb moisture. To finish the top of the turntable to prevent wood grain showing through the water surface, I sanded the smooth side of the plywood and sealed it with a thick coat of a 50-50 mixture of PVA primer and drywall compound before adding the water texture.

If you're considering building the RMIM as a standalone module, I recommend attaching the legs in the locations shown in 1. My RMIM module is on the heavy side due to the water texture layer, plywood thickness, and backdrop on the turntable. So I made my module sit on top of four removable 2 x 3 legs illustrated in 11. MR

Mike has been in the N scale community since the late 1990s, starting in the hobby through Ntrak. Mike lives in the Pacific Northwest, is married to Michele, and has a daughter named Tia. Mike and his family enjoy ice skating year-round.



Mike Tylick scratchbuilt this timber cribbing loading dock for his On30 layout using railroad ties for the walls. He merged several photos of the full-size dock in Torrington, Conn., to get an approximation of what the prototype looked like.

Scratchbuild a timber cribbing loading dock

A chance find during a railfan trip inspired this project

By Mike Tylick • Photos by the author

On my On30 layout, the Marshfield & Old Colony meets the Braintree Electric Ry. at Scituate Harbor. This location called for a freight transfer dock, but the site was oddly shaped. I didn't want the aggravation of trying to frame a wood structure. There was already plenty of wood framing at a nearby ship pier. I toyed with the idea of a concrete or stone platform, but decided against both. I found my answer during a railfan outing with some friends.

It had been a long time since I'd ridden a train. Friends convinced me to ride the *Torrington Extra* on the Naugatuck RR, a trip organized by the Massachusetts Bay Railroad Enthusiasts. As we reached Torrington, Conn., the northernmost leg of our journey, I saw an old loading dock from my window. There was no time to get out for photography, but the train was a slow one and I knew we'd pass by the dock on the return trip.

When I got home, I took another look at the Scituate Harbor site. The design of the full-size dock in Torrington was just what I was looking for. Follow along as I share my techniques for modeling a timber cribbing loading dock.

Mike Tylick's byline has been appearing in the pages Model Railroader magazine for decades. The Massachusetts native models the Marshfield & Old Colony in On30.

Step 1 Evaluating the scene



The photo above shows the site for my loading dock. The tracks for the standard and narrow gauge lines aren't parallel. They're also curved at both ends, complicating clearances. Since the doors of narrow and standard gauge cars aren't at the same height from the rail, narrow gauge track is typically raised. This wasn't possible here, as there's an at-grade crossing nearby.

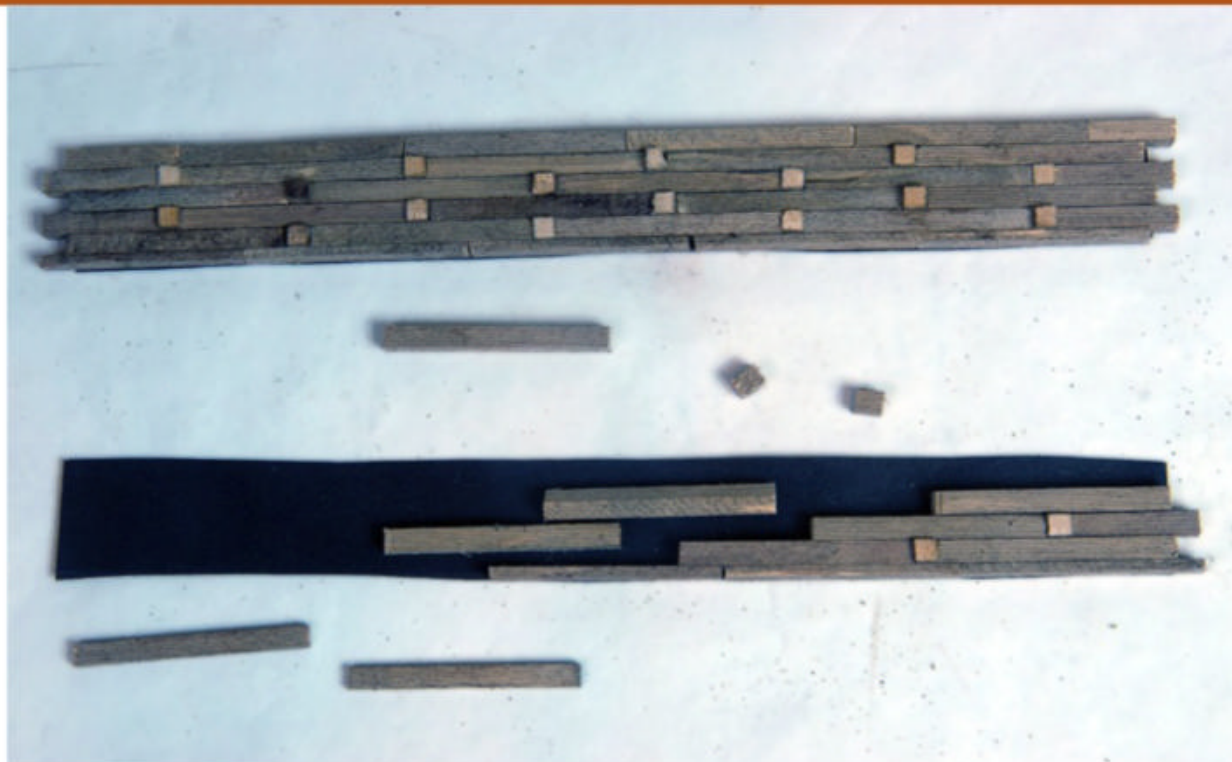


I made a paper template to determine the dock's footprint. I used pushpins to hold the paper in place and masking tape to secure additional pieces of paper. Though the template looks a bit rough, the old-fashioned cut-and-paste method got the job done.

Step 2 Building the walls



I used small (8" x 8" x 8'-0" long) railroad ties for the dock walls. Instead of using a miniature table saw to cut the ties, I used a Micro-Mark Miter Master. I taped a temporary cardstock fence to the side to quickly measure the ties.

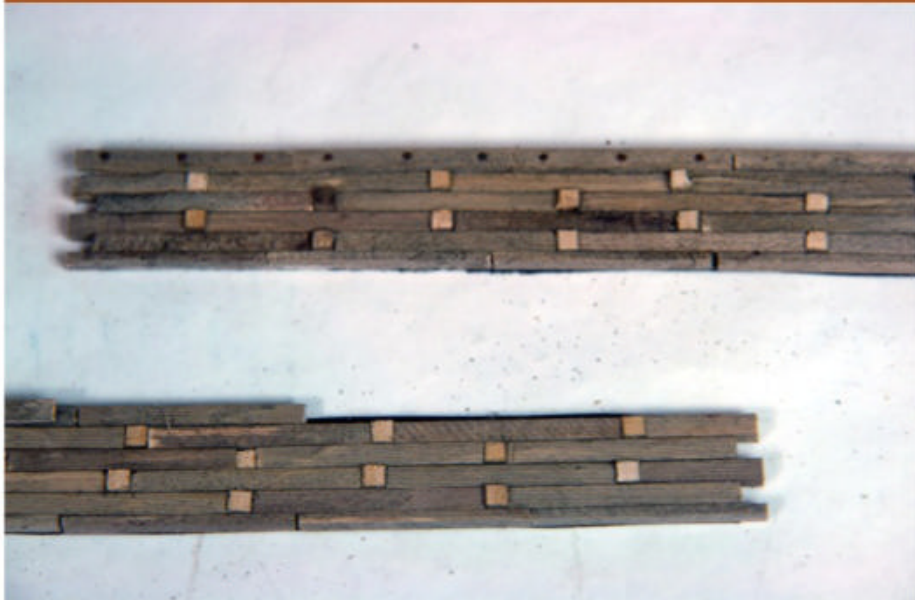


To establish the length and height of the two walls, I cut a backing template. Then I used black construction paper to hide any gaps between the boards. Note that the walls are slightly different lengths.



Departing from the original design, I added perpendicular anchors to my dock. Though the full-size dock has withstood the test of time without them, I thought visible bracing would add interest to the model. The narrow strips at the bottom bring the wall to the correct height and give the impression of at least a shallow excavation.

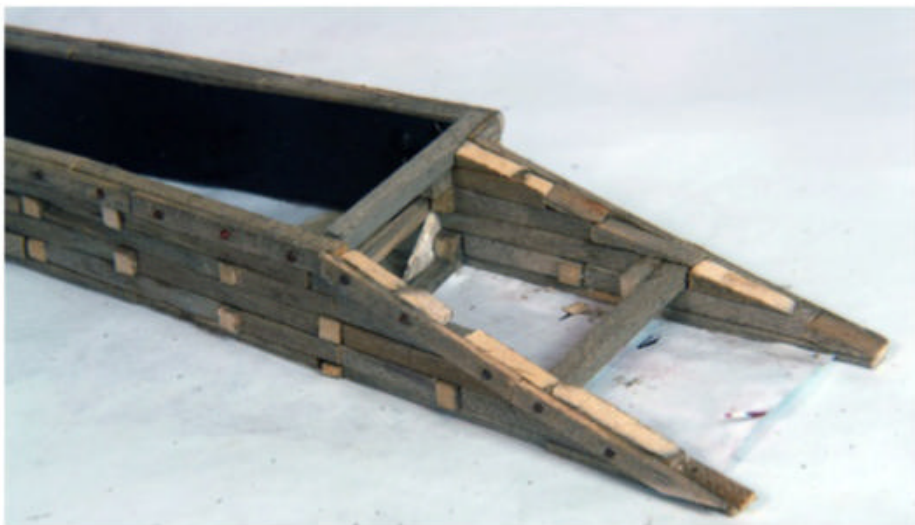
Step 2 Building the walls (cont'd)



After I assembled the walls, I added a cap along the top edge. I used a cardstock template as a guide for positioning the holes needed for the nut-bolt-washer (n.b.w.) castings. I was able to quickly drill the holes with a Micro-Mark drill press.



Next, I attached the side walls to the paper template. The two end crossties interlock with the sides on the left end of the dock. The cardstock angles (right) ensure the wide sides are perpendicular to the ground.



Finally, I added a ramp at the wide end of the dock. Though most of the perpendicular anchors are cosmetic, one is full length to keep the sides spaced correctly. I carried the wall cap and n.b.w. castings from the side walls to the base of the ramp. Some touch-up staining will be necessary.

Step 3 Filling and installing



Initially I considered filling the cavity between the walls with extruded-foam insulation board. Then I changed course and used broken bits of foam packing peanuts. On top of that I applied a mixture of sawdust, white glue, and water. With the mixture still wet, I sprinkled on a layer of Scenic Express Fine Dirt level with the top of the walls.



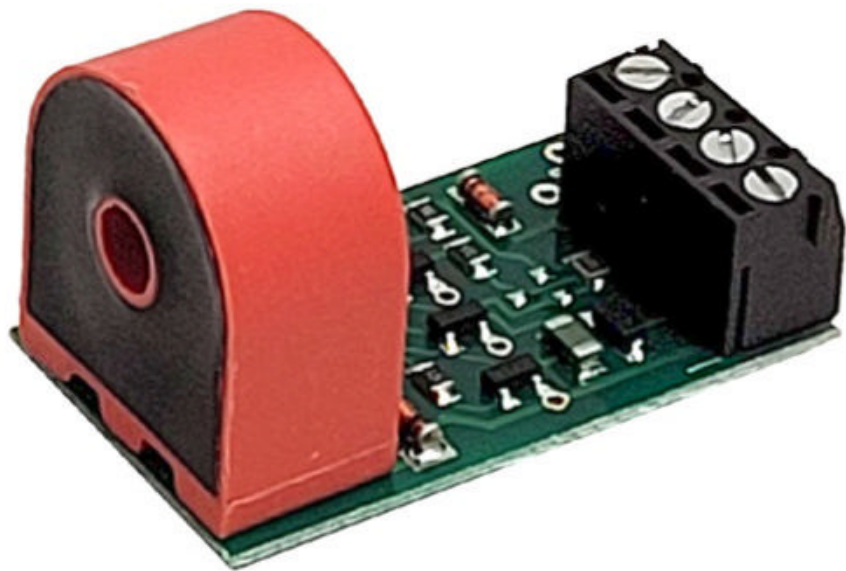
While I was waiting for the sawdust, glue, and water mixture to dry (it took several days), I tried to make the hardshell terrain where the dock would be installed as level as possible. I used hot glue to install the dock. Careful observers will note the platform is a little too low for the standard gauge refrigerator car and a bit too high for the On30 boxcar. That was poor planning on my part. I didn't think of the door height until after I attached the dock to the layout.



After the dock was in place, I applied more sawdust-and-glue filler along the base. I followed that up with Fine Dirt, grass, and weeds. I completed the dock scene with some O scale figures, barrels, pallets, and crates.

The next time you're invited to ride a train, jump at the opportunity. And more importantly, bring your camera. Your next modeling project may roll into your viewfinder when you least expect it. 

Block detection for signaling



1 NCE BD-20 block detector. Note the hole in the tombstone-shaped current transformer for the wire to your detected track section.



2 Digitrax BXP88 eight-zone block detector. This device features a proprietary circuit that's very sensitive. The BXP88 detects transponders in locomotives and rolling stock.



3 Digitrax BXPA1 auto-reversing unit and block detector.



4 Digitrax BD4N four zone block detector. It has isolated outputs that can be used with products sold by other companies if you wish.

Nothing beats lights to add a dimension of life to a model railroad. Crossing signals that flash or colored lights that change as a train moves over the layout are even better. Maybe you have a more utilitarian need, like keeping track of trains on hidden track. So it's no surprise that most model railroaders can find some reason to add block detection to their layouts.

I'll provide you with block detection basics so you can get started now. For more information on signals, see Dave Abeles' *Guide to Signals and Interlockings* from Kalmbach Books.

There are several ways to detect a model train. You can use optical sensors to detect a train passing overhead or

current sensors for sections of track. Block detection is done with current sensors. You don't need to sense every piece of track; usually just main lines, passing sidings, and maybe hidden tracks.

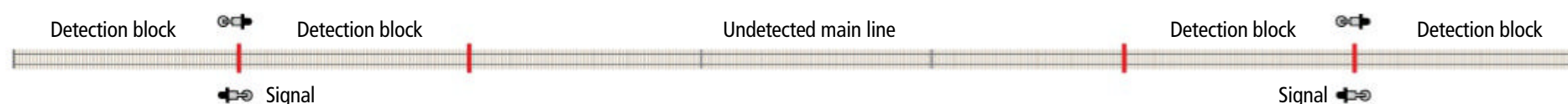
NCE sells current sensors that use a device called a current transformer. They have a hole in the middle 1. You pass the track bus wire leading to the detected block through the hole. The detector can be made more sensitive by looping the wire through the hole more than once. The NCE BD-20 detector manual has recommendations for looping and wiring in its clear instructions.

The BD-20 has a status light, can drive a small relay

or a control panel status light, and can drive switch inputs on circuits looking for a contact closure to ground when a train is detected. The BD-20 can be used with the NCE Mini-Panel and Auxiliary Input Unit. Its block detector can be used with circuits made by other manufacturers, as well. The output of the current transformer type can be used with any system without worrying about voltages appearing in undesirable places and damaging equipment. The wire through the hole is electrically isolated from the block being detected, making it versatile.

Digitrax block detectors use a proprietary circuit that's very sensitive. It sells an eight-block detector module, the BXP88 2, that also detects transponders in your locomotives and rolling stock. I've always thought that being able to know which locomotive is in which block was very cool. The company's decoders include transponders, or you can add transponders (the TL1 or the four-function TF4) to locomotives or rolling stock.

The BXP88 can't be used to span booster districts; separate BXP88s would be needed. If you want to detect



5 If you want to automate some of your train operations, you may need several detected zones to make your train stop just before the signal. Illustrations by Kellie Jaeger

a train in a reversing section, there's the BXP88 **3**, which detects trains and reverses the block for you. Both of these products have electronic circuit breaker capability for up to 3A. All of the Digitrax devices report occupancy status over LocoNet for use with their SE8C signaling product or with JMRI. The BXP88 comes with clear wiring diagrams and can also drive status lights on a control panel.

It's difficult to see the screw terminal labels without removing them. I found sticking a pen into the holes where the wires go and lifting firmly, alternating from each end of the terminal block, will lift it up so that you can see the labels. Wiggle it up a little at a time to avoid bending the pins. You have the choice of mounting the terminal block vertically. Note that if you wire it first and then opt to mount the terminal block vertically, you'll need to swap all the wires on the terminal block. This is because what was wire 1 will become wire 4, and so forth.

The Digitrax BD4N is a four-zone block detector **4**. As with the BXP88, the four zones must all be within the same booster district. The BD4N doesn't connect directly to LocoNet and has optically-isolated outputs, so it can be used even if you don't have a Digitrax DCC system. Like the NCE BD-20, the optically-isolated outputs will prevent unintended voltages and ground loops from causing problems.

Digitrax users can connect the BD4N to LocoNet by employing Digitrax's DS64 turnout controller or their SE8C signal controller. The BD4N's optically-isolated

outputs can be used to drive LEDs to display the status of hidden tracks. The BD4N also has built-in occupancy status LEDs. Like the BXP88 and BXP81, the BD4N utilizes Digitrax's high-sensitivity detection circuitry.

Regardless of whose block detector you use, one wire of your booster goes to a common rail within its booster district. The other wire from the booster goes through the block detector and then the second rail.

If you're like me and use Frog Juicers to power your turnout's frogs, you can't put them after a block detector. The Frog Juicer always draws a little bit of power, so it will cause the block detector to show that the block is always occupied. Use switch contacts on your switch machines to avoid the need for Frog Juicers or use turnouts with frogs like the Peco Unifrog, which can optionally be left unpowered, or the Insulfrog (which is being phased out).

Likewise, if you're using electronic circuit breakers, they have to come before the block detector because they, too, draw some power. Also, don't use RC filters after a block detector, as they will likely generate a false occupied signal.

Twisting bus wires couples a bit of the DCC signal between the wires. So if you twist wires after a current transformer type block detector, it may show that the block is occupied. If your



6 Here's an example of block detection for yards. All the turnouts are in the same block, which saves money, but still allows you to know when a train clears the turnouts.

block isn't far from your detector, you won't need to twist your wires anyway.

If signaling is your goal, you'll have to know how your chosen railroad implemented signaling. Do you want to stop a train just before a signal? You can put a short block in front of the signal **5** or install an optical sensor to detect the front of your train.

If you want to monitor travel, maybe you need to block detect every few pieces of track on a long section. Maybe one detector will do for a long section.

If you have a hidden storage yard, surely you want one block detector for each track **6**. What about the turnouts to the hidden ladder track? You'll also want to know when a train has cleared these turnouts.

Keep in mind that steam locomotives don't pick up power on the pilot truck and sometimes not on the tender, either. So, you may have several inches of train that aren't

seen by your block detector. Remember this as you decide exactly where your detected blocks will begin and end or modify your locomotive to solve the problem.

If you want to detect freight cars, you'll need to add resistors to the wheelsets.

Lighted passenger cars and lighted cabooses don't need any modification.

I put resistor wheelsets on the two outside axles on a freight car. Digitrax can detect as high as 22kΩ resistors. As noted before, NCE sensitivity can be increased with several loops through the current transformers. Don't freak out about your cars drawing power; they won't draw much. It would take a lot of them to amount to anything.

You can glue resistors on plastic axles with metal wheels and then connect the wheels to the resistors with conductive ink. The resistors are tiny. I've seen bigger fleas! Whatever you do, don't sneeze! Take your time and be patient if you install resistors on your axles.

It's easier to buy wheels with resistors built in. In HO, they're sold by JBWheelSets, jbwheelsets.com/resistor.html. For HO and N resistor wheelsets, as well as other signaling products, check out Logic Rail Technologies, logicrailtech.com.

If you're considering signaling, hopefully this will get you started. Signaling does add some cost to your railroad, so maybe you'll opt to allow for it now and add it later when you have the money.

For quick links to manufacturers, part suppliers, and my web pages, bookmark WiringForDCC.com/dcc_currents.htm and use it each month. 



IF SIGNALING IS YOUR GOAL, YOU'LL HAVE TO KNOW HOW YOUR CHOSEN RAILROAD IMPLEMENTED SIGNALING.
— ALLAN



ScaleTrains.com N scale UP standard turbine

A powerful and technologically innovative locomotive unique to the Union Pacific is the latest N scale offering from ScaleTrains.com's high-end Rivet Counter line. The standard turbine, a 4,500hp jet-age marvel, was developed by Alco/General Electric in response to UP's constant drive for more potent motive power. ScaleTrains.com's version captures the appearance and spirit of the prototype in N scale, from the distinctive square air intakes on the sides to the turbine's characteristic roar in Digital Command Control-equipped models.

History. In the years following World War II, Union Pacific had taken steam power about as far as it could go with such iconic behemoths as the 4-12-2, the 4-6-6-4 Challenger, and 4-8-8-4 Big Boy. Taking its inspiration from jet aircraft of the day, UP called on Alco/GE to harness turbine power in a new class of locomotive. The manufacturer came through with a demonstrator model, no. GE 101, a double-ended gas turbine that was renumbered no. 50 for tests on

the UP in 1949. The engine produced twice the horsepower of diesels of its day, impressing Union Pacific execs enough to order 10 single-ended versions, the first of which was delivered in 1952.

Rather than driving pistons as in a diesel engine, in a gas turbine, a mist of aerosolized fuel is mixed with compressed air in a combustion chamber. The fuel is then ignited and explodes at an extremely high temperature, rushing out of the combustion chamber and spinning the turbine blades. These blades turn a driveshaft that turns a generator, which powers electric traction motors on the locomotive's axles. This means the turbines are more properly known as gas turbine electric locomotives, or GTELs.

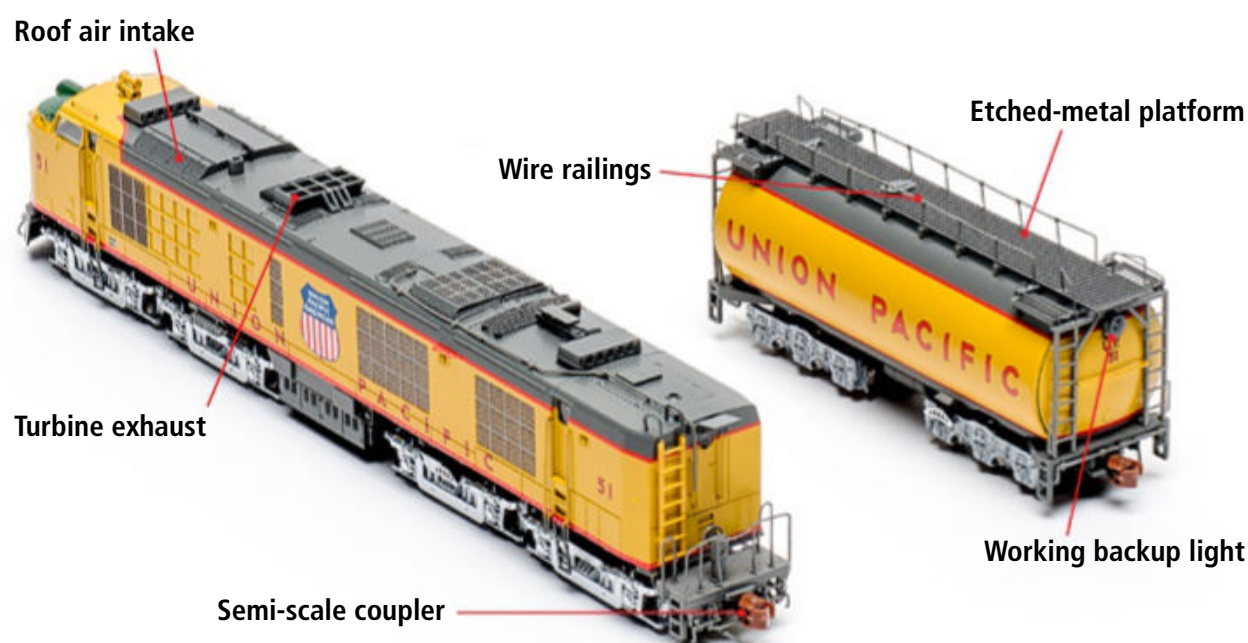
Though gas turbines produced far more horsepower than the diesel locomotives of their day, they did so at the cost of horrendous fuel efficiency. A gas turbine used about 600 gallons of fuel an hour at full load. But that was OK with UP, because the turbines ran on Bunker C oil, an inexpensive leftover of the fuel refining process.

These thirsty turbines meant that the locomotive's 7,200-gallon main fuel tank gave it a range of only about 200 miles before needing refueling, so starting in 1955, UP started equipping them with auxiliary fuel tenders. Made from the running gear of a type 18-C tender from a retired 4-12-2 steam locomotive and two of those tenders' water tanks welded back-to-back, these tenders carried an additional 22,000 gallons of fuel, extending the GTEL's range and usefulness.

So if UP's GTELs were so successful, what happened to them? One word: plastics. As the plastics industry found new uses for Bunker C oil in the 1960s and improvements in refinery technology let more useful fuels be extracted from it, the cost took off like, well, a jet. No longer able to run its oil-guzzling turbines on refinery waste, UP had them scrapped. No standard turbines were preserved.

The once-over. ScaleTrains.com's N scale UP standard turbine is an impressive-looking model. The wire hand grabs, the etched-metal windshield wipers and tender platform, the lighted number boards, the silver-tipped train line hoses, and the scale couplers are all features one would expect to find on an HO scale model. The wire handgrabs are close to scale thickness, as are the ladders. The silver trucks have separately applied brake cylinders, and there is diamond tread texture on the locomotive's rear platform.

I found a dimensioned manufacturer's drawing of the standard turbine in Thos. R. Lee's book *Turbines Westward* (T. Lee Publications, 1975). Almost all of the model's dimensions that I checked with my caliper matched those on the diagram. The only measurement that was off was the length over the coupler's strikers. Since the overall length of the



Living up to ScaleTrains.com's "Rivet Counter" line, the N scale locomotive has numerous separately applied details.

carbody was accurate and model couplers have to be longer in order to allow the models to transit sharp curves, this isn't a big deal. They're only off by 7.5 scale inches, anyway.

When the first prototypes were delivered, they took in air for the turbine through an array of square intakes on the engine's sides. These were protected with stainless steel Farr grills. In 1953, turbine no. 53 had its intakes moved to the roof and a number of the side vents were plated over. When this test proved successful, the other standard turbines were converted to roof intakes in late 1953, and the grills were removed.

Lee's book has many good photos of the prototypes, and the placement of details and markings on our test model matched them in appearance, with one exception. The prototype photos show the last cluster of air intakes on no. 51's sides has 15 square panels – five vertical rows of three. Our model of no. 51 has only 12 panels, in four vertical rows. This grill arrangement does match other standard turbines, including nos. 53, 55, and 56, according to prototype photos.

Test run. Since our sample model is equipped with an ESU LokSound 5 Micro dual-mode Digital Command Control sound decoder, it will run on either direct current or DCC. I tested it on DC first.

Sound-equipped locomotives usually take a lot of voltage to get started. Our sample started up at only 6.25 volts and started rolling at a steady 1.6 scale mph when I turned it up to 7.75V. At our power pack's maximum setting of 13.5V, the locomotive zipped along at 138 scale mph, more than twice the prototype's top rated speed of 65 mph. Sounds under DC were limited to the diesel auxiliary motor and turbine, which was rather loud, as expected.

I had more control of the sounds under DCC. With a

press of function key 8, I heard the startup sequence for the locomotive's diesel auxiliary motor. The turbine came on at the press of F3. Other keys rang the bell, sounded the horn, turned on the Gyalite, and more.

Just like under DC power, on DCC the engine had an impressively slow starting speed, less than 1 scale mph. It also reached an excessively fast 119 scale mph at speed step 28, but a quick adjustment to Configuration Variable 5 (CV5, Vmax) brought that down to a more prototypical level.

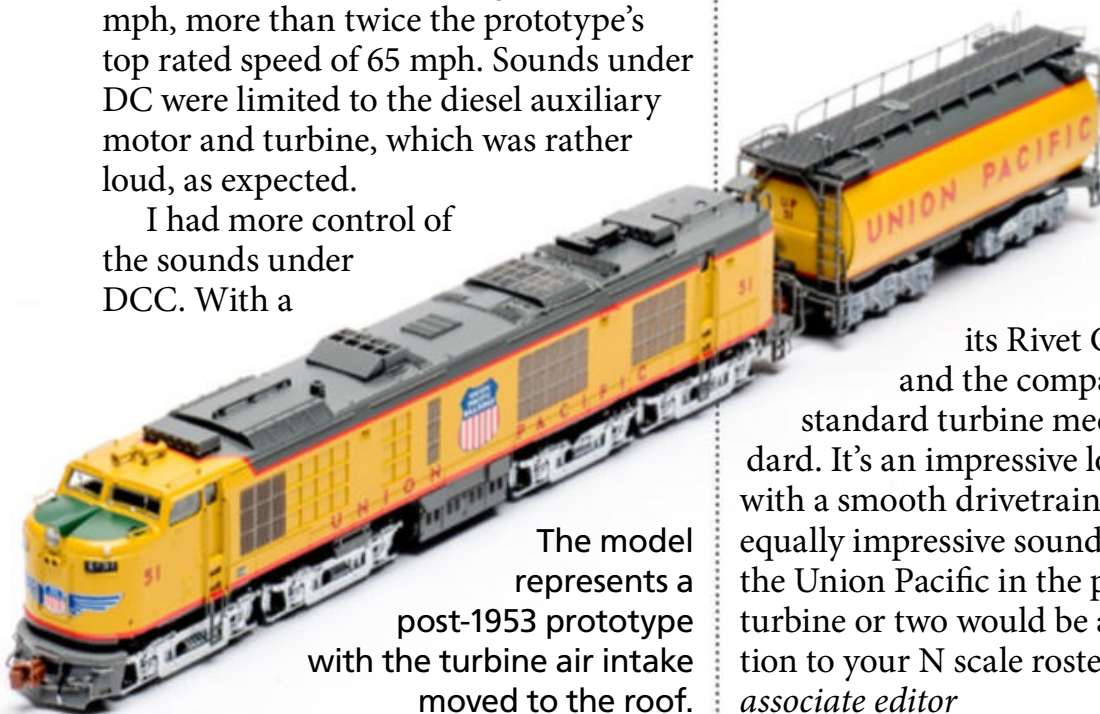
On the prototype, the locomotive's inner two trucks were attached to the locomotive's frame by span bolsters, while the outer two were attached directly to the frame. All four were powered with traction motors. However, to let the model negotiate curves as tight as 11", its two inner trucks are free-floating, pivoting from the front and rear trucks. This means that on the model, only the front and rear trucks can have gear towers connecting them to the motor.

Even so, the model locomotive provided a respectable amount of drawbar pull, almost an ounce, which is equivalent to 23 free-rolling, properly weighted 40-foot freight cars on straight and level track. As a real-world test, I put the turbine and tender on our N scale Canadian Canyons layout and hitched up a baker's dozen of Canadian National coal gondolas – not a prototypical load, but a good test of the model's pulling capabilities. The locomotive handled our 2019 project layout's 13" curves, Peco medium-radius turnouts, and 1.9 percent grades (both up and down the helix) like a champ.

Impressive inside and out. Scale Trains.com sets the standard for fine detailing and accuracy with

its Rivet Counter line, and the company's new UP standard turbine meets that standard. It's an impressive looking model with a smooth drivetrain and, in DCC, equally impressive sounds. If you model the Union Pacific in the postwar years, a turbine or two would be a perfect addition to your N scale roster. – *Steven Otte, associate editor*

The model represents a post-1953 prototype with the turbine air intake moved to the roof.



Facts & features

Price: Locomotive only: direct current model, \$134.99; with Digital Command Control and sound, \$229.99. With fuel tender: DC, \$179.99; DCC sound, \$274.99

Manufacturer

ScaleTrains.com

7598 Highway 411

Benton, TN 37307

scaletrains.com

Era: 1952 to 1964 (tenders added in 1955)

Road names: Union Pacific (four road numbers)

Features

Locomotive

- Detailed cab interior
- ESU LokSound 5 Micro sound decoder (Digital Command Control models only)
- Five-pole, skew-wound motor with dual flywheels
- Front and rear trucks are geared; inner trucks are free-wheeling
- Light-emitting-diode headlight, backup light, Mars light, and number boxes
- Minimum radius 11" (18" recommended)
- Semi-scale knuckle couplers
- Separately applied horn, trainline hoses, ladders, and other details
- Wire grab irons
- Weight: 5 ounces

Tender

- Etched-metal running board
- Light-emitting-diode backup light
- Scale knuckle couplers
- Separately applied brake wheel, trainline hoses, ladders, and other details
- Wire grab irons
- Weight: 1 ounce

PERFORMANCE CHARTS

DRAWBAR PULL	.96 ounces 23 free-rolling freight cars
---------------------	--

SCALE SPEED (DC)

VOLTS	SCALE MPH
6.25	Sounds on
7.75	1.6
9	24
10	29
11	76
12	120
13.5 (max)	138

SCALE SPEED (DCC)

SPEED STEP	SCALE MPH
1	.8
7	24
14	46
21	115
28	119



Atlas HO General Electric Dash 8-40B

Atlas is back with its General Electric Dash 8-40B, originally released in 2001. The new model is now available with an Electronic Solutions Ulm (ESU) LokSound dual-mode decoder.

General Electric (GE) built 151 Dash 8-40B locomotives in 1988 and 1989 for Atchison, Topeka & Santa Fe; Conrail; New York, Susquehanna & Western; St. Louis Southwestern (Cotton Belt); the U.S. Department of Energy; and one kept by GE as a demonstrator. Second-hand owners include CSX, which acquired engines from Conrail and Susquehanna; BNSF Ry., all ex-ATSF; Union Pacific, from Southern Pacific via SSW (Cotton Belt); Providence & Worcester from Susquehanna; and Albany & Eastern, which came from CSX.

These locomotives are still working for some of their second (or third)

owners, but they're essentially gone from Class 1 service. The Illinois Railway Museum has UP no. 1848, ex-Cotton Belt no. 8049.

These 4,000hp locomotives used GE's FDL 16-cylinder diesel engine and microprocessor control for improved efficiency over earlier locomotives. The four-axle locomotives rode on GE floating bolster (FB) trucks. Class 1 customers purchased these high-horsepower locomotives to move fast intermodal traffic efficiently, and the four-axle locomotives were the best solution in the late 1980s and early 1990s. By the middle '90s, the units were being replaced by six-axle power. The Dash 8-40 line would be the last four-axle models offered by GE.

Our sample is decorated as Santa Fe no. 7417, one of Atchison, Topeka & Santa Fe's initial order for 20 Dash

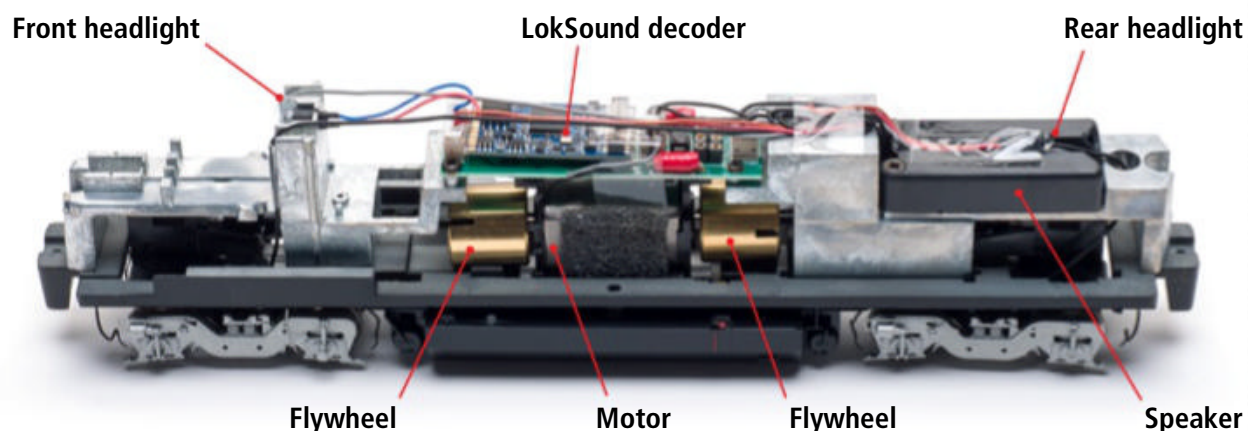
8-40Bs, built in June 1988. Another 20 were built in April 1989. (Santa Fe eventually purchased another 83 Dash 8-40BW locomotives with the North American Safety cab.)

Comparing the model to dimensions published in the April 1989 *Model Railroader*, the truck center-to-center spacing is almost 1 scale foot short. The overall locomotive length is within scale inches of those drawings, meaning the trucks are about 6" farther in from the ends on the model than they are on the prototype.

There are a few other discrepancies between the model and the Santa Fe prototype. The Santa Fe ordered smaller fuel tanks, 3,250 gallons vs. 3,900 on other railroads' orders. Also, Santa Fe opted for headlights mounted in the front of the low hood instead of between the number box above the cab windows. And on top of the cab, Santa Fe ordered air conditioner units, which are absent on the model.

General Electric plated over the headlight locations at the top of the cab on the Santa Fe orders, so modelers could do the same with a bit of shim brass. Air conditioner castings are available from detail parts suppliers, and the fuel tank is molded in two separate plastic halves, so they could be removed and reworked to simulate the smaller Santa Fe versions.

If you're not modeling the Santa Fe, these are non-issues. Other road names have specific details appropriate to their



Here's a look under the shell of the Atlas HO scale General Electric Dash 8-40B. The speaker for the ESU sound decoder is above the rear truck.

PERFORMANCE CHARTS	
DRAWBAR PULL	2.9 ounces equivalent to 40 free-rolling freight cars
SCALE SPEED (DC)	
VOLTS	SCALE MPH
8.4	Sounds on
9.9	2
10	6
11	19
12	40
13 (max)	76
SCALE SPEED (DCC)	
SPEED STEP	SCALE MPH
2 (start)	2
7	14
14	36
21	67
28	71

paint schemes (including air conditioners). None of the others have shorter fuel tanks, which appears to be true of the prototypes as well.

There is much to appreciate on these models. Separately applied, painted wire grab irons and handrails adorn the body shell. Photo-etched metal grills add depth to the radiators. Uncoupling levers, m.u. cables and hoses, brake lines, and grab irons add interest to the pilots, plus in front, there's a snowplow.

The cab has an amber rotary beacon and antennas on its roof and modeler-installed sunshades over the side windows. Painted crew members take their places inside the cab.

The FB trucks have separately applied dampers, brake cylinders, and a brake chain on the engineer's side of the locomotive. The die-cast metal frame has appropriate flange detail and piping, and there are air and sand line details as well.

The paint is smooth and opaque with sharp separations between the blue and yellow sections of the warbonnet

Factory-installed details include wire grab irons, windshield wipers, and a snowplow on the front pilot.



scheme, and the Santa Fe billboard lettering is sharp and opaque against the blue surrounding it. Yellow paint is always an adventure on models.

General Electric builders plates adorn the sides of the walkways in front of the cab, and it appears nearly every door on the long hood has a warning label of some sort. The frame rails have labels indicating fuel fill, lube oil fill, and drain locations, ownership details of the locomotive, and even an emergency fuel cut-off label on the frame above the front air tank. Nicely done!

Under the hood is a die-cast metal chassis. To separate the body shell, start by removing the coupler boxes. Then carefully detach the brake chain from the small plastic hook under the cab on the engineer's side.

Mounted in the middle of the frame is a five-pole, skew-wound can motor with brass flywheels. Die-cast metal weights are secured above the front and rear trucks and drive train. All wheels are driven and pick up power from the track.

A printed-circuit (PC) board motherboard is attached with screws to the weights above the motor, and the ESU LokSound V5 decoder is plugged into the motherboard with a 21-pin plug. A downward-facing speaker is mounted in an enclosure above the rear truck. A single light-emitting diode (LED) illuminates the headlight and number boxes. As on the prototype, the number boxes are painted over on the rear of the Santa Fe locomotive.

I started testing on my home switching layout using my NCE PowerCab. The ESU LokSound V5 decoder didn't hold many surprises, smoothly starting the locomotive, but in speed step 2 instead of step 1. I adjusted Configuration Variable (CV) 2 to increase the starting voltage. I changed the value to 6 (from the default 3). After this adjustment, the locomotive recorded 1.76 scale mph in speed step 1. Top speed was 71 scale mph in speed step 28, similar to the prototype's top speed.

All of the typical features are available with this decoder, with headlights at function 0 (F0), bell at F1, horn at F2, and engine startup at F8. Testing at home, I make use of CV63 to

Facts & features

Price: \$289.95 (DCC, sound), \$179.95 (DC, no sound)

Manufacturer

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

Era: 1989 through approximately 1999 (as decorated)

Road names: Atchison, Topeka & Santa Fe; Albany & Eastern; Conrail; CSX (ex-NS); New York, Susquehanna & Western; Providence & Worcester; St. Louis Southwestern (Cotton Belt); Union Pacific; and undecorated

Features

- Accumate knuckle couplers, mounted at correct height
- Detailed trucks
- Die-cast metal underframe
- Directional lighting
- Five-pole skewed armature motor with dual flywheels
- Painted crew figures
- Separate, factory-installed scale windshield wipers, metal grab irons and fine scale handrails
- Snowplow
- Weight: 1 pound, .4 ounces

reduce the overall volume significantly. A setting of about 50 meets with the other living room occupants' approval.

I tested the locomotive with my trusty Model Rectifier Corp. Tech II Railmaster 2400 with the pulse power switched off. Sound started at about 8.5V with an engine startup sequence. The locomotive started moving at nearly 10V at 2 scale mph and topped out at 76 scale mph at the maximum output of 13V.

The four-axle road switcher was perfectly happy negotiating Atlas no. 4 turnouts and pushing and pulling cars on my switching layout.

This is another in a long line of quality locomotives from Atlas. The detail meets current standards, despite a few roadname-specific discrepancies; the paint and performance are top-notch; and the sound system is fun and easy to use. If you need to haul time-sensitive freight across your 1990s-era layout, be sure to check these models out. – *Eric White, senior editor*



Accurail HO two-bay covered hopper kit

Accurail, well-known for its line of HO scale freight car kits, has added a new model to its product range, the American Car & Foundry (ACF) 2,970-cubic-foot capacity two-bay Center Flow covered hopper. The injection-molded plastic car features a mix of molded and separately applied parts, two-piece pneumatic-gravity discharge gates, and Accumate couplers.

Prototype background. The Center Flow covered hopper design was unveiled by ACF in the early 1960s. The rounded sides made the covered hopper easier to load and unload compared to traditional covered hoppers. The freight car manufacturer built Center Flow covered hoppers in various capacities with different hatch cover styles and between two and four bays for more than three decades. The Center Flow design continues to be used on cars produced by The Greenbrier Companies today.

Our sample is decorated as C&NW no. 175070, part of the railroad's 175000 through 175299 series built by ACF under lot no. 11-02743 in 1967 at its Huntington, W.Va., plant. The cars were originally painted gray with a CHICAGO AND NORTH WESTERN RAILWAY herald in black and white. The Accurail car depicts a covered hopper that was repainted into the railroad's dark green scheme with an EMPLOYEE OWNED NORTH WESTERN herald at the C&NW shops in Clinton, Iowa.

The "B" under the road number indicates the car is in bentonite service. This stencil was added to 64 cars from the 175000-175299 series in late 1976. An article on bentonite covered hoppers is in *North Western Lines* no. 3 from 2007.

The model. The Accurail kit consists of a one-piece injection-molded plastic body. The underbody shares a sprue with the stirrup steps and discharge gates. A second sprue contains the slope sheets, draft-gear box covers, brake appliances, crossover platforms, and hatch covers. Remaining parts include roller-bearing trucks, plastic wheelsets, Accumate couplers, screws, and a steel weight.

If you're familiar with Accurail kits, the two-bay covered hopper follows familiar construction techniques. A small handful of items are needed for assembly, including glue (plastic cement, cyanoacrylate adhesive [CA], or CA gel), a Phillips screwdriver, needle nose pliers, sprue cutters, a hobby knife, and tweezers.

A single-sided sheet with written and illustrated instructions takes modelers through the 14 steps to build the kit. It took me about 30 minutes to assemble the model.

By the numbers. I compared the model to prototype drawings published in the *Chicago and North Western Final Freight Car Roster* by Joseph Piersen and Ira Kulbersh (Chicago & North Western Historical Society, 1999). The majority of the dimensions closely follow published data. The model is equipped with Barber S-2 roller-bearing trucks and 33" plastic wheelsets. The full-size car had ASF A-3 Ride Control roller-bearing trucks with 36" wheels.

Online, I found a prototype photo of car no. 175070 taken in 1990. The lettering placement largely matches the full-size car. An ownership stencil is missing from the upper left corner, and the B should be shifted slightly to the right. The

Facts & features

Price: Single car, \$20.98; three-pack, \$61.98

Manufacturer

Accurail Inc.
P.O. Box 278
Elburn, IL 60119
accurail.com

Era: 1975 to mid-1990s (as decorated).

Road names: Chicago & North Western (green and yellow schemes), CSX (tan with Chesapeake & Ohio reporting marks), Denver & Rio Grande Western (gray), Great Northern (gray), and Erie Lackawanna (gray). Also available painted gray with data only. Other road names listed on website but not formally announced.

Features

- 33" plastic wheelsets, correctly gauged
- Accumate body-mounted couplers, at correct height
- Weight: 2.9 ounces (.5 ounce too light based on NMRA RP-20.1)

herald incorrectly has AND between EMPLOYEE and NORTH WESTERN.

The consolidated stencil is printed on the side of the model. On the prototype, the stencil was applied to a separate metal plate. This could be replicated with Plano Model Products part no. 10879 and a decal.

The body-mounted Accumate couplers are at the correct height. Kadee nos. 5 and 148 couplers are drop-in fits for those who desire metal replacements. At 2.9 ounces, the two-bay Center Flow covered hopper is .5 ounce too light per National Model Railroad Association Recommended Practice 20.1.

I tested the model on our Wisconsin & Southern staff layout. It ran without incident while being pushed and pulled in a train. The car can easily negotiate 18" radius curves.

A fun build. In an era dominated by ready-to-run models, Accurail has carved out a solid place in the hobby with its line of easy-to-build HO scale freight car kits. The ACF 2970 two-bay Center Flow covered hopper has a nice mix of molded and separately applied parts, so it will stand up to regular handling without shedding details. – *Cody Grivno, group technical editor*



Walther's HO Modern Suburban Station kit

If you're in the market for a station to accompany a passenger line on your layout, this kit may be the addition you've been waiting for. The Walther's Cornerstone HO scale Modern Suburban Station is a relatively quick and easy build, and the end result is a clean, modern station with lots of room to add personal modifications.

The kit comes molded in six different colors and includes a sheet of cardstock printed with a variety of different station names, ticket machines, and maps to choose from. It also includes a sheet of acetate for the windows. Don't be alarmed; the small square of plastic, at first glance, doesn't seem like enough to fill the station's multitude of windows both big and small. But if you're careful and measure out your pieces, you can glaze all the windows just fine.

The building came with quite a few interesting details that added an extra element of casual realism to the structure. There were gas meters, ticket

vending machines, vents, a platform access ramp, and a roof-top air conditioner unit, as well as a handful of bollards to line the front of the structure. This, paired with detailed brickwork and separate windows and doors, all tied together nicely in the end.

I assembled the kit over the collective span of about eight hours (although, to be fair, I probably work slower than most). Everything came well molded with little cleanup required. I ended up spray-painting the building, roof, and attached sidewalk with Tamiya paint. Once the paint was all dry, I attached the walls of the station to the sidewalk base. The roof was to be last, after all the windows had been glued into place.

The only hiccup during the project was connecting the separate roof gable (meant to go over the front door of the building) to the rest of the roof piece. It didn't come with any slots or pegs that could be inserted for an easy attachment, and therefore had to be glued along the flat slanted surface and held in place

Facts & features

Price: \$34.98

Manufacturer

Wm. K. Walther's Inc.
5601 W. Florist Ave.
Milwaukee, WI 53218
walther's.com

Era: 1970s to present

Features

- Clear acetate window glazing
- Detail parts include electrical panel, gas meter, platform access ramp, rooftop air conditioner and vents, safety and security posts, station signs, and vending machine
- Full color signs
- Measures 10⁷/₁₆" x 6¹/₂" x 3¹/₈"
- Plastic parts molded in six colors
- Separate doors and windows
- Parking lot (no. 933-3540) and suburban station platforms (no. 933-4099) available separately
- Step-by-step written and illustrated instruction sheet included



Rooftop details on the station include large and small air conditioner units and a pair of vents.

while it dried. This resulted in some smearing around the edges. This was the same case with the station name signs – the small pin-sized legs of the signs had to be carefully glued to the slanted roof and risk being knocked over with a strong gust.

Small grievances aside, this station was well-designed and will fit perfectly in a suburban community on any layout era set within the last 50 years or so. Though the kit is listed as out of stock at the manufacturer, you can still find it at brick-and-mortar and online hobby shops. – *Sammi DiVito, assistant digital editor*



A ticket vending machine, route map, gas meter, and electrical panel are some of the separately applied parts on the building's exterior.

21st-century train orders

Can you think of the Long Island Rail Road without the image of the Dashing Commuter? Indeed, LIRR's electrified, multi-track main line stretching east from New York's Penn Station is the very picture of commuter rail. Centralized Traffic Control governs most of its train movements, but its farthest reaches rely on train orders and manual block operation.

Yes, train orders. Last August in *On Operation*, I stated that LIRR ended its timetable-and-train-order (TTTO) operation in 2012. However, several readers urged me to be more specific, explaining that the last Form 19 order was completed on Sept. 4 that year, but TTTO is alive and well. Alas, the writer's occupational hazard: corrections from readers.

I peeked at the rules on "Movement by Form L" in a 2019 LIRR rulebook. Form L is a 21st-century hybrid of a Form 19 and a track warrant, on which appear sections for out-of-service trackage, speed restrictions, other conditions, and Line 5, where orders are written. The rulebook contains "Rules for Movement by Train Orders" almost identical to their counterparts in the Standard Code.

Here's Rule 201: "Form L is the prescribed form for a train order. Its instructions must be brief and clear, and it must be without erasure, alteration or interlineation." Those familiar with train orders will recognize others which stipulate that a Form L continues in effect until fulfilled, superseded, or cancelled; that time be stated in figures and duplicated in words; and that names of stations be pronounced and then spelled letter by letter. The rules require a block operator



Long Island Rail Road DE30AC no. 406 leads train No. 250's typical summer consist of three cars away from Riverhead, passing the LD block limit signal on July 6, 2019. Jeff Ertlitz photo

to repeat the Form L after receiving it, with the dispatcher underscoring each word of the Form L before making it complete, as readily as do those of us who practice TTTO in operating sessions.

Technology changed the delivery of Form L train orders, however. They may be transmitted to employees electronically via Form L printers at locations designated by special instructions in the employee timetable. When received electronically, the employee addressed must repeat the Form L to the block operator by voice. These requirements ensure that instructions are accurately transmitted and received by those whose actions will be affected. The practice has train order roots, which current Form D, Direct Traffic Control, and Track Warrant systems also respect.

Long Island Rail Road relies on train orders over its 42-mile line between Ronkonkoma and Greenport, a terminal at the tip of Long Island's North Fork so far east that a friend familiar with the area chirped, "You can almost see Boston on a

clear day." Here run trains not to be confused with the Chicago & North Western's. Weekdays see passenger service by the Greenport Scoot operate over this line five times in each direction. New York & Atlantic Ry. (NYAR) freights add to the mix several times each week.

This is also manual block territory, another seeming anachronism. Here, too, LIRR rules read unmistakably. Rule 305 demands that block signals govern the use of blocks and not supersede the superiority of trains, just as does Rule 302 of the Erie 1923 Manual Block System rules in my collection.

How does this play out? NYAR freight RS70 serves industries as far as Riverhead, well east of Ronkonkoma. Recent practice saw it made up ready to follow a midday Scoot, No. 250, scheduled to depart Ronkonkoma at 12:46 p.m. A Form L Line 5 could read

just as the Standard Code prescribed, NYAR 261 RUN EXTRA KO (Ronkonkoma) TO YO (Yaphank) AND RETURN TO KO.

However, before the operator can allow Extra NYAR 261 East to proceed, No. 250 must report clear of the next two blocks so that at least one block separates the two movements. No. 250's equipment returns as No. 251, due to leave Yaphank at 3:47 p.m. This gives NYAR a tight window. To avoid delaying the Scoot, NYAR must wait unless it finishes its work there well enough before 3:47 p.m. to run two blocks ahead. Isn't this classic TTTO?

My October 2017 column

credited Cumbres & Toltec Scenic Ry. as the last road using TTTO in the United States, but track warrants caught up with C&TS last year. Nevertheless, there's still a 21st-century TTTO adherent, with manual block the icing on the cake: LIRR. Well, I'll be. **MR**



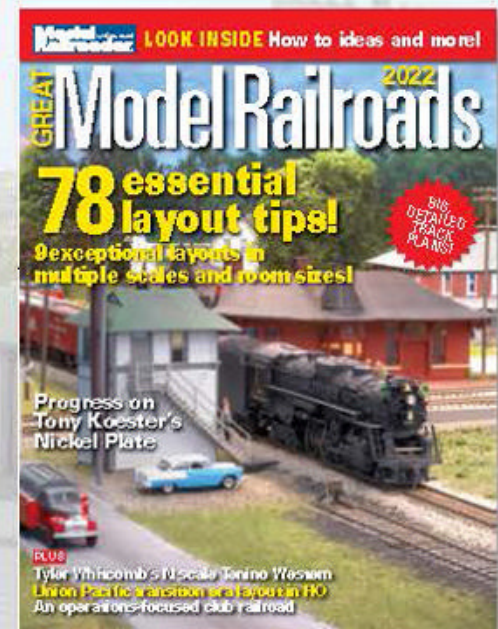
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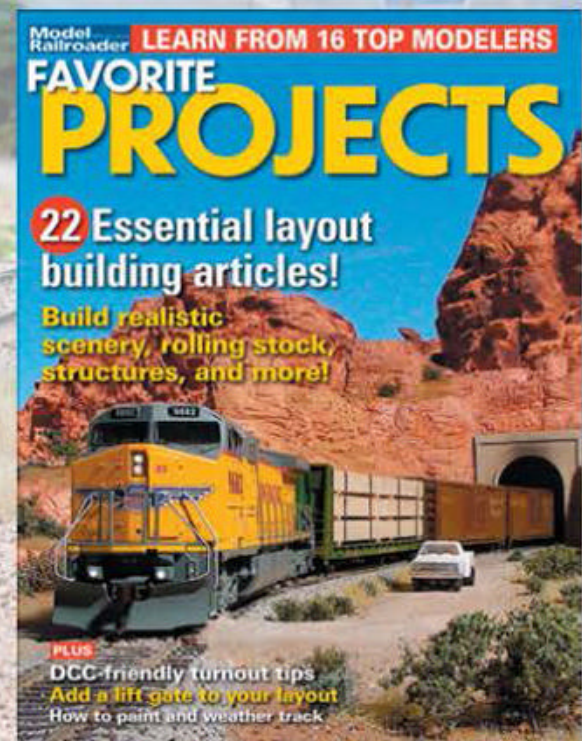
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The old Visalia Electric RR has been folded into the San Joaquin RR, and the crew at the Exeter, Calif., shop is working to bring the locomotives up to current requirements. Rick Sutton of Atascadero, Calif., shot the photo on his HO scale layout. The locomotives are from Athearn and Atlas. The shop building is a photo of the prototype structure, laminated on a 3D frame.



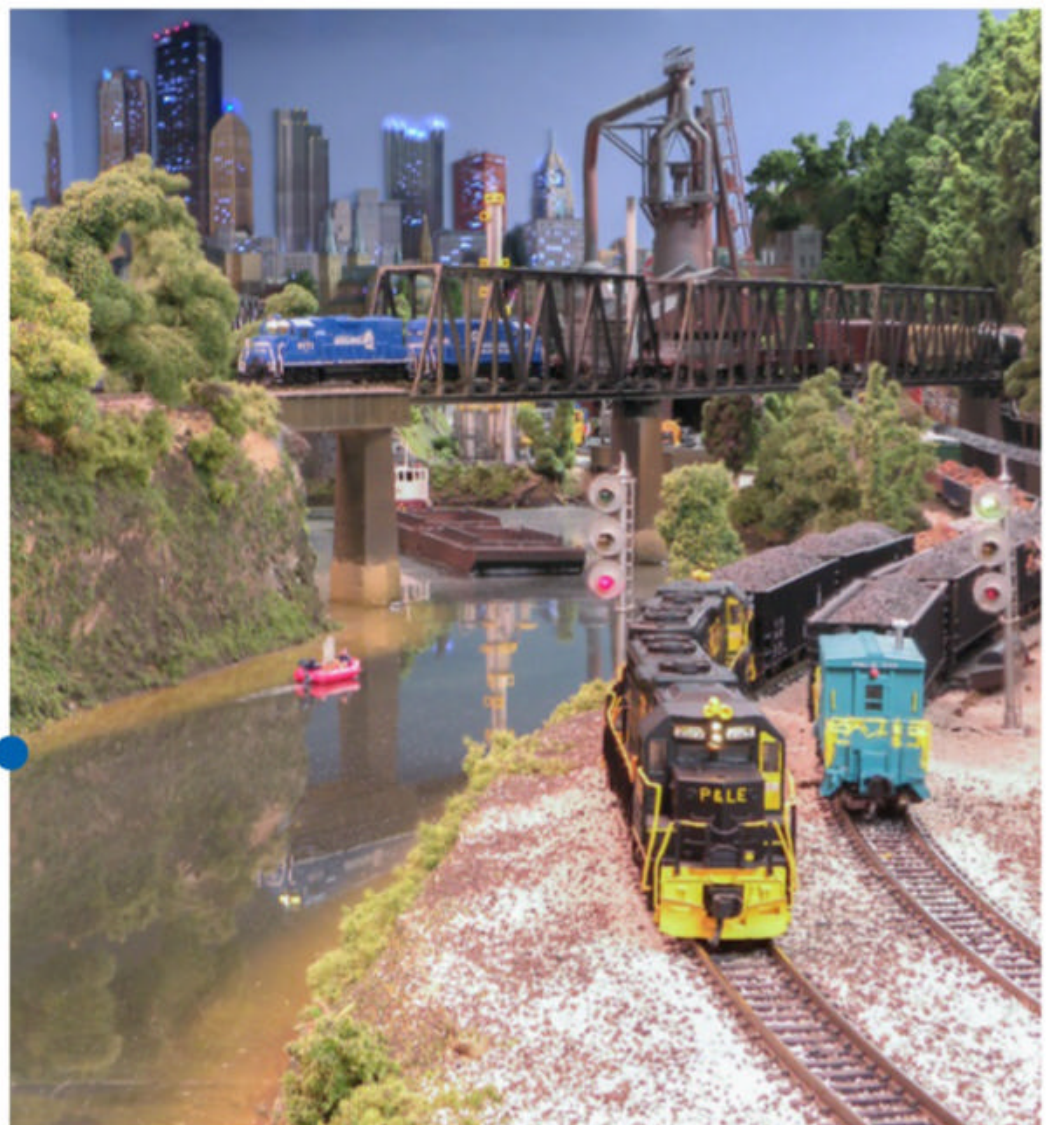
The conductor looks at just the right moment to be caught by a railfan's camera as Iowa Interstate EMD SW1200 switcher pulls a bulkhead flatcar across the Rock River. This scene is from Scott Thornton's HO scale IAIS Milan Branch layout. The locomotive is a Proto2000 by Walther's model. Scott scratchbuilt the bridge and installed a sound module to play the sounds of flowing water and birds chirping.



Atchison, Topeka & Santa Fe diesels await fueling at the BNSF Mojave service area. The N scale scene is part of the freelanced “Mojave style” layout built by Eugen Haenseler of Horgen, Switzerland. Eugen built the expansion to his model railroad to give him a place to store his locomotives.



A pair of Pittsburgh & Lake Erie slow freight drags pass each other beneath Conrail’s Port Perry Bridge while city lights twinkle to life in the background. Todd Treaster of Burnham, Pa., who is an engineer on the full-sized Norfolk Southern, aimed his camera up the Monongahela River toward Pittsburgh on his N scale railroad for this photo.



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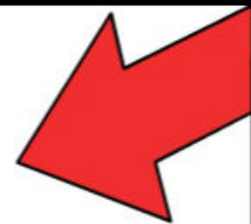
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Schedule of Events Rate: \$45 per issue (55 word maximum). Ads will contain the following information about the event: state, city, sponsoring organization and name of event, meet, auction or show, dates, location, times, admission fee, name and/or 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.

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

Schedule of Events

AR, JACKSONVILLE: 11th Annual Train Show, Jacksonville Community Center, Municipal Drive, Jacksonville, AR. August 21-22, 9:00am - 4:00pm. Vendors, Layouts, Contests. Admission \$8.00, 12 and under free. Contact RAIL & SPRUE Hobbies, 1200 John Harden Drive, Jacksonville, AR, 72076. 501-982-6836, or railandsprue@aol.com

FL, BROOKSVILLE: Regal Railways presents Toy Trains & Hobby Show. Hernando Fairgrounds, 6436 Broad St. Saturday, September 11, 2021. 9:00am-2:00pm. Adults \$5.00. Vendors and operating layouts. Serving lunch items. Contact: Joe at 727-244-1341 or visit: www.regalrailways.com for more information.

FL, PINELLAS PARK: Suncoast Model Railroad Club Train Show/Open House. Saturday, September 18, 2021. SHOW- New venue! Pinellas Performing Arts Center, 4951 78th Avenue N., Zip: 33781. 9am-3pm. Admission: \$7.00, Children \$2.00, under 11-free. Free parking. Food/snacks. Tables: Hugo Sacco: saccohugo459@gmail.com OPEN CLUBHOUSE- 12355 62nd Street North, Suite A, Largo, FL 33773. Admission: free. Visit: www.suncoastmrrc.com

GA, ATLANTA: Scott Antique Markets (featuring Anton's Antique Toy & Train Show), September 9 - 12, 2021. Atlanta Exposition Center, 3650 & 3850 Jonesboro Rd., Atlanta, GA 30354. Thursday: 10:45am-6pm, Friday & Saturday: 9am-6pm, Sunday: 10am-4pm. Admission: \$5, good all weekend. Contact: Anton 937-397-3499, or email: tweissmann6@gmail.com

Events (cont.)

GA, CARTERSVILLE: The Piedmont Division Model Train Show. Clarence Brown Conference Center, 5450 Hwy 20. October 2-3, 2021. Saturday 10am-5pm & Sunday 10am-4pm. Admission: \$9 for adults, kids 9 and under are FREE. NMRA 2-Day Event, Free Parking, 150 vendor tables, 6 operating layouts, White Elephant, Raffle Layout! Information: www.piedmont-div.org or leave a message at 404-550-4816

MI, WYOMING (GRAND RAPIDS): The Greater Grand Rapids Fall Train Show. Saturday, October 9, 2021. HSB Inc., 5625 Burlingame Avenue SW. 10:00am-3:00pm. Adults \$5.00, under 12 free. 203 vendor tables of trains and supplies. See Thomas the Train and Lego play area. Fun for kids of all ages! Contact Ken Skopp, 616-667-9680, kwsokopp@gmail.com, www.grvrrc.org

OH, FOSTORIA: 19th Fostoria Rail Festival, 1001 Park Avenue, Zip 44830. New larger school building. Saturday, September 25, 2021, 10:00am-4:00pm. Admission: \$5.00, children 10 and under free w/adult. Information: Fostoria Rail Preservation Society, 419-435-1781, EllenGatrell@gmail.com, www.FostorialronTriangle.com, Fostoria Rail Park Facebook

TX, AUSTIN: Austin Train Show. New location! Over 25,000 sq.ft. of railroading fun for the whole family! Palmer Events Center, 900 Barton Springs Road, Austin, TX. August 28-29, 2021. Saturday 10am-6pm, Sunday 10am-4pm. Admission \$8 (includes both days, children 12 and under FREE). Vendors, model and Lego railroads, home layout tour included. For more information, visit austintrainshow.org

TX, HOUSTON: Greater Houston Train Show presented by the San Jacinto Model Railroad Club. Saturday, August 14, 2021, 10:00am-4:30pm. Stafford Centre, 10505 Cash Rd. (at Murphy Rd.), Stafford, TX 77477. Instructive classes, vendors, operating layouts, contests. \$5 admission, under 12 free, \$10 family. Concessions and free parking. Subject to mandates surrounding Covid. More info at: http://sanjacmodeltrains.org/

TX, TEMPLE: 39th Annual Temple Model Train Show by Centra Mod Inc. Central Texas Area Model Railroaders, Frank Mayborn Convention Center, 3303 North 3rd St., Temple, TX 76501. September 18-19, 2021, Saturday 10:00am-5:00pm and Sunday 10:00am-4:00pm. Adults \$7.00, Seniors & Military \$6.00, under 12 Free. FREE Parking! Contact: Craig Caddell, 254-760-3761

WA, CHEHALIS: Lewis County Model Railroad Club, Annual Fall Train Show and Swap Meet. Southwest Washington Fair Grounds, Blue Pavilion Building, 2555 N. National Ave., Chehalis, WA 98532. October 9-10, 2021. Saturday 10:00am-4:00pm and Sunday 10:00am-3:00pm. Admission \$5.00. Free parking. Contact information: Ted, 360-985-7788 or TedsTrains@LewisCounty.com

WA, KELSO: LK&R MRR Club Train Show and Swap Meet. Saturday, September 11, 2021, 10am-3pm. Admission: \$5.00. Three Rivers Mall, Kelso, WA. Interstate 5, Exit 39, southwest corner. Up to 200 tables. 2 Estate sales. Information for vendors and guests, see our web site at: http://lkrtrains.yolasite.com or contact Rich Easley 360-431-5790, email: kmann_98632@yahoo.com

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

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Can you see the difference?



The yard job at Lake Linden is working on South Dock using a Bachmann On30 2-6-2 "Trench" locomotive with a replacement cab. All rolling stock is Bachmann. Larry Burk photo

Scale model railroading is all about perceptions, even deceptions. We're trying to convince onlookers and ourselves that what they and we are seeing is actually 160 or 87 or 48 or whatever times larger than it actually is. We suppose trains are longer and curves are broader than they actually are. We assume the traffic will start moving again when the light changes, that the pedestrians are also waiting for a break in the traffic, that the windmill will start pumping water with the next gust of wind. So it's a con game from day one.

Our job, therefore, is to manage the transgressions, to keep things within the realm of plausibility. It's easy not to pose a figure in mid stride running for a bus; better that we show them in repose.

We can also manage concerns about our overly tight curve radii by blocking the most flagrant examples from ready view and not running long cars or locomotives. We

can also choose to emulate railroads that had short rolling stock and tight curves.

One of the easiest ways to accomplish the latter is to model one of the myriad narrow gauge railroads that dotted North America. An early assumption by those overtaken by Narrow Gauge Fever was that the smaller the gauge, the cheaper the construction costs and the quicker the return on the investment. As George Hilton documents in *American Narrow Gauge Railroads* (Stanford University Press, 1994), they were cheaper to build. But their economic virtues soon proved lacking.

For many modelers, economic hardship is a boon, as dilapidated, swayback equipment has been in vogue since John Allen showed us the light back in the 1950s. Better still, we can buy superb narrow gauge equipment in scales ranging from Tiny to Huge. The days of "NoRun3" are over.

But a point of contention still exists. Back when good mechanisms for HOn3 locomotives were few and far between, pioneers like Dave Frary and Bob Hayden adapted better-running N scale chassis to create what was called HOn2½ but now more commonly known as HOn30. Overlooking the slightly wide gauge, they could quickly get their Maine 2-foot (sort of) gauge railroads running on commercial N gauge track. And some 3-foot-gauge modelers could do the same thing.

O scale narrow gaugers soon followed suit by using HO scale track and mechanisms to create On2½, now also known as On30. Commercial support led by the late Lee Riley at

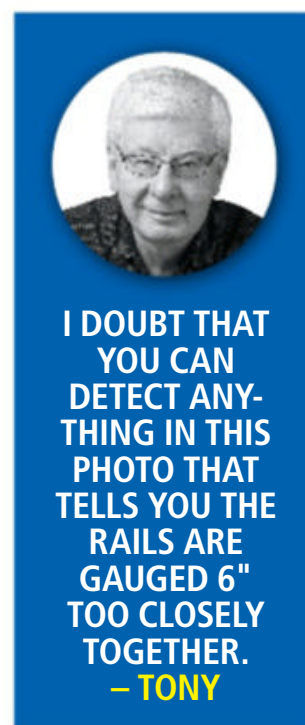
Bachmann was not long in coming, and today's On30 modeler – whether he or she models down to emulate On2 or up to On3 – has a cornucopia of choices on the hobby store shelf when it comes to steam locomotives and rolling stock.

Which brings us to Larry Burk's On30 Laurium, Mohawk & Brockway RR, seen at left, which depicts a 3-foot-gauge short line in Michigan's Keweenaw Peninsula in 1935. When he switched from HO, he looked to On30 for the great-running locomotives, wide selection of ready-to-run rolling stock (he had a large model railroad to build, after all), and their economical cost. (You can read more about the LM&B in the Nov. 2020 *Model Railroader* and *On30 Annual 2020*.)

But we were discussing not economy but plausibility, of leading you to believe what we want you to believe. I doubt that you can detect anything in this photo that tells you the rails are gauged 6" too closely together.

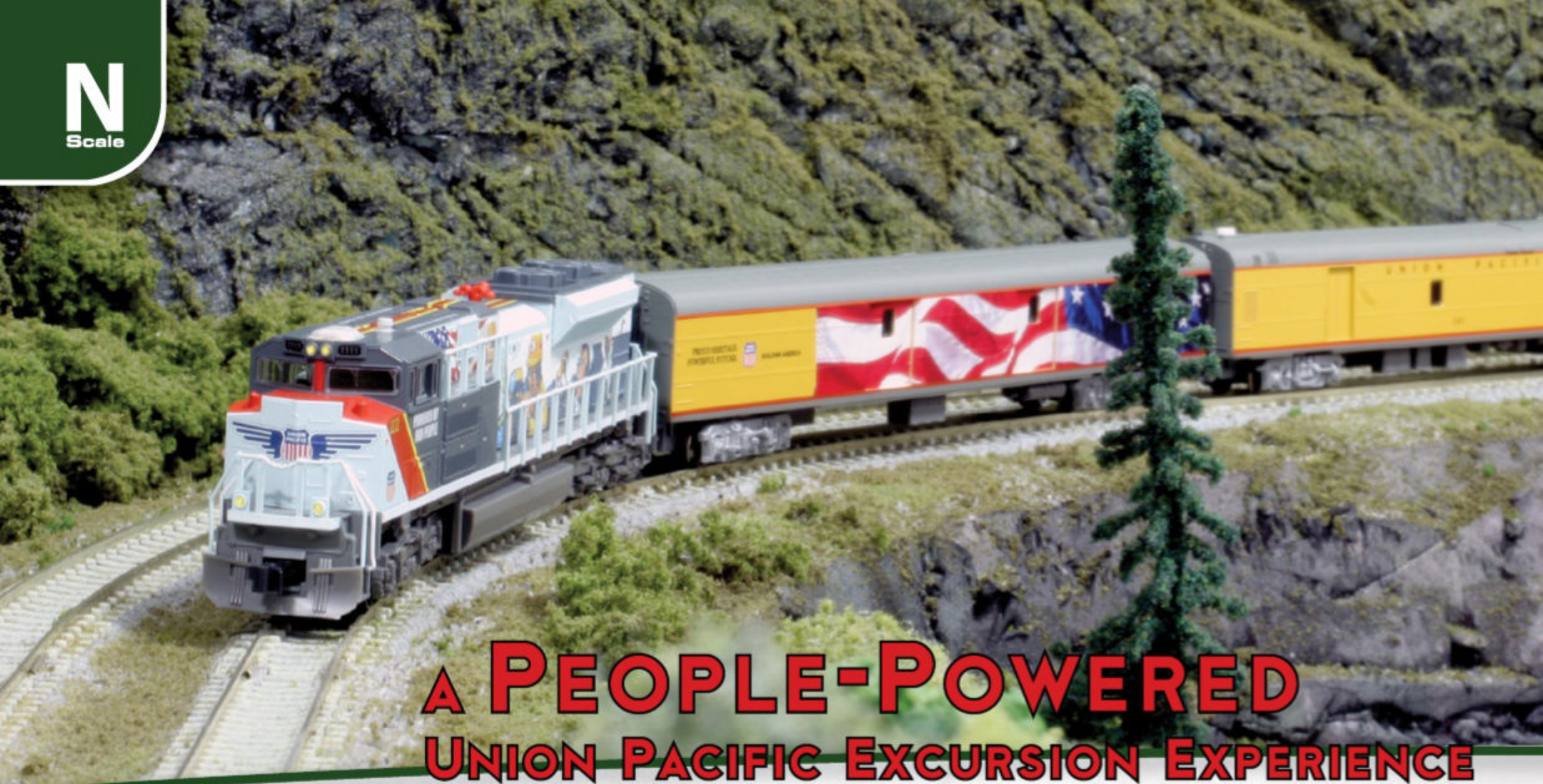
Aiding in such subterfuge is the fact that Larry built the railroad 48" above the floor. When newcomers ask me

how high their railroads should be, in most instances my answer is from 48" to 58". That range of elevation provides a more realistic look at the railroad while allowing reasonably comfortable access for construction, maintenance, and operation. And it makes it difficult to notice a 1/8" gauge error. **MR**



I DOUBT THAT YOU CAN DETECT ANYTHING IN THIS PHOTO THAT TELLS YOU THE RAILS ARE GAUGED 6" TOO CLOSELY TOGETHER.
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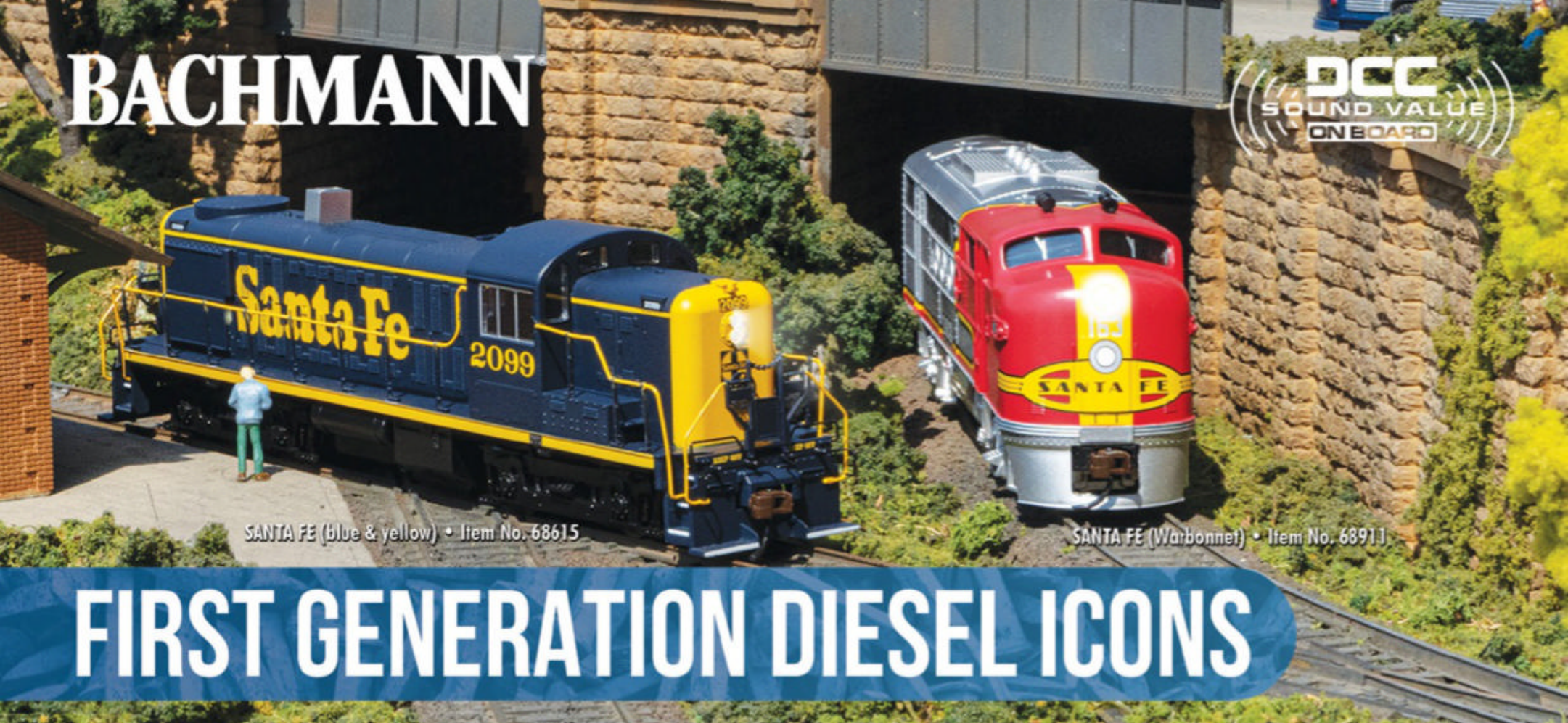
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