

Build this layout **IN A WEEKEND** p.26



September 2017
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Strictly the good stuff!

This mountain HOn3 railroad stays true to its rugged vision

p.40

Keep your
DCC system
properly
grounded

p.56

HOW TO

Model repaired panels on hopper cars p.32

Simulate sunshine shadows with paint p.50

Use natural rocks and soil in scenery p.52

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On the cover: A train crosses one of the many scratchbuilt wooden bridges on Bob Hamm's HOn3 Iron Gorge Subdivision. Lou Sassi photo



Next issue

In October, Paul Dolkos describes street running on his layout, DCC Corner columnist Larry Puckett explains power districts, Harold Russell drawings come to life, and more!

MREXTRA

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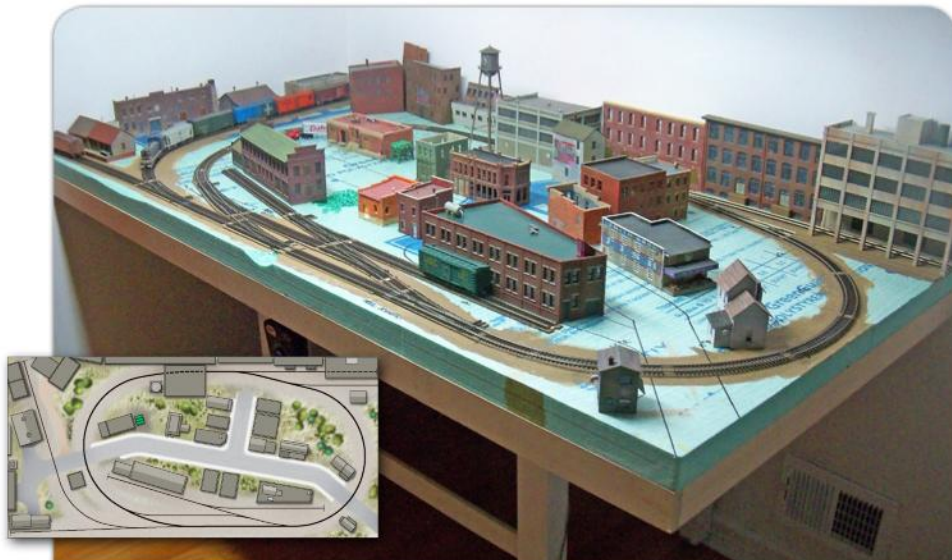


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TTX 1970s





A small layout you can build

Don't miss Paul Boehlert's "Layout in a weekend" on page 26. For a look at another space-saving model railroad that Paul designed, check out the HO scale Central Maine RR. This month you'll find Paul's Central Maine RR article complete with a track plan and list of track components under Online Extras at www.ModelRailroader.com.

DIGITAL BRIEFS

MREXTRA



See new locomotive models in action

In addition to the review on page 58, subscribers can watch a video demo of the new sound-equipped Walther GP35 on the MR website. New reviews and videos are added each month to the online product review database.



Watch the Log Blog series on MRVP

In this new series on Model Railroader Video Plus, you can follow producer David Popp as he builds an extension to the On30 Olympia Logging Co. layout. Visit ModelRailroaderVideoPlus.com to subscribe. You can also click on Free Videos to sample a variety of the shows offered by MRVP.



MR Quick Tip Videos

At less than a minute each, these videos live up to their name. Watch them on the MR Facebook page.



The Iron Gorge Subdivision

Inspired by the narrow gauge lines of the Denver & Rio Grande Western and Rio Grande Southern, the HO_{N3} Iron Gorge Subdivision captures the stunning scenery of its prototypes. Subscribers can watch an exclusive video of trains running through the detailed scenes of this month's cover layout.



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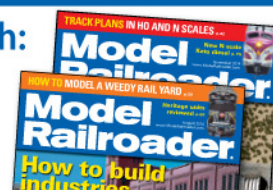
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Enough theory; where do I put the wires?

Our Digital Command Control columnist Larry Puckett writes about common wires and grounds on page 56 this month. It's important stuff, and we are pleased to share Larry's expertise with you each and every month when it comes to digital model railroad control and electrical power.

For our magazine staff, Larry's topic set off another occasional round of the great hallway electricity debate. The impromptu conversations always boil down to this: how deep in electron-speak should any *Model Railroader* wiring story go, and when is it time to just tell you where to connect the two wires?

We all know that electricity comes from power plants. We all know that the electricity we use travels through wires. And we all know that model railroads, at their cores, require two wires (we'll

save battery-powered layouts for another time). But no two model railroads are alike, which means no two layout wiring diagrams are quite alike. There's the rub.

Individuality puts the kibosh on our ability to simply tell those of you who don't care about electrical theory where to connect your wires.

So please bear with Larry and others each month when at times we are compelled to explain *why* wires go to one place or another instead of just telling you *where* to make the connections.

July's editorial about keeping "hobby hoards manageable" touched a nerve for some readers. After all, *Model Railroader* magazine is about building layouts, not taking them down.

My friend Rick Wright sent me an e-mail with some points to consider when

stockpiling model railroad supplies. Rick wrote that hobby shops aren't as plentiful as they once were, so get supplies while you can; and stocking up on kits to build upon retirement is a good thing. He also added that his daughters were pleased that model railroading has kept him active and happy for a long time, so why object to the supplies on the shelves of his basement?

Rick McKay, another reader, wrote that he thought such an editorial was long overdue. Rick made a pitch for a feature story on the subject, and wrote that model railroaders should not leave the inevitable task to their spouses or children.

On this month's cover, the caption asks why this bridge on Bob Hamm's HOn3 layout looks like it has been built twice. Bob is modeling a



bridge that is being rebuilt while remaining in service, hence the dual framework. Read all about his layout starting on page 40.

NEIL BESOUGLOFF

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Electro-Motive Division GP38-2 diesel locomotive. Athearn offers this Genesis-series model decorated for Missouri Pacific; Atchison, Topeka & Santa Fe; Chicago & North Western; Gulf, Mobile & Ohio; Illinois Central (black); and Union Pacific, in four road numbers per scheme. The HO scale model has

road-number-specific details, wire grab irons, and detailed cab interior. Direct-current models with a Quick Plug for a Digital Command Control decoder retail for **\$169.98**. Versions with a dual-mode SoundTraxx Tsunami 2 sound decoder list for **\$269.98**. Athearn Trains, 800-338-4639, www.athearn.com

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- **Alco C-630 and C-630M diesel locomotives.** C-630: Duluth, Missabe & Iron Range (Union Pacific patchout, two numbers); Louisville & Nashville (gray with yellow nose, two numbers); and Reading Co. ("Bee Line Service" slogan with Hi-Ad trucks in two numbers, Tri-Mount trucks in three numbers). C-630M: Canadian National ("wet

noodle" herald and sergeant stripes, two numbers each) and Canadian Pacific (maroon and gray with script lettering, three numbers). Revised tooling with separately applied details, blackened nickel-silver RP-25 contour wheels, and can motor with flywheels. Direct-current model with 21-pin plug for Digital Command Control decoder, \$199.95; with ESU LokSound Select dual-mode DCC and sound decoder, \$299.95. January 2018. Bowser Manufacturing Co. Inc., 800-327-5126, www.bowser-trains.com

- **Illinois Central Paducah, Ky.,-rebuilt GP10 diesel locomotive.** New paint schemes: Arizona & Eastern (Genesee & Wyoming scheme, two road numbers), Bloomer Line (two numbers), Carlton Trail Ry. (four numbers), Central Kansas Ry. (Okanagan Valley Ry. patchout, two numbers), Gulf & Mississippi (one number), Hudson Bay Ry. (one number), Louisiana & Delta (Genesee & Wyoming scheme, one number), Okanagan Valley

Ry. (three numbers), RaiLink (one number), and Winchester & Western (with and without ditch lights, one number). Railroad-specific details, die-cast metal frame, and Kadee couplers. Direct-current model, \$199.95; with ESU LokSound Select Digital Command Control and sound decoder, \$289.95. December 2017/January 2018. InterMountain Railway Co., 303-772-1901, www.intermountain-railway.com

HO scale freight cars



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- **Assorted freight car kits.** Bangor & Aroostook 40-foot double-sheathed boxcar, \$17.98. Bath & Hammond sport, New Orleans Public Belt RR, and Raritan River 50-foot boxcars with exterior posts (single car, \$17.98; three-pack, \$52.98). Canadian National Pullman-Standard 4,750-cubic-foot-capacity three-bay covered hopper, \$19.98. Pennsylvania RR 40-foot single-sheathed boxcar, \$17.98. Pittsburgh & West Virginia 41-foot steel gondola, \$17.98. Union Pacific 40-foot combination-door boxcar ("Be Specific – Ship Union Pacific" slogan), \$17.98. Wheeling & Lake Erie United States Railroad Administration twin hoppers (single car, \$16.98; three-pack, \$49.98). Injection-molded plastic kits with plastic wheelsets and Accumate couplers. Accurail, 630-365-6400, www.accurail.com

- **36-foot old-time double-sheathed boxcar.** International Mexican ("Eagle Pass Route" slogan, one road number), Maryland & Pennsylvania, Mississippi Central, New York Central & Hudson River RR, Pacific Electric, Southern Pacific (Galveston, Harrisburg & San Antonio and New York, Texas & Mexican reporting marks, one number each), and Virginia & Truckee. Three numbers per scheme unless noted. Injection-molded plastic body, 50-ton archbar trucks with 33" metal wheels, and body-mounted McHenry scale couplers. \$25.98. May 2018. Roundhouse line. Athearn Trains, 800-338-4639, www.athearn.com



- **Canadian Pacific 40-foot single-sheathed automobile boxcar.** One-piece cast-resin body, laser-cut wood running board, photo-etched ladders and details, Tahoe Model Works archbar trucks, and Black Cat Publishing decals. \$55. Yarmouth Model Works, www.yarmouthmodelworks.com

HO scale



General American 50-foot insulated boxcar. New paint schemes on this Moloco boxcar are Norfolk & Western (ex-WADX 2-82 repaint and ex-NKP DE 3-80 repaint in two numbers each), Milwaukee Road (MS 5-79 repaint version one in two road numbers, MS 5-79 repaint version 2 in one number, and MS 1-72 repaint in one number), and St. Louis-San Francisco (SN 5-73 repaint in road number, SN 7-74 repaint in two numbers, and as delivered in two numbers). The HO scale model (\$53) has scale 10'-6" offset plug doors and narrow door rods. Moloco, www.molocotrains.com

- **Evans 50-foot welded-side boxcar.** Boston & Maine ("Hydro-Cushion Underframe" and "DF Loader" stencils), Burlington Northern, Conrail (Jade Green), Illinois Central ("Mainline of Mid-America" slogan), Rock Island (blue), and United States Army (yellow with red doors). Two road numbers per scheme. Retooled with thinner stirrups and added door gussets, 33" turned-metal wheelsets, and Proto-Max couplers. \$27.98. Walther's Mainline. Wm. K. Walther's Inc., 414-527-0770, www.walthers.com

HO scale details and accessories

- **1955 Ford F-100 panel truck.** Civil Defense, Ford Motor Co., maintenance of way (orange), police department, Reliable Plumbing, and Super Food Market. Interior with separate steering wheel, clear window glazing, and rolling vinyl tires. \$24.98. May 2018. Athearn Trains, 800-338-4639, www.athearn.com
- **Assorted vehicle kits.** Cement mixer (\$31.98), four-wheel-drive farm tractor (\$31.98), road grader (\$27.98), tracked excavator (\$37.98), tracked loader (\$34.98), and truck crane (\$34.98). Injection-molded plastic kits with cab interior and clear window glazing. SceneMaster line. Wm. K. Walther's Inc., 414-527-0770, www.walthers.com



- **Wilson 43-foot grain trailer.** Archer Daniels Midland (1962-2000 and 2001 to present logos) and Co-Op. Trailer is molded in silver plastic with painted white panels. Includes decals and instructions, as well as graphics to decorate a matching tractor cab. \$27.95. Lonestar Models, www.lonestarmodelsinc.com

N scale locomotives



- **Electro-Motive Division E5 diesel locomotive.** Chicago, Burlington & Quincy ("Red Band" scheme). Numbers 9911A (*Silver Pilot*, Illinois Railway Museum version) and 9912A (*Silver Pilot*, 1960s version). Directional golden-white light-emitting-diode headlights, five-pole motor with all-wheel electrical pickup, and blackened metal wheels. Compatible with Train Control Systems KOD8-E Digital Command Control

motor decoder. \$110. Kato USA Inc., 847-781-9574, www.katousa.com



• **Electro-Motive Division SD40-2 diesel locomotive.** New paint scheme: Burlington Northern (American Revolution Bicentennial, one road number). Prototype-specific horn placement, rooftop beacon, and Sitting Bull and General Custer signboards. \$185. Kato Custom line. Kato USA Inc., 847-781-9574, www.katousa.com

N scale freight cars

• **36-foot old time double-sheathed boxcar.** International Mexican ("Eagle Pass Route" slogan, one road number), Maryland & Pennsylvania, Mississippi Central, New York Central & Hudson River RR, Pacific Electric, Southern

Pacific (GH&SA and NYT&M reporting marks, one number each), and Virginia & Truckee. Three numbers per scheme unless noted. Molded truss rods with turnbuckles, separately applied brake wheel and running board, and screw-mounted trucks. \$21.98. May 2018. AthearnN. Athearn Trains, 800-338-4639, www.athearn.com

• **65'-6" mill gondola.** Baltimore & Ohio (black), Central of Georgia ("The Right Way" slogan), Chesapeake & Ohio ("C&O for Progress" herald), Chicago & North Western ("Chicago & North Western System" herald), Rock Island ("Route Rock" slogan), St. Louis Southwestern ("Cotton Belt" billboard lettering), and Wabash (black with billboard lettering). Three road numbers per scheme. Positionable drop ends, die-cast metal body and underframe, and screw-mounted trucks. \$23.98. May 2018. AthearnN. Athearn Trains, 800-338-4639, www.athearn.com

• **American Car & Foundry Hart 70-ton ballast car.** New paint schemes: Canadian Pacific (black with script

lettering), Erie Lackawanna (post-1960 Erie patch), Milwaukee Road (billboard lettering), and Soo Line (billboard lettering). New road numbers: Chicago, Burlington & Quincy and Chicago & North Western (Chicago & North Western System herald). Five road numbers per scheme (two single cars and one three-pack); also available undecorated. Die-cast metal chassis, 70-ton solid-bearing trucks, and Accumate offset-shank couplers. Single car, \$27.95; three-pack, \$83.85. Master Line. Atlas Model Railroad Co., 908-687-0880, www.atlasrr.com



• **Two-bay offset-side hopper.** Cambria & Indiana (single car and two-pack), Chesapeake & Ohio (post-1948 scheme), Delaware & Hudson (ilmenite service), Litchfield & Madison (single car and two-pack), Pittsburg & Shawmut

Continued on page 14

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Showcase



1 Paint station. This machine-cut medium-density fiberboard kit includes 36mm-wide slots for paint bottles; 12 holes for holding brushes, nail files, knives, and glue; and two water cup holders. The paint station measures 15.7" x 11.8" x 2.4". **\$25.95.** HobbyZone USA, www.hobbyzone.biz

2 48-foot smooth-side intermodal container.

Walthers offers this SceneMaster line model lettered for Burlington Northern and Atchison, Topeka & Santa Fe. The HO scale container sells for **\$12.98.** Wm. K. Walthers Inc., www.walthers.com

3 Southern Pacific Thrall-built class G-100-22 gondola. ExactRail offers this HO scale car in nine road numbers. The Platinum series



gondola (**\$44.99**) has wire grab irons, CNC-machined wheels and axles, and Kadee no. 158 couplers. ExactRail, 866-945-1701, www.exactrail.com

4 70-foot Husky-Stack well car. The latest paint scheme on this Micro-Trains ready-to-run car is Northwestern Oklahoma. The N scale model (**\$28.90**) features die-cast metal and



plastic construction and is offered in two road numbers. Micro-Trains Line Co., www.micro-trains.com

5 Piggyback & Container Traffic. Jeff Wilson's latest book covers the history of piggyback and container traffic from the 1930s to today. The 130-page book sells for **\$21.99.** Kalmbach Books, KalmbachHobbyStore.com

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HO scale



Morton Salt factory. This towering building is the latest factory-assembled structure from Menards. The HO scale Morton Salt factory has more than 20 light-emitting-diode (LED) lights, a water tower with two blinking red LEDs, an illuminated Morton Salt sign, and six figures. The building is attached to a scenicked base that has four bushes and a tree. The lighting requires a 4.5V AC to DC power adapter (sold separately). The building measures 6" x 6½" x 8⅜" and is priced at **\$69.99** plus shipping (free shipping to your local Menards store). Menards, www.menards.com

Continued from page 12

(single car and two-pack), Reading Co. (speed lettering), St. Louis-San Francisco (Frisco), and Texas & Pacific (single car and two-pack). Three to six road numbers per scheme. Die-cast metal center sill assembly, injection-molded plastic hopper doors, and Fox Valley Models metal wheelsets. Single car, \$24.95; two-pack, \$49.90; and three-pack, \$74.85. Early 2018. Bluford Shops, 618-822-6833, www.bluford-shops.com

• **New York Central class X65 boxcar.** New York Central, Pittsburgh & Lake Erie (one road number), and Lehigh Valley. Two numbers per scheme. Body-mounted couplers, etched-metal brake wheel and

crossover platforms, and Atlas American Steel Foundries A-3 Ride Control trucks. Price to be announced. Eastern Seaboard Models Corp., www.esmc.com



• **Norfolk Southern Officer Car**
Special head-end power boxcar

no. 40 and double-plug door material-handling car no. 41. Head-end power boxcar features positionable sliding door and printed vents on sides. Both models have die-cast metal underframe, plastic wheelsets, and truck-mounted Magne-Matic couplers. Two-pack, \$89. Produced by Micro-Trains, available from Lowell Smith Signature Series, www.lowellsmith.net

N scale passenger equipment



• **Milwaukee Road Olympian Hiawatha nine-car set.** 8-double-bedroom lounge-observation (*Coffee Creek*); baggage-dormitory; two 48-seat coaches; Super Dome lounge; diner; 14-section Touralux sleeper (*Mount St. Helens*); and two 10-roomette, six-double-bedroom sleepers (*Lake Pewaukee* and *Lake Oconomowoc*). Cars equipped with low-flange wheels and Kato knuckle couplers. Optional interior lighting kit sold separately. Super Dome and lounge-observation car will have maroon interiors and flush window glazing. \$280. Mid-2017. Kato USA Inc., 847-781-9574, www.katousa.com



• **12-sections, 1-drawing-room heavyweight sleeper.** New paint scheme: New York, New Haven & Hartford (*East Columbia*). Injection-molded plastic model with interior, window glazing, plastic wheelsets, and body-mounted Magne-Matic couplers. \$29.95. Micro-Trains Line Co., 541-535-1755, www.micro-trains.com

N scale details and accessories

• **40-foot trailer with exterior posts.** Atchison, Topeka & Santa Fe ("Truck Rail Service" slogan); Bangor & Aroostook ("piggyback" lettering); Pennsylvania RR ("TrucTrain"); Penn Central; Reading Co. (blue diamond); and Northern Pacific. Three numbers per scheme. \$20.98. May 2018. AthearnN. Athearn Trains, 800-338-4639, www.athearn.com

- **Vintage fuel tanker tractor-trailer sets.** With Peterbilt 350 tractor: Esso, Gulf, Mobilgas, Shell, and Texaco. With Peterbilt 351 tractor: Chevron, Hess Gasoline, Phillips 66, Sinclair, Sunoco, and Union 76. \$52.95. First quarter 2018. Trainworx, 970-874-9747, www.train-worx.com

N scale train sets



- **2016 Operation North Pole Christmas train.** Four-unit set (\$195) includes Electro-Motive Division F40PH no. 133, bi-level coaches nos. 6050 (Rosemont) and 6054 (LifeSource), and bi-level cab-coach no. 8515 (Allstate Arena). Set is in "Starter Series" style hanger box with special decorations. Track and transformer sold separately. Two-car add-on set (\$65) includes bi-level coach no. 6518 (Operation North Pole) and bi-level cab-coach no. 8415 (Donald E. Stephens Convention Center). Two-car set includes bookcase-style case to hold six-unit consist. A portion of the proceeds from every sale of an Operation North Pole train set helps fund the chartering of this annual train. Kato USA Inc., 847-781-9500, www.katousa.com

O scale freight cars

- **1923 American Railway Association 40-foot X29 boxcar.** New road numbers: Baltimore & Ohio, Erie, Erie Lackawanna (two road numbers), Maine Central, New York Central, and Pennsylvania RR. Four numbers per scheme unless noted. Plastic body, die-cast metal chassis, and prototype-specific door styles. \$72.95. Atlas O, 908-687-9590, www.atlaso.com

Z scale locomotives



- **Electro-Motive Division GP30 diesel locomotive.** New paint scheme: Atchison, Topeka & Santa Fe (pinstripe scheme). Two road numbers. Directional

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News & Products

light-emitting-diode headlights, prototype-specific details, and AutoLatch couplers. American Z Line, 614-764-1703, www.americanzline.com

- **Electro-Motive Division GP38-2 diesel locomotive.** New paint scheme: Missouri Pacific. Traction tires, optional plows and pilot, and directional light-emitting-diode headlights. Designed for Digitrax and TCS drop-in Digital Command Control decoders. American Z Line, 614-764-1703, www.americanzline.com

Z scale freight cars



• Greenville 7,100-cubic-foot-capacity 60-foot double-plug-door boxcar.

New paint scheme: Norfolk & Western. Single car and four-pack. Metal wheels and AutoLatch couplers. American Z Line, 614-764-1703, www.americanzline.com

• Trinity 17,600-gallon tank car.

Thiele. Injection-molded plastic model with metal wheelsets and AutoLatch couplers. Two single cars and one four-pack. American Z Line, 614-764-1703, www.americanzline.com

Electronics/controls



- **Dennis Drury's dual automatic block signal controller.** Board provides signal control for two blocks of three-aspect (green, yellow, red) route signaling. Can be used in either single-track (one segment for each signaled direction) or double-track (Rule 251, current of traffic) applications. Board drives three lead common-anode signals. No software required. Assembled and tested board, \$16.50; bare board, \$3. Model Railroad Control Systems, 415-602-1510, www.modelrailroadcontrolsystems.com

Weathering supplies



- **Dust Wash.** Earth, Dust, and Sand. Can be used straight from the bottle or thinned with water. Apply over wet surfaces to increase flow. Apply with brush or airbrush. Water-based resin product. .64-ounce bottle, \$5.62 (price may vary based on exchange rate). IronWorkModels, www.true-earth.com



- **SDW Rust.** Four shades. Water-based resin product with blending abilities of oil-based weathering products. Apply with brush or airbrush. .64-ounce bottle, \$5.62 (price may vary based on exchange rate). IronWorkModels, www.true-earth.com

Decals

- **Assorted decals.** Toledo, Peoria & Western 50- and 52-foot boxcars. HO scale, \$8.25; N scale, \$6.75. Microscale Industries, 714-593-1422, www.microscale.com



- **N scale highway stripes.** Includes white fog lines, broken and solid yellow lines, white stop lines, white arrows for turn lanes, and railroad



Walthers announces next name train

Milwaukee, Wis.,-based Wm. K. Walthers Inc. announced that its next HO scale name train will be Chesapeake & Ohio's *George Washington*. The train will feature equipment assigned to the train between 1954 and 1971, including a newly tooled American Car & Foundry (ACF) 70-foot heavyweight Railway Post Office/baggage car (\$69.98); an ACF 70-foot arched-roof baggage car (\$69.98); Pullman-Standard (PS) 85-foot 52-seat coaches with fluting (with and without skirts, \$74.98 each); PS 85-foot 10-6 sleepers with fluting (with and without skirts, \$74.98 each); and a PS 85-foot dormitory-diner rebuild with fluting but without skirts (\$79.98).

The passenger cars will have a simulated stainless steel finish as appropriate, a sheet of decal names and numbers, and modeler-installed extended drawbars for 22" radius curves.

The train will be powered by C&O class PE-225 Electro-Motive Division E8A diesel locomotives. Two A-A sets and two single A units will be available. Direct-current models will be priced at \$229.98 each (single units) and \$399.98 each (A-A sets). Versions with a dual-mode ESU LokSound Select sound decoder will retail for \$329.98 each (single units) and \$598.98 each (A-A sets).

In addition, Walthers will be offering two Deluxe Edition seven-car sets, slated for release in May 2018. The limited-run sets (200 of each) will feature factory-printed car names and/or numbers, factory-installed light-emitting-diode interior lighting (as appropriate), and more than 80 Preiser passenger and crew figures. The sets are priced at \$729.96 each.

The passenger cars and locomotives will be released between January and June 2018. For more information, visit www.walthers.com.

crossing symbols. One sheet has enough stripes for more than 2 feet of road. \$8. Produced by Microscale Industries, available from Summit USA, 337-436-8481, www.summit-customcuts.com

Books

- ***A Compendium of Model Railroad Operations: From Design to Implementation.*** Co-edited by Steve Benezra and Phil Monat. Covers aspects of prototype operations and how to apply them to a model railroad. Topics

include layout design, operating positions, yards, freight and passenger operations, paperwork, communications, signals, dispatching, car forwarding, and hosting operating sessions. Hardcover, 310 pages. Includes more than 350 photos and 120 illustrations. Operations Special Interest Group (OpSIG) members, \$39.95; non-members, \$49.95. \$8 shipping to U.S. addresses. For shipping rates outside the U.S., e-mail opsig.editor@gmail.com. Steve Benezra, 2737 Thistle Trail, Hillsborough, NC 27278-9302 



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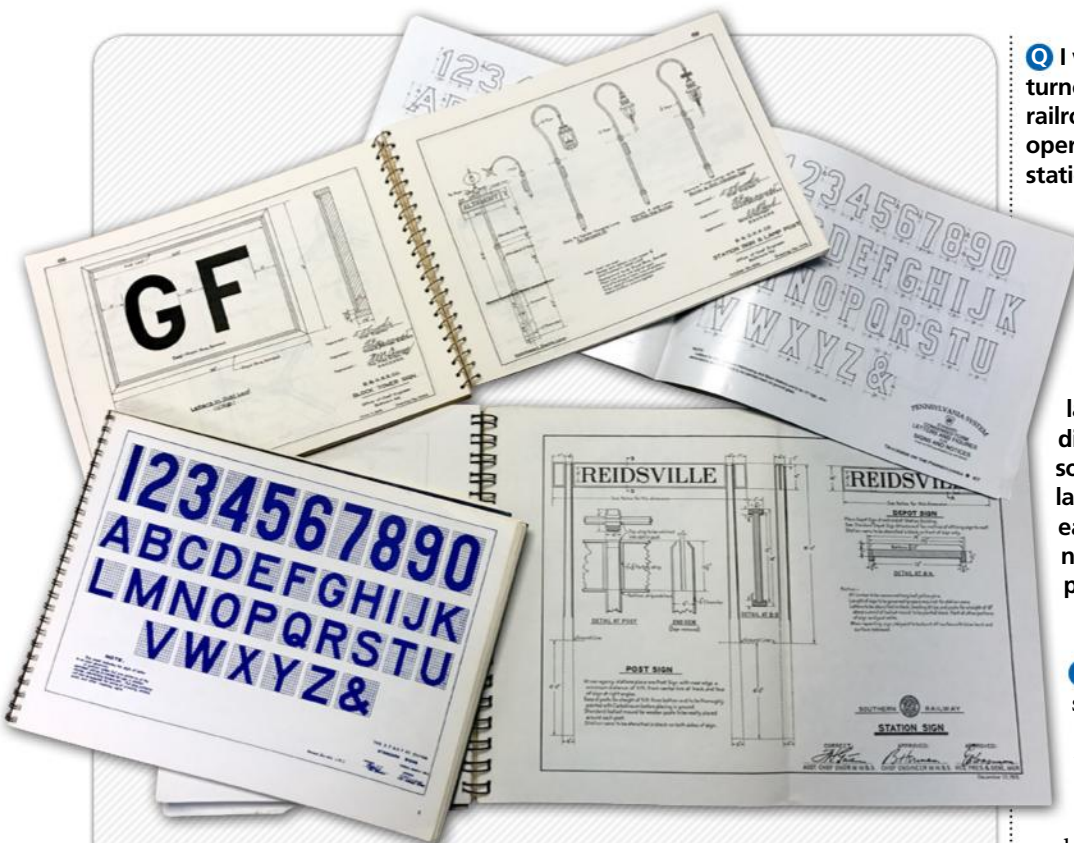
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Railroad engineering standard books are great sources of information on how the prototypes built their physical plants, from stations to bridges to the lettering on signs. Steven Otte photo

What font to use for depot signs?

Q I have several small town depots on my HO scale layout. I'd like to make name signs for them. Can you suggest a font style and point size that would be appropriate? Thanks.

L.B. Groover, Tyrone, Ga.

A That depends on the era and prototype of your railroad. Prototype railroads developed books (known variously as engineering books, standard books, or plan books) that detailed how everything on the railroad was to be built or made, including the size, placement, and lettering styles of signs. These are great resources for modelers, as they also include architectural drawings and plans for such things as depots, interlocking towers, work sheds, trestles, and even some cars and tools. Check with the historical society of your prototype to see if it has reprints of your railroad's plan book available. Or check your favorite online auction site or memorabilia vendor.

If you aren't modeling a prototype, but freelancing, you're free to do whatever you like. For historical believability, though, look for vintage photos of stations in your modeled era for ideas. Times and Copperplate are classic fonts that look good in any time period. Futura was invented in 1927 and Helvetica in 1957, so don't use them to model earlier times. Avoid fonts created for use on computers, like Courier, Charcoal, or Chicago. And never use Comic Sans. For anything. *Ever*.

But whatever typeface you choose, remember that the key is readability. Ornate fonts wouldn't serve the railroad's purpose of conveying information clearly and quickly.

Q I wonder how best to identify the turnouts on my layout. My model railroad has 55 turnouts that are operated by Digital Command Control stationary decoders. I need an easy way for my operators to know what address to use to line each turnout. I prefer not to place a panel on the fascia, as I have beautiful wood cabinets with glass shelves to display my rolling stock and locomotives under the layout. And I'd rather not mount a diagram on the wall, either. Does someone make a sign that could be labeled with the numeric value of each switch machine? Perhaps the number could be written onto a pin placed at each turnout?

Ben Bruno, Richmond, Va.

A The full-size railroads had an answer for your question. Install scale-sized mileposts along your right-of-way. Each turnout on a railroad would be designated in the employee timetable by its milepost location, like "Switch 72.5". If you follow a prototype, you can use the railroad's actual milepost designations for your turnouts, or if you freelance, you can simply measure the distance from an arbitrary zero mile marker you set. Then program your stationary decoders' addresses to their milepost locations.

Look in a railroad engineering plan book or search online for images of "railroad mileposts" for inspiration. Tiny number decals or dry transfers, meant for numbering cars or locomotive number boards, can be applied to a small rectangle of styrene and glued to a styrene or stripwood post to model a modern milepost. For older railroads, do the same on both sides of a square styrene strip painted to represent a wood or concrete milepost.

If scale mileposts are too small for your operators to easily read, prepare a track diagram in the style of those that appeared in employee timetables of your layout's day, and hand out copies to your operators. Make it even more useful by adding important information on the sidings, like the name of the industry served, any clearance hazards, weight or speed restrictions, and how many cars it will hold. Consider adding timetables for scheduled trains as well as operating rules, both standard ones and those unique to your road, and you've created



A milepost, like this one on Norfolk Southern's famous Saluda grade in Zirconia, N.C., would be a prototypical way to number turnouts on a layout.

Grady McKinley photo

a prototypical operator's aid for your model railroad.

Look for employee timetables from your favorite railroad at train shows, swap meets, online auctions, and railroad historical societies.

Q My 1990s-era HO locomotives have open-frame motors that require frequent cleaning to remove carbon buildup from the commutators. I'm thinking about replacing them. Do can motors require the same cleaning?

Rob Hurley, Baltimore

A No. Can motors are fully enclosed in a metal cylinder (hence, the "can" nomenclature). Cleaning them is neither necessary nor practical.

Q My question is regarding HO plastic building kits. How do you glue the corners so glue doesn't seep through the front or sides? I've tried using a jig and also tried adding a strip of styrene to give the joint a larger surface.

Bob Devine, no address given

A It could have to do either with the glue you're using or how you apply it. Glue seeping out of styrene joints and getting on the surface of a model happens a lot with thick plastic cement that comes in tubes. Avoid using that kind of glue on models you care about. Instead, go to your hobby shop and get liquid styrene cement, like that made by Testor Corp., Plastruct, or Tamiya, among others. These thin liquids come in bottles, not tubes, often with a brush in the cap.

Test-fit all model joints before gluing, and use fine sandpaper, a sanding stick, and/or jeweler's files to make sure the parts fit snugly before trying to glue them together. Hold your parts together, keeping your fingers off the joint itself, and use a fine brush to apply a small amount of the cement to the back of the joint. Capillary action will draw the cement into the joint. Hold for a few seconds, and the cement should grab. Avoid the impulse to apply more cement than you need — since liquid plastic cements work by dissolving the plastic, applying more glue doesn't make the joint stronger. Good luck with your build!

Q After stripping paint off an old Tyco diesel shell with Superclean, I air-brushed it with water-based paint. I noticed a few places where the paint looked rough, so I again stripped off the paint, but then I noticed these same spots were crazed. (Superclean is not supposed to craze plastic). I tried to sand off the roughness, but was afraid of ruining the details. Sanding did help to smooth out the surface, but I need a better method to make the surface look right without removing details.

Richard Hamann, Vermont

A Try some sanding sticks. They come in sizes small enough that in most cases you can sand in and around details. If you can't find them, or they aren't small enough, try gluing small squares of 600- to 1,000-grit sandpaper to a piece of stripwood to make your own. The finer grit you use, the smoother you can make your surface.

Q I'm starting to build my N scale layout, with double-track operation. Do our trains run the same way as highway vehicles do, or British style?

Jerry Ashley, Manteno, Ill.

A It depends on which prototype railroad you're modeling. Most American railroads use right-hand running, like American highways. But some prototypes — notably, the Chicago & North Western — did the opposite. To confuse things further, there are instances where railroads reversed the running direction only for certain stretches. So even though right-side running is the rule, there are enough exceptions that you can justify doing whatever you want on your model railroad.



Hanging above the tracks just short of the west portal of Gallitzin Tunnel on the Pennsylvania RR is a row of dangling chains, called a telltale. David P. Morgan

Memorial Library collection

Q I'm curious about a strange device that I think was only used during the steam era. It stood beside the tracks and had an arm that stretched over the rails to support something I can only describe as a comb in appearance. What was it called? What was its purpose, and is it still used today?

Robert Parsons, Charleston, W.Va.

A That trackside item is called a "telltale." Model versions might resemble combs due to the rigid plastic often used to model them. But on the prototype, the parts that hung down were usually made of rope or thin chain.

The purpose of the telltale was to provide a physical warning to any crew members on the roof of the train that a tunnel, signal bridge, overpass, or other low clearance was coming up, and they'd better get off the roof. Telltales began to disappear from the prototype as air brakes replaced manual brakes on freight cars, and the need for a brakeman to walk the roof of freight trains disappeared. A few can still be found here and there, though.

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

A little paint can improve N scale ready-to-run freight cars

A few weeks ago I bought an N scale freight car at my local hobby shop. The car was a bright yellow Milwaukee Road covered hopper by Trainworx, and besides the marvelous detail, it had two other features I've come to look for on cars: metal wheels and body-mounted Magne-Matic couplers.

Without body-mounts, my freight trains with mid-train helpers can't climb Tehachapi Pass without littering the terrain with derailed cars. And by using couplers of all the same brand, I cut down on inadvertent uncouplings.

An exquisite car like this earns and gets a bit of a premium price, but in my case I save about five bucks on the replacement couplers and wheels I'd have to add. Also, I'll almost certainly get a perfectly centered, perfectly installed coupler, as opposed to my effort.

Eliminating the black holes.

So what is there to do on a car like this beyond taking it out of the box and checking it for wheel gauge and trip pin height? Well there's weathering, which eventually I'll do, lightly in this case because the car is so darn pretty, and there's one other thing – painting.

Railroad standard practice is that wheels and couplers on the prototype not be painted, as paint can hide cracks or flaws. Besides, given the marvelous things steel makers can do nowadays, these parts quickly oxidize to a rich mineral brown coating that's attractive and also protects them from further oxidation (that is to say old-fashioned rust, the arch-enemy of railroading).



Here's a Micro-Trains boxcar in the process of getting painted trucks and stirrups. The couplers have been body-mounted and the plastic wheels have been swapped out for metal. Jim usually stays away from painting couplers to maintain good operation. Bill Zuback photo

But those same parts on models can benefit from a bit of color. I can paint the trucks brown because that's the color they often are on the prototype. For us, a major advantage of painting trucks is that we can get rid of the shine that's characteristic of the unpainted engineering plastic that's used to manufacture these parts.

The advantage of such plastics is that they're slippery, as you well know if you've held a truck while changing out the wheels. These slick plastics give axle ends a smoother bearing surface in which to turn more freely.

Painting also makes our trucks more visible. With unpainted black trucks, the cars look as if they're floating on air. And I think cast brown trucks look worse and even more toylike.

Painting trucks and wheels.

You certainly don't need to crank up an airbrush to paint trucks and wheels. Just remove the trucks from the car, pull out the wheels, and paint with a brush, lightly of course. Don't paint the insides of the trucks, as you

don't want paint anywhere near the axle-bearing surfaces, and you can't see them on the finished car anyway.

When painting wheels, take the same precautions. Don't paint the axle ends, as they'll be hidden by the journal boxes, and it would interfere with the low friction of that slick plastic on the needle-point axles. Also keep paint off the wheel treads. If you do get paint on them, the paint will eventually transfer to your rails. Enough grunge ends up there without adding more.

Lightly drybrush the truck details with a little white, and those black holes under your cars will be replaced by nicely detailed parts you can actually see. And nothing on a car has more detail per scale square foot than a truck.

And now to the stirrups. For several decades Micro-Trains was the undisputed champion of accurately detailed freight cars, but

one worrisome detail always bothered me – the corner stirrups. These were scale size and exquisite, and they were usually cast in that slick, black plastic, making them less susceptible to damage.

Unfortunately, casting them in the black plastic makes them invisible. The solution to this problem, as you'd probably guessed, is paint. I always brush-paint them first with a gray acrylic primer. A primer will save you having to apply two or three coats of color.

Next comes the color. You don't need a precise match; being in the ballpark will do. I mix mine from an inexpensive set of tube acrylic paints from the craft shop.



NOTHING ON A CAR HAS MORE DETAIL PER SCALE SQUARE FOOT THAN A TRUCK. - JIM

A nice thing about these mini-projects is that you can do them when you don't have much time. You don't get a lot of instant gratification in model railroading, but here's one little area where you do. 

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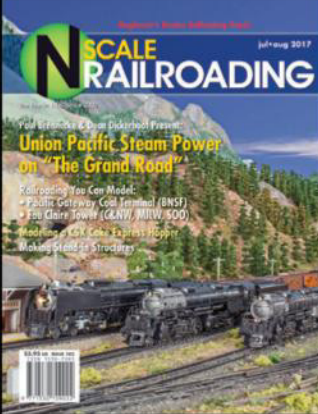
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This HO scale Baltimore & Ohio class M-15k boxcar is modeled as the prototype appeared in 1946. The basis of the model is a Fox Valley Models class M-53 boxcar (inset) with modified sills that rides on an Accurail fish-belly frame. Bill Zuback photos

Kitbashing an early B&O wagontop boxcar

Converting an M-53 to an M-15k with a multimedia mini-kit

Last October, *Model Railroader's* editor, Neil Besougloff, attended the RPM (Railway Prototype Modelers) Chicagoland 2016 conference in Lisle, Ill. I stopped by Neil's office to ask how the meet went and noticed the RPM 2016 conference program opened to prototype photos of a Baltimore & Ohio RR class M-15k boxcar. Next to the booklet was a Fox Valley Models box. That firm had made an HO scale class M-53 wagontop boxcar, so were they now offering the earlier wagontop? Not exactly.

The Fox Valley Models car was one component of the conference mini-kit for that year's RPM meet, which happened to be a B&O class M-15k boxcar. In 1936, a year before the class M-53 steel boxcars were built, the B&O shops replaced the wooden bodies on some of its class M-15 double-sheathed boxcars with new all-steel "wagontop" bodies.

While it had the same wagontop profile as a class M-53 boxcar, the narrower

cast-steel frame of the M-15k gave it some distinct spotting features, including notched side sills and protruding end sills. The older underframes also had fish-belly rather than straight center sills.

As a modeler of the early steam-to-diesel transition era, I really wanted to add an M-15k to my roster, so I volunteered to build the car.

This mini-kit, like those offered at past RPM meets, is essentially a kitbashing project in a box. The heart of the kit is an undecorated Fox Valley Models class M-53 boxcar, including all detail parts, trucks, and couplers. The kit also includes an Accurail fish-belly underframe, a sheet of resin detail parts, various sizes of Evergreen white styrene strips, and a decal sheet.

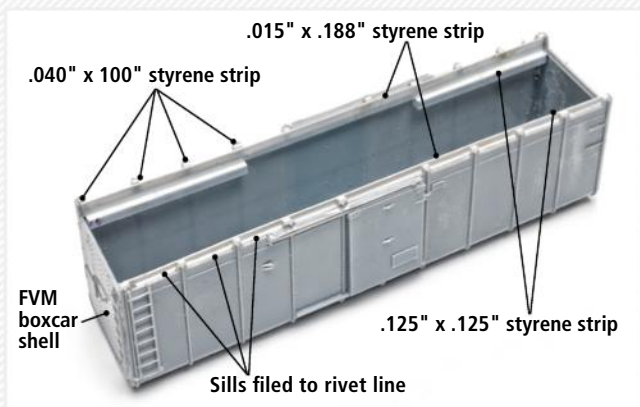
In addition to the prototype information and photos, the conference program included some general instructions for building the kit. The included in-process photos of the side sill modifications and

the finished underframe proved especially helpful.

Modelers who would like to build their own class M-15k could piece together a version of this mini-kit. The undecorated FVM car kits can still be found at online retailers or swap meets, and Accurail boxcars with fish-belly frames are readily available. Firms, including Tichy Train Group and Cal Scale, sell HO scale plastic AB brake components. The resin end sills would be the trickiest parts to reproduce, but I think a reasonable model could be fabricated from strip styrene. For another option, Funaro & Camerlengo (www.fandckits.com) sells a resin kit of a class M-15k boxcar in HO scale.

Follow along as I describe how I built the mini-kit and added a unique wagontop to my 1940s freight car fleet. For more about the upcoming RPM Chicagoland Conference for 2017, visit www.rpmconference.com.

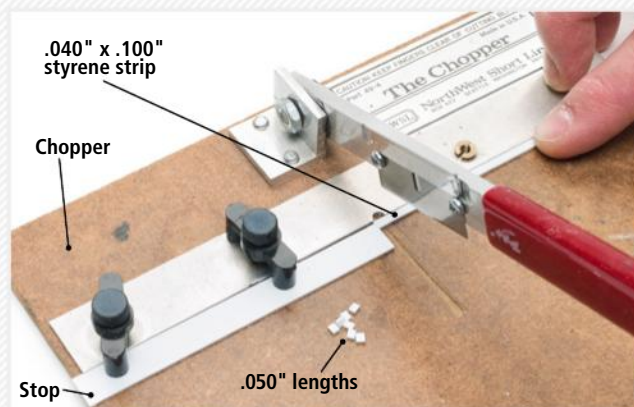
STEP 1 SIDE SILLS



I used **medium-viscosity** cyanoacrylate adhesive (CA) to assemble all the parts used in this project.

First I cemented .040" x .100" styrene strips cut to fit along each side of the body. As per the instructions, these strips were aligned with the existing floor stops in the body shell. I then made four new floor stops out of .125" x .125" styrene strip and attached those with CA.

Next I used a NorthWest Short Line chopper to cut 20 .050"-long pieces of .040" x .100" strip. The Chopper has built-in clamps so I could use a scrap of styrene as a stop.

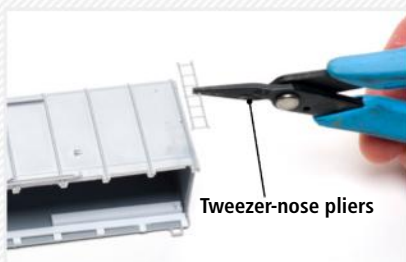


This setup made quick work of cutting consistent lengths of the parts. I glued these strips behind each exterior post.

With the extra reinforcement in place, I used a flat jeweler's file to form the notches between the side ribs. I removed the material to just below the bottom rivet line. I worked slowly to avoid removing too much material.

To finish off the side sills, I attached two .015" x .188" strips cut to fit behind the reinforced posts. The photo above shows the completed sills after some detail parts had been added.

STEP 2 DETAILING THE BODY



I prefer **tweezer-nose pliers** for installing handrails, ladders, grab irons, and other details. The pliers' grooved jaws provide a firm grip.

For the ladders and a few grab irons I added CA to the part's locator pins, then inserted them into the pre-drilled holes on the body. Once the CA dried, I removed any excess glue with fine-grit sandpaper.

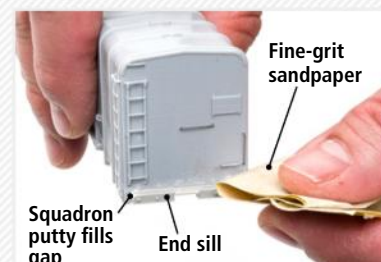
Once I got sick of cleaning up glue blobs, I found a better method. Using a no. 80 bit in a pin vise, I drilled each hole completely through the body. After pressing the part in place, I used a Microbrush to apply CA into the holes from the inside, minimizing the mess.



To keep the parts a prototypical distance from the car sides, I placed a scrap of .030" styrene strip under the handrail or grab iron rungs. Once the CA cured, I removed the strip.

Comparing photos of M-15k to M-53 cars, I noticed the stirrup steps looked different. It also appeared that the B&O shops used a few different styles of stirrups during the M-15k rebuilds. I used a sprue cutter to remove the square plastic stirrups from the FVM body, then replaced them with Detail Associates brass offset stirrup steps, shown in the photo of the finished model on the previous page. The orientation of the steps matches a prototypal photo.

STEP 3 RESIN END SILLS

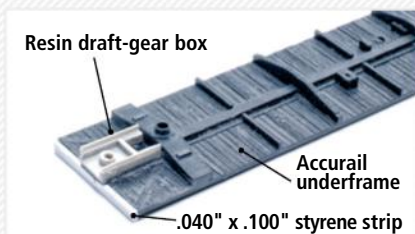


Using a **no. 11 blade** in a hobby knife, I carefully cut the resin end sills out and filed away all the flash. Be careful with resin parts, as they are more brittle than their styrene counterparts.

I then washed the resin parts in warm, soapy water to remove any mold release residue that could affect paint adhesion.

After I attached the sills, there were gaps where they joined the body. I used a Microbrush to fill the gaps with Squadron white modeler's putty, waited for it to dry, then carefully sanded the seam smooth with a small, folded-over sheet of fine-grit sandpaper.

STEP 4 UNDERFRAME



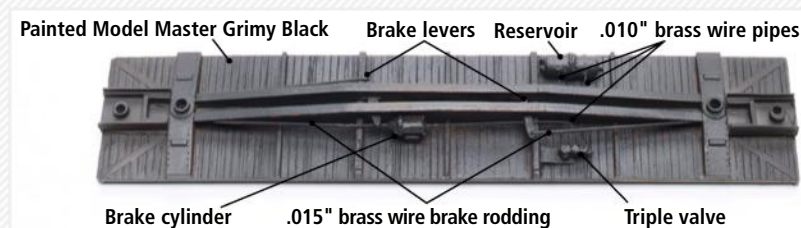
Most of the resin parts included

with the kit were underframe details, including narrower draft-gear boxes that better match the narrow coupler openings on the resin end sills, and the main components of the AB brake system. I prepared the parts in the same manner as the resin end sills in the previous section.

There were two unused part holes in the Accurail frame that I filled with styrene scraps and CA. After the CA cured, I filed the styrene flat.

Although it was the proper width, the Accurail frame was slightly shorter than the FVM boxcar body. As suggested in the instructions, I added strips of .040" x .100" styrene to each end of the underframe. I then filed and sanded each end until the underframe fit snugly into the body.

Satisfied with the fit, I removed the underframe from the body. Next, I inserted the two fish-belly center sills



into the appropriate slots and secured them with CA.

I used sprue nippers to cut away the sides of the draft-gear boxes and screw bosses that were molded into the underframe. Then I filed the surfaces flat.

After test-fitting, I attached the resin draft-gear boxes with CA. I used a toothpick to align the screw hole in each box with that in the frame. This ensured that the new draft-gear boxes would be properly centered. I set the draft-gear box covers aside, as I wouldn't need them until I added the couplers during final assembly.

Making sure the parts were properly positioned, I attached the AB brake components to the frame with CA. This step included the brake levers, which fit into the existing slots in the center sills.

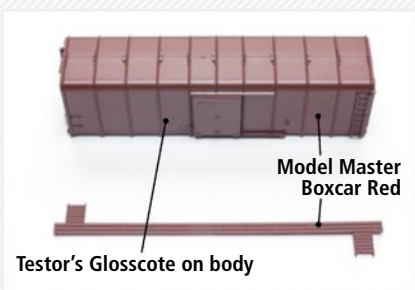
There was no brake piping or rodding included with the kit, so I made

my own from brass rod – .010" diameter for the piping and .015" diameter for the brake rodding. Prior to assembly I'd used a no. 78 bit in a pin vise to drill shallow holes in the brake components to help me position the rods. I also drilled two holes through the center sills for the piping between the triple valve and the reservoir.

A pair of flush-cutting nippers helped me accurately cut the brass rod to length. I used my tweezer-nose pliers to bend the rod as required.

I painted the underframe with Rust-Oleum Painters' Touch 2X Flat Gray Primer and let it dry completely. Then I airbrushed the underframe with Model Master Grimy Black acrylic. Once that paint dried, I applied A.I.M. weathering powders. For the underframe I used Gray and Earth powders as well as Light Rust on the center sills, bolsters, and other simulated metal parts.

STEP 5 FINISHING THE BODY



After sanding away any excess glue,

I sprayed the boxcar body and running board with Flat Gray Primer. I let the primer dry overnight, then airbrushed the parts with Model Master Boxcar Red flat acrylic.

Once that paint dried, I sprayed the boxcar body with Testor's Glosscote. This step provides a smooth

surface that makes decaling much easier. The Glosscote also slightly darkened the red color. However, after weathering and a spray of Dullcote this wouldn't be noticeable.

Prior to decaling, I finished assembling the model. I used CA to attach the running board, running board brackets, and corner grab irons. The instructions didn't specify a method for installing the underframe on the body. Following my usual boxcar kit practice, I attached the included sheet metal weight to the top of the underframe with Walther's Goo. Then I carefully inserted the underframe into the body until it rested flush against the styrene strip floor stops.

After setting the car on a piece of track, I noticed something was amiss.

The car body rode about a scale foot higher than it should have, even though when I test fit the underframe as described in the previous section, it fit perfectly. I disassembled and reassembled the car a number of times before I figured out the cause of this problem.

The sheet metal weight ran the length and width of the underframe. The position of the floor stops didn't account for the added thickness of the weight. I disassembled the car one more time – thankfully, before the Goo fully cured – and carefully pried off the weight.

I thought through my options, including prying off and repositioning the floor stops to accommodate the weight or sticking smaller pieces of

STEP 5 FINISHING THE BODY (CONT'D)

moldable lead car weights to the top of the underframe.

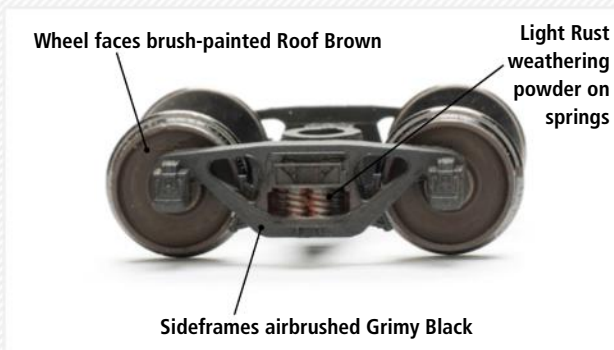
Then a better and easier solution came to mind. I simply inserted the weight into the boxcar body and let it rest on top of the .125" x .125" styrene floor stops. The underframe could then be installed so that the

top of the part was flush with the bottom of the floor stops. The car then rode at the proper height.

The underframe fit tightly, so I didn't apply adhesive. The weight is also loose, but heavy enough that it doesn't rattle around inside the boxcar during normal operation.



STEP 6 GETTING THE CAR ROLLING



After applying a coat of gray primer and letting it dry, I airbrushed the plastic truck sideframes with Model Master Grimy Black. Then I weathered the trucks with Earth and Gray A.I.M. weathering powders. Using a Microbrush I applied A.I.M. Light Rust to the molded spring details on the sideframes. I sealed the powders with a light mist of Testor's Dullcote.

After brush-painting the faces of the metal wheelsets with Model Master Roof Brown acrylic, I let them dry and then installed them into the sideframes. I was careful not to get any paint on the metal wheel treads.

The FVM truck screws included didn't fit the screw bosses on the Accurail underframe, so I used two screws from a spare Accurail boxcar kit in our workshop. I also didn't use the included plastic couplers, instead opting for a pair of Kadee metal no. 148 whisker couplers. Because the centering spring is integrated into the shank, I find these couplers easier to install than those with a separate centering spring. I also appreciate the added durability of the metal knuckles and shanks.

I painted the couplers with Model Master Roof Brown, being careful not to get any paint on the coupler knuckle spring. The painted and weathered couplers are seen in the photo on page 22.

I also added a simplified, non-operating uncoupling lever, which wasn't included in the kit. Following prototype photos I made a couple right-angle bends in a length of .015" brass wire cut to length. Then I used CA to attach the levers to the end sills. These parts are also shown in the photo on page 22. As per the prototype the levers are located on the left side of the B (brake wheel) end and the right side of the A end of the car.

STEP 7 DECALS AND WEATHERING

The set includes a water-slide decal sheet printed by Microscale from artwork provided by freight car authority and author Ted Culotta. The artwork features various heralds, reporting mark configurations, and reweigh dates. This allowed the model to be decorated for the prototype at any point in its long career from the late 1930s to the mid-1950s. I decorated my model for car no. 371031 as it appeared in 1946.

Decals after applying black marker



First I colored the back of the decal sheet with a black marker. Once the ink soaked through the backing paper, I could clearly see the artwork on the other side. This made it much easier for me to cut out the decals as close to the artwork as possible.

It's important to note that the black ink can make the decal paper more waterproof. I had to let the decal soak in water for a few minutes, rather than the usual few seconds. This was especially true of the large heralds and lettering. In the future I'll reserve this technique for only the tiny stencils.

I used a toothpick to position the decals according to prototype photos. Then I used a cotton swab to soak up the excess water. When satisfied with a decal's position, I carefully brushed it with Microscale Micro-Sol decal setting solution.

I finished one car side, let it dry overnight, then sealed the decals with a spray of Testor's Dullcote. I then repeated the process for the other car side as well as the car ends.

I finished off the model with A.I.M. weathering powders. First I used Earth powder, brushing it on the roof and car sides using downward strokes. Then I added Grimy Black powder along the running board and roof to simulate soot. I used Gray powder along the bottom of the body and on the trucks to simulate dust from ballast. Using a fine brush I applied streaks of black and brown powder on the end sills to simulate where the wheels had kicked up dirt and grime.

Now that it looked like it worked for a living, my HO scale M-15k was ready to head down the main line. 

BUILD A LAYOUT IN A



The Layout In A Weekend is built on a 36" bi-fold door. Setting it on a metal shelf unit and reusing structures from previous layouts helped get the model railroad ready to run quickly.

WEEKEND

You can start building a small switching layout Friday night and be operating by Sunday evening



SOME MODEL RAILROADS REQUIRE years of work before the first train ever runs. On the other hand, my new switching layout was started after dinner one Friday evening and hosted its first operating session that Sunday. I worked alone and didn't rush or cut corners, but in just a few hours spread over three days, a pile of parts on a table became an operating model railroad.

"What's your hurry?" you ask. Usually it's more fun to relax and enjoy this marvelous hobby, but there are times, such as a fast-approaching open house, when you want quick results. In my case, I had dismantled my old layout and was suffering from Model Railroad Withdrawal Syndrome (MRWS). Whatever your reason, you can be making setouts and pickups on this little railroad in a couple evenings.

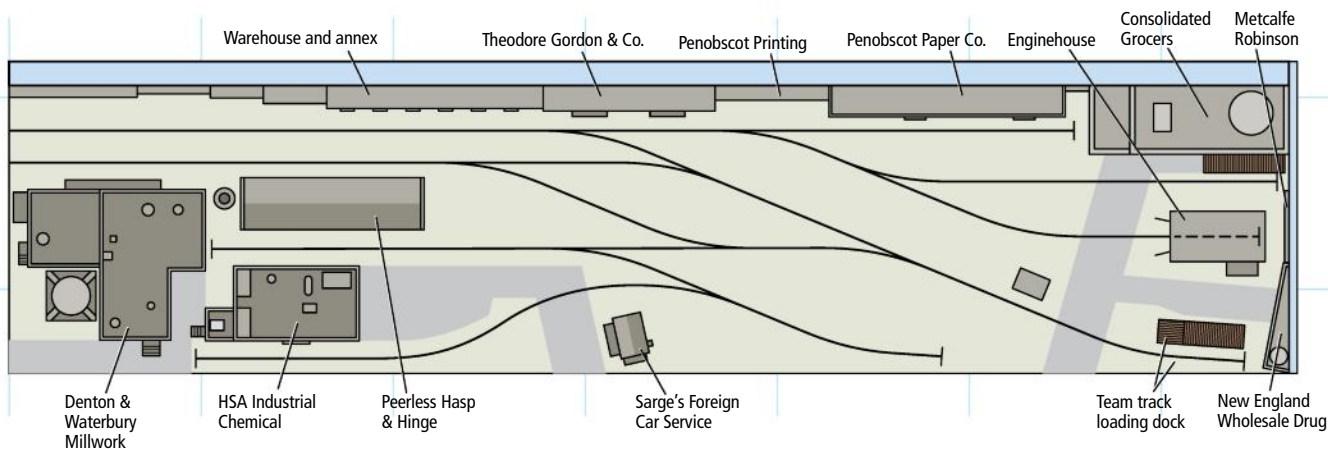
Planning and preparation

A project like this needs a good track plan, and I found one in Mat Chibbaro's *Norwest Terminal* from *Model Railroading In Small Spaces* (Kalmbach Books, 2011). My railroad differs from Mat's in just two significant ways; I flipped the track plan around to better fit my space, and made his removable

7:22 p.m. Friday
Elapsed time, 1 minute



1 Instant benchwork. Paul set the bi-fold door on top of the metal shelf unit that supports the layout, then raised the backdrop panel to a 90 degree angle.



The layout at a glance

Name: Layout In A Weekend

Scale: HO (1:87.1)

Size: 18" x 80"

Prototype: freelanced

Locale: southern New Hampshire

Era: 1969

Style: shelf switching

Mainline Run: none

Minimum Radius: 18"

Turnouts: Atlas Snap-Switch

Maximum Grade: none

Benchwork: hollow-core, bi-fold door

Height: 52"

Roadbed: none

Track: Atlas code 100 flex and sectional track

Scenery: extruded-foam insulation board

Backdrop: painted hollow-core door and plywood

Control: direct-current

Layout In A Weekend

HO scale (1:87.1)

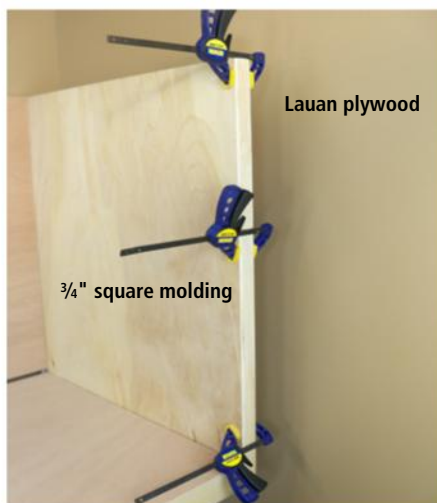
Layout size: 18" x 80"

Scale of plan: 1" = 1'-0", 12" grid

Numbered arrows indicate photo locations

Illustration by Rick Johnson

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



2 Keeping things straight. To keep the plywood end panel from warping, Paul glued $\frac{3}{4}$ " molding along the edge.

staging cassette a permanent, scenicked part of my layout.

My Layout In A Weekend is built from code 100 sectional and flextrack, so it's suitable for modelers of any skill level. To keep things flowing smoothly, I made a checklist of the necessary construction steps and planned to have a couple of jobs going at once.

Reusing a number of the structures from my previous layout was a big time



3 Weighted down. Paul coated the surfaces of the foam and the door with Glidden Gripper primer, joined them while tacky, and weighted them overnight. The last item on Friday's checklist read, "Get some rest. Big day tomorrow."

saver, as was setting the layout on an existing shelf unit, but there was no chance of cosmetically finishing the layout in such a short time. I'd consider the project a success if all the track was down, no raw wood or foam was visible, and the structures were in place on Sunday evening.

On top of that, I wanted to be able to run a train and switch cars. So, no pressure.

Friday evening: Zero to benchwork in 5 seconds

The big weekend kicked off with a trip to the home-improvement store, where I bought a 36" bi-fold flush panel door, a 2 x 2-foot panel of $\frac{1}{4}$ " lauan plywood (hardboard would also work well), a 2 x 8-foot x $1\frac{1}{2}$ " thick sheet of extruded-foam insulation board, and sample jars of paint in sky blue and earth tan. You'll

Materials list

Atlas Model Railroad Co.

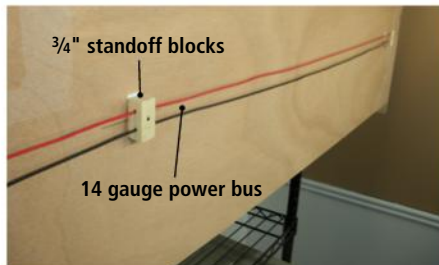
55 insulated rail joiners (2 pr.)
168 code 100 flextrack (8)
842 terminal rail joiners (3 sets)
861 right-hand Snap-Switch (5)
860 left-hand Snap-Switch (4)

Glidden

Gripper primer (1 quart)

Miscellaneous

1½" ring-shank light wire nails for plywood backdrop
8 ounce sample jars of matte-finish paint in sky blue, earth tan, and your chosen fascia color
14 AWG wire in red and black for power bus wiring
36" bi-fold door
Aleene's Tacky Glue or Woodland Scenics Foam-Tack
Insulation Displacement Connectors ("Scotchlok" or "suitcase" wire connectors)
No. 6 x 2" wood screws for power pack shelf
Power pack/throttle



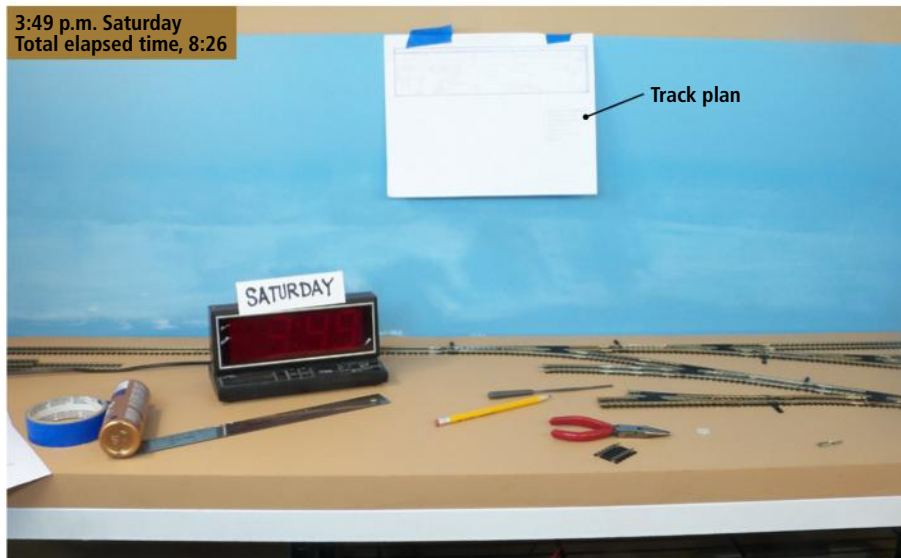
4 Power lines. Stand-off blocks suspend the bus wires about ½" below the bottom of the layout.

also need about 4 feet of ¾" square molding, plus some 1 x 4 and 1 x 2 lumber. I used scraps I had on hand. Once everything was carried into the house, construction was ready to begin.

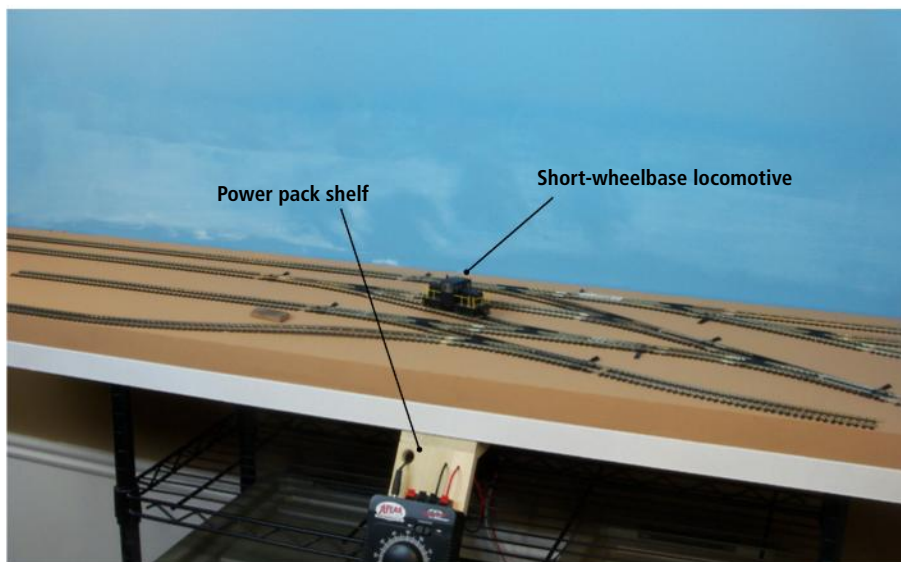
A 36" bi-fold door, also known as a closet door set, consists of two 18 x 80-inch panels hinged together. After unwrapping the door, I placed it atop my shelf unit and raised the top panel to the vertical. Taa-daa! In seconds, I had a solid piece of flat-top benchwork complete with backdrop **1**, on page 27.

To keep the sky from falling, I trimmed my plywood panel to size and nailed it to the right end of the layout **2**, on the previous page. I then set the insulation board on the benchwork, marked it to size, and trimmed it with a utility

3:49 p.m. Saturday
Total elapsed time, 8:26



5 Keeping things straight. Taping the track plan to the backdrop while track laying helped ensure the right piece went in the right place.



6 Testing the trackwork. Using a short-wheelbase locomotive for this step reveals even the smallest dead spots. Paul tested the track every time a new piece was added, so any problems were easy to find and fix.

knife. Once the edges were sanded smooth, I painted the foam board with my earth color and carefully set it aside.

Next I gave the backdrop panels two coats of Gripper primer by Glidden. This product has another use as well, which I'll get to in a moment. After the primer coats dried, I painted the backdrop with my sample jar of sky blue.

In between other projects I dressed up the appearance of my Atlas Snap-Switches. I removed the switch machines, then trimmed the molded-on tabs from the ends of the ties that held the machines. The modified turnouts look great. I worked on a couple whenever a glue joint or coat of paint was drying.

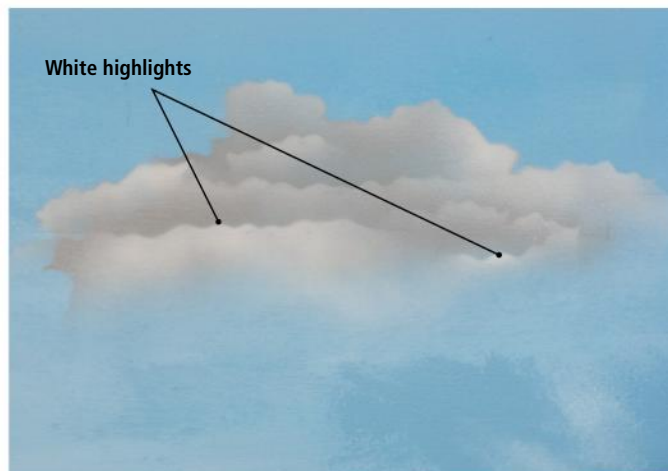
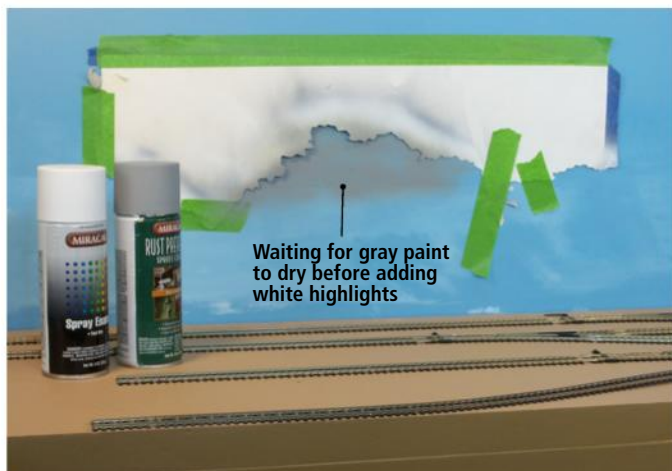
Instead of adhesive, the foam was bonded to the door with the same primer

I'd used on the sky backdrop. Crafters and boatbuilders get excellent results using Gripper to bond foam to wood, and so did I. Photo **3** on the previous page shows the end of the first evening's work.

Saturday morning: Paul gets wired

After removing the books, paint cans and old trophies that were weighting the insulation board to the door while the adhesive primer dried, I carefully tipped the layout over so the bottom was facing me. Doing wiring this way is much more comfortable than crawling underneath.

Mounting wiring directly on the door's surface would make it hard to work with, so I made three small



7 A little rain must fall. To depict an approaching rain shower, Paul used some stencils and spray paint to add clouds to the sky backdrop. He covered the track with a drop cloth while painting to protect it from overspray and worked in a well ventilated area. Here's a finished rain cloud, right, with white highlights showing where the sun is illuminating the top billows. This one took less than five minutes, most of which was waiting for the paint to dry.



New York Central no. 165678, a boxcar of empty steel drums for HSA Industrial Chemicals, was the first setout Sunday night on Paul's Layout In A Weekend.

Paperless car routing for small layouts

I'd rather spend my hobby time running trains, not filling out operational paperwork. But any operating layout needs a way to route cars to their proper destinations. For about 10 years now, I've been using a paperless operating scheme that delivers appropriate cars to each industry without the need for car cards, switch lists or other written forms.

When I chose the mix of businesses the Layout In A Weekend would serve, I made sure each industry ships or receives a different type of freight car. It's obvious where each inbound car belongs, simply based on its type. No paperwork is required.

Providing empties for outbound loads is simple too. Two businesses don't ship by rail, and the other industries all use boxcars. So the occasional boxcar on the staging track is designated as an empty bound for loading at whichever industry has an unoccupied spur. — *Paul Boehlert*

stand-off blocks from leftover pieces of $\frac{3}{4}$ " square stock and drilled two holes in each. My power bus wires run through these holes and are suspended beneath the panel **4**, on the previous page.

Setting the layout back upright, I drew the track plan full size on the foam, working from the back of the layout to the front. It was time to start laying track.

Layout designer and *Model Railroader* author Lance Mindheim has a great tip for installing track feeders through a

hollow-core door: drill a small hole on the top side of the door, but a big one on the underside where it won't be seen. I used a long $\frac{3}{32}$ " bit on top, and a 1" hole saw below, making it much easier to fish the wires through the door's hollow core.

Saturday afternoon: Late start but a big finish

My copy of *Model Railroader* arrived in the mail at lunchtime, so I lingered

over lunch and didn't get back to the layout room until mid-afternoon. But when tracklaying resumed I got into a rhythm. I prepared a piece, attached it temporarily then ran an engine over it. If all was good, I applied Aleene's Tacky Glue to the bottom of every fifth or sixth tie and used weights or Woodland Scenics Foam Nails to hold the track section in place while the glue set up **5**, on the previous page.

When laying each turnout, I slipped a short piece of .020" thick strip styrene under the switch rod, which gave just enough friction to hold the points in place. Eventually I'll install sprung ground throws, but this temporary fix works great.

After the adhesive set, I gave the rails a good going-over with a track cleaning block and vacuumed up any debris. A test run over the whole layout **6**, on the previous page, confirmed all the track was getting power and there were no short circuits. Wait – am I done?

At 5:58 p.m. Saturday, a full day ahead of schedule, the trackwork was complete on the Layout In (Less Than) A Weekend. Now where's that golden spike?

Sunday: Clouds, structures, and the first op session

Before starting work I wanted to have all the track laid and a train running by Sunday evening, but that milestone had been reached the previous day. So late Sunday morning I swept up, looked at my to-do list, and chose three quick projects.

First, I soldered the rail joints. If your layout room isn't climate-controlled, leave a few joints unsoldered to allow the rails to expand and contract with temperature and humidity changes.



8 Operating session no. 1. Locomotive no. 1272 picks up the first cut of cars on Paul's new model railroad.

The thick backdrop panels were distracting, so I painted their edges the same color as the room walls. Then they blended right in with the room. The benchwork edges and power pack shelf got a coat of a darker brown – not a very attractive color, but that's a OK because the eye doesn't dwell on it.

I put my backdrop flats in position and lightly traced their silhouettes onto the "sky." Then I covered the track with a drop cloth and painted clouds above the skyline **7** (be sure to ventilate the room while spraying paint). After the paint dried I reinstalled the

low-relief buildings and set the other structures, which had been built for my previous layout, in their places.

Now it was time for the payoff. I placed five cars on the staging track and began the first informal operating session on my new railroad **8**. When I operate solo – which is usually what I do – I use a simple paperless operating scheme to route cars to their destinations. (See "Paperless car routing for a small layout" on the previous page.)

Building a layout in a weekend was exciting and fun **9**. Normal life still went on. I ran errands, did laundry, and graded my students' papers. But in between, I built a new model railroad and had a great time doing it. Next month, I'll show you the completed Layout In A Weekend. **MR**

MORE ON THE WEB

Registered users can take a look at one of Paul's other layouts, "A space-saving urban track plan," at ModelRailroader.com

2:33 p.m. Sunday
Total elapsed time, 43:10



9 And there you have it. From a folded door sitting on a wire shelving unit to an operating model railroad in less than 48 hours.

Living in Whitesboro, N.Y., Paul Boehlert is a small-layout enthusiast. This is his fourth story in Model Railroader about planning or building a small layout. Paul teaches college English and is a professional storyteller whose performances regularly include stories about trains.



Using thin styrene, masking tape, and paint, M.R. Snell has broken up the long lines of hoppers in his freight trains by modeling repairs made to these hardworking pieces of rolling stock.

How to model REPAIRED HOPPERS

A few basic modeling skills can turn common cars into standouts

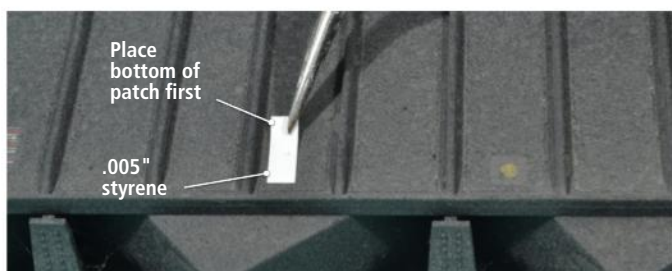
By **M.R. Snell** • Photos by the author

Open hoppers are often the most active cars on railroads, in constant motion from shipper to consignee and then back for the next load. This rigorous service leaves little time for repairs, and those that are made are done quickly, with more emphasis on a rapid return to service than aesthetics.

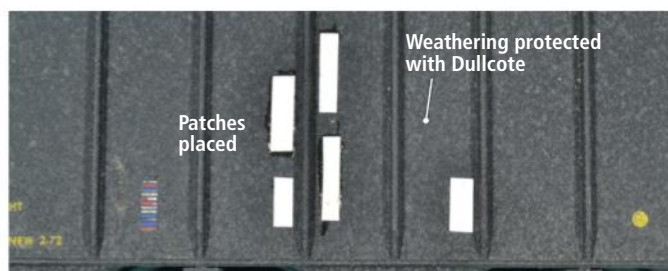
As a result, many cars carry a well-worn look that can last until the car is fully rebuilt or retired. Although our models are hardly subject to these conditions, we model these repairs to add interest to freight car fleets. A few repaired cars can help to break up the monotonous appearance a unit train often exudes.



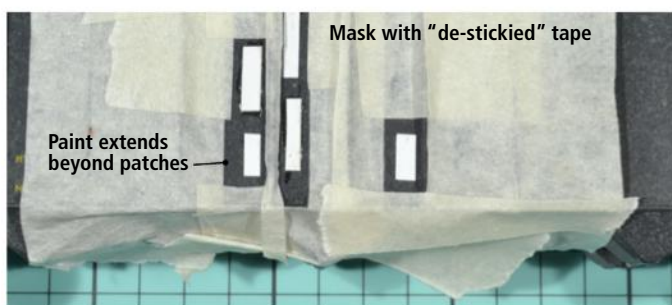
1 Small patches. When holes are small, they're patched with roughly cut panels, as seen in this prototype photo. The panels are welded into place and the area is repainted to match the carbody color.



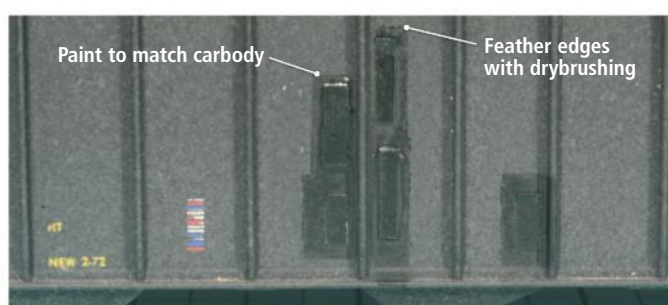
2 Place patches. Use tweezers to place .005" styrene patches using slow-setting cyanoacrylate adhesive.



3 Patches in place. This method favors pieces that aren't exactly square, as it's intended to model quick repairs.



4 Masking it up. Place masking tape on your work surface and peel it up a few times to make it less sticky.



5 Finished repair. The fresh paint and slightly raised surfaces add interest to the otherwise dull hopper.

Small patches

The first repair we'll look at are small patches applied to hoppers with exterior posts (see **1**). These repairs are often the response to rust or machinery leaving holes in the carbody.

One simple remedy employed by shop crews is to weld small patches over the affected areas, then paint both the patch and surrounding area to match the original carbody color. This often leaves a mismatch of fresh and faded paint along the sides.

These small patches aren't precisely cut, and are tailored to fit the damaged area of the car side. Paint applied to the patched area is intended only to protect the repair and is done quickly.

To re-create these patches, begin by cutting several small rectangles from .005" sheet styrene. Next, grip the top edge of the styrene patch with tweezers and apply a single drop of thick cyanoacrylate adhesive (CA) to the back of the patch. Spread this evenly on the back of the patch with a toothpick. Remove

excess cement by touching a paper towel to the edge of the patch to wick up the extra adhesive. This will prevent the cement from oozing around the patch when it's applied to the model.

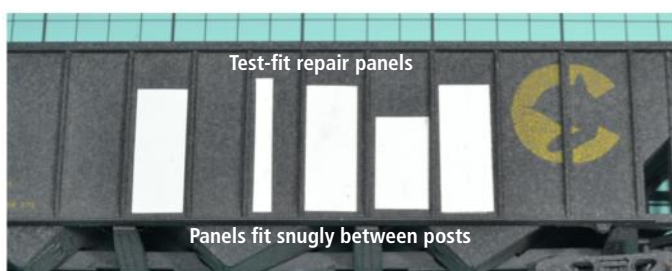
Place the bottom edge of the patch in position, then lay it down, allowing it to fully contact the car side from the bottom to the top, shown in **2**. Once the patch is in place, press down on its surface to force out any trapped air. Additional patches may be added using the same technique (see **3**).

Allow the cement several hours of drying time and then paint the patches to match the carbody with either a paintbrush or airbrush. Using an airbrush will require masking the portions of the model that will not be repainted with painter's tape (see **4**). The painted patches are shown in **5**.

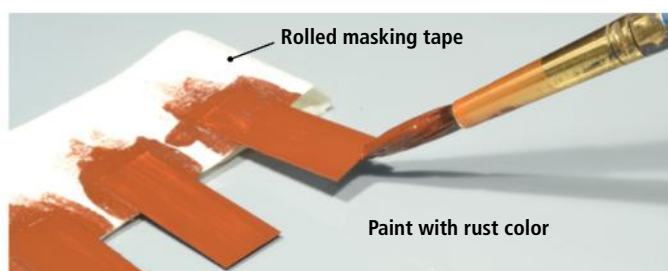
To protect a weathered model, spray the model with a flat finish, such as Testor's Dullcote, before masking. A second way to reduce the chance of damaging the car's finish is to "de-sticky" the tape by dabbing it onto a cutting mat several times.



6 Large patches. Sometimes cars suffer heavier damage, and a small patch isn't sufficient. In this case, large sections of panels on this prototype car have been replaced, some spanning from post to post.



7 Precise fits. The piece must fit exactly between the posts. Spacing can vary, so measure each location.



8 Paint first. It's easier to simulate a rusty panel by painting it before installation.



9 Place carefully. Patches should be even with the bottom of the panel and fill the space between the posts.



10 Blending. Weathering powders help blend the newly painted panels with the rest of the car.

Large patches

The second repair we'll look at are large patches applied to a hopper with exterior posts, shown in **6**. These large patches often encompass the entire area between the posts. In many cases they retain their bare metal surface, which is quickly covered in rust. This is likely the most noticeable of repairs, as the large, rusted panels provide a stark contrast to the weathered black color common on many open hoppers.

These larger patches require precisely cut styrene that fits exactly between the posts. Choose the panels to be "repaired," then measure the distance between the posts, taking separate measurements for each patch. Post spacing can vary.

Transfer each measurement onto .005" styrene sheet. Cut the sheet into long strips using a metal straightedge. After each patch has been cut to width, trim it to the correct height, then test the fit by placing it on the car side (see **7**).

Once the fit and look are satisfactory, remove each patch from the car side and number it to correspond to its location on the car.

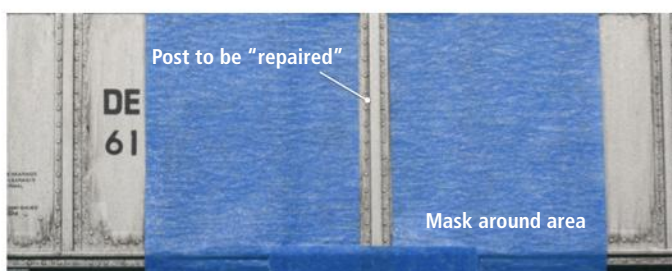
Painting the larger patches requires a different technique. Since they will retain their rusted-metal look, it's easier to paint them before putting them on the car. Whether using a paintbrush or airbrush, one easy way to paint the patches is to hold them using rolled tape, as shown in **8**.

After the paint is dry, pull the patches from the tape and cement them to the car side using the same technique used with the small patches, this time matching each numbered patch to the corresponding location on the hopper car (see **9**).

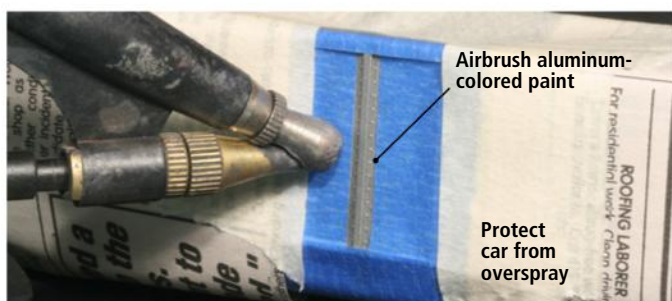
Once the cement has fully dried, blend the patches to the weathered car sides using weathering powders, shown in **10**, and seal with Testor's Dullcote. This will add texture to the rust color while reducing the stark contrast between the "clean" paint of the patches and "dirty" car sides.



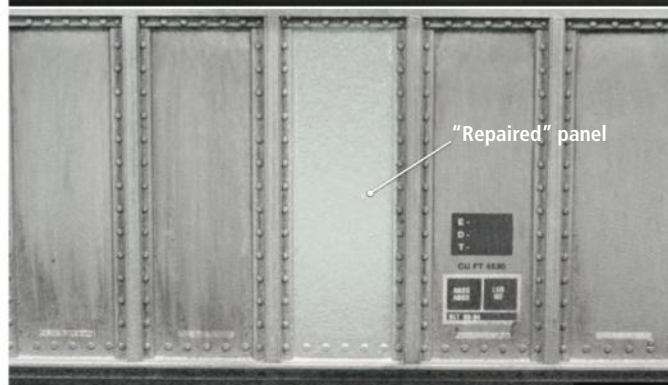
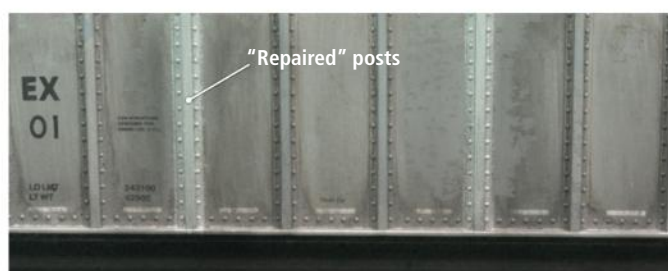
11 And now, for something different. Hoppers with aluminum bodies, like this prototype car, need repairs too, but generally parts are removed and replaced instead of patched. This can be modeled with paint.



12 Get out the tape. Usually, repairs are made to the posts or panels. Here, a post has been masked for painting.



13 Spray it on. An airbrush gives a smoother finish than a paintbrush for this application.



14 Quick finish. The repainted post and panel stand out, and all it took was a little aluminum-colored paint.

And now, for something different

While these prototype repair methods work well for older steel hoppers, the newer generation of coal gondolas is constructed from different materials and requires different repair techniques. These repairs tend to be much cleaner and involve replacement of entire damaged panels or posts (see **11**). We can also replicate repairs made to the newer aluminum Coalporter-style cars by using yet a third technique – paint only.

To model a simple repair such as replacement of a damaged post, we need only weather the car, then mask off the area surrounding the post and paint it a bright aluminum color. Likewise, replicating a new panel requires only masking around the recessed panel, then applying a bright aluminum paint. Once the masking tape is removed, the bright paint will stand out against the darker weathered background of the rest of the car.

Using “de-stickied” tape will protect the existing finish of the hopper. Apply the tape precisely to each side of the post or panel, as shown in **12**, then mask the adjacent panels as well as the top and bottom of the hopper. Next, wrap the remainder of the car in newspaper to protect it from overspray, then air-brush several thin coats of bright aluminum-colored paint onto the “repair” (see **13**).

Apply the desired color in multiple thin coats, which will minimize the chances of paint bleeding around the masking, promote fast drying, and give better control over the shade of the new paint. The finished repairs are shown in **14**.

The next time you’re watching a train of hoppers or gondolas glide by, take a closer look. Although at first glance they may all seem the same, subtle differences such as repairs can break up the endless string of seemingly identical cars. **MR**

M.R. Snell is a frequent contributor to Model Railroader.



Model a TRAILER HOME scene

A shed and small details add to visual interest

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

AS I WAS DESIGNING my On30 South China & Sheepscot River RR, set in rural Maine during the 1950s, I knew I wanted to add a trailer home scene. When I came across MTH's O scale stainless steel mobile home at a local hobby shop, I had the starting point for my project. Though the model is small compared to most prototypes, it's similar in appearance to those that were found in Maine and throughout the United States for decades.

The story behind the scene is that the family's patriarch, Gordon, is a World War II veteran going to school on the G.I. Bill. His father runs Hilton's General Store in Strong, Maine. There was some empty land between the store and the railroad right-of-way, which Gordon's dad made available for a living space.

The fictional history set the stage for the elements in the scene. The actual modeling was pretty simple.

Trailer home alterations

The starting point for the scene is an MTH mobile home (no. 39-90005). The model is fitted with a V-shaped mount for two propane cylinders at the front.

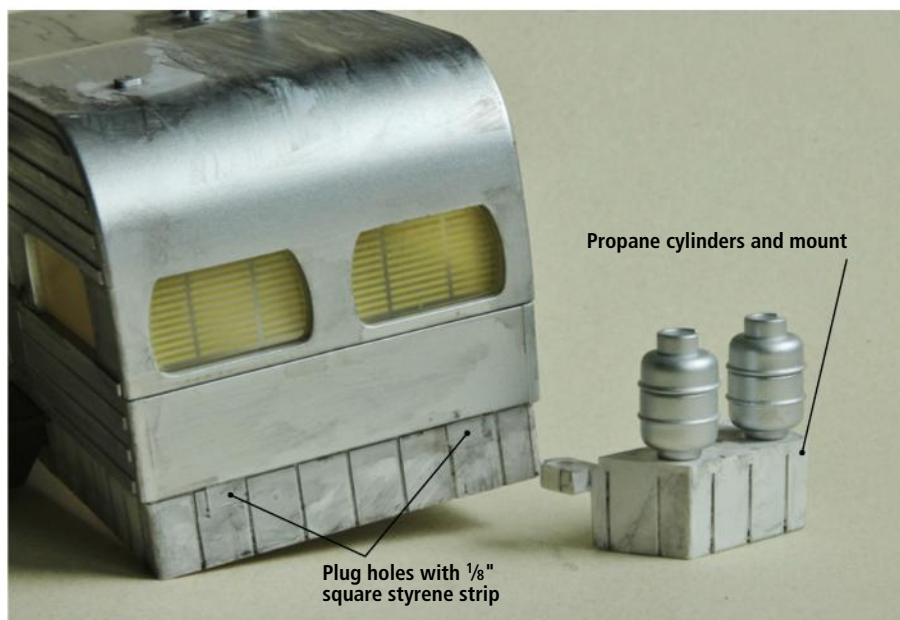


A family enjoys a warm autumn day outside their trailer home. Bob Bennett shares how he modeled this O scale scene, using an MTH trailer home as a starting point.

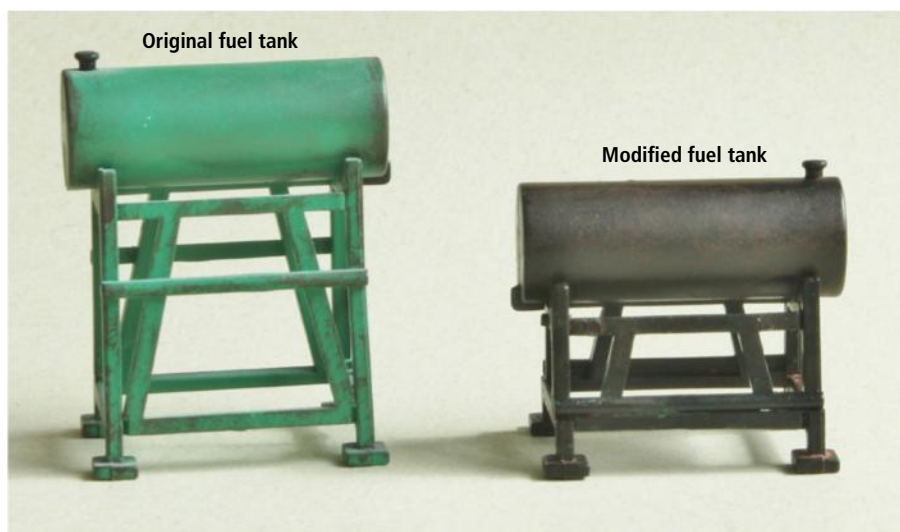
Research indicated that the early 1950s was a bit too early for these cylinders. I removed the cylinders and mount, which left two rectangular holes in the mobile home's skirting. I filled the openings with $\frac{1}{8}$ " square styrene strip ①.

To provide power and heat to the trailer, I added a fuel tank to the scene. I cut the frame about 3 scale feet below the middle horizontal brace and then re-attached the footings ②. Then I painted the tank Floquil Weathered Black [Tamiya no. 56 Metallic Gray is a suitable replacement. – Ed.] and applied Rustall weathering washes.

Most mobile homes that I've seen have some sort of protection from the weather over the main entrance. Accordingly, I made an awning from .040" sheet styrene to cover the front door and added HO scale styrene 6 x 6 supports ③ on the next page. I dragged a fine-tooth razor saw on all four sides of the strips to make the styrene look like distressed wood. I painted



① **Out of gas.** Bob removed the propane cylinders and mount attached to the trailer's skirting. He plugged the holes with $\frac{1}{8}$ " square styrene strip.



② **Give tanks.** Without propane, the trailer needed a new heat source. Bob modified a fuel tank from his scrap box (left) by removing 3 scale feet from the legs, painting it Floquil Weathered Black, and weathering it with Rustall washes.

the bottom of the awning and the supports with Floquil Foundation [Model Master no. 1709 Radome Tan is a similar color. – Ed.], applied an India ink and alcohol wash, and glued the styrene in place.

When the glue had dried, I used Aleene's Tacky Glue to secure two pieces of Northeastern Scale Models paper corrugated metal roofing. After coating the roofing material with Floquil Primer Gray [Model Master no. 1730 Flat Gull Gray would also work. – Ed.], I added Rustall weathering washes.

I finished my modifications to the mobile home by removing the TV antenna on the roof. Then I applied a light India ink wash to the trailer and set it aside.

Styrene shed

Reasoning that storage room was essentially nonexistent in a trailer home, I added a scale 10 x 13-foot shed to the scene. I scratchbuilt the shed from Evergreen no. 4081 clapboard siding, since I had that on hand. I distressed the siding with the same fine-tooth razor saw I used earlier. Then I added nail holes using a Vintage Reproductions rivet tool.

I trimmed the shed with Evergreen .100" angle and HO scale 2 x 10 styrene that I similarly distressed before gluing in place ④.

The front swinging doors are scribed styrene with Grandt Line HO strap hinges attached. I made the handle and

Materials list

American Model Builders

FEN-419 fence

Evergreen styrene

186 .125" x .125" strip
293 .100" angle
409 .250" x .250" strip
4081 clapboard siding, .080" spacing
8208 HO scale 2 x 8
8210 HO scale 2 x 10
8406 HO scale 4 x 6
8408 HO scale 4 x 8
8606 HO scale 6 x 6
9020 .020" sheet
9040 .040" sheet

Grandt Line

3753 36" x 56" double-hung window
5118 HO scale strap hinges

JTT Scenery Products

97408 ribbed roof

MTH Electric Trains

39-90005 stainless mobile home

Northeastern Scale Models

OCORRPRF3B cardstock metal roofing

Rustall

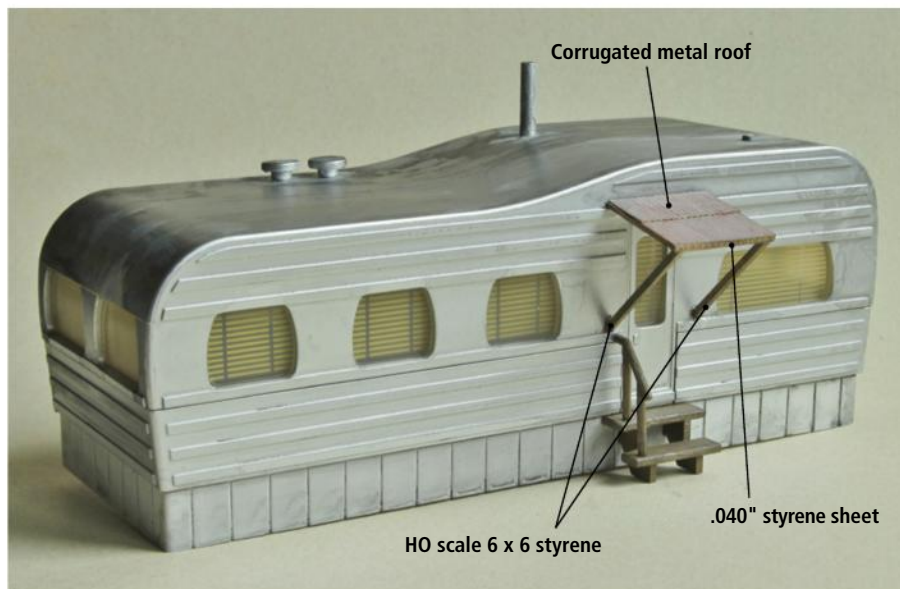
Four-bottle weathering set

Woodland Scenics

A2765 backyard barbecue

Miscellaneous

.015" brass wire
HO scale 2 x 4 stripwood



3 Under cover. The MTH trailer included stairs and a handrail. Bob further enhanced the model by adding an awning and supports. The roofing material is by Northeastern Scale Models.

two holders from .015" wire. The rear double-hung window is a Grandt Line casting that was in my parts box **5**.

With the shed assembled, I sprayed the entire structure with a light coat of Floquil Reefer White [Now discontinued. Use Model Master no. 4873 Reefer White. – Ed.] After the paint dried, I applied the same India ink wash that I used on the mobile home. I made the concrete slab foundation from 1/8" square styrene strip.

I used JTT metal roofing, sprayed silver and with Testor's Dullcote, for the shed roof. I used Rustall washes for the weathering, as seen in **6**.

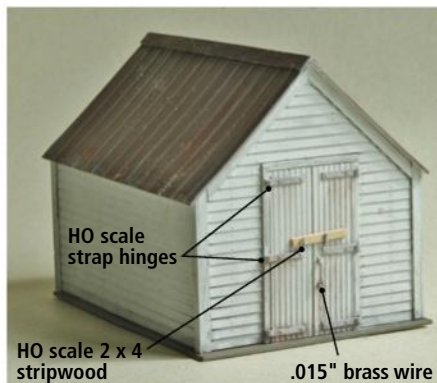
Finishing the scene

When I bought the trailer, I also purchased a Woodland Scenics backyard

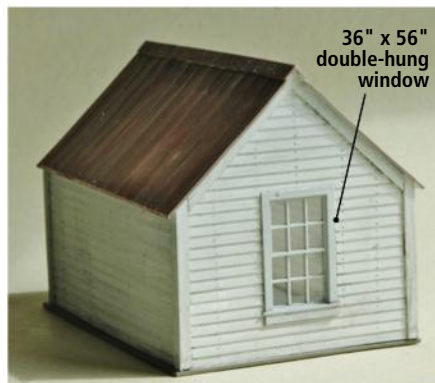
barbecue set (no. A2765). I built a picnic table from HO scale 2 x 8, 4 x 6, and 8 x 10 styrene strip. I distressed the styrene prior to assembly. Then I painted the picnic table with a coat of gray spray primer.

I made the clothes line pole from styrene strip, nut-bolt-washer castings, and thin floral wire, which replicates rope well. I attached a matching beam to the side wall of the shed **7** on the next page.

The birdhouse is a piece of shaped 1/4" square styrene strip with an 1/8" square strip post and .020" sheet roof and base. The perch is a length of wire and the entrance is a drilled hole. Likewise, the mailbox is styrene strip glued together and sanded to shape, sitting on an HO scale 4 x 8 styrene post. The birdhouse and mailbox have wire pins in the



4 Extra room. Bob scratchbuilt this scale 10 x 13-foot shed using styrene clapboard siding. He added the nail holes to the siding with a Vintage Reproductions rivet tool. The HO strap hinges look right on the O scale model.



5 Window to the world. While building the shed, Bob found this Grandt Line double-hung window in his scrapbox. Since the shed most likely didn't have electricity, the window let in natural light.



6 Close it up. Bob used JTT Scenery Products metal roofing for the shed. He painted the roof silver, muted the color with Testor's Dullcote, and applied Rustall weathering washes parallel with the seams.



7 Out to dry. In nicer weather, clothes can be hung on the line to dry. Bob used styrene strip, nut-bolt-washer castings, and floral wire to model the clothesline.

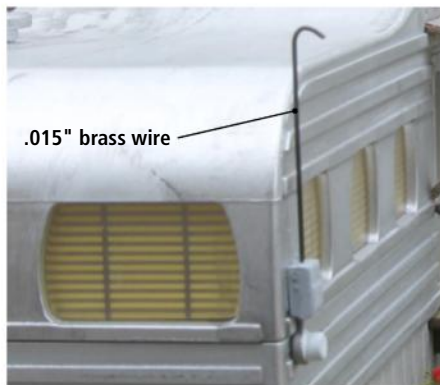
bottom which are glued into matching holes in the scene's base **8**.

To provide a bit of separation between the mobile home and the nearby railroad, I added two lengths of American Model Builders picket fence. I spray painted the fence white and weathered it with an India ink and alcohol wash.

The electrical box on the end of the trailer is a white metal casting left over from another kit. Berkshire Valley no. BV 413 is a similar part that would work for this application. The wire mast is .015" brass wire **9**.

A firm foundation

I made a base for the trailer home scene from 1/32" plywood. I secured the buildings and details to the plywood with Liquid Nails adhesive.



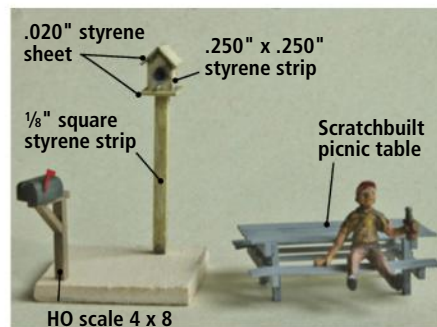
9 Recycled parts. A leftover white-metal casting from another kit became the electrical box for the trailer home. After painting and installing the box, Bob added a piece of .015" brass wire for the mast.

I then applied a thick layer of earth-colored latex paint and sprinkled on a mix of several grades of green ground foam. I used fine sand to simulate the driveway.

When the scenery glue had dried, I added the rest of the detail parts, including a barrel, wheelbarrow, old bathtub, and tires, among other items **10**. An HO sack seemed the right size for a bag of charcoal briquettes next to the grill. When all the details were in position, I applied Woodland Scenics Scenic Cement.

A compact scene

This was a simple project, but one that provided a realistic scene for my



8 It's in the details. Bob scratchbuilt a mailbox, birdhouse, and picnic table from assorted pieces of styrene strip. The figure seated at the table is from Woodland Scenics backyard barbecue set no. A2765.

in-progress layout. Mobile homes are prevalent in most parts of the country, and observing their construction and surroundings can provide much of what you need to replicate them accurately.

Trailer homes are available in most of the popular scales. For HO modelers, Lou Sassi provides a lot of inspiration in chapter 7 of his book, *How To Build & Detail Model Railroad Scenes* (Kalmbach Books, 2004). And coming up with a fictional account of the residents and their history can provide a fun bit of background and rationale. **MR**

Bob Bennett lives in South China, Maine, with his wife, Nan. They have two grown sons. Bob is a retired history teacher with 38 years of classroom experience. In addition to model railroading, Bob enjoys fly fishing, cycling, snowshoeing, and cross-country skiing.



10 Final details. A barrel, ladder, tires, and an old bathtub next to the shed give the scene an everyday look. Bob attached the trailer home, shed, and details to a piece of 1/32" plywood.



① Two trains frame the entrance to the Iron Gorge Line on Bob Hamm's HO_n3 Iron Gorge Subdivision. This freelanced line connects prototype-based scenes along the narrow gauge lines of the Denver & Rio Grande Western and the Rio Grande Southern.

Re-enacting Rio Grande narrow gauge

By Bob Hamm • Photos by Lou Sassi

The HOn3 Iron Gorge Subdivision combines
prototype-based modeling with a freelanced twist

For me, the narrow gauge gets in my blood. From the early days of westward expansion to the 1950s, little steam trains plied the rails of southwestern Colorado, hauling coal, lumber, ore, farm goods, and livestock. Combine this history with beautiful mountain scenery, and how could I not be captivated? My HOn3 (HO scale, 3-foot gauge), 1,400-square-foot Iron Gorge Subdivision models scenes along the narrow gauge lines of the Denver & Rio Grande Western and Rio Grande Southern, as well as a “little known” (aka mythical) connection between the two roads.

I don’t think of my model railroad as a layout. It’s a living, breathing depiction of the narrow gauge with the sights and sounds of mountains and streams, mines and mills, and steam locomotives rattling along the tracks. As work on my Iron Gorge Subdivision progresses, I think less about “layout operation” and more about re-enacting a trainman’s typical day.

Finding a vision

My love affair with narrow gauge began more than 40 years ago. Back in 1975 I built my first HOn3 layout. My initial thoughts of building a freelanced pike soon evolved into a more prototype-based line that modeled the D&RGW and RGS. I enjoyed that railroad until 1999, when my wife and I had a new home built. Then I began to plan the new model railroad.

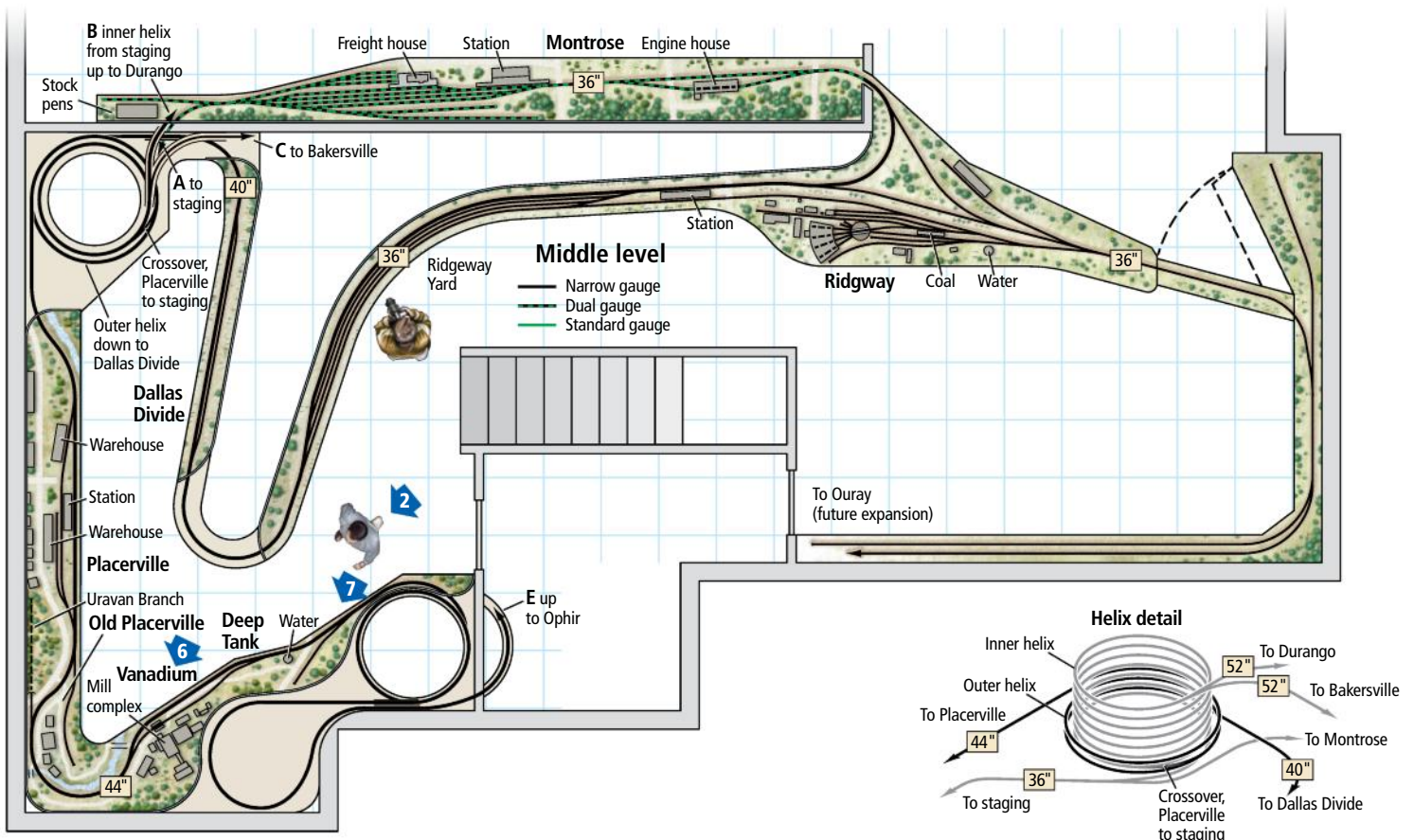
Transforming a layout into a railroad involves having a vision that places the model into the real world. Set between 1938 and 1942, my current layout models a line in Colorado that runs between Durango in the south, up the Silverton branch, then over a “little known” connection to the RGS just east of Trout Lake. The line then heads north to Ridgway and Montrose and connects back to the D&RGW. Through a slight bending of history, this “little known” Iron Gorge Sub makes the connection without detracting from its realism.

As David Day, a former editor of the area’s local newspaper, would say, “It’s all true... mostly.”

I’ve made many trips to Colorado to research the scenes I model. For the new layout these include Matterhorn, named Trout Lake Junction on the layout, which is where the freelanced Iron Gorge Sub connects to the RGS. Other locales include the RGS high line, where I’ve modeled four of the prototype’s six trestles, and Ophir; Vance Junction, with its branch leading to Telluride; Vanadium and its big mill; and finally, Placerville.

At a couple of these locations I’ve tried to model scenes that I found in actual photos. These include two kids standing in front of a depot at Vance, and Vera Belisle, the female station agent at Ophir in the 1940s.

I think the believability of a scene and the layout as a whole is enhanced when we depict ordinary, everyday life. Layouts that jam every scene with “cute” but non-typical situations, such as a parade down Main Street, a house on



The layout at a glance

Name: Iron Gorge Subdivision

Scale: HO_{N3} (HO scale, 3-foot gauge)

Size: 28 x 45 feet

Prototype: Denver & Rio Grande Western and Rio Grande Southern

Locale: Durango to Montrose, Colo.

Era: 1938 to 1942

Style: multilevel walk-in

Mainline run: 400 feet

Minimum radius: 22"

Minimum turnout: no. 4

Maximum grade: 3 percent

Benchwork: L-girder and open-grid

Height: 36" to 66"

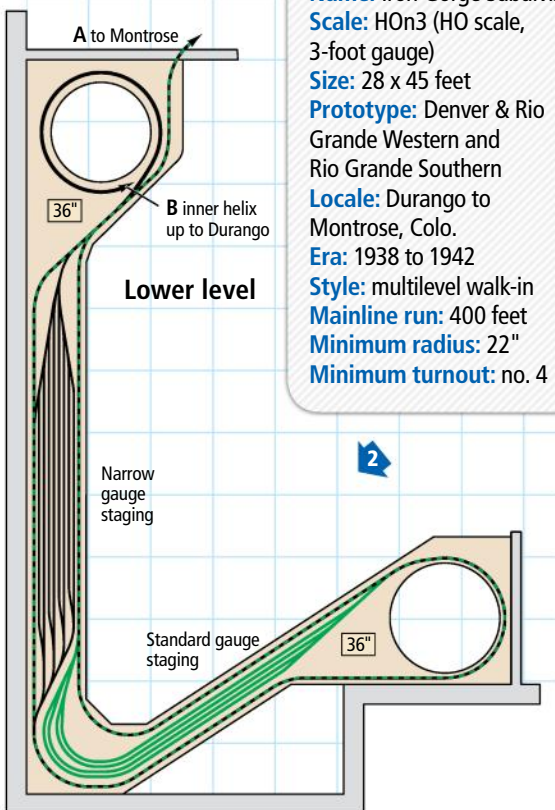
Roadbed: Homasote and cork

Track: handlaid and flextrack, code 70

Scenery: extruded-foam insulation board and Hydrocal over cardboard lattice or chicken wire

Backdrop: photos

Control: CVP Digital Command Control



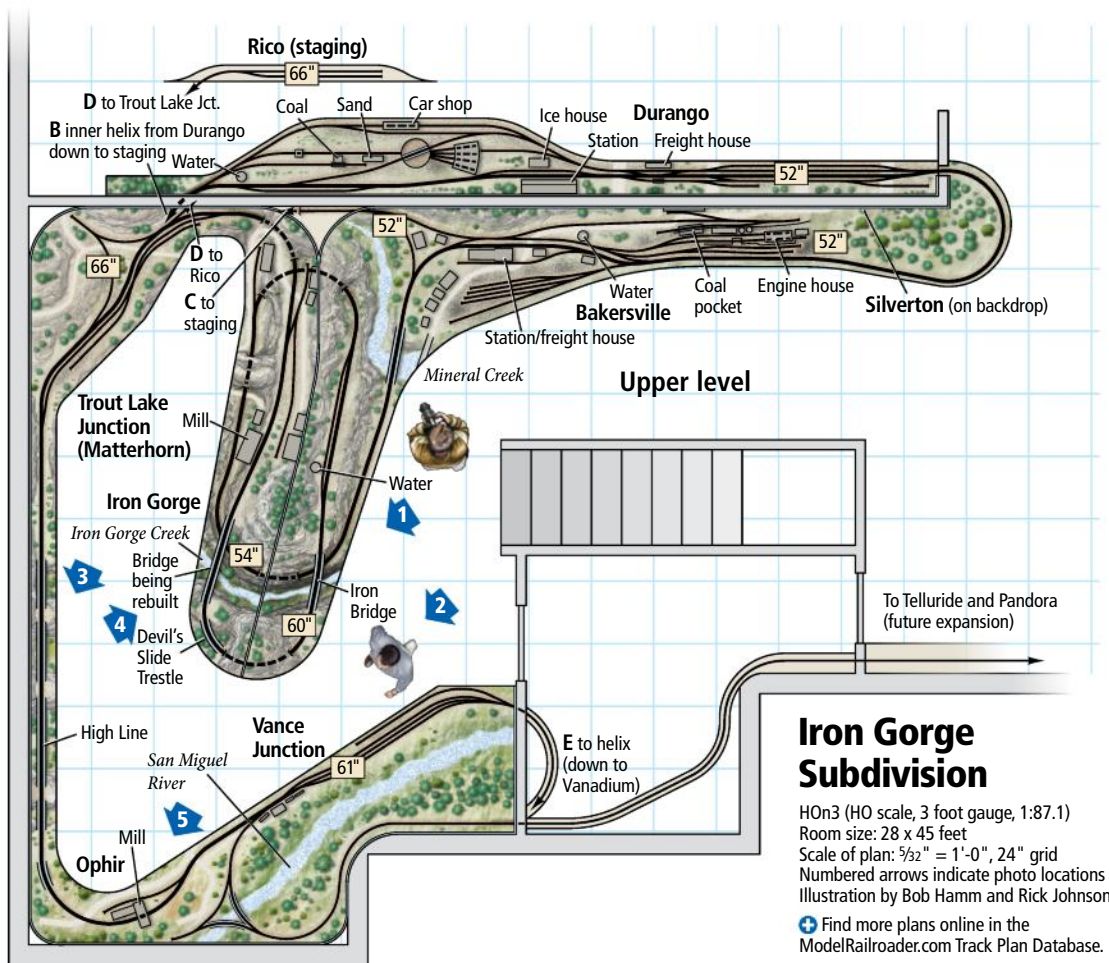
fire, or a bear sneaking up on a hunter are "cute," but hardly typical. For the setting and era I model, life in the mountains was hard, and most people spent their time eking out a living.

For operation, I plan to run trains typical of my modeled era. The free-lanced connection between RGS and D&RGW over the Iron Gorge Sub will result in additional traffic from Silverton and points south over the RGS via track-age rights to Ridgway and then up to Montrose and interchange with the D&RGW standard gauge line.

Basement and benchwork

My new layout reflects lessons learned from the previous one. While planning the layout I followed a list of design criteria. These included a linear walkaround design, no duckunders, multiple levels to increase the mainline run and scenicked area, a 22" minimum radius, 3 percent maximum grade, Digital Command Control (DCC), extruded-foam insulation board instead of plaster scenery base to make planting trees easier, and a minimum 30" aisle width, as few of us get narrower as we age.

I had the new basement designed with a model railroad in mind. The heating



plant, water heater, and electrical panel are out of the way in one room, to which we later added a deep sink and toilet. I also planned space for a wood shop, model shop, and train crew lounge. The wall along the wood shop provided a main beam, so no support columns were needed in any of the rooms. All the main rooms are finished with drywall, a drop ceiling, and composite vinyl floor tiles.

Since my basement is a walk-out type, I installed a 6-foot-wide double door to the outside. This proved helpful during layout construction, when we brought in supplies as well as two large sections of my old model railroad – Bakersville and a mountain section. Both of these sections are built on L-girder benchwork.

For the new lower (staging) level, I used open grids made of 1 x 4 frames with 1 x 2 joists. The grids were screwed to the walls and supported every 5 to 6 feet with 2 x 2 legs near the front of the benchwork. The legs are stabilized by 1 x 2 bracing and have leveler nuts to allow minor height adjustments.

For the upper levels I used light-weight $1\frac{1}{2}"$ steel angle topped with $\frac{1}{2}"$ plywood and supported by wall brackets. At only 2" thick, this benchwork let me maximize the vertical space between levels. The steel angle can also span a



2 The three layout levels are clearly visible in this view, with Vance Junction on upper level, Deep Tank and Vanadium on the middle level, and staging on the lowest level. On the right is one of the several bridges along the Iron Gorge's steep climb from the middle to upper level.



3 A freight train crosses bridge 46D along the Rio Grande Southern High Line. Bob scratchbuilt several wood trestles and bridges on the layout.

greater distance unsupported than a similarly sized wood beam.

Two helixes connect the layout levels. These are made of three layers of $\frac{1}{4}$ " thick lauan plywood supported by threaded rods.

On large, flat layout sections, including the staging yard and Bakersville, I installed $\frac{1}{2}$ " fir plywood over the joists followed by a layer of Homasote. On the middle and upper levels, I added $\frac{1}{2}$ " plywood over the benchwork followed by 1" extruded-foam insulation board. This material makes it easy to carve out

ditches, streams, and other below-grade scenery.

On most of the new layout sections I used cork roadbed atop extruded-foam insulation board. To deal with its continuous grade and curves, I used spline roadbed made from laminated Homasote strips on the mountain section, as described on page 46.

Track and wiring

For the first 10 years of working on my previous layout, I handlaid all the track, which was a satisfying but time-consuming experience. In 1985, I switched to Shinohara flextrack and turnouts with code 70 rail. On the new

layout, I continued using Shinohara turnouts with Caboose Industries N scale ground throws, but switched to Micro Engineering code 70 flextrack.

For most of my turnouts I use Tam Valley Hex Frog Juicers, which draw power from the track bus and provide a one-wire connection to the frog. Depending upon which way the switch points are lined, the Frog Juicer powers the frog with the correct polarity to prevent short circuits. I also have several turnouts in remote locations that use Tortoise by Circuitron switch motors.

At every other track section, or 6-foot length of flextrack, I solder the metal rail joiners and feeder wires. For some shorter sections, this interval is every



3 to 5 feet. I don't solder the joiners between the wired track sections, allowing the rail to expand and contract rather than kink due to humidity and temperature changes.

While I used direct-current block control on my previous layout, I now use a CVP EasyDCC system on the new layout. The system includes a main fascia-mounted panel with two integrated throttles. I've located the panel so that the one throttle can control Durango Yard on the upper level and the other controls Montrose Yard on the middle level. I also have four wireless throttles.

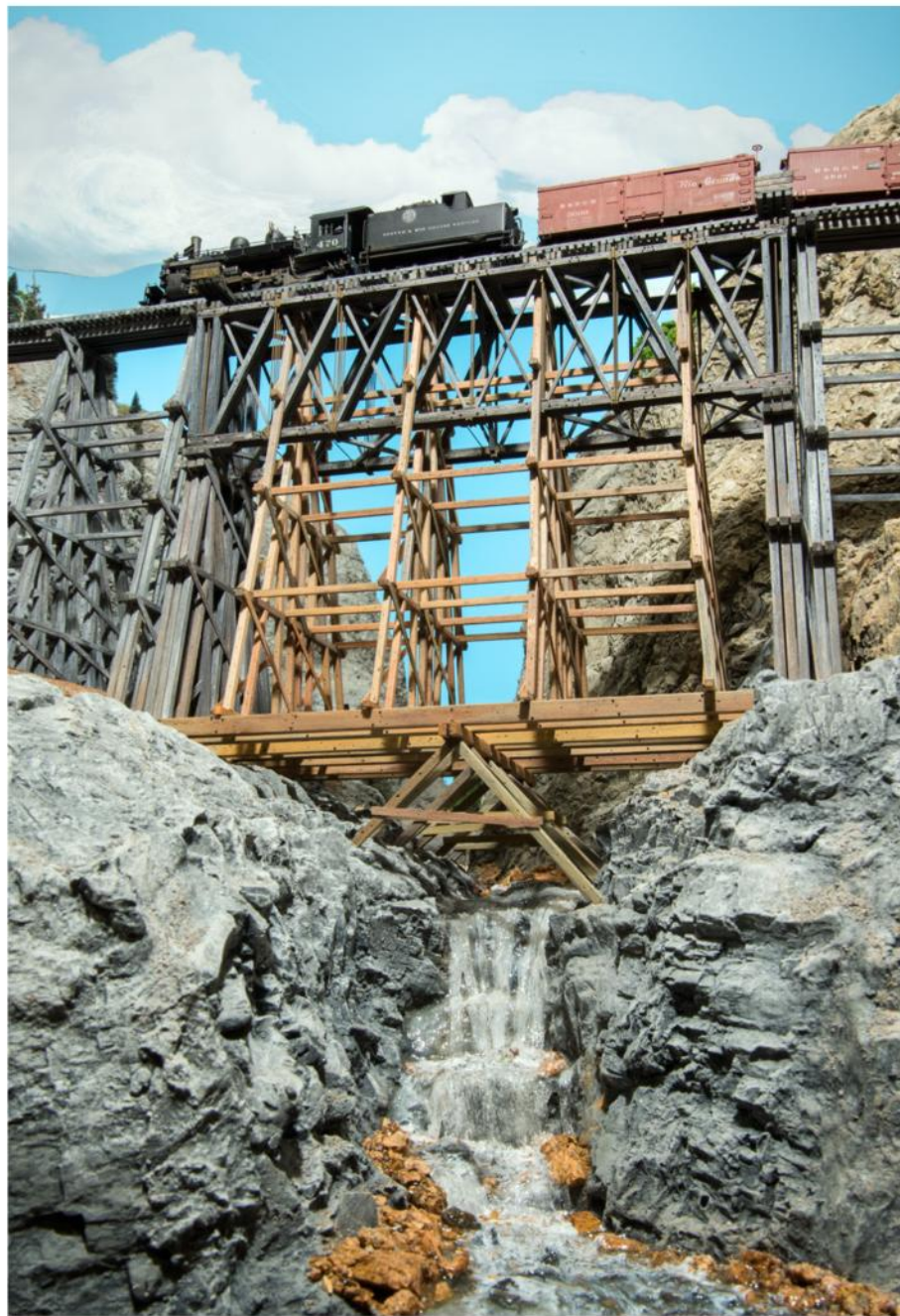
On my previous layout I added background outdoor sounds, including birds and wind through the trees by installing

a bank of automobile cassette players and stationary speakers.

For the background sounds on this layout, I installed ITT Products digital sound modules and miniature speakers at various scenes around the layout. Sound effects include a rushing stream and other outdoor sounds as well as coal being shoveled or dropped into a locomotive tender. I keep the volume low, so that the sound effects can be heard only by someone right next to the appropriate scene.

The art of scenery

Model railroad scenery is my strong suit. When I give a clinic at a National



4 This scene models a bridge during an in-service rebuild. Wood trestles have been built through the earlier Howe Truss bridge before it's disassembled.

Model Railroad Association convention, I tell the attendees that model railroad-ing is a mix of art and craft. Benchwork, track, wiring, and even building structure or rolling stock models are largely crafts. The modeler follows a series of steps, and with a reasonable amount of skill, the project turns out well. Scenery, in my opinion, is largely art. Yes, knowing specific techniques and skillful application is important, but a modeler also has to have a vision, an image in his head to work toward. He or she also needs the artistic judgment to sense when that



Bob used spline roadbed, made by laminating strips of Homasote, for some of the track on his layout. Bob Hamm photo

Homasote spline roadbed

On the mountain section recycled from my previous layout as well as its extension on the new layout, I used spline roadbed made by laminating strips of Homasote. This technique works especially well for modeling the multiple curves on this part of the railroad.

First I cut the Homasote, usually sold in 4 x 8-foot or 2 x 4-foot sheets, into 1½"-wide strips. I suggest doing this outside, as it's dusty work.

Next I clamp 1" x 2" wood risers to the benchwork joists on the track centerline. Then I bend a Homasote strip from one riser to another. Soaking the Homasote in water for an hour or so will help it bend, but don't soak it any longer or the material will be damaged. I use a 2"-long finishing nail tapped into the top of each riser along the centerline to guide and secure the strip.

With the first strip on one side of the centerline, I overlap another strip on the other side and glue it to the first strip. Then I continue this process down the line, using clamps to secure the strips until they dry.

When I'm happy with the grades and curves, I go back and add more strips. For HO_{n3} I use a total of four laminations, but for HO standard gauge, five or six would work better.

This technique is efficient, as I used all the Homasote with minimal waste.
— Bob Hamm

image has been achieved. The result is a believable scene.

I follow nature as I apply the scenery in a progression of layers. The basic landforms, including mountains, rock faces, and rivers, come first, followed by dirt and loose rock, then grasses and bushes. Trees are installed last.

My layout scenery reflects the part of the country and the time of year that I model: the San Juan Mountains of southwestern Colorado in the early fall. The climate is relatively dry with plenty of exposed dirt and rock. Trees are typically a mix of aspen, cottonwood, and other deciduous trees combined with a lot of conifers such as fir and spruce

trees. In addition there are high mountain meadows with grasses, bushes, and wild flowers.

Backdrop and lighting

Prior to modeling scenery, I installed the backdrops. A good backdrop adds a lot of depth to a layout's scenery. I enjoyed painting the backdrop on my previous layout and wrote about it in the July 1985 *Model Railroader*. However, painting backdrops took a lot of time.

On the new layout I used photo backdrops made with the help of several friends. I used many photos from my trips to Colorado. The images were



digitally stitched together in Adobe Photoshop and printed on self-stick vinyl thanks to my friend Bill Brown, who owns the backdrop company LARC Products (www.larcproducts.com).

I think that great scenery without good layout lighting is a wasted effort. I installed 3000K fluorescent lights to the drop ceiling behind a 6" valance. To light the middle level, the tubes are mounted behind the steel angle of the upper level benchwork. In locations that are more than 3 feet deep, I added a second set of tubes closer to the backdrop. Track lights in front of the valance illuminate the cars and structures near the front of the layout.



Rocks and rivers

On the old sections of the layout, the scenery base is Hydrocal over balled up newspaper, cardboard strips, or chicken wire. These techniques worked but were messy. The dried plaster proved so hard that I couldn't penetrate it with an awl and had to drill holes when I later wanted to add trees to my landscape.

On the new layout sections the landforms are made of extruded-foam insulation board covered by a mixture of equal parts drywall joint compound, ground up extruded-foam insulation board, vermiculite, and a little water. The material doesn't shrink or crack, and

after it cures, I can easily poke holes in this surface to plant my model trees.

I'm planning a high mountain scene above Timberline where there will be no trees. For this area I'll use plaster-impregnated cloth.

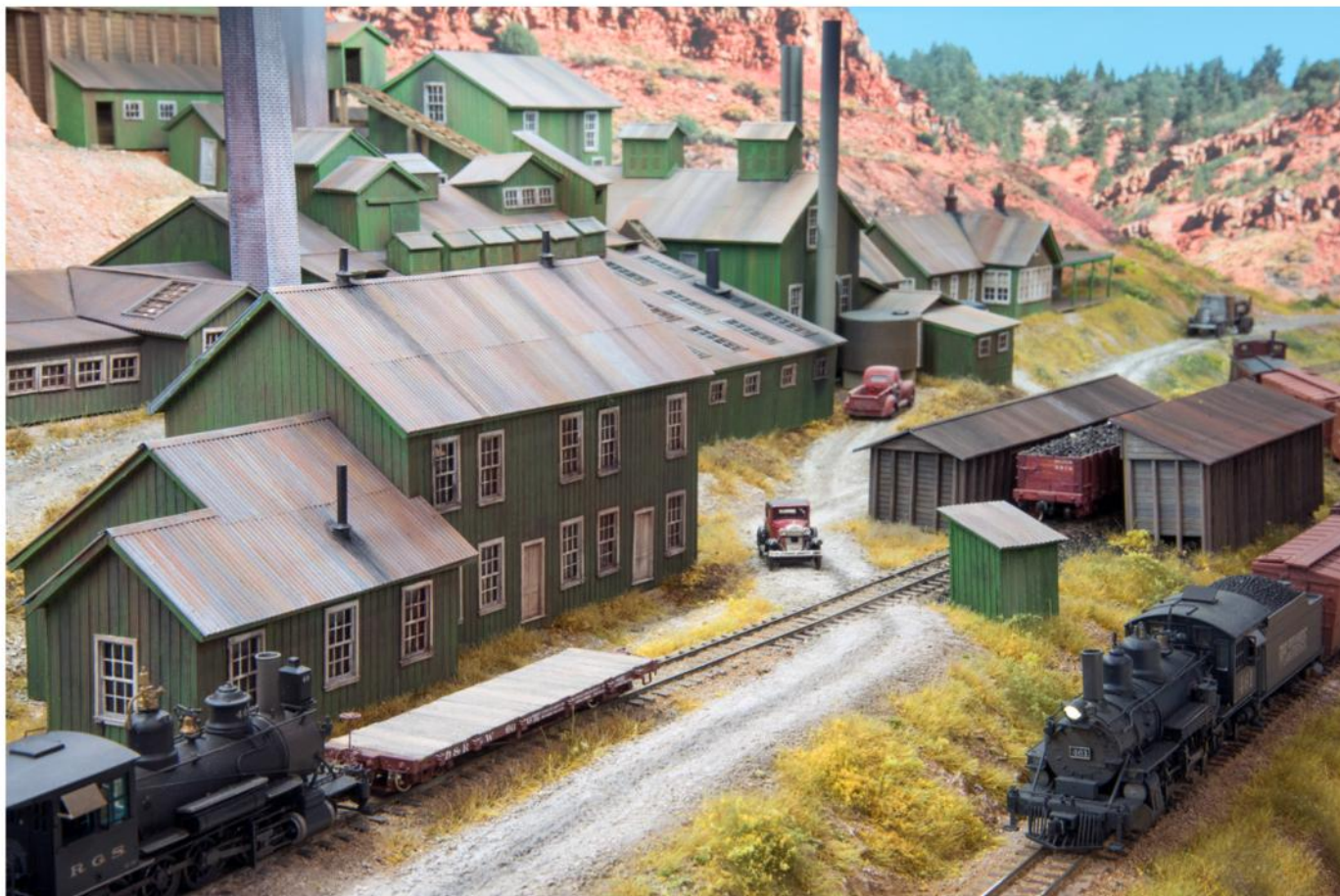
I modeled the exposed rock faces with Hydrocal cast in latex molds. I cemented the castings in place using the same joint compound mix I used to cover the scenery base. I colored the rocks in a three-step process, using dark, medium, and light shades of a particular rock color.

On my layout the sun is always over my right shoulder. I begin by painting the entire rock the darkest shade. After

5 At Ophir, station agent Vera Belisle (in the blue dress) hails Rico-bound train No. 40. Bob modeled the scene after a historical photo.

that dries, I stipple the medium shade over the upper and right side surfaces. The last step, after the medium shade dries, is to stipple the lightest shade over only the uppermost surfaces on the right side.

For rivers and streams, I begin by carving the channel in the 1" thick extruded-foam insulation board. Then I cover the stream or riverbed with my joint compound mixture, embed real dirt and rocks, and paint the surface a dirt-color. I use Enviro-Tex Lite



6 The big mill at Vanadium is one of the largest industries on the layout. Bob commissioned the model from custom builder Rich Cobb.

two-part resin to model the water. After this dries I use acrylic gloss medium to form waves or ripples on the surface. White latex caulk works well for modeling white water.

Ground cover and trees

I started collecting real dirt for scenery modeling back in the mid-1970s. To date I have 70 different varieties, including some that my mother-in-law gave me from her trip through Colorado, Utah, and Arizona. I needed about 5 gallons of dirt for my main ground cover. To ensure I had enough, I used dirt from around my home. I use the other dirt colors as scenery accents.

After painting the ground cover with brown latex paint, I sprinkled on the dirt. Sometimes I mixed in Aleene's Tacky Glue for extra adhesion.

Then I added different commercially available scenery products from Woodland Scenics, Scenic Express, and Noch to model grasses and other vegetation. This includes static grass applied with my homemade applicator.

Bushes and flowers came next. I used a thin web of poly fiber, lichen, and pieces of floor buffing pads for armatures. Then I sprinkled on AMSI ground foams fixed in place with hairspray.

For trees, I used both commercially available products and natural materials. I used Scenic Express SuperTrees armatures for some foreground deciduous trees as well as Heki wound wire firs for some conifers. I also wound my own larger foreground conifers from wire and made deciduous trees out of weed heads. I described some of my tree-building techniques in the article "In pursuit of better trees," published in the May 1995 *Model Railroader*.

Structures

My structures are a mix of kit-built and scratchbuilt models that I've constructed over my decades of modeling the Rio Grande. When I went through the NMRA Achievement Program, I scratchbuilt a number of prototype-based models for the towns of Chama and Bakersville. More recently I scratchbuilt many of the

timber trestles and buildings of well-known prototype scenes along the northern division of the RGS.

Some recent models include the buildings in Ophir, the large mill in Vanadium, and several other models that I had custom-built by Rich Cobb, a professional model builder in central New York State.

Locomotives and rolling stock

When I first started modeling narrow gauge, the only HOn3 locomotives available were brass models from Korea and Japan. These models required rebuilding and remotoring to get them to run smoothly. I also installed Pacific Fast Mail sound modules, and eventually DCC decoders, in some of them.

Thankfully by the time I started work on my new layout, Blackstone began producing ready-to-run HOn3 locomotives. I now have three Blackstone class K-27 2-8-2s and four class C-19 2-8-0s. All came factory-equipped with SoundTraxx Tsunami DCC sound decoders. To handle the short stretches of standard gauge and dual-gauge track on the

MORE ON THE WEB

Subscribers can watch a video of trains running on the Iron Gorge Sub. Visit our website at ModelRailroader.com



layout, I purchased two SoundTraxx-equipped Bachmann 2-8-0s.

My first narrow gauge rolling stock consisted of LaBelle and Tomalco wood kits, which were the only option for HOn3 modelers at that time. Over the decades I also bought out the collections of a few HOn3 modelers who were switching scales.

These cars require a little work to meet my operating standards. This includes bringing the car up to the proper weight (about 2 ounces for a scale 30-foot car) and installing Kadee couplers (I remove the trip pin and add air hose details). I also add other detail parts, better paint, and extra weathering.

As with locomotives, life got easier when Blackstone started producing HOn3 ready-to-run plastic models of Rio Grande rolling stock, including boxcars, gondolas, and stockcars. I also purchased HOn3 cars produced by Micro-Trains.

Of my 330 cars, about 60 are up to my operating standards, and I hope to add a dozen or so each year to build up an adequate roster for operations.

Operation

Back in the 1990s, my friends and I regularly operated on each other's

model railroads. One good friend, Tom Rhodes, who had been a dispatcher and station agent on the Delaware & Hudson Ry., helped us all learn the ropes. It also helped that as part of the NMRA Achievement Program I had to develop an operating system and train chart as well as log 50 hours of model railroad operation at various jobs.

Formal operations haven't started yet on the Iron Gorge Sub. The layout should accommodate two yardmasters and four mainline crews. Studying modified prototype train schedules, I could see at most 26 trains running in a single day. However, this might be on the high side.

I'm looking forward to providing a relaxed activity where crews run their trains as well as enjoying the layout's scenes and sounds. I know that I won't be using any anachronistic radio headsets. Instead I'm working on putting in a telephone system around the layout using old 1930s-style Western Electric-period Bakelite handsets.

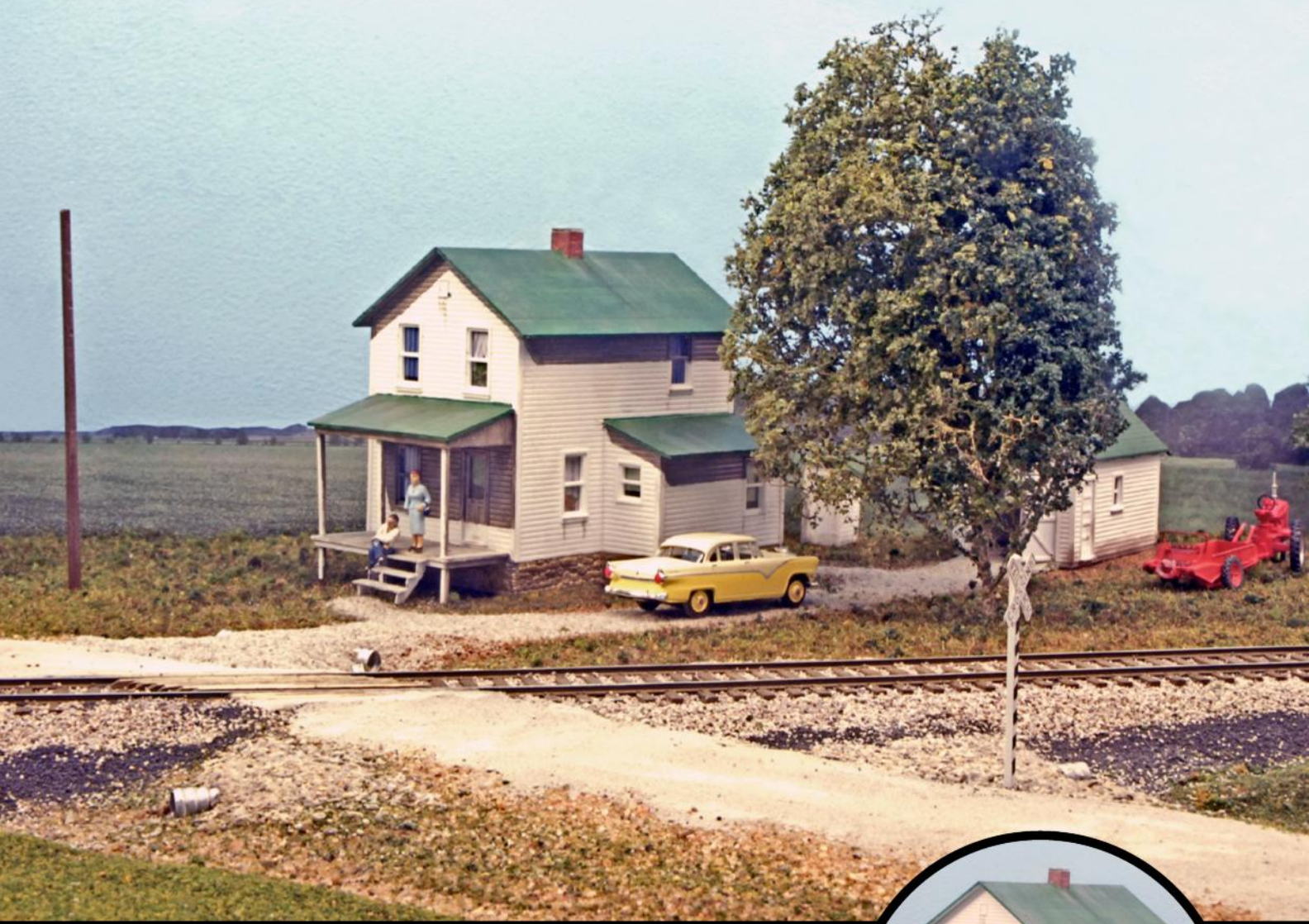
What's next? I'll keep building, visiting the San Juans, and sharing my railroad. If you get the urge to take a trip back to yesteryear, come on over. I might be able to get us a cab ride. As we ride, I'll tell you the story of the narrow gauge, and it's all true... mostly. **MR**

7 RGS no. 40 drops off flats on the spur at Deep Tank to be loaded by Montezuma Lumber. Layers of trees, wildflowers, grasses, and other ground cover make this an artfully composed model railroad scene.



Meet Bob Hamm

A member of the National Model Railroad Association (Northeastern Region), Bob Hamm earned a Master Model Railroader certificate and is the NMRA National Contest Chairperson. Recently retired, Bob spent 42 years as a mechanical engineer. He and Pat, his wife of nearly 50 years, split their time between homes in New York State and Florida. They have two adult daughters and five grandchildren.



Before (inset) and after photos show the original soft shadows and the effect of much more dramatic artificial sun shadows added with paint. Contributing editor Tony Koester shares how he added artificial shadows to the house and tree.

Add shadows to structures with paint

Simulating the sharp-edged effects of sunshine

By **Tony Koester** • Photos by the author



We've long complained about how flat indoor lighting is. Maybe we can do something about that without earning a degree in theatrical lighting. To that end, I experimented with simulating the strong shadows of a sunlit day on a structure and its surroundings without changing the otherwise excellent cool-white fluorescent lighting system in my train room.

Of course, it's possible to produce strong shadows using point sources of light. But on a basement-size layout like mine, that simply isn't practical for a variety of reasons. Unlike incandescent bulbs, fluorescent tubes don't consume a

lot of power or produce a lot of heat, and they're cheaper than light-emitting diodes (LEDs) – so far, at least. And even the LED replacement “tubes” for existing fluorescent fixtures still produce flat lighting. So let's explore a Plan B.

Orientation and time of day

The usual advice for those modeling a railroad north of the equator is to build our layouts so that the sun – that is, our artificial lighting – illuminates the south-facing sides of our structures and trains. The south wall will always be in at least partial sunlight, but the east and west walls will be sunlit or in shadow depending on the time of day. So the first step is to decide where the sun is at the time depicted on our layouts.

If 3-D models are located near 2-D structures on a photo backdrop, that will usually provide strong clues about which parts of a modeled structure should be in shadow. Lacking that, the layout lighting system may cast soft shadows that can be accented by painting over the shadows with darker colors.

Adding artificial shadows

Oddly enough, what got me thinking about creating artificial shadows was rock ballast. I liked the ballast contributing editor Pelle Søbørg used on his former HO scale layout [shown on the July 2013 cover. – Ed.] and ordered some of the same, Arizona Rock & Mineral no. 138-2.

But when I received the shipment, I was concerned about its salt-and-pepper look. When I applied it to the railroad, however, it looked good. I concluded that the dark particles added a shadow effect, as would be expected in coarse rock ballast in natural sunlight.

That prompted me to try creating artificial shadows on a white farmhouse. For this experiment, I built a second City Classics house kit, as I wanted to paint in the shadows on window frames and doors before glazing the windows. With some experience, it would be practical, and easier, to paint the shadows on walls before assembling the kit, **1**.

I also applied Scenic Express dark-green leaf flakes to the shadow side of the company's SuperTree. That worked, but an even darker foliage material would enhance the shadow effect.

Looking ahead

It's too early to draw any broad conclusions about applying artificial



1 Pencil it in. Tony marked the edges of the soft shadows created by the overhead fluorescent lighting with a pencil. He reinforced the shadows using Polly Scale Southern Pacific Lettering Gray.



2 More shadow ideas. This historic home in Oakland, Ill., shows the effects of soft, but distinct, shadows cast by a porch and also by a tree on the sun-facing wall and roof. Note that the entire left-hand wall is in shadow.

shadows to structures, trees, and landforms on an entire model railroad. And I've barely scratched the surface of the different methods for applying shadow effects.

On a freshly mowed lawn, for example, it would be interesting to use a darker foam or electrostatic grass in

areas shaded by structures and trees. We could also paint the irregular shadows cast by a tree onto the sides of structures, as shown in **2**.

But perhaps the experiment I've documented here will begin a conversation about yet another way to enhance the realism of our models. **MR**



A Colorado Midland freight passes the gorge at Hell Gate on Andrew Dodge's Proto:48 (O fine scale) layout. He used real dirt, small rocks, and large stones to scenic his model railroad.

Use natural soil and rocks in scenery

If you want to match the prototype's look, go to the source

By **Andrew Dodge** • Photos by the author

My Proto:48 (O fine scale) Colorado Midland Ry. layout is set between Leadville and Basalt, Colo., in 1897. Before starting construction on the model railroad, I made a research trip to the region to study the scenery. Beginning in Basalt, I found the ground cover was a little brown. Proceeding east, the colors changed to a dusky red, to deep brown approaching black, and finally to what appeared to be almost white rock.

I brought several resealable freezer bags along during my trip to Colorado for collecting dirt, rocks, and stones. Before I could use the dirt on the layout,

I first had to sift it through a screen into a large container ❶ as shown on the next page. In locations where I needed really fine dirt I further sifted it through a tea strainer.

After painting the layout surface with a flat, earth-toned paint, I applied diluted glue (a 50:50 mixture of white glue and water). With the glue still wet, I sprinkled on the dirt heavily enough to add texture and color ❷.

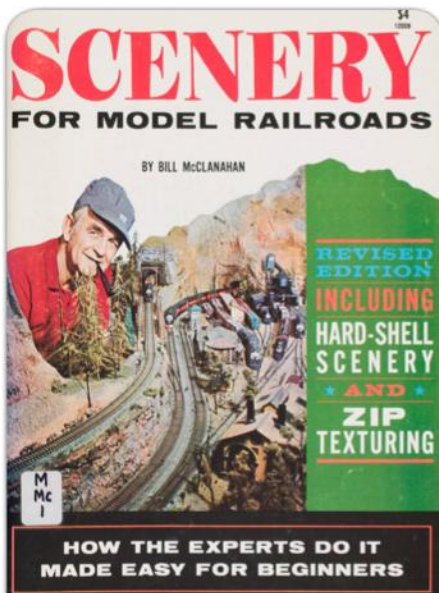
Talus and rocks

As I was sifting the dirt, I saved any large pieces caught in the screen for talus.

After distributing the talus, I sprayed it with wet water (water with a few drops of dish soap added to break surface tension). I then applied a $\frac{1}{3}$ white glue, $\frac{2}{3}$ wet water solution to secure the talus. In some cases it took a second application of glue to hold everything in place ❸.

During my trip to Colorado I also gathered rocks. I tried to select rocks that were appropriate for O scale in a realistic variety of colors ❹, as shown on page 54.

Before installing the rocks, I washed them to remove dust and other residue. Cleaning the rocks helped the colors stand out. Then I used a small palette



Bill McClanahan sports an engineer's cap on the cover of his scenery book. Bill Zuback photo

The original guide to scenery

Bill McClanahan's 1958 book

Scenery for Model Railroads was groundbreaking for its era. During a time when dyed sawdust was commonly used for ground cover, Bill's book showed how to make model railroads look more realistic. Topics covered included railroad geology, scenery materials and techniques, trees and shrubs, water, details, and backgrounds.

Revised editions of the book, including the one shown above, covered other scenery techniques, such as hardshell scenery and former *Model Railroader* editor Linn Westcott's zip texturing. The book has since gone out of print.

Though many of the techniques are dated by today's standards, Bill's book set the example for scenery for a generation of model railroaders. — Cody Grivno, associate editor

knife to apply acrylic ceramic tile adhesive to the back of each one. Since the adhesive is acrylic, I was able to tint it in small batches with water-based paint to match the color of the rocks, as seen in 5 on the next page.

I referred to prototype photos while setting the rocks on the model railroad. Remember, things in nature aren't symmetrical. As you can see in 6, the



1 **Screen time.** Andrew collected dirt from the locations he was modeling in Colorado. He used screen material and a tea strainer to sift it into various grades.



2 **A fine road.** This image shows how Andrew used the dirt. He applied the coarser dirt around buildings. He used the finer dirt for roads and walking paths.



3 **Mixing materials.** When Andrew was sifting the dirt, he saved the larger pieces caught in the screen for talus. He then used the talus to help blend the real rocks with the plaster castings.



4 Rock on. Andrew also collected small rocks during his visit to Colorado. Andrew washed the rocks (right) to help the colors stand out.



6 Pile them on. Here's an example of a cluster of rocks installed on the layout. Andrew followed prototype photos when installing the rocks.



7 Blending it together. Once the rocks were in place, Andrew applied sifted dirt. He put pieces of Woodland Scenics Clump-Foliage in the scene to add some color.



8 Into, not on top of. Following Bill McClanahan's advice in *Scenery for Model Railroads* (see page 53), Andrew installed the larger stones so they appeared to be in the ground, not on top of it. Andrew used tile adhesive and real dirt to blend in any gaps that didn't look realistic.



5 Stick to it. AcrylicPro ceramic tile adhesive holds the rocks to the layout. Andrew tinted the acrylic adhesive in small batches with water-based paint.

grouping features small, medium, and large rocks.

After the adhesive had dried, I sprinkled dirt over the rocks. I also added Woodland Scenics Clump-Foliage to add some vegetation to the scene **7**. I secured the rocks and Clump-Foliage with the same diluted glue I used earlier.

Large stones

The deep chasm at Hell Gate was one of the most scenic areas on the Colorado Midland. I couldn't fully capture the scene on my model railroad, but I could capture the feeling using large stones **8**.

I applied hot glue to the bottom of each stone. Then I pressed the stones in place until the glue hardened. If I didn't like how a stone was positioned, I removed it and tried again.

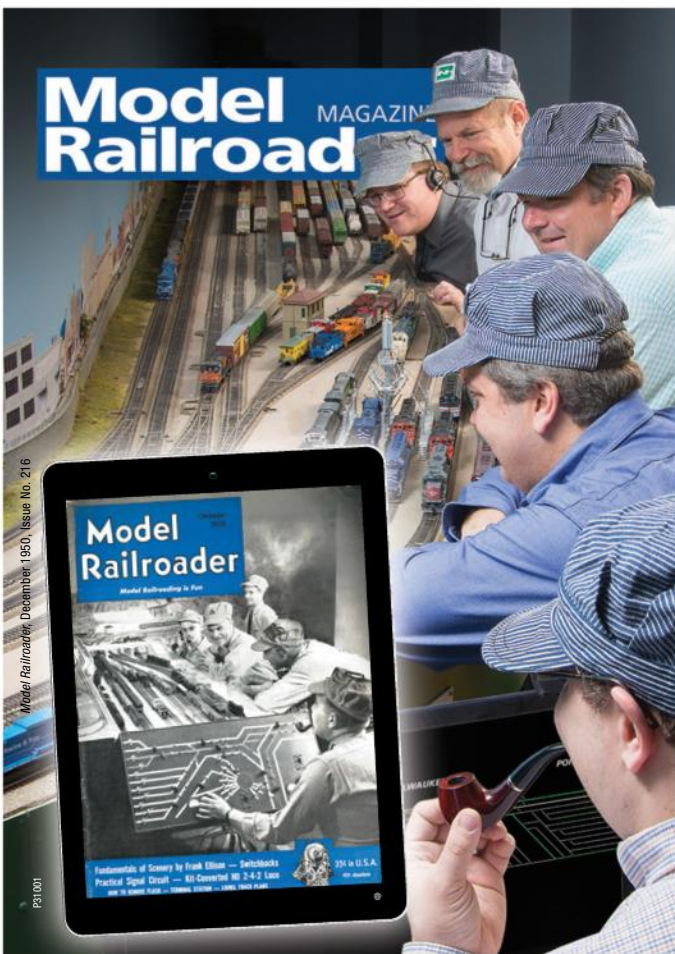
I followed Bill McClanahan's advice from his book *Scenery for Model Railroads* (Kalmbach Publishing Co., 1958) when installing the stones. Bill advised that the stones must be sitting in the ground, not on top of it.

There were a few instances where I needed to fill gaps between the stones. Tinted tile adhesive was an excellent gap filling material. While the adhesive was still wet, I sprinkled in small amounts of dirt and talus.

Go natural

The combination of dirt, small rocks, and large stones from the actual locations I'm modeling further reinforces the setting of my Colorado Midland. Though sifting dirt and cleaning rocks requires a bit more effort than using off-the-shelf materials, you'll be rewarded with scenery that has prototypical textures and colors. **MR**

Andrew Dodge has written articles for Model Railroader and its special issues. His model railroad will be featured in Great Model Railroads 2018.



Model Railroader, December 1950, Issue No. 216

P21001

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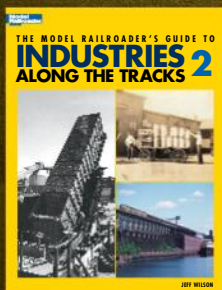
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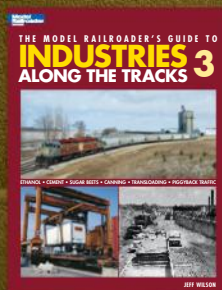
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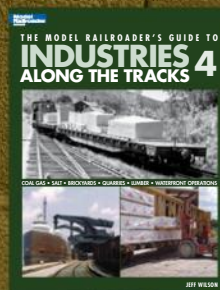
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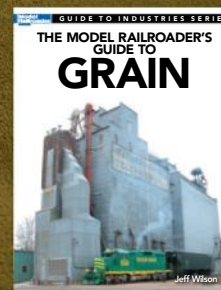
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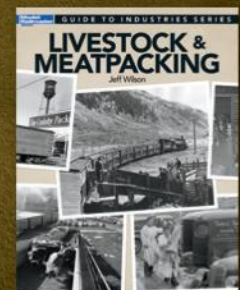
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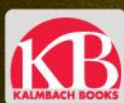
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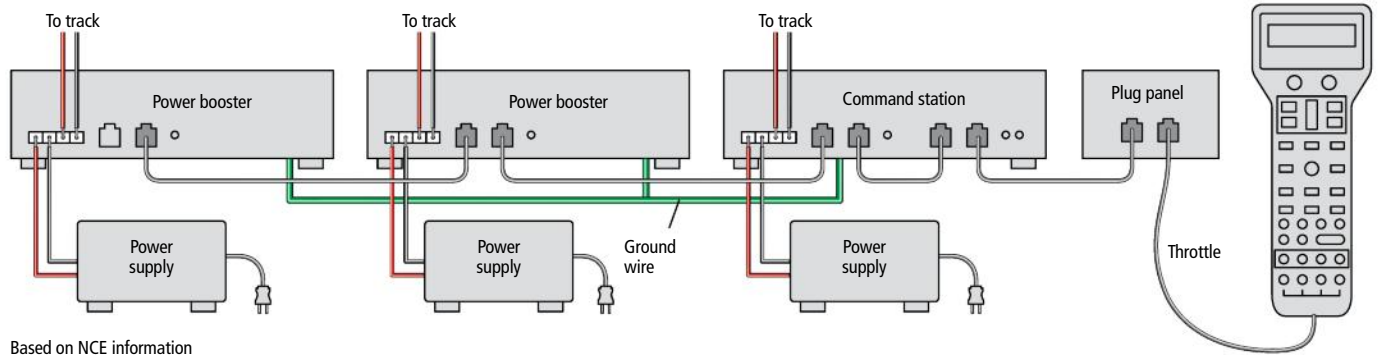
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2BKMR

P25438

Commons, grounds, and DCC



Based on NCE information

1 Reference ground. Some manufacturers of DCC systems recommend that a common reference ground (shown in green) be connected between the command station, boosters, and some other equipment.

Wiring can be a confusing subject, especially when the topics of commons and grounds are added to the discussion. For example, some DCC manufacturers recommend grounding their equipment, while others don't.

In addition, there are several other commons and grounds that can create problems if not properly installed. So what's the difference between all these commons and grounds, and what do they mean for DCC?

First, let's define what we're talking about here. In many cases the words common and a ground are used interchangeably and things may even be referred to as a common ground, which can add even more confusion.

The reason for these apparent conflicts is that a common can be anything we define it to be. It can be a shared connection on a circuit board, a shared power source or sink, a shared connection between boosters and other DCC equipment, or a shared connection to an earth ground. So a common is any shared connection, but what then is a ground?

The term ground can also have different meanings depending on how it's defined and used. In electrical circuits it typically denotes a common negative connection, but it can also be a common positive. It can mean that the ground wire in an electrical device is connected to the case and is called a chassis ground.

In our household electrical systems, the ground wires, as well as the neutral wires, are all connected to a bus strip in the main electric panel box. That bus is connected to a water pipe and a pair of

long steel rods driven into the ground, making it a true earth ground.

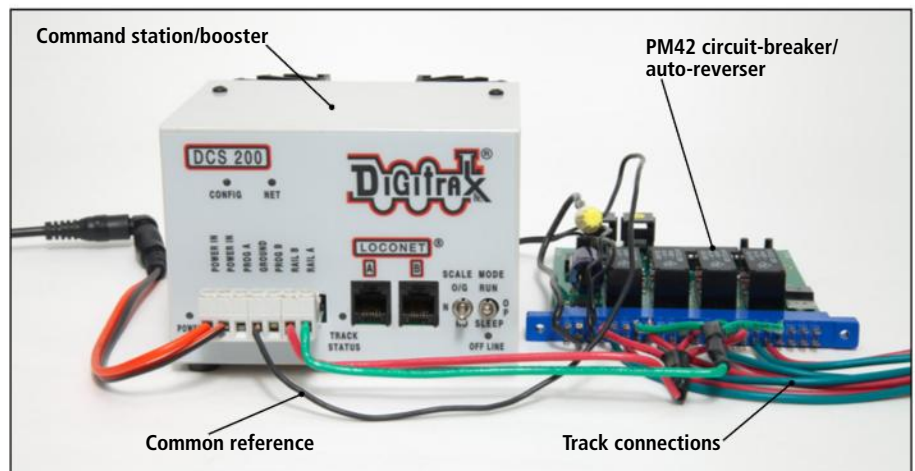
Some DCC manufacturers recommend a common or ground of one type or another. So let's take a look at what that means and why. The primary reason manufacturers recommend a common connection between command stations, boosters, and some other pieces of hardware is to provide a stable electrical reference among these components.

This electrical reference allows locomotives to operate properly when they cross rail gaps between power districts. One symptom of a problem is a locomotive stuttering or stalling when crossing these rail gaps. The common connection is also important for some circuit breakers and auto-reversing circuits to operate reliably.

Both Digitrax and NCE recommend common reference grounds for their equipment **1**. And with these systems we're not talking about the small common or ground wire that's part of their DCC network cables. Instead, these are 14AWG to 12AWG wires daisy-chained from device to device.

In some cases the wire is attached to a screw on the command station or booster housing. In others there's a common contact on the unit itself **2**. That said, some other DCC systems appear to depend on what is referred to as the ground wire in their network cables.

In addition to common reference grounds, some modelers also face the problem of a common rail. Common rail wiring was very popular among those using DC power for their layouts and is



2 Connect it together. Digitrax provides a common reference terminal labeled "Gr" or "Ground" on its command stations and boosters. In addition to boosters, the reference common should be connected to some other devices, such as the PM42 circuit breaker/auto-reverser shown here.

still described in some wiring books and manuals.

It uses a common rail or wire to simplify wiring. However, that common rail connection creates problems for DCC, since it adds another common to the system. In order to use DCC on common rail layouts, special opto-isolated boosters and command stations are required and the common reference ground is eliminated.

Opto-isolators are small electrical devices that use an optical interface to transmit a signal instead of a physical wire or metal connection. Digitrax sells opto-isolated equipment and NCE equipment can be modified for opto-isolation.

Powering multiple boosters with a single power supply can also introduce yet another type of common. The wires from the power supply to the booster and command station act as a common. This is why most manufacturers recommend using separate power supplies for each booster.

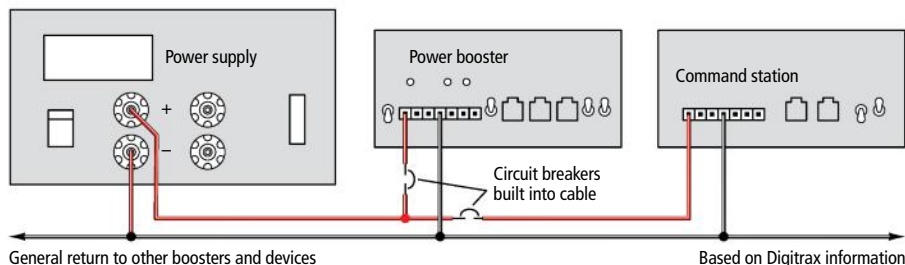
While it's possible to use a single high-amperage power supply like the Digitrax PS2012, special cables like the PSYC52 and modified wiring connections are required to prevent problems **3**.

Another issue debated among model railroaders is the use of a true earth ground. Digitrax has always suggested this practice as an option. NCE, on the other hand, uses what's referred to as a floating ground and is adamant that earth grounds should not be used with its systems.

So what's a true earth ground and why might it be useful? As I said before, the electrical wiring in our homes is connected to a water pipe and to a pair of steel rods driven into the earth – this is a true earth ground.

All the electrical devices in a home with a ground plug [Three prongs. – Ed.] connected to an electrical outlet are therefore theoretically grounded to earth. This is done to guarantee that should a hot wire make a connection with the outside of an electrical device, the current will be safely conducted to earth instead of through you.

Some therefore argue that an earth ground on a DCC component is a similar extra measure of protection. However, others argue it's unnecessary, since power supplies themselves are grounded and should isolate alternating



3 Special considerations. Special wiring must be used with the Digitrax PS2012 power supply and PSYC52 wiring harness with more than one command station/booster. Opto-isolated equipment must have individual power supplies.

current from a wall outlet from the low-voltage DCC components. While this is becoming more the case now that commercial power supplies are replacing do-it-yourself units cobbled together by modelers, there are still a lot of older, suspect units in use.

There are also potential problems if earth grounds aren't done properly. For example, the DCC system shouldn't be connected to an earth ground at more than one location. Multiple grounds create what are referred to as ground loops, which can result in differing electrical potentials among them.

So if your manufacturer recommends adding an earth ground, ground only the command station and then run a common between the command station, boosters, and any other equipment requiring it.

Because a water pipe may not be nearby, many modelers use the ground wire connection in household electrical wiring, as Digitrax recommends. Because the screw that holds the faceplate in place on an electrical outlet is often grounded through the ground wire, it's a simple matter to connect your DCC ground there.

However, never insert a wire into any of the openings in the electrical socket. Also make sure a metal screw is used instead of a plastic or nylon one.

One of the best pieces of advice I've seen is to make sure your layout room's electrical circuit is protected with a ground fault circuit interrupter (GFCI)

breaker or outlet. This can be either a GFCI breaker in your main panel box or the first GFCI outlet in the circuit. These devices trip if the current running through the hot wire isn't returning via the neutral wire in the circuit.

Another reason an earth ground may be used is to discharge static electricity we may accumulate and transfer to our DCC systems. If you live in an area prone to static buildup and decide to install a ground to deal with it, there are two options, (1) purchase an electrostatic discharge (ESD) ground wire designed for this purpose, or (2) wire a 1MΩ resistor in the line on the earth ground.

The resistor will allow static discharges to travel to ground while preventing any potential flow of current from the electrical wiring to your DCC system.

So what's the bottom line? First, pay close attention to what your DCC system manual says about using commons and grounds. If there's nothing in the manuals, then contact the manufacturer's tech support for advice. Keep in mind that using an earth ground where one isn't recommended or is specifically prohibited probably will violate your warranty and in most cases isn't necessary.

For most modelers who use a single command station/booster, the issue of multiple commons will only arise should you decide to add additional boosters. Also, many standalone auto-reversing circuits and circuit breakers don't require a common reference ground.

Finally, if you're not familiar with AC electrical wiring and your local building codes, have an electrician make any connections and installations for you. For more information on commons and grounds, visit Mark Gurries' website at <https://sites.google.com/site/markgurries/home> or my own website, www.dccguy.com. **MR**





Walther'sProto HO scale EMD GP35 diesel

Modelers waiting for an HO scale Phase II GP35 have had their patience rewarded with the new locomotive model from Walther'sProto.

Previous models of GP35s have all been variations of the Phase I locomotive, which represents more than three-quarters of production. But Walther's engine has the thin side sills of the final months of production, along with the correct inertial filter hatch cover and intakes, depending on the prototype.

The prototype. General Motors Electro-Motive Division built 1,333 GP35 locomotives between October 1963 and January 1966, 1,250 for U.S. railroads and the remaining 83 for Canadian and Mexican customers.

These locomotives were the last hurrah for the venerable 567 diesel engine, which produced 2,500 hp from 16 cylinders in the GP35. As second-generation

diesels, many GP35s rode on traded-in trucks, either from earlier EMD products or Alco AAR Type B trucks.

Early locomotives, referred to as Phase I by railfans, had heavy sills shared with previous GP models. Starting in the summer of 1965, EMD began constructing the frame from sectioned I beams, resulting in a thinner sill. Phase II locomotives were further divided into three subgroups, called Phase IIa, IIb, and IIc.

The Phase IIa locomotives retained the flat inertial filter hatches of the Phase I locomotives. The inertial filter hatch is the roof panel just aft of the cab. Inside is the inertial filter, which provides clean air for the blowers that cool the electrical equipment, and for engine intake air.

While both Phase IIb and IIc had raised inertial filter hatches, the later Phase IIc locomotives introduced the corrugated inertial filter intakes seen on

GP40 and later locomotives. The intakes for the filter are on the sides of the locomotive just below the hatch.

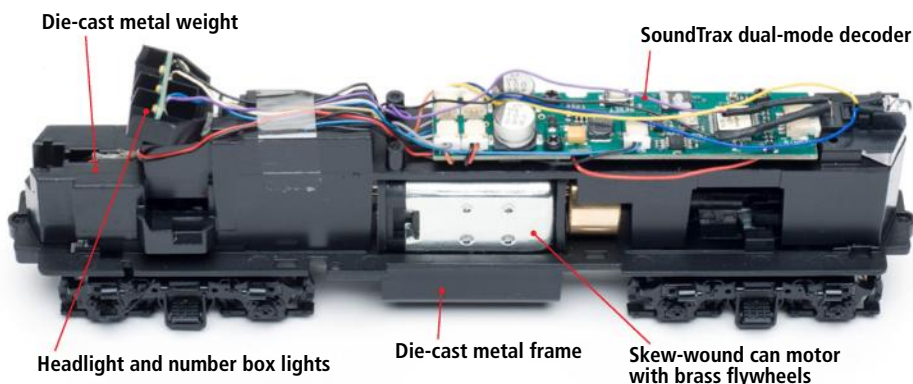
Many railroads had both Phase I and Phase II GP35s, but the Milwaukee Road; Richmond, Fredericksburg & Potomac; Rock Island; and Toledo, Peoria & Western purchased only Phase II GP35s. Rebuilt locomotives are still working for short lines and regionals today.

The model. Walther's new models all have thin side sills and raised inertial filter hatches, making them Phase IIb and IIc models. Dimensions match those on drawings of a Phase II GP35 in the October 1990 issue of *Mainline Modeler*.

I reviewed Walther's model of Milwaukee Road 1505, a Phase IIb locomotive with a raised inertial filter hatch and flat inertial intake grills. The model also has the correct MILW number boxes on the sides of the dynamic brake blister, and eight jacking pads – four at the standard locations centered over the trucks, then four more just inside the footwells. Other models have the standard four jacking pads, as appropriate.

Color separation between the orange and black paint is sharp, and all lettering, including the trust plates by the rear footwells, is legible. All handrails and grab irons are painted appropriately based on their positions.

The EMD Blomberg trucks on our sample feature separately applied spring hangers, brake cylinders, and a speed recorder on the front axle of the front truck on the fireman's (left) side of the



The Walther'sProto GP35 has a die-cast metal frame. A metal weight surrounds the motor and flywheels and supports the decoder and speaker enclosure.

locomotive. See-through fan grills reveal painted fan blades, and the corner steps are perforated. The cab is equipped with seated engineer and fireman figures.

The GP35s are available as direct-current models or with dual-mode Tsunami Digital Command Control (DCC) decoders from SoundTraxx.

To lift off the shell, I removed the couplers, then the fuel tank. Under the fuel tank are two screws that must be removed before the shell can be lifted off.

Reassembling the model was a bit more difficult. The lights for the headlight and number boards fit into a shroud in the top of the locomotive cab. The lights and shroud won't slide past the crew figures inside.

On our sample, the cab was glued to the rest of the shell. In order to get the lighting elements back into the top of the cab, I had to carefully separate the glued joints so the cab could be removed. With the cab off, it was a simple matter to reinstall the lighting elements.

[After I contacted Walthers about the issue, a rep suggested carefully spreading the cab sides slightly, removing material from the inner sides of the figures, or leaving the figures out of the cab to more easily re-install the shell. – Ed.]

Walthers' Geep features a skew-wound can motor mounted in the center of a die-cast metal frame. Brass flywheels and driveshafts on both ends of the motor connect to gear towers on the plastic trucks, driving all four axles. All the metal wheels pick up track power.

A die-cast metal weight covers the motor and drive train and supports the decoder and speaker, if equipped, or the printed-circuit (PC) light board with DCC socket.

On the test track. The locomotive performed as expected for a dual-mode decoder-equipped model.

In DC, sound started steadily at 7V, and at 8V the engine began to move smoothly after two toots of the horn at a speed of 6.7 scale mph. Top speed at 12V DC was 80 scale mph. The bell rang until about 8.5V. The headlight was illuminated to match the direction of travel.

PERFORMANCE TESTS	
DRAWBAR PULL	3.04 ounces 42 HO scale freight cars
SCALE SPEED (DC)	
VOLTS	SCALE MPH
8 (start)	6.7
9	31
10	43
12	80
SCALE SPEED (DCC)	
SPEED STEP	SCALE MPH
1	3
7	21
14	41
28	75

All sounds, such as start-up and the sound of the diesel engine revving as the speed of the locomotive increased, were automatic in DC. A quick boost to the throttle produced a grade-crossing signal, and a quick drop in the throttle resulted in brake-squeal sound effects.

In DCC, sound started when power was applied to the track. Engine sound notched up as I advanced the throttle, with the locomotive moving at 3 scale mph in speed step 1. In speed step 28, the locomotive reached a prototypical 75 scale mph top speed.

I easily advance-consisted the locomotive with a second GP35. Changing the address number to match the number on the cab and adding a bit of momentum to acceleration and deceleration were straightforward.

With the programming changes made, I took the locomotive to our Milwaukee, Racine & Troy staff layout. Using the locomotive brake feature of the SoundTraxx Tsunami decoder, function 9, it was enjoyable to bring a train into the Williams Bay yard, sort the cars, and deliver them to the industries along

Facts & features

Price: \$199.98, DC, no sound; \$299.98, DCC and sound

Manufacturer

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

Era: 1963 to present

Roadnames: Chicago, Milwaukee, St. Paul & Pacific (Milwaukee Road); Atchison, Topeka & Santa Fe; Burlington Northern; Chesapeake & Ohio; Chessie System; Chicago, Rock Island & Pacific; Conrail; Erie-Lackawanna; Gulf, Mobile & Ohio; Southern Pacific; and undecorated

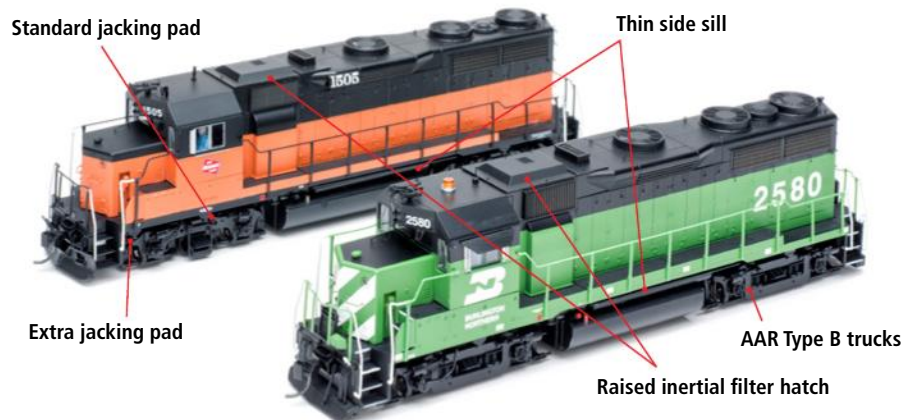
Features

- Five-pole, skew-wound, high-torque, high-efficiency can motor
- Road-specific details
- Proto-Max metal knuckle couplers at correct height
- Turned metal wheels, in gauge
- Weight: 13.1 ounces

the backdrop. The locomotive had no trouble pushing and pulling cuts of cars through the yard ladders and no. 6 turnouts at the sidings.

With the outbound train assembled, the GP35 dug in and hauled 13 cars up the 3 percent grade heading out of Williams Bay.

Walthers has filled a niche that has long been open with this particular GP35. This smooth performer makes adding the later Phase II locomotive to layout rosters a much simpler task. – Eric White, associate editor



The model has the thin side sill of a Phase II locomotive, as well as the later raised inertial filter hatch. The BN engine has traded-in Alco AAR Type B trucks.

MORE ON THE WEB

Subscribers can watch a video of the sound-equipped GP35 in action at ModelRailroader.com



InterMountain N scale SD40-2 with sound

A newly tooled N scale SD40-2 with a detail level that rivals larger scale models joins the InterMountain Ry. roster. For the most part the 1:160-proportion model stacks up well against its General Motors Electro-Motive Division prototype. I tested a version factory-equipped with an ESU LokSound Select decoder.

Prototype. Part of EMD's Dash 2 product line, the SD40-2 was the locomotive builder's best-selling locomotive of all time. Electro-Motive delivered 3,126 SD40-2s to railroads across the United States, 719 to Canadian railroads, and 107 to Mexican lines.

Produced between 1972 and 1986, the SD40-2 featured a turbocharged 3,000 hp 16-cylinder 645E diesel engine. The SD40-2 featured many improvements over its SD40 predecessor, including modular electronic components and high-adhesion HT-C trucks.

The model. The model's major dimensions match a prototype drawing in *Model Railroader Cyclopedia: Vol. 2, Diesel Locomotives* (Kalmbach

Publishing Co., out of print). The plastic body shell features well-defined molded detail, including engine-access doors.

Separate plastic parts include a rooftop "firecracker" antenna and three-chime air horn. The handrail and stanchion assemblies are made of flexible acetal plastic to resist breaking.

All the cab windows have clear plastic glazing, as does the water-level sight glass on the engineer's side of the long hood. Etched-metal details include the wind deflectors and separately applied windshield wipers.

The plastic truck sideframes match prototype drawings of HT-C trucks. The blackened metal wheels are the correct 40 scale inches in diameter.

Our review sample models GATX no. 7366 as the prototype looked after 1990, when its lease reverted back to its owner, GATX Capital Corp. Built in 1975, the locomotive began its career in Missouri Pacific blue as no. 3185, followed by Union Pacific livery as no. 4185 after that company absorbed the MP in 1982.

The model has clearly printed graphics, including the correct Burlington

Northern West Burlington Shops logo on the battery box doors. The GATX logo on the sides of the hood and cab looks thinner and its spacing doesn't match prototype photos of no. 7366.

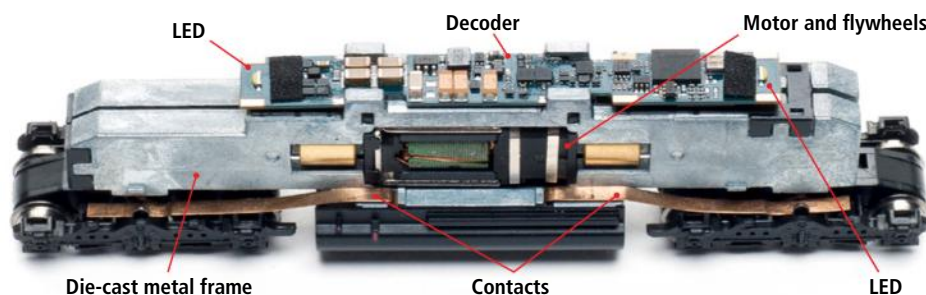
Railfans refer to the detail changes that took place during the SD40-2s production run as "phases." Like its prototype, the model is of a phase I SD40-2. The model correctly has a ratchet-style hand brake, wire air intake grills, and riveted cab panels. A later-production SD40-2 would have a brake wheel, louvered grills, and welded panels.

On the model the short hood measures 88 scale inches long, which is correct for a phase II SD40-2 but not the model's phase I prototype. The short hood length on a phase I SD40-2 is 81".

Mechanism. After removing the front and rear couplers, I carefully lifted off the plastic body shell. A split die-cast metal frame surrounds the motor and flywheels. Truck-mounted gearboxes transfer power to all six axles. The ESU LokSound decoder slides into slots on top of the frame. Surface-mount light-emitting diodes on each end of the decoder illuminate the headlights.

Out of the box, the locomotive continually stalled. Phosphor bronze strips run from the die-cast metal frame to the top of the truck on each side, but weren't making good contact with the truck pickups. Using tweezers, I bent the strips downward and made sure each one was secure on the sideframe.

After a few test runs, the locomotive ran smoothly without stalling. The engine easily rounded 10" radius curves.



Our review sample features a split die-cast metal frame and ESU LokSound decoder. The metal contacts were bent down to make better electrical contact.

ESU Full Throttle. With the contacts fixed, the model ran smoothly on our DCC test track from 2 scale mph to a prototypical 70 scale mph top speed. The decoder can be switched to 128 speed steps for more precise speed control.

The ESU decoder has some built-in momentum, but more can be added via configuration variables (CVs). There are CVs that control every aspect of the decoder's sound, light, and motor performance, including function mapping and setting individual volume levels. I easily programmed the decoder to the locomotive cab number, added momentum, and advance-consisted the SD40-2 with another decoder-equipped N scale diesel. A quick-start guide is included. Extensive online user guides are available at intermountain-railway.com.

The decoder came programmed with ESU Full Throttle diesel sound effects. The HOLD feature provides a useful alternative to button-controlled manual notching. After getting the locomotive to the desired speed, I pressed function 9. Then I could use the throttle to notch the engine sounds up or down without affecting locomotive speed. When I pressed function 9 again, the speed automatically matched the sound.

I'm happy that the decoder features an independent brake. Pressing function 10 applies or releases the brakes regardless of the throttle setting.

Following instructions on the InterMountain website, I activated two

PERFORMANCE TESTS

DRAWBAR PULL	.5 ounce 12 N scale freight cars
---------------------	-------------------------------------

SCALE SPEED (DC)

VOLTS	SCALE MPH
7 (start)	2
9	20
10	38
12	60

SCALE SPEED (DCC)

SPEED STEP	SCALE MPH
1	2
7	12
14	30
28	70

additional Full Throttle features. The COAST function sets the rpm to idle, and the throttle controls the speed without affecting the sound. The STRAIGHT TO 8 function simulates the sound of the engine being put into notch 8 when starting out with a heavy train.

On our DC test track, sound and lights came on after I advanced the power pack to 5.5V. The model started moving at 7V with a little jerkiness that smoothed out at 8V. From there the SD40-2 accelerated smoothly to a top speed of 60 scale mph.

On DC layouts, sound effects are limited to the prime mover. The RPM sounds realistically increase before the model starts moving with some built-in momentum. When I flipped the power pack direction switch, the locomotive slowly came to a stop and reversed without any interruption in the sounds or headlight flicker.

Facts & features

Price: \$139.95 (DC, no sound); \$189.95 (DCC, no sound); \$249.95 (DCC, sound)

Manufacturer

InterMountain Ry. Co.

P.O. Box 839

Longmont, CO 80502-0839

www.intermountain-railway.com

Era: 1972 to present

Road names (multiple road numbers): GATX Capital Corp.;

Atchison, Topeka & Santa Fe; Burlington Northern; CSX; Iowa, Chicago & Eastern; Norfolk Southern; Union Pacific; and more than 40 other road names in multiple paint schemes announced. See InterMountain website for specific liveries.

Features

- All-wheel drive and electrical pickup
- Blackened metal wheels in gauge
- DCC versions feature ESU LokPilot (no sound) or LokSound Select decoders
- Directional LED headlights
- Five-pole skew-wound motor with dual brass flywheels
- Operating knuckle couplers at the correct height
- Weight: 3 ounces

After some tweaking, the SD40-2 proved to be a smooth-running model, and the ESU Full Throttle decoder made me feel like I was in the engineer's seat. – *Dana Kawala, senior editor*

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Atlas HO scale FMC 5347 boxcar

A new HO scale boxcar based on a 1970s prototype has been released by Atlas Model Railroad Co. The FMC 5,347-cubic-foot-capacity boxcar features a one-piece injection-molded plastic body, wire grab irons, etched-metal crossover platforms, and separately applied ladders and stirrup steps.

FMC Corp. produced the 5,347-cubic-foot-capacity boxcar at its plant in Portland, Ore. Some of the spotting features of the boxcar include seven exterior posts on each side of the door, 3/3 non-terminating ends, and bolsters attached to the sill with six fasteners in a U-shaped pattern.

The Atlas model closely follows prototype drawings published in the 1980 *Car and Locomotive Cyclopedia* (Simmons-Boardman Publishing Corp.) Though the Youngstown sliding doors aren't positionable, I did appreciate that the lower door track on each side is mounted to stand-off brackets. The tack and route board location match prototype photos.

The boxcar's underbody is also well detailed. The crossies are molded; the center sills and crossbearers are a one-piece casting. The air reservoir, brake cylinder, triple valve, support brackets, and levers are a separate casting. Wire brake

rods further add to the model's realism. The car rides at a prototypical height, so the sill obscures most of these items.

The draft-gear box and bolster is a one-piece casting. The model is equipped with Accumate scale couplers. A separate draft-gear box and bolster is included if you want to equip the model with Kadee whisker couplers. The end-of-car cushioning unit and uncoupling levers, as well as installation instructions, are included in the box.

Our sample is decorated for the Savannah State Docks RR (SSDK), which operated from 1952 to 1998 before it was acquired by shortline conglomerate Genesee & Wyoming and renamed the Savannah Port Terminal RR. The SSDK had 100 FMC 5,347-cubic-foot-capacity boxcars, numbered 1000 through 1099, that were built under lot 17962 in May 1979. In 1986 the SSDK's cars went to the Minnesota, Dakota & Western. Fourteen years later, the cars moved east to Vermont's Green Mountain RR.

The paint is evenly applied with crisp color separation lines. One discrepancy I noticed was the color of the lettering on the door stencils and the end reporting marks. On the model, the lettering is white; on the prototype, it's black.

Facts & features

Price: \$39.95 (undecorated, \$32.95)

Manufacturer

Atlas Model Railroad Co.

378 Florence Ave.

Hillside, NJ 07205

www.atlasrr.com

Era: 1979 to 1986 (as decorated)

Road names: Savannah State Docks RR, Apalachicola Northern, Chicago & North Western, Delta Valley & Southern, Mississippi Export, New Orleans Public Belt, and Providence & Worcester. Three road numbers per scheme.

Features

- Correctly gauged 33" metal wheels on plastic axles
- Accumate scale couplers at correct height (trip pins too low)
- Weight: 4.7 ounces, .2 ounce too heavy based on National Model Railroad Association recommended practice 20.1

I operated the boxcar on our Wisconsin & Southern project layout. Out of the box, the trip pin was low on both Accumate scale couplers. A quick adjustment with Kadee trip pin pliers brought them to the correct height. The car operated without incident while being pushed and pulled through the no. 5 turnouts.

Atlas has hit another home run with its HO scale FMC 5,347-cubic-foot-capacity boxcar. With a high level of detail, a solid paint job, and excellent performance, the well-proportioned boxcar certainly lives up to its Master Line status. – *Cody Grivno*, associate editor



Separately applied brake hardware and wire brake rods are just some of the underbody details on the Atlas HO scale FMC 5347 boxcar.

QUICKLOOK

Tangent HO 40-foot Mini Hy-Cube boxcar

Price: \$44.95

Manufacturer

Tangent Scale Models

P.O. Box 6514

Asheville, NC 28816

www.tangentscalemodels.com

Era: 1967 to 1990 (as decorated)

Road names: Chicago, Burlington & Quincy; Burlington Northern; Denver & Rio Grande Western; Illinois Central; Milwaukee Road; and Northern Pacific. Multiple road numbers per scheme. Undecorated kit also available.

Comments: A Pullman-Standard PS-1 40-foot Mini Hy-Cube boxcar is the latest addition to the Tangent Scale Models line of HO scale freight cars. Pullman-Standard built 122 of the 4,900-cubic-foot-capacity boxcars at its plant in Bessemer, Ala.

The cars were designed to transport appliances such as refrigerators,

washers, dryers, and water heaters. In later years, the boxcars were used in paper and maintenance-of-way service.

Our sample is painted as Chicago, Burlington & Quincy no. 19828, part of the railroad's 19825 through 19839-series of cars built under lot no. 9255 in October 1967. The model's dimensions match prototype drawings in the June 2017 issue of *Railroad Model Craftsman*.

The boxcar features a high level of detail, including separately applied plastic ladders, wire grab irons, and etched-metal crossover platforms. The lettering placement matched prototype photos, and the BURLINGTON ROUTE herald was well rendered. I especially appreciated that the lot number was accurate to the road number.



The underbody features a separate air reservoir, triple valve, and brake cylinder; levers and hangers; and a non-functioning P-S Hydroframe-40 cushion underframe.

The model has Kadee scale couplers mounted at the correct height. The CNC-machined 33" metal wheels are properly gauged. At 4.3 ounces, the car is .5 ounce too heavy based on National Model Railroad Association recommended practice 20.1.

The Tangent Scale Models HO scale Hy-Cube boxcar would look good on any model railroad set between the late 1960s and the early 1990s. – *Cody Grivno, associate editor*

QUICKLOOK

BlueRail Trains App upgrade

Price: Free

Manufacturer

BlueRail Trains

2540½ Foothill Dr.

Vista, CA 92084-6578

www.bluerailtrains.com

Comments: For modelers who use BlueRail Trains or Bachmann E-Z App Bluetooth train control, a recent upgrade adds consist and speed matching functionality.

BlueRail Trains introduced its Bluetooth control system a couple of years ago. A touch screen on a smartphone, tablet, or other Internet-enabled device takes the place of a Digital Command Control or direct-current throttle. The system works on DC and DCC layouts, and a battery control "dead rail" version is also available.

See the October 2016 *Model Railroader* for my BlueRail Trains review and the April 2016 MR for my Bachmann E-Z App locomotive review.

I have the BlueRail app installed on an Apple iPad. To upgrade the app,

I clicked on the BlueRail icon in the App Store.

The updated app also wirelessly updated the firmware in the BlueRail Trains board. All I had to do was put the locomotive on powered rails and open the app. No wires or special programmer were required.

For Android users, the BlueRail App is available in the Google Play store.

The new consist feature has been added to the multi-train screen. Instead of using configuration variables (CVs) to program the locomotives to run as a consist, a toggle switch has been added to each throttle on the screen. Set the switch for each locomotive to the same letter (either A, B, C, or D), and the locomotives are consisted. All the throttles except for the lead engine are then ghosted out.

In this screen I could also set the direction of travel for each engine. A



MAKE LEAD button on the rear locomotive's throttle is useful for running a push-pull train. The touch screen controls are very intuitive. A short tutorial video is also available on the BlueRail website.

Once the locomotives were consisted, I could open the speed matching screen (shown at left).

The locomotives can be speed matched at three different speed points – low, mid, and high. In this screen the throttle controls are replaced with up and down arrows for more precise control. During speed matching the locomotives need to be placed about 6 inches apart on the same track. Within a few minutes I had both of my BlueRail equipped locomotives speed matched.

With its regularly updated features, BlueRail Trains continues to provide an intriguing alternative to DCC. – *Dana Kawala, senior editor*

New York Central no. 6024, a 4-8-4 Niagara, departs Ellison Union Station with the afternoon express while no. 9403, a class A-2A Berkshire, enters the yard with a manifest freight. The action takes place on Lee Gasparik's O scale Pennsylvania and New York Central layout in Wiley Ford, W.Va. The Niagara is a Precision Scale Crown model. The A-2a is by Overland. Both have been converted to run on battery power. Paul Kahne shot the photo.







Milwaukee Road Fast Mail Train 56 races east above Valley with no pause at High Bridge in an effort to stay on schedule. John Matitz of Milwaukee photographed the scene on the HO scale North American Prototype Modelers club layout in Milwaukee. John detailed and weathered the Broadway Limited Imports E6 locomotives, along with the Athearn, BLI, Fox Valley, and Walthers cars.

From the late 19th century until the 1970s, Belgium operated an extensive interurban trolley network known as the Vicinal. Glyn Thomas of Philadelphia built and photographed this 1-foot-square diorama of the Vicinal as it appeared in the 1970s. The HOm (1:87 scale, 1 meter narrow gauge) diesel trolley is a Saroulmapoul model. The structures are all scratchbuilt.



Send us your photos

Trackside Photos is a showcase for the work of *Model Railroader* readers. Send photos (digital images 5 megapixels or larger) to: *Model Railroader*, Trackside Photos, P.O. Box 1612, Waukesha, WI 53187-1612; or upload them to <http://fileupload.kalmbach.com/Submission/contribute>. For a copy of our photo submission guidelines, contact associate editor Steven Otte at sotte@mrmmag.com.

MORE ON THE WEB

Paul Kahne's photo of Lee Gasparik's layout on page 64 is this month's free wallpaper. Get it from ModelRailroader.com

A Portsmouth & Androscoggin RR

crew prepares for its 12-mile run from Mahican, Maine, to Portsmouth, N.H. Richard Walz of Northampton, Mass., photographed the scene on his HO scale diorama. The roundhouse, mostly scratchbuilt, won Best In Show at the National Model Railroad Association's 2009 national convention in Hartford, Conn. The locomotive in the foreground is a Bachmann 2-8-0 Consolidation.



What's special about instructions?

A question from a reader about employee timetables and their special instructions stirred fond memories about the first timetables I collected. This leads me to ways to use them on our layouts.

I once had a paper route with an important commuter line only a few blocks away. After unleashing a hard slider that sent my last paper zinging to its subscriber's door, I'd pedal to the tracks to watch the first evening rush-hour trains. I remember the oily smell of kerosene smoke curling from the lanterns hung on the gates as dusk fell. One day the crossing watchman presented me with the gift of Erie Lackawanna Time Table No. 2, "For Employees Only." It was as wondrous to me as a Gutenberg Bible.

Like public timetables, employee timetables contain the schedules of regular trains. However, they contain other important information necessary to work on a railroad, so an employee timetable must exist whether its territory has scheduled trains or not.

Major railroads like the New York Central and Union Pacific issued employee timetables for divisions or groups of divisions. Smaller lines might have only one timetable covering the entire system.

Typically, an employee timetable lists the stations on the lines it covers, their milepost locations and hours of operation, passing sidings and their length, and other facilities such as water tanks and wyes. They also include the schedules of regular

trains, if any. Systems of operation, such as Yard Limits, Automatic Block Signal, or Centralized Traffic Control are shown.

Contemporary editions would specify Track Warrant Control (TWC) or Form D Control System (DCS) methods, where they apply. Track diagrams have now become common in timetables, too.

A timetable will also contain special instructions. These may modify certain operating rules, state speed limits and tonnage ratings, and give other detailed information. Close clearance notices naming industries served can feed a modeler's imagination.

I created an employee timetable for my own Susquehanna layout, an eight-page condensed version of the prototype. I prepared timetable schedules with a friend's help, using spreadsheet software. Mine shows all the railroad's stations, including unmodeled ones, to create the illusion of distances greater than my layout offers. I used

a bold font to distinguish those actually modeled.

Its prototype has 34 pages dense with information. Repeating all this and insisting that crews apply it would make drudgery of operating sessions that are supposed to be fun. Instead, I selected key elements of

thousand, three thousand").

Placing speed restrictions adds another prototypical measure to operations. I made

10 scale mph the limit for movements over a curved crossing. Movements in and out of yards and over lift bridges spanning duckunders are also limited to 10 scale mph.

Other special instructions specify the use of certain tracks, such as requiring trains arriving at one staging yard to use the yard lead, not the loop track.

Susquehanna instructed that cars carrying explosives be placed in trains spaced at least 16 cars from the engine and 10 cars from the caboose. I made this more practical by reducing the required spacing to only two cars.

I scanned the original's front and back covers and modified them using image-editing software. I laid out the text in bifold (brochure) format, printed the pages, and assembled them to make a master. One of the major office supply chains then printed them for me, a couple dozen copies for less than the price of a ready-to-run freight car. But a simple page of instructions on plain paper can suffice for your layout.

Find an employee timetable at a swap meet or online auction. Thumbing through it might be as enjoyable as browsing a Walther's catalog. You'll discover much you can use to detail your own railroad's operations. **MR**



Employee timetables from the author's collection, including one he developed for his Susquehanna layout.

Jerry Dziedzic photo

operation that I want my sessions to emphasize.

Mine begins with the operating rules in effect, citing a rulebook dated July 1, 1930. The layout's era is 1947, but rulebooks are issued infrequently. Employee timetables provide for regular updates and revisions.

One of my junctions uses a signal aspect not shown in the 1930 rulebook. A special instruction describes this "non-conforming" signal and gives its indication. Another rule instructs train crews about an approach signal to a staging yard.

Timetables usually gave a speed table so enginemen could time a mile. This isn't practical on most layouts. Mine relates speed with car lengths. For example, at 20 scale mph, two car lengths pass every three seconds (say slowly: "one thousand, two





I am so excited about this new series on the Olympia logging line phase 2! MRVP is so informative and just plain enjoyable to watch.

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— DAVID YOUNG



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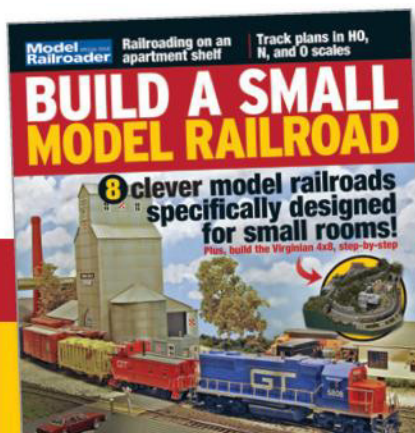
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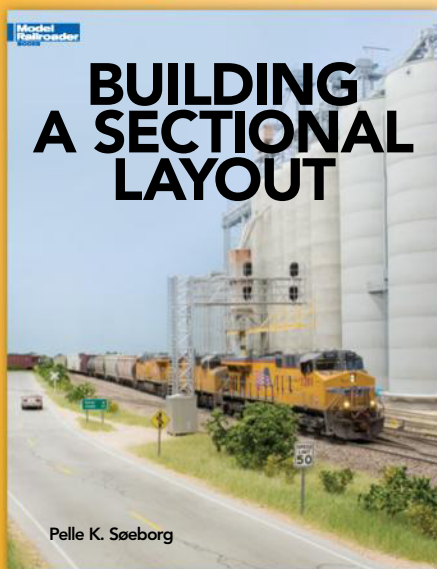
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Note to Readers:

Schedule of Events

AR, JACKSONVILLE: Train Show, Jacksonville Community Center, Municipal Drive, August 26-27, 10:00am-4:00pm. Vendors, Clinics, Contests, Admission \$7.00, 12 and under free w/adult. Contact Rail & Sprue Hobbies, 1200 John Harden Drive, Jacksonville, AR, 72076. 501-982-6836, or railandsprue@aol.com

CA, ONTARIO: NMRA PSR Convention, September 13-16, Radisson Ontario Airport. Will feature a complete set of clinics covering all aspects of model railroading. Swap meet, prototype tours, railroad model contest and AP evaluations. Wednesday welcome dinner, Saturday Awards Banquet. Details: <http://www.psrconvention.org/ontariomanifest/> Contact: Gary Butts, Editor@CajonDivision.org

CA, SACRAMENTO: T.T.O.S. River City Toy Train Meet. Scottish Rite Center, 6151 H Street, Zip Code: 95819, Saturday, September 30, 2017, 10:00am-3:00pm, Single \$5.00, Families \$9.00, children under 12 free with adult. Free parking. Contact John DeHaan, 707-642-8023

CA, SIMI VALLEY: Swap Meet, Santa Susana Railroad Historical Society, Santa Susana Park, 6503 Katherine Rd., August 26, 2017, 7:00am-10:00am, \$2.00 donation, kids under 12 free. All scales, equipment, scenery, books and photos. For vendor table availability contact Dave, 661-753-6006 or e-mail events@santasusanadepot.org

CT, ESSEX: New Haven RR Historical & Technical Association train show September 9, 2017 at Valley Railroad Co. Modeling clinics, dealers, film & slide shows. Contact Rick Abramson 203-372-0818 or nhrr379@att.net. Information at www.nhrrta.org

CT, GREENWICH: Southern Connecticut Model Train Show, Greenwich Civic Center September 24, 2017, 9:00am-3:00pm. Adults \$7.00, under 12 free. Valley HO Trak Layout & more. Clinics, 150 tables; trains, books, artwork, DVD's. Door prizes, free parking, refreshments. Ron's Books, PO Box 714, Harrison, NY 10528, 914-967-7541. ronbooks@aol.com, southerncttrainshow.com,

FL, BROOKSVILLE: Regal Railways presents Toy Trains & Hobby Show/Sale. Hernando Fairgrounds, 6436 Broad St. Saturday, September 30, 2017, 9:00am-2:00pm. Adults \$5.00. Vendors, videos and operating layouts. Serving lunch items. Contact: Joe at 727-244-1341 or visit: www.regalrailways.com for more information.

FL, PLANT CITY: H.B. Plant Railroad Historical Society Train Show and Swap Meet. John Trinkle Building, Plant City Campus, Hillsborough Community College, 1206 North Park Rd., Zip: 33663. September 23, 2017, 9:00am-3:00pm, Adults \$7.00, under 17 free w/adult. Contact: Gilbert Thomas, 863-412-3090, E-mail: Thomas_12399@msn.com Website: www.hbplantrr.org

IA, HAMPTON: NCIMRRC Train Show. Franklin County Convention Center, 1008 Central West, Sunday, October 29, 2017, 9:00am-3:00pm. Admission \$5.00. Trains (all scales), memorabilia and collectibles to buy, sell and trade. Individual tables welcome. For information or table reservations contact Eastside Trains, 641-456-1998, e-mail eastsidetrains@gmail.com

IL, KANKAKEE: Kankakee Model Railroad Club Train Show. Gov. Small Memorial Park Civic Center, 803 South 8th Ave. Sunday, October 22, 2017, 9:30am-3:00pm. Admission: \$3.00, under 5 free. 8' tables \$15.00 and 6' tables \$12.00. Operating layout. Contact lrv at 815-465-2420 or daswoodwerkhous@yahoo.com for more information.

IL, ST. CHARLES: 26th Annual Chicago Railroadiana and Model Train Show. Kane County Fairgrounds, 525 South Randall Rd. Sunday, October 15, 2017, 10:00am-3:00pm. Admission: \$6.00 (includes tax). Tables \$60.00. For information: 847-358-1185, RussFierce@aol.com or www.RRShows.com

IN, AUBURN: RxR Mania Train Show & Antique Show. Kruse WWII Museum, (National Military History Center), 5634 County Road 11-A; from Interstate 69, Exit 326; Saturday, October 28, 2017, 9:00am-3:00pm. Adults \$5.00, under 12 free. \$20.00 per table, 5+ tables \$15.00 each. Info: www.RxRMania.com or 260-715-2519

IN, SOUTH BEND: Notre Dame Campus, NMRA Michiana Division Education and Training Conference, Modeling Like the PROTOTYPE. September 22-23, 2017, McKenna Hall Conference Center, Notre Dame. Clinics, workshops and more. Registration \$35 (\$30 for NMRA members). More information: <http://michiana-nmra.org/> or contact Bob Blake, 203-788-1342 or rm7blake@earthlink.net.

KS, WICHITA: 23rd Annual Model Train Show, Cessna Activity Center, 2744 George Washington Blvd. September 23-24, 2017, Saturday, 9:00am-5:00pm; Sunday 10:00am-3:00pm. All gauges, operating layouts, 40+ vendors, repairs, concessions, door prizes. Children's Depot. Admission: \$8.00 Adults, Children under 18 FREE w/Adult. www.WichitaToyTrainMuseum.org

MI, HASTINGS: Train & Toy Show & Swap Meet at Barry Expo Center, 1350 North M-37 Hwy. September 16, 2017, 10:00am-3:00pm. Admission \$5.00 13 and older. Sponsored by Iron Rails. Over 120 dealer tables, door prizes, several operating layouts. Information: Brad Miles, 269-953-9171, magichb@aol.com

MI, WYOMING (GRAND RAPIDS): Grand River Valley Railroad Club Fall Train Show, Saturday, October 14, 2017. Home School Building, 5625 Burlingame Avenue SW. 10:00am-3:00pm. Adults \$5.00, 12 and under free. 210 vendor and display tables. Food. Free parking. Door prizes. Vendor tables \$16.00 each. Contact Ken Skopp, 616-667-9680, kwskopp@gmail.com. www.grandriverrailwayrrc.org

NC, RALEIGH: 33rd Annual Neuse River Valley Model Railroad Club Model Train Show, November 4-5, 2017, 9:00am-5:00pm both days. Free Parking. Admission \$9.00, \$1.00 off coupon available at nrvcub.net Children 12 and under free. Vendors wanted. Contact George Lasley glasley@bellsouth.net

NH, CONCORD: Concord Model Railroad Club Show at the Everett Arena, Loudon Road. Sunday August 20, 2017, 10:00am-3:00pm. Adults \$5.00, children under 12 free with an adult. \$12.00 per family max. Dealers, door prizes and operating layouts. For more information: www.trainweb.org/cmrc/index.html

NY, ORCHARD PARK: TCA Upstate NY Chapter Show. American Legion Post 567, 3740 North Buffalo Rd. Zip: 14127. Sunday, September 17, 2017. TCA members 9:00am. Public: 9:30am-2:30pm. Admission, Adults \$5.00 under 17 FREE with paid adult. Info, www.upstate-ny-tca.com Chuck 716-390-8216

OH, CLEVELAND: Great Berea Train Show, Cuyahoga County Fairgrounds, 164 Eastland Road, Berea, Ohio 44017. NMRA MCR Div. 4. October 7-8, 2017, NEW SHOW TIMES 10:00am-4:00pm. This is an all gauge Train Show with over 300 tables. 440-785-9907, www.thegreatbereatrainshow.org

OH, FOSTORIA: 16th Fostoria Rail Festival, 1001 Park Avenue, Zip 44830. Saturday, September 23, 2017, 10:00am-4:00pm. Admission: \$4.00, children 10 and under free w/adult. Information: Fostoria Rail Preservation Society, 419-435-1781, EllenGatrell@gmail.com, www.FostoriaIronTriangle.com, Fostoria Rail Park Facebook

OH, PAINESVILLE: Railroad Memorabilia Show, Painesville Railroad Museum (Painesville Depot), 475 Railroad Street, Zip Code: 44077. Sunday, August 27, 2017, 10:00am-4:00pm. 216-470-5780 Email: prrm@att.net www.painesvillerrailroadmuseum.org

OH, TOLEDO: Kahle Center Train Club, Show from 9:30am to 3:00pm. Hobo dinner at 11:00am-2:00pm. Dinner \$7.50 in advance \$8.50 at the door. Table rental is \$9.00 at the show. For information call Dave: 419-346-8497 or Cathy: 419-476-2745

PA, ALLENWOOD: 42nd Annual Train Meet "The Allenwood Show". Sunday, August 27, 2017, 9:00am-2:00pm. Warrior Run Fire Department Social Hall, Second Street, (Convenient to U.S. Route 15). Central Pennsylvania Chapter, National Railway Historical Society.

PA, ELIZABETH TOWNSHIP: Central VFC of Elizabeth Townships, 2017 Fall Train Show, Court Time Sports Complex, 95 Enterprise Drive, Elizabeth, 15037. September 16-17, 2017. Doors open on the 16th at 10:00am and 9:00am on the 17th. Admission \$5.00. For info and group rates www.Central147.com or call 412-751-9712

PA, NEW HOPE: METCA 2 HR. Fall Train Trip New Hope to Buckingham Valley PA and back. Leave SPM sharp Saturday September 16th 2017. Includes buffet w/desserts, soft beverages. Adult \$60. Children 6-12 \$10. 5 and under Free. Purchase tickets online. Info: www.METCA.org; Contact/Info Sam Deo, eusdesa@yahoo.com, 201-757-3507. All Board.

TX, PLANO: NTC 3rd Annual Fall Plano Train Show. Plano Centre, 2000 E. Spring Creek Parkway, September 30th, and October 1st, Saturday 10:00am-5:00pm; Sunday 10:00am-4:00pm. Adults \$8.00, 12 and under free w/adult. All scales & Tin Plate. Dealer tables, How-To Clinics. Information: Chris Atkins, chris@railroadmodeler.com 469-438-0741. Visit www.dfwtrainsshow.com

TX, TEMPLE: 35th Annual Temple Model Train Show. Frank Mayborn Convention Center, 3303 North 3rd St. September 16-17, 2017, Saturday, 10:00am-5:00pm and Sunday, 10:00am-4:00pm. Adults \$7.00, Children 12 and under Free. Discounts for Seniors, Active Duty Military and their dependents. Centra Mod, Inc., PO Box 1264, Temple, TX 76703

VA, VIRGINIA BEACH: Tidewater Division 28th Annual Train Show/Sale September 30 & October 1, 10:00AM-4:00PM Virginia Beach Convention Center, 1000 19th St. Zip: 23451. Admission \$9.00, under 12/Scouts Free, 150+Tables, Layouts. Locomotives, Equipment, Supplies/Tools, Books, Memorabilia Train Doctors, Contact Bill Miller 757-409-3623, Ktsdad1934@cox.net Flyer: <http://nmra-mer-tidewater.org>

VT, RUTLAND: 6th Annual Rutland Railway Association Model Railroad Show & Swap Meet. College of St. Joseph, 71 Clement Road. September 30, 2017, 10:00am-3:00pm. Admission \$5.00, under 12 free. Model Railroad Vendors, All Gauges & All Ages, Railroad Memorabilia, Layouts, Tables Available. Information: John Schaub, 802-774-8412, call/text

WA, CHEHALIS: Lewis County Model Railroad Club, Annual Fall Railroad Swap Meet and Show. Southwest Washington Fair Grounds, Blue Pavilion Building, 2555 N. National Ave., Zip: 98532. October 14-15, 2017, 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

WI, MILWAUKEE: Trainfest, at Wisconsin State Fair Park. 9am to 5pm Nov. 11&12. WISE Div. NMRA. Exhibitors include operating layouts, major manufacturers, modeling clinics, and hobby vendors. Admission information and tickets available at www.trainfest.com Contact us at info@trainfest.com

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Next Issue

Going back to the Harbor District

Paul Dolkos describes how he planned, built, and operates Carroll Street on his HO scale Baltimore Harbor District layout that was featured in the December 2015 issue. He outlines some of the modeling techniques that he used for the 7-foot long scene, including laying girder rail in the streets.

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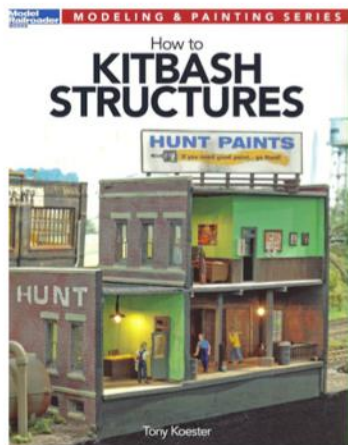
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Fighting the clicker wars



Need a nap?

As a focus slide for his presentations, Tony often uses a reminder that a book on the topic is available, especially when giving a clinic after lunch or dinner. Tony Koester photo

I've given enough clinics to have had just about every technical problem in the known universe come to visit me at the most inopportune time. Back in the 35mm slide days, I could depend on a slide not to drop from a Kodak Carousel tray if the projector was tilted up at more than a shallow angle. And we presenters got very good at changing the very hot burned-out bulbs in projectors mid-presentation.

Today, the problems are harder to diagnose. Or are they? Perhaps they're just harder to cope with in real time. Problems that seem like no-brainers in retrospect can seem like a life-threatening crisis when you're "on stage."

I clearly remember the time I couldn't get the digital projector to fire up. Bill Schneider of Rapido Trains was sitting in the front row quietly observing my frustrations. After a suitable interval,

he calmly got up, walked past me, and plugged the extension cord into the wall outlet.

More recently, I was giving a clinic in Cincinnati, Ohio. I usually start with a "focus" slide I use to make sure everything is working, which remains on the screen as the attendees are filing into the room. (Andy Sperandeo wisely chose a slide that showed a cell phone with a diagonal red line running through it. Of course, when a phone rang shortly after I began one of my clinics, it was my own.)

On this occasion, everything was going along just fine until I used my radio remote to trigger the next slide. As I began my overview of the presentation, my peripheral vision picked up movement behind me. I turned to the screen and discovered the focus slide was again visible. I cycled it back to the second slide, turned to the audience again

— and the same thing happened once more.

For a short time, everything settled down to a logical sequence of slides. But then the inexplicable slide-changing nonsense happened again. For a while there, it was a battle to defeat the projector, which had seemingly developed a mind of its own. I considered abandoning the use of the remote but managed to stagger through the presentation.

After my talk, I headed out the door, only to discover that my good friend Tony Thompson, who had been giving a clinic in the room next to mine, had experienced the same thing. You guessed it: our remotes were on the same frequency.

(I have since purchased a second remote from the same company, and it also works on the same frequency. I guess it's like Henry Ford's black-only Model T: I can have any frequency I want as long as it's this one.)

Another good friend experienced a similar battle, but of his own making. Honestly though, I could see the very same thing happening to me.

Unlike my hit-and-miss tribulations with radio remote, this gentleman was using a remote that didn't

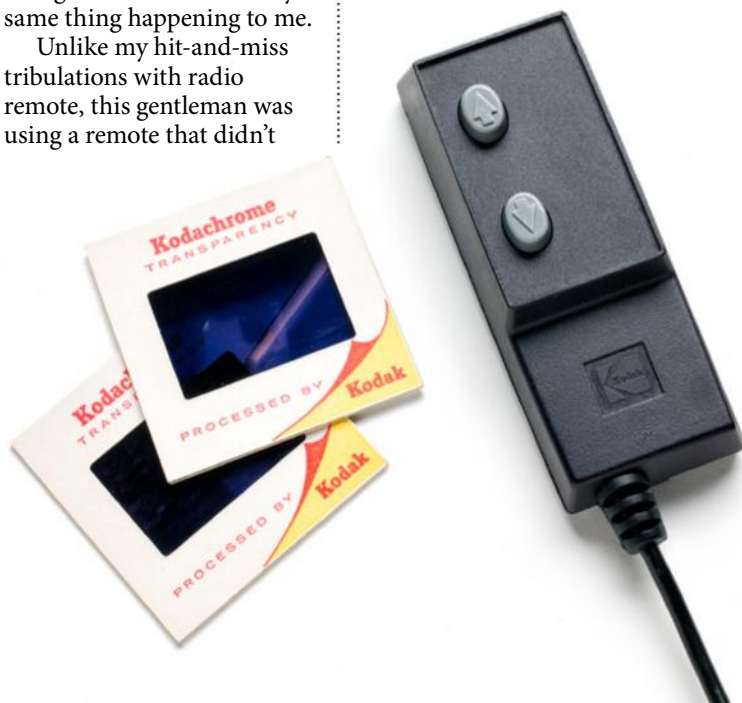
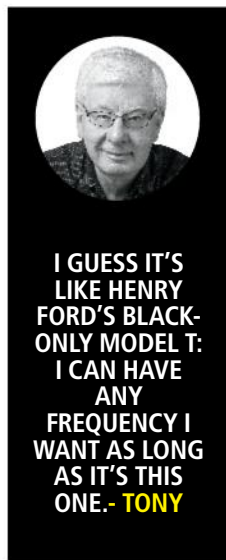
have a built-in laser pointer. So off he went with the remote in one hand and the pointer in the other.

But with his mind focused on what he wanted to tell the audience, a problem was brewing: he would advance a slide, point out something with the laser pointer — and then become mixed up as to which device was in which hand. Repeated attempts with the pointer to change a slide were fruitless, but the laser was briefly beaming just fine.

His frustration grew as he realized what was happening. It obviously required a lot of focus to keep straight which hand performed which function while narrating.

As he finally got really good at this, for some reason he switched hands. Bad move.

My remote has a laser pointer built in, but it's rather weak. So I bought a more powerful laser pointer...and set myself up for precisely the two scenarios I have just described. If you come to one of my presentations, I can almost guarantee it will be, um, entertaining. **MR**





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