

HOW TO hide backdrop openings p.26



Atlas GP38
diesel tested p.66

November 2016
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9 TROUBLESHOOTING TIPS

SOLVE ELECTRICAL PROBLEMS

Expert Don Fiehmann explains
how to track down gremlins
p.30

**Room-size
track plan
in N scale**
p.40

HOW TO

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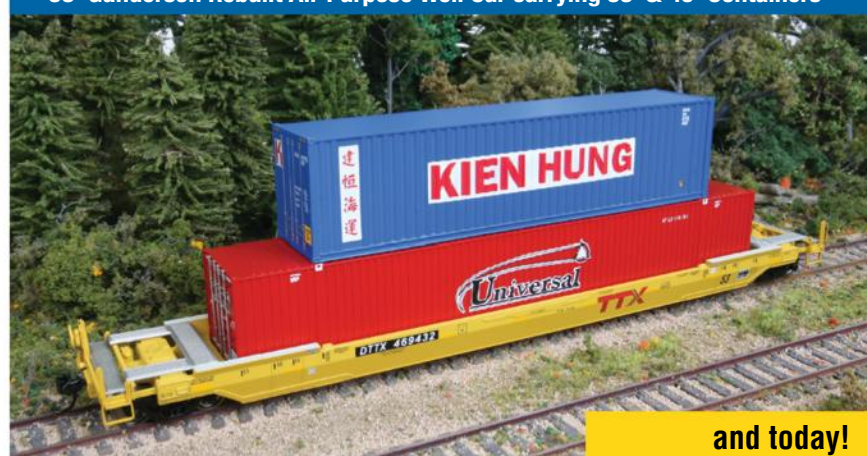
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On the cover: Model railroads need maintenance too. For help finding the source of electrical problems on your layout, turn to page 30. Bill Zuback photo

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Layout visit videos



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Superdetailed scenes on the Blue Ridge & Allegany

Towering city buildings, the Appalachian Mountains, and structures detailed inside and out all highlight Ron Hale's spectacular HO scale Blue Ridge & Allegany RR. This month, *Model Railroader* subscribers can watch an exclusive video of trains running along this transition-era layout.

Bonus desktop wallpaper



Trackside photos from *Great Model Railroads*

The *Model Railroader* special issue *Great Model Railroads* 2017 features 10 outstanding layouts in N, HO, and O scales. This month you can download photos from each layout to use as a backgrounds on your computer screen.

Diesel locomotive demos

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Product review videos

Subscribers get an exclusive look at the latest locomotive models at www.ModelRailroader.com. The Product Reviews page features hundreds of videos, including the Kato HO scale SD40-2 and the Atlas HO GP38 from this issue.

MR staff project



Tips from the HO scale Eagle Mountain RR

Backdrops are great for splitting a layout into scenes. The *Model Railroader* staff's HO scale Eagle Mountain RR features a backdrop that runs down the middle of the 3'-10½" x 6'-0½" layout. In this online bonus video, associate editor Eric White describes the techniques he used to hide backdrop openings.

More from Pelle



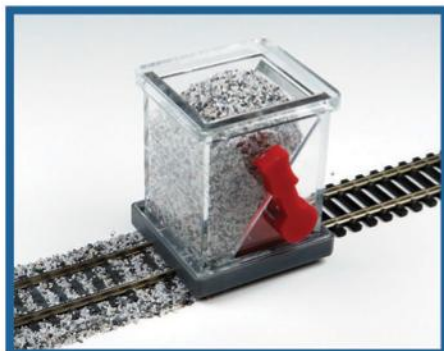
Railfan Pelle's weathered coal train

Contributing editor Pelle Sæborg shows you how to realistically weather modern coal gondolas so that they look like they work for a living. Check out Pelle's finished cars rolling behind Union Pacific power in this video from Pelle's old Mojave Desert layout. You'll find several bonus videos, how-to stories, and more from Pelle at www.ModelRailroader.com. Simply type "Pelle" in the search box on the MR home page.

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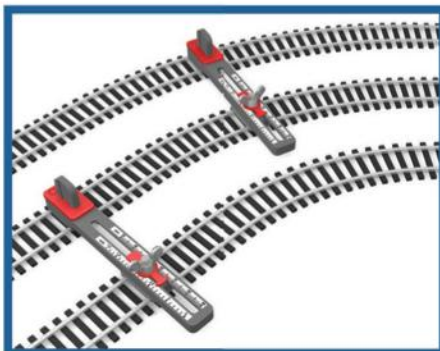
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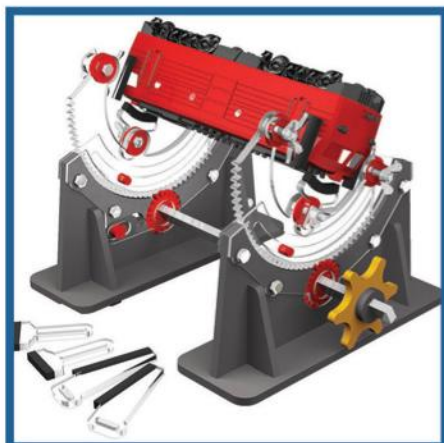
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Divide, divide, and conquer



This month's cover story is about electricity. Specifically, what to do when it misbehaves.

Author Don Fiehmman, in his story about electrical troubleshooting on page 30, makes note of a technique called "divide and conquer."

A few years ago, when the staff was building *Model Railroader's* Rice Harbor project railroad (see the January through May 2014 issues), we divided, divided, and divided, before we conquered.

That layout was built in two relatively narrow, 8-foot-long sections, each with its own legs and tabletop. The sections could be arranged side-by-side to form an oval of track or in an L-shape to create a shelf switching layout.

To keep the ends of the flextrack rails in gauge as trains crossed from one layout section to the other, David Popp, *Model Railroader* Video Plus' producer, soldered printed-circuit (PC) board ties to the rails about 1/2 inch in from the joints. PC board ties are like a sandwich – copper on top and bottom, and non-conductive resin cloth in the middle.

The soldered joints kept our rails perfectly in gauge. David cut a groove through the copper cladding across the top of the tie to avoid a short circuit.

We glued the flextrack onto cork roadbed using latex caulk. To keep the flextrack sections in alignment when the layout sections were butted against each

other, David used a small block of wood in place of the cork roadbed at the joints. He screwed the wood block to the plywood tabletop, and spiked the ends of the rails through the PC board ties and into the wood. The track was going nowhere: the solder held the rails in gauge and the spikes held the flextrack section in place.

Once feeders were connected to the bus lines, we turned on the power.

And the power abruptly shut off. We had a short circuit.

After lots of standing around with our hands on our hips, we decided to "divide and conquer," as Don has advised in this month's cover story.

We cut a few feeders. Nothing. We cut a few more. Nothing. We cut a few more.

At this point, we were left with the sections of flextrack that connected the tabletops together. The shorts were somewhere in these sections. We even re-cut the top surface of the PC board ties. Still there was a short circuit.

David was frustrated. The next day he tore out a piece of offending flextrack.

A bright light came on and the angels started singing.

David realized that while he had cut a groove through the copper cladding on top of the PC board ties, the long metal spikes he later had driven to hold the track ends in place had pierced the bottom of the ties, which also were clad in copper. No groove had been cut across the bottom of the ties, because all of the soldering was topside.

So there was our short circuit.

Take a look at Don's advice, starting on page 30. It may save you from dividing, dividing, and dividing before ultimately conquering.

NEIL BESOUGLOFF

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New York Metropolitan Transportation Authority; and Penn Central (black, New Haven patchout, or blue and yellow). The model has a five-pole skew-wound motor, separately applied grab irons, and Magne-Matic couplers. Direct-current models list for \$169.95. Models with a dual-mode ESU LokSound decoder retail for \$279.95. Rapido Trains, 855-572-6917, www.rapidotrains.com

H0 scale locomotives



■ **Electro-Motive Diesel SD70ACe diesel locomotive.** Norfolk Southern heritage schemes: Illinois Terminal; Delaware, Lackawanna & Western; Penn Central; Reading Co.; and Savannah & Atlanta. SoundTraxx Sound Value sound package. \$319. Bachmann Trains, 215-533-1600, www.bachmanntrains.com

■ **Union Pacific tenders.** Union Pacific early water tender no. 907853, 23C fuel tender (no number), and 24C fuel tender (no number). Photo-etched metal tender deck walkway, operating light-emitting diode, and 36" metal wheelsets. \$69.99. May 2017. Rivet Counter line. ScaleTrains.com, 844-987-2467, www.scaletrains.com

■ **Electro-Motive Division E8Am and E9A diesel locomotives.** E8Am: Atchison, Topeka & Santa Fe. Four road numbers (two each in DC and Digital Command Control). E9A: Chicago,

Burlington & Quincy (post-1959 repaint). Three road numbers (one in DC, two in DCC). Both models feature metallic finish, railroad-specific details, die-cast metal underframe, and Proto-Max couplers. Direct-current models, \$229.98; with dual-mode SoundTraxx sound decoder, \$329.98. January 2017. Walther's Proto. Wm. K. Walther's Inc., 414-527-0770, www.walters.com

H0 scale freight cars

■ **Assorted freight car kits.** Burlington Northern (1991 scheme) 4,750-cubic-foot-capacity covered hoppers (single car, \$18.98; three-pack, \$55.98). Chesapeake & Ohio United States Railroad Administration (USRA) two-bay hopper (single car, \$15.98; three-pack, \$46.98). Delaware & Hudson USRA panel-side two-bay hopper, \$15.98. Great Northern 41-foot steel gondola (single car, \$16.98; three-pack, \$49.98). North Western Refrigerator Line Co. 40-foot double-sheathed refrigerator car (single car, \$17.98; two-pack, \$34.98). Penn Central 50-foot double-door boxcar, \$16.98. Pere Marquette and Union Pacific 40-foot

plug-door boxcar, \$16.98 each. Injection-molded plastic kits with plastic wheelsets and Accumate couplers. Accurail, 630-365-6400, www.accurail.com

■ **50-foot boxcar.** Atchison, Topeka & Santa Fe ("Shock Control" slogan); Bangor & Aroostook ("State of Maine Products" slogan); Chesapeake & Ohio (blue and yellow with "The Chessie Route" lettering); Northern Pacific; Peoria & Eastern (New York Central scheme); Southern Pacific; Union Pacific ("Ship and Travel the Automated Railway" slogan); and Western Pacific. Three road numbers per scheme. Separately applied running board and brake wheel, 33" machined metal wheels, and body-mounted McHenry scale couplers. \$26.98. June 2017. Round-house line. Athearn, 800-338-4639, www.athearn.com

■ **Evans 52-foot gondola.** New paint schemes: Burlington Northern (black with three horizontal white lines and reporting marks), Chessie System (Chesapeake & Ohio reporting marks), Indiana Harbor Belt (coil loading), Kansas City Southern (mineral red), and National Ry. of Mexico (black). Four road

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numbers per scheme. Metal wheelsets and Accumate couplers. \$25.95. Trainman line. Atlas Model Railroad Co., 908-687-0880, www.atlasrr.com



■ **54-foot gondola.** Herzog (mineral red and black), Amtrak, Canadian National, Milwaukee Road, Pennsylvania RR, RailGon, and Union Pacific. Injection-molded plastic model with metal wheelsets and cast-resin tie load (each road name offered with full load and half load). \$28.98. Con-Cor, 520-721-8939, www.con-cor.com

■ **Assorted freight cars.** Louisville & Nashville ("The Old Reliable" slogan) 40-foot boxcar, \$35.95. Northern Pacific Pullman-Standard PS-2 covered hopper, \$42.95. Kadee scale couplers and two-piece self-centering trucks. Kadee, 541-826-3883, www.kadee.com

■ **Gunderson Maxi-IV three-unit articulated well car.** New road numbers: TTX (new logo) and Pacer Stacktrain. Two numbers per scheme. Steel-compound plastic construction with separately applied details, metal wheelsets, and Kato couplers with modeler-installed trip pins. \$105. December 2016-January 2017. Kato USA, 847-781-9574, www.katousa.com

HO scale structures



■ **Downtown Alleyway flat.** Cast Hydrocal kit with plastic doors and windows, pallets, oil barrels, boxes, crates, gas cylinders, and signs. Painting and weathering tips included. Building is almost 30" long. \$64.95 plus \$10 on direct orders. Downtown Deco, 406-821-0181, www.downtowndeco.com

■ **Canadian Pacific elevated tower for crossing gates.** Laser-cut walls with cast windows, printed mullions, self-adhesive roofing, cast rails, and coal bin. Based on railroad plans from 1913.



■ **HO scale Chippewa Valley Farm Supply.** Midwest home-improvement chain Menards continues to expand its line of HO scale factory-assembled structures. Chippewa Valley Farm Supply features a working exhaust fan with slow-moving blades, a light-emitting-diode (LED) strip under front eaves, LED yard lights on other three sides, an elevator leg, figures, and details. Lighting requires a 4.5V power source (sold separately). The structure measures 8.15" x 6.5" x 6.3" and sells for \$59.99 plus shipping (free shipping to your local Menards store). Menards, www.menards.com

Footprint is 1½" x 1¼". \$30. Kanamodel Products, www.kanamodel.com

\$64; with, \$89. The TrainMaster, www.thetrainmaster.com



■ **Carl's Jr. restaurant.** Laser-milled styrene kit with street sign, self-adhesive signs and window posters, and clear acrylic window glazing. Measures 8¼" x 4¾" x 2½". \$79.95. Summit USA, www.summit-customcuts.com

HO scale details and accessories



■ **Automatic Equipment Identification tag scanner and tags.**

Scanner two-pack, \$7; tag scanner with 80 tags, \$12; 40 tags, \$5. Injection-molded plastic. White Rose Hobbies, 717-505-8676, www.dccinstalled.com



■ **RIP Track Services.** Limited-edition craftsman kit with scale stripwood and roofing material. Footprint is 3" x 8". Without RIP track details (welding equipment, oil cans, and car jacks and stands, among other items),



■ **International 7600 vacuum truck.** White or red cab. Plastic, die-cast metal, and polycast construction; detailed cab interior with upgraded mirror detail; and clear window glazing. Boom not

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NEWS&PRODUCTS



HO scale Electro-Motive Division F7A-A diesel locomotives. Märklin offers this two-locomotive set decorated in Great Northern's *Empire Builder* scheme. Each locomotive has two powered axles with traction tires. One locomotive has a pickup shoe for Märklin three-rail track with stud contacts, while the other has an unpowered truck with metal wheelsets. The drawbar-connected diesels have European-style couplers, directional light-emitting-diode headlights, wire grab irons, and detailed cab interiors. The F7A-A set is priced at \$529.99. Märklin, www.marklin.com

positionable. With white wheels, \$152.95; with chrome wheels, \$155.95. Limited production. Available now. Zycon Models, 972-252-0866, www.zyconmodels.com

N scale locomotives

■ **Alco RS-3, RSD-4, and RSD-5 diesel locomotives.** New paint schemes. RS-3: Pittsburgh & Lake Erie and Jersey Central. RSD-5: Chesapeake & Ohio and Milwaukee Road. New road numbers. RS-3: Boston & Maine, Canadian Pacific (three numbers), Great Northern, New York Central, and Seaboard Air Line. RSD-4: Atchison, Topeka & Santa Fe (black and silver). Two numbers per scheme unless noted. Scale Speed motor, directional golden-white light-emitting-diode headlights, and Accumate couplers. \$119.95. First quarter 2017. Master Line. Atlas Model Railroad Co., 908-687-0880, www.atlasrr.com



■ **Electro-Motive Division SDP40F diesel locomotive.** New paint scheme: Amtrak (phase 2). Two road numbers. Five-pole motor, all-wheel electrical

pickup, and directional golden-white light-emitting-diode headlights. Direct-current model, \$125; with ESU LokSound sound decoder, \$250. Kato USA Inc., 847-781-9574, www.katousa.com

N scale freight cars

■ **FMC 50-foot offset-double-door boxcar.** City of Prineville Ry.; Oregon, Pacific & Eastern; Port of Tillamook Bay; Union Pacific; Union RR of Oregon; and Yreka Western. Three road numbers per scheme. Separately applied brake wheel, screw-mounted trucks, and metal wheelsets. \$21.98. June 2017. AthearnN. Athearn Trains, 800-338-4639, www.athearn.com

■ **TTX F89J 89-foot flatcar.** PTTX reporting marks with deck risers (yellow 2000s scheme), TTX marks with middle and end hitches (as-delivered and yellow 1970s scheme), and RTTX marks with triple hitch (black TTX logo). Six road numbers per scheme. Die-cast metal frame, 70-ton BLMA trucks, and metal wheels. \$36.95. Atlas Model Railroad Co., 908-687-0880, www.atlasrr.com

■ **Three- and six-bay cylindrical covered hoppers.** Three-bay: Ajax; Burlington Northern; CSX; Grace/Davison Chemical Co.; Maypo; Pillsbury (East Erie Commercial reporting marks); Southern Pacific; Toledo, Peoria &

Western; and Union Pacific. Six-bay: Chessie System (Baltimore & Ohio reporting marks), French's, and Great Northern. Three road numbers per scheme. Roller-bearing trucks, Fox Valley Models metal wheelsets, and body-mounted couplers. \$19.95. January 2017. Bowser Manufacturing Co. Inc., 570-368-2379, www.bowser-trains.com

■ **Assorted freight cars.** Atchison, Topeka & Santa Fe 50-foot double-door boxcar, \$23.60. Conrail 100-ton three-bay hopper with coal load, \$25.30. Navy Gas & Supply Co. three-dome tank car (one road number), \$29.95. Two numbers per scheme unless noted. Injection-molded plastic models with plastic wheelsets and Magne-Matic couplers. Micro-Trains Line Co., 541-535-1755, www.micro-trainsline.com

■ **Flexi-Van flatcars.** Atchison, Topeka & Santa Fe (white with "Mark V" lettering in three road numbers and class FT-65 in six numbers); New York Central (white with "Mark III" and "Mark IV" lettering in three numbers each); and Trailer Train (yellow and black with VTTX reporting marks in six numbers). Die-cast metal underframe, scale trucks with Fox Valley Models metal wheelsets, body-mounted couplers, and etched-metal grab irons and stirrup steps. \$28.95. First quarter 2017. Trainworx, 970-874-9747, www.train-worx.com

N scale passenger cars



■ **3-compartment, 2-drawing-room heavyweight business car.** New paint scheme: Canadian National (*Bonaventure*). Detailed interior, modernized windows and roof, and Magne-Matic couplers. \$34.90. Micro-Trains Line Co., 541-535-1755, www.micro-trainsline.com



■ **Osgood Bradley 10-window lightweight coaches.** New York, New Haven & Hartford (Hunter Green and Pullman Green with partial skirts in six

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NEWS&PRODUCTS



HO scale custom-lighted vehicle. East Coast Circuits offers a line of custom-lighted vehicles, including this River Point Station Ford Expedition lettered for police supervisor (\$85). The Expedition features 18 flashing emergency lights in red, blue, and warm white. The lights operate on 9V to 12V DC. The lighted vehicles are only available direct from the manufacturer. East Coast Circuits, www.eastcoastcircuits.com

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numbers each, no. 401 green with no skirts in six numbers, and McGinnis scheme with no skirts in 10 numbers); Boston & Maine (maroon in 10 numbers); Bangor & Aroostook (gray and blue in three road numbers); and Long Island Rail Road ("Dashing Dan" scheme in 10 numbers). Each scheme is available decorated but unnumbered; also available undecorated (two versions). Detailed interior and underbody, wire grab irons, and battery-operated interior lighting. \$59.95. Rapido Trains, 855-572-6917, www.rapidotrains.com

N scale structures

■ **S.J. Asher Supply.** Laser-cut wood kit with separate chimney and roofing material. Footprint is 2 3/8" x 6 1/2". \$49.99. RSLaserKits, www.rslaserkits.com



■ **Assorted structures.** Work shed, tin shack, and wood shack. Factory-painted and weathered structures with

separate detail parts. \$19.99 each.
Built-&-Ready Landmark Structures.
Woodland Scenics, 573-346-5555,
www.woodlandscenics.com

■ **Merchant's Row I.** Injection-molded plastic kit with five stores. Includes decal signs. \$39.98. Cornerstone Series. Wm. K. Walther's Inc., 414-527-0770, www.walthers.com

O scale locomotives

■ **Electro-Motive Division SD40 diesel locomotive.** CSX, Norfolk Southern (horsehead silhouette), Southern Pacific (speed lettering), Southern Ry. (high short hood, three road numbers), Union Pacific (lightning stripe), and Wheeling & Lake Erie. Two numbers per scheme unless noted. Die-cast metal chassis, fuel tank, trucks, and pilot; dual motors with flywheels; and metal handrails and grab irons. With QSI sound decoder, \$524.95; unpowered (one number per scheme), \$249.95. Second quarter 2017. Atlas O, 908-687-9590, www.atlaso.com

O scale freight cars

■ **Pullman-Standard 4,750-cubic-foot-capacity covered hopper.** New paint schemes: Atchison, Topeka & Santa Fe (billboard lettering); Cargill (yellow grain-service scheme and green salt-service scheme); Norfolk & Western; Rock Island (blue); and Seaboard Coast Line. Two road numbers per scheme. Die-cast metal 100-ton trucks with rotating bearing caps, 36" metal wheelsets, and separately applied running boards and brake wheel. \$63.95. Atlas O, 908-687-9590, www.atlaso.com

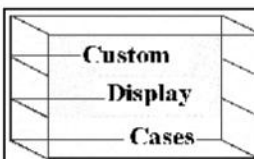
O scale details and accessories

■ **20-foot intermodal containers.** New paint schemes: Evergreen, Hanjin, K-Line, and MOL. Eight container numbers per scheme (four two-packs). Two-pack, \$24.95. Trainman series. Atlas O, 908-687-9590, www.atlaso.com

Z scale locomotives



■ **Electro-Motive Division GP30 diesel locomotive.** New paint scheme: BNSF Ry. (Heritage I). Three road



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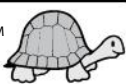
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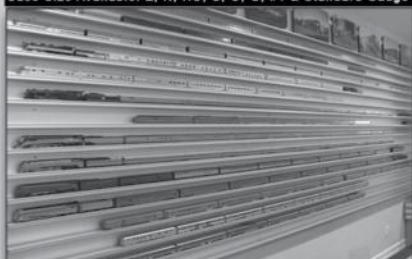
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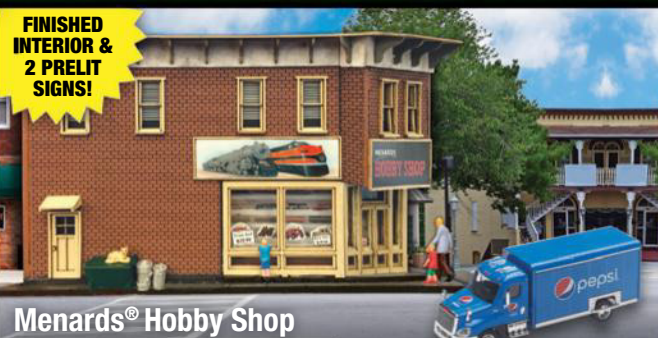
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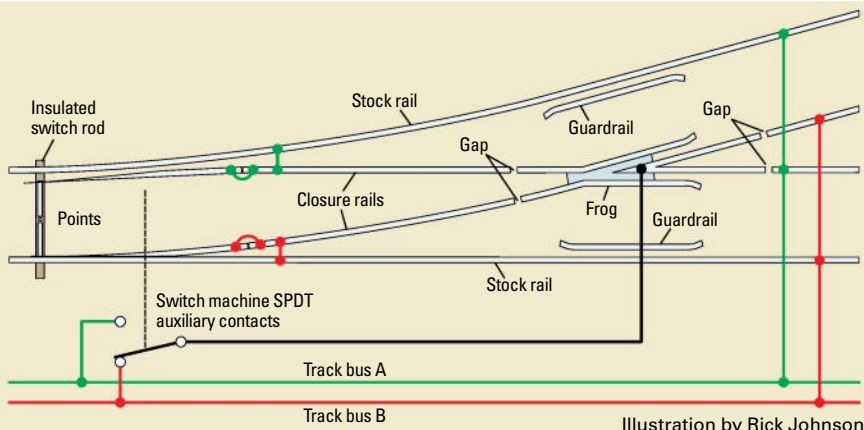
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Rolling stock with out-of-gauge metal wheels can cause short circuits on both insulated-frog and live-frog turnouts. Gapping and wiring a power-routing turnout to isolate the points can make it more “DCC friendly.”

What makes a turnout “DCC-friendly?”

Q I’m about to order turnouts for my 12 x 24-foot HO scale layout. What do I need to know to make my turnouts and double-slips Digital Command Control-friendly?

Charles Gaskin, Jefferson City, Mo.

A Any turnout, crossing, or crossover made these days will work on a DCC layout, whether it’s called “DCC-friendly” or not. What that term generally means is the rails are gapped and isolated to prevent a wheel from spanning two rails of different polarity (such as the stock rail and the adjacent open point rail) and causing a short circuit. (Short circuits can occur on direct-current layouts, too, but DCC components are far less forgiving of them.) If your turnouts and your rolling stock’s wheels are up to snuff according to your National Model Railroad Association standards gauge, there shouldn’t be a problem, but wheels that are almost-but-not-quite in gauge have a way of finding turnouts that are almost-but-not-quite in gauge at the worst possible times.

So, to make a turnout “DCC friendly,” you have to gap the rails on either side of the frog and wire both the frog and the point rails so they’re always the right polarity, as shown in the diagram above. You’ll find more information in Larry Puckett’s book *Wiring Your Model Railroad*, which you can find on our website, www.kalmbachhobbystore.com. Good luck with your layout!

the electrical pickups to the motor are reversed. If you’re handy with a soldering iron, you could switch them yourself, or if not, take it in to a local hobby shop that does repairs.

Q I’ve been out of the hobby for nearly 20 years in terms of having an active model railroad. I’ve noticed that there’s now a vast array of products for code 83 rail, which wasn’t the case years ago. Is there a noticeable increase in derailments on code 83 rail versus code 100?

Randy Fritz, Anthony, Fla.

A Not if you’re running recently made equipment. If you’re using locomotives or rolling stock from 20 years ago, they may have what are colloquially called “pizza cutter” wheels, referring to their oversized flanges. Such wheels (which even 20 years ago were going out of style) may have trouble with code 83 crossings, turnout frogs, and the like. But wheels made to the National Model Railroad Association’s Recommended Practice RP-25 contour are designed to work on code 83 and even code 70 rail. Get an NMRA standards gauge to see if your rolling stock will clear smaller code track or needs replacement wheelsets.

Q Over the years, I’ve read several times to block cars in trains in the order in which they’re spotted – that is, the first car to be dropped off is right behind the engine, the next car to be spotted behind the first, etc. But what about pickups? If the same train is picking up cars, where do they go?

Eric Severn, Toronto, Ont.

A Cars in a local train are blocked based on where and how they’re to be dropped off, but that doesn’t always mean in the exact order they’ll be dropped off. Other factors may intervene. For instance, a spur might have a load or clearance limit that would require it be switched using a “handle” of other cars to reach in. A car bound for a facing-point spur might be blocked at the end of the train. And some cargos, like livestock or hazardous materials, have regulations that dictate how they’re handled and where in the train they go.

As for pickups, how fast the engineer can make his pickups and setouts and get back to the yard is the main factor. As long as he observes those previously

Q I’m trying to find the issue of Model Railroader in which David Popp built a barge for a project layout. Was there also a video?

Ronald Rosenberg, West Bend, Wis.

A That was part of our 2014 Rice Harbor series. Construction of the car float was covered in our March 2014 issue. It was also the subject of a series of videos on Model Railroader Video Plus. If you’re an MRVP subscriber, you can find all six videos by searching the MRVP site for the keyword “float”.

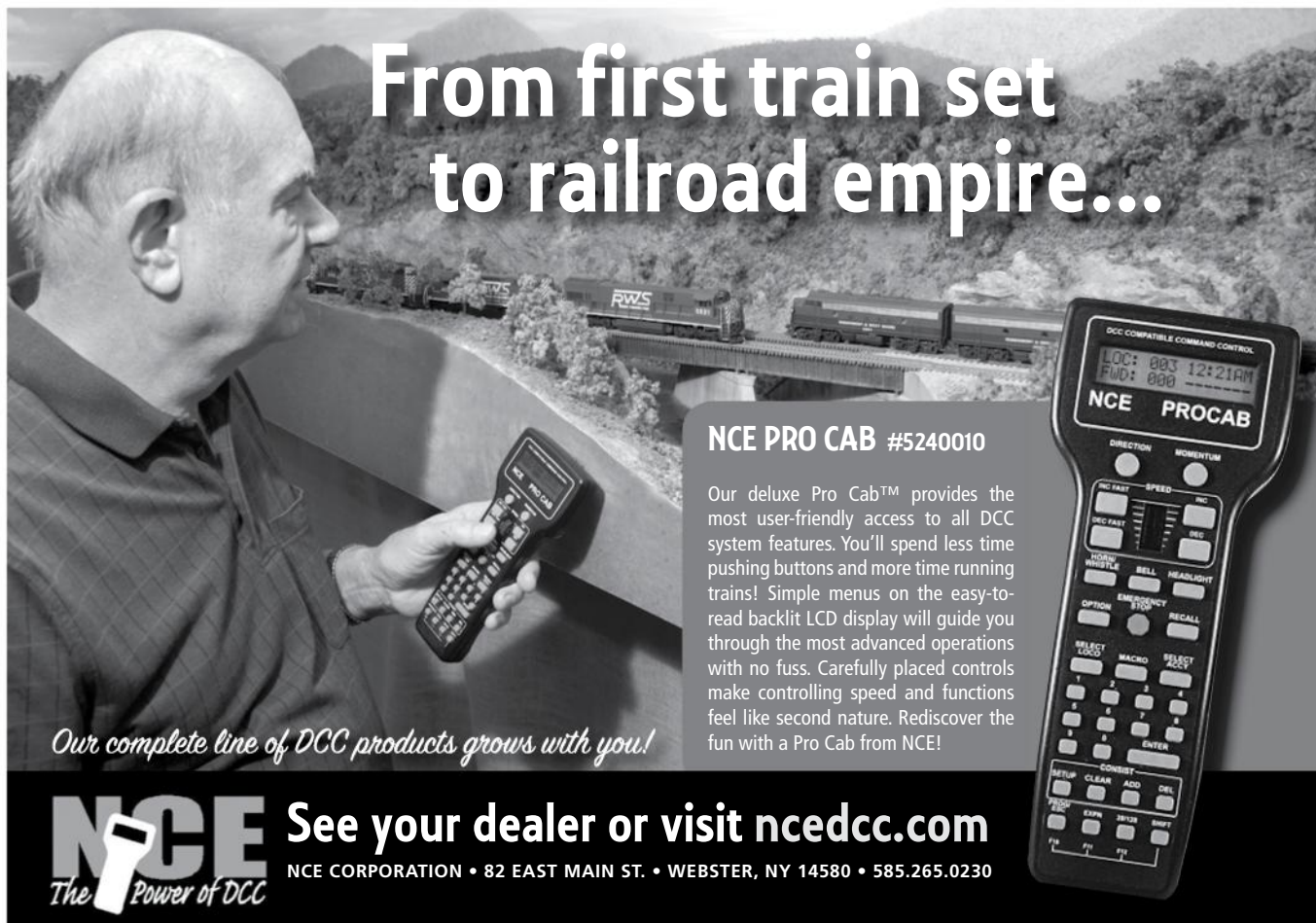
Searching for “Rice” will turn up the entire Rice Harbor video series.

Q How come my HO scale locomotive runs in the opposite direction of other engines on the track? No matter what I do, it won’t go in the same direction. I run my trains with direct-current block control.

Don Hederman, Dubuque, Iowa

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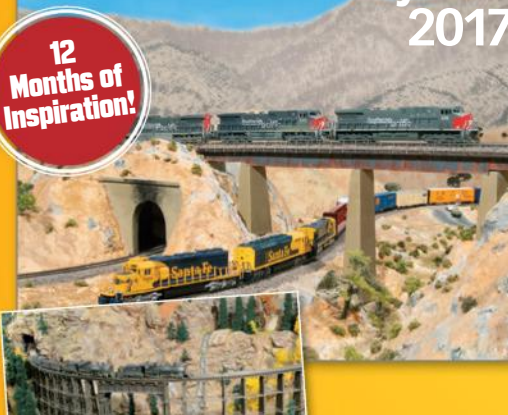
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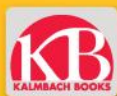
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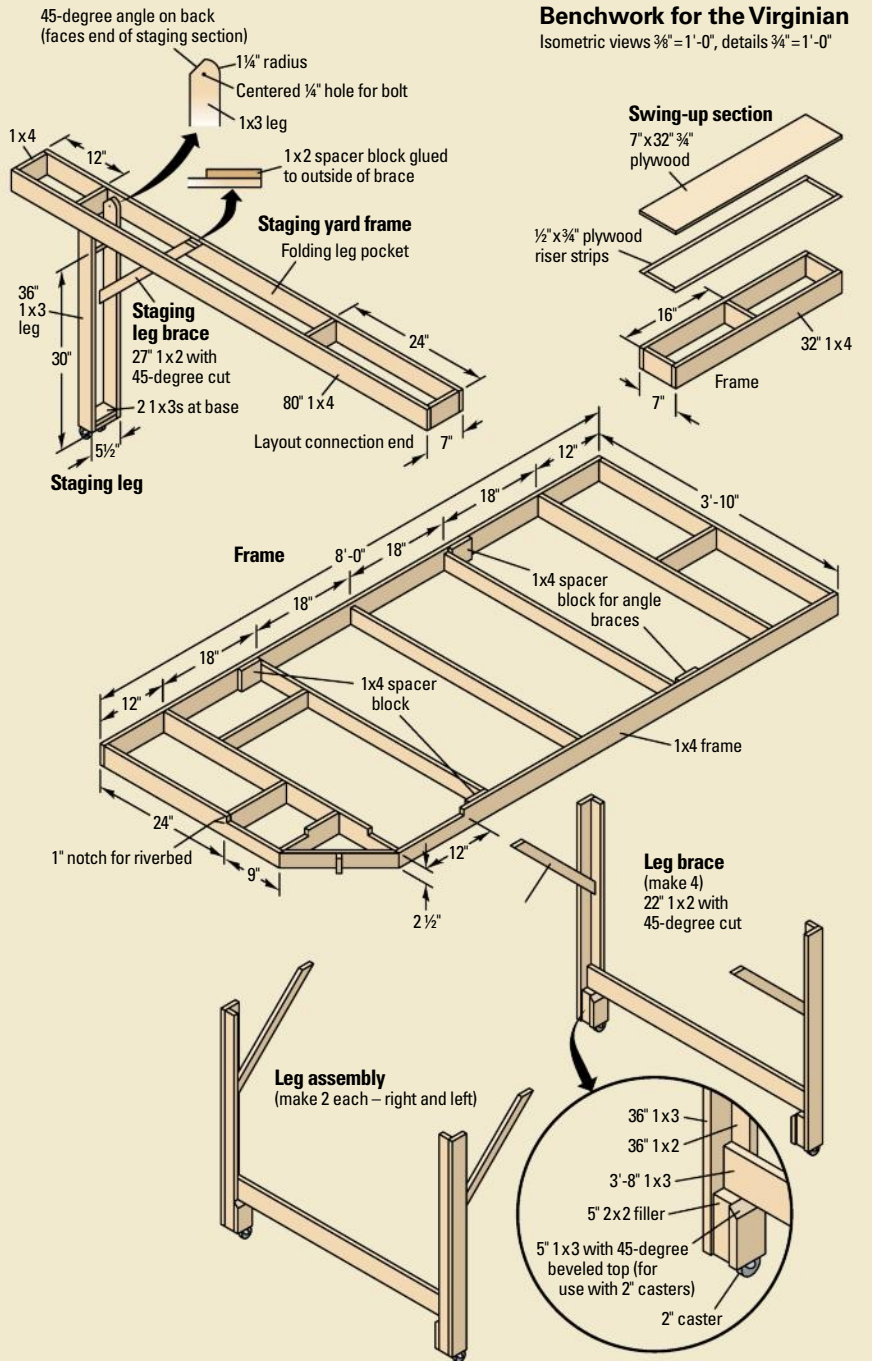


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mentioned rules – keep hazardous cargos away from the engine or caboose, switch livestock as little as possible – he’ll put those pickups wherever it’s convenient. If he has multiple cars bound for the same destination, he’ll try to keep them together, but in general, sorting cars is the classification yard’s job.

Q I recently bought a laser-cut wood creamery kit from Laser Art Structures by Branchline Trains. I was considering interior decoration. Any recommendations as to this or as to where I can turn for more info?

Staffan Wahlander, New York, N.Y.

A An internet image search for “old creamery interior” showed tanks, boilers, piping, tables, shelves, conveyers, bottlers, and refrigerators used in the pasteurization, bottling, and storage of milk. And, of course, lots of milk cans! Depending on the era you’re modeling and the focus of the creamery’s business, there might also be industrial butter churning machines and ice-cream makers. This could be a fascinating subject for a cutaway structure, showing a fully detailed interior. But if not, and the interior will be visible only through windows, the interior equipment could be represented simply, as a collection of styrene shapes. Just remember that milk-handling equipment must be absolutely sanitary, so paint it to model stainless steel and resist the impulse to rust it like you would other industrial equipment.

Q In the April [2016] issue, where did the author purchase the cork for his track work? I’m having trouble finding it in the thicknesses he used.

Michael Johnson, Palmdale, Calif.

A If you’re referring to MR contributing editor Pelle Søborg’s article on realistic track and roadbed, the answer is, Europe. Pelle lives in Denmark, so most of the products he works with are in metric dimensions. But you can get metric-dimensioned cork sheet here. We found 2mm and 5mm cork sheet, the thicknesses he used in that article, listed on amazon.com. Check there or with your local hobby or craft store.

Q I enjoyed Robert Pethoud’s article on his switching layout [in the March 2016 *Model Railroader* – Ed.]. I’d like to know more about the benchwork design. What does “open frame” mean?

Jeff Olivares, Fontana, Calif.

A “Open frame,” or more commonly, “open grid” benchwork refers to box-shaped support structures built using structural members standing on end. The illustration above shows the construction of a typical open-grid train table. It’s most often used with subroadbed attached to the grid using risers. If the grid’s topped with a solid plywood sheet, it’s called “tabletop” benchwork.

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

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Jim's N scale Atlas GP30 is all new under the hood thanks to a newer DCC-ready mechanism. A bonus was the new drivers. The nickel-silver plating had worn off the treads on the old locomotive, and they were difficult to keep clean.

A few weeks back I pulled an Atlas N scale GP30 locomotive off the back burner to see why it had been sitting there for so long. It turned out the problem was with the decoder, or more precisely, the decoder installation. The first decoder had served well for nearly a quarter-century, but it finally died, and I'd failed twice in trying to wire a replacement.

A little N scale decoder history.

This was an early-'90s locomotive from back in the day when decoders had to be hardwired. Those of you who've never experienced hardwiring an N scale decoder probably have no idea what I'm talking about – consider yourselves lucky.

To make room for the decoder and wires, you had to mill or file the frame. I always left this job to Aztec, a company that did it professionally for \$20. You mailed them your stock frame, meaning of course you had to take the engine completely apart, not an easy task. In addition, there was a small thumbnail-sized light board at each end of the frame, and you had to modify one of them and solder three or four connections. Your margin for error was zero. I'm shivering just thinking about it.

On my first attempt to replace the broken 20-year-old decoder, the taillight exploded, followed shortly by a growing

black spot on the orange plastic decoder wrapper. On my second attempt, I broke the light board by ramming and jamming it so hard trying to get it into the frame. Patience must have been lacking that day.

Those old-style light boards are no longer available, and I was weighing some options when a thunderous voice in my head spoke: "No more. Thou shalt never hardwire another locomotive, not ever!" Hardwiring decoders had whipped me. Back in the day my success rate on these installations was probably about 85 percent, but in the last several years it's probably been no better than 50. My Friday lunch companions can attest to my whining about my decoder installation woes.

Reasonable readers might ask, "Why not just retire the locomotive? You've certainly gotten your money's worth." Well, the answer is that this is one of my handful of locomotives that was detailed specifically for the Santa Fe and weathered.

Atlas Classics to the rescue. Atlas has rerun the GP30s several times over the years in its Atlas Classics line with improvements with each new release. For the Santa Fe, these included handrails cast in yellow plastic instead of black. (Beyond the inconvenience, painting already-plump N scale handrails makes them even fatter.)

Also, the newer models had numbers on the number boards, eliminating the need for another really tedious job. At some point Atlas introduced its slower-speed motor. And you could buy the newer models DCC-ready, or even with DCC decoders already installed!


I'd purchased a pair of the decoder-equipped Atlas Classic GP30s some 15 years ago, and was finally taking them out of the boxes and putting them onto the track. After all that time it took a little persuasion and gear grease to get them going, but soon they were running great. "Hmm," I'm wondering if my older, detailed body shell will fit on this newer frame. It did, perfectly.

I could have my detailed and weathered GP30 back in action, but I'd also have an ATSF body shell with nowhere to go. I decided to keep the newer engine intact and shop for a new, decoder-ready mechanism for my old shell.

Actually I shopped for two. One for 2713, the engine I've been talking about, plus one for 2776, its stablemate bought and detailed at the same time. Its decoder was still working well, but lacked some of the features and precision of the newer ones, mainly the ability to program on the main, a feature I've come to really enjoy.

A visit to Hiawatha Hobbies' website (www.hiawathahobbies.com) revealed it had two undecorated DC Atlas Classics GP30s in stock and sale-priced. The shop is in nearby (for me) Waukesha, Wis., so soon I had the two models and two Digi-trax plug-and-play decoders in hand.

Buyer beware. The first installation went well, although I had some difficulty working the two motor clips up into the slits provided in the decoder board. (I didn't have to do this. The decoder will work fine if the clips make good contact on the pads the slits are cut into.) Anyhow, my old locomotive was now all new under the hood! And it was even prototypical. The Santa Fe was rebuilding lots of engines in the early 1980s.

I turned to the second undecorated engine. What the heck? It had the old-style frame that required milling. I'd assumed the two locomotives were identical, and I'd assumed wrong. I should've looked over the box before buying. Old number 2776 will just have to carry on a while longer. 

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A backdrop down the middle of the Eagle Mountain RR splits our 2016 project layout into two distinct scenes. This month, we show you an alternative to a tunnel entrance to disguise a track passing through a backdrop.

Hide a backdrop opening with structures

Backdrops are a common method of expanding the boundaries of a model railroad. Using them to divide scenes is a great way to make a small layout, like our 4 x 6-foot Eagle Mountain project railroad, seem larger than it really is.

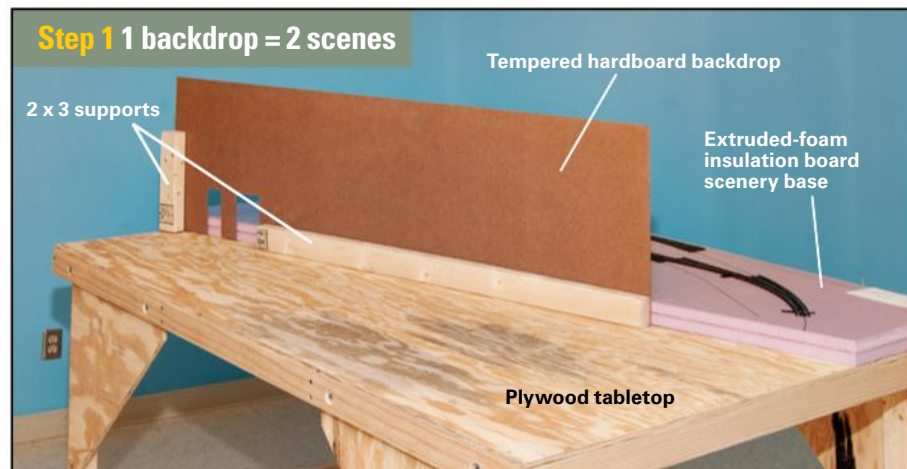
Splitting the layout into two sides makes it appear that trains come and go

from a scene, instead of simply orbiting a loop. But that creates a problem. How does the track go through the backdrop?

Last month, I showed you how I built a tunnel liner as part of a mountain project. That disguised the track disappearing through the backdrop on one side of the layout. But we didn't have room for a

mountain on both sides of the backdrop, so a different strategy was necessary.

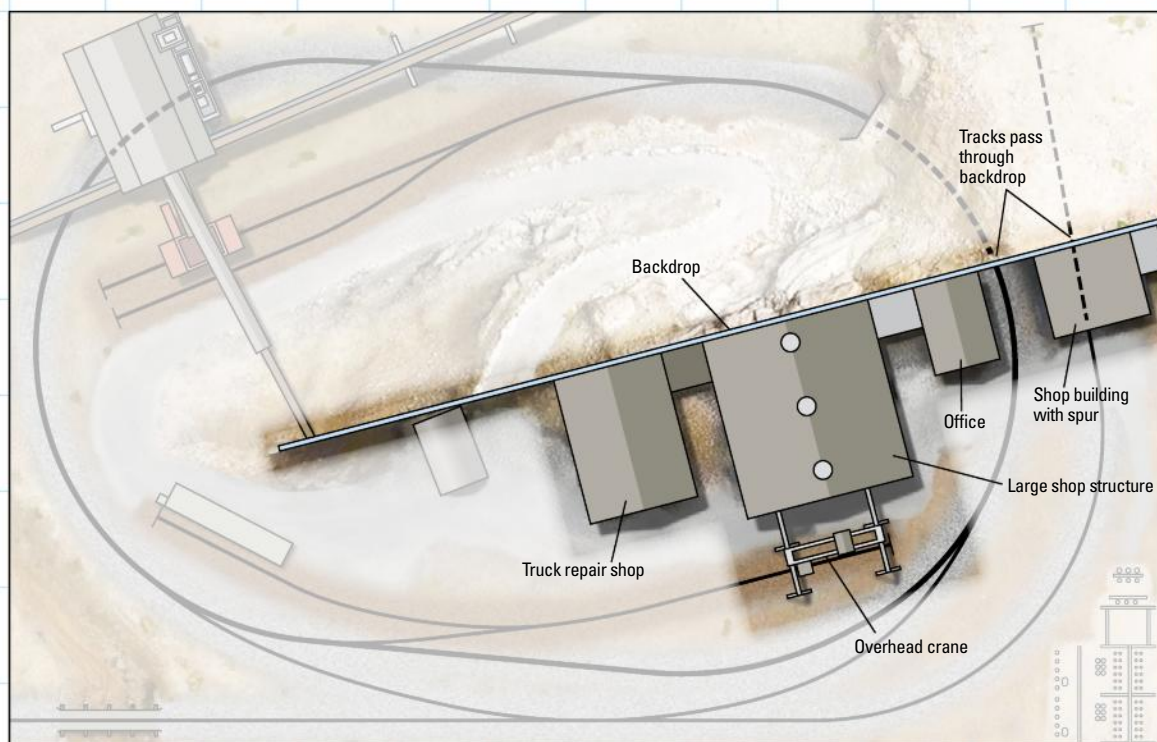
This month, I'll show you how I used buildings placed against the backdrop to minimize the fact that trains vanish into – well – the sky. I'll also show you how I installed a printed photo backdrop onto tempered hardboard.



Our backdrop is a piece of $\frac{1}{8}$ " thick tempered hardboard 15" high by 57 $\frac{1}{4}$ " long. I chose the height by setting a yardstick at the end of the backdrop location, then noting the measurement that aligned with the table's far edge when I looked down on it. That ensured I wouldn't see the surface of the layout beyond the backdrop. We didn't want to pierce the backdrop twice, so it doesn't go the entire length of the tabletop.

The backdrop cuts across the layout diagonally to provide more

Step 1 1 backdrop = 2 scenes (cont'd)



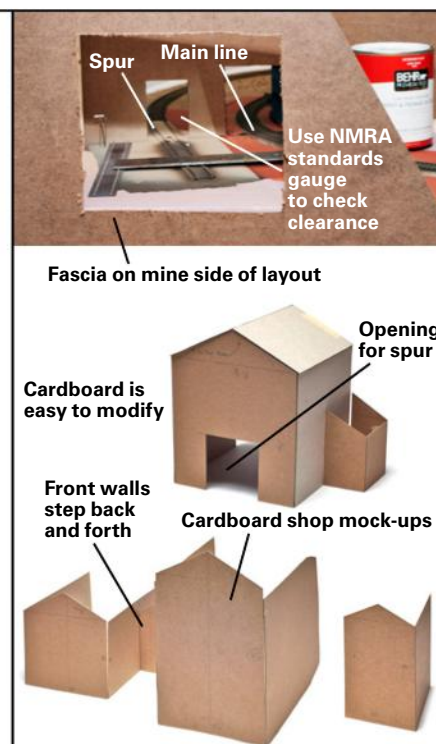
depth to the scenes on each side. On the shop side, I wanted the track to pass through the backdrop at close to a right angle so buildings could be placed close to the opening on both sides. This allowed me to make the opening as narrow as possible.

To start, I used a National Model Railroad Association standards gauge to check that the cutouts through the backdrop would be large enough for trains to pass through. Just to be sure, I found some 50-foot hi-cube boxcars to test the openings after I'd cut them, but before the backdrop was attached to the layout.

On the mine side, I needed enough room for the ore-loading sidings and the base of the slag piles. I also wanted a road to come down from the hills, pass along the sidings, then curve around to the shop side of the layout. This was a consideration in the backdrop's length, too.

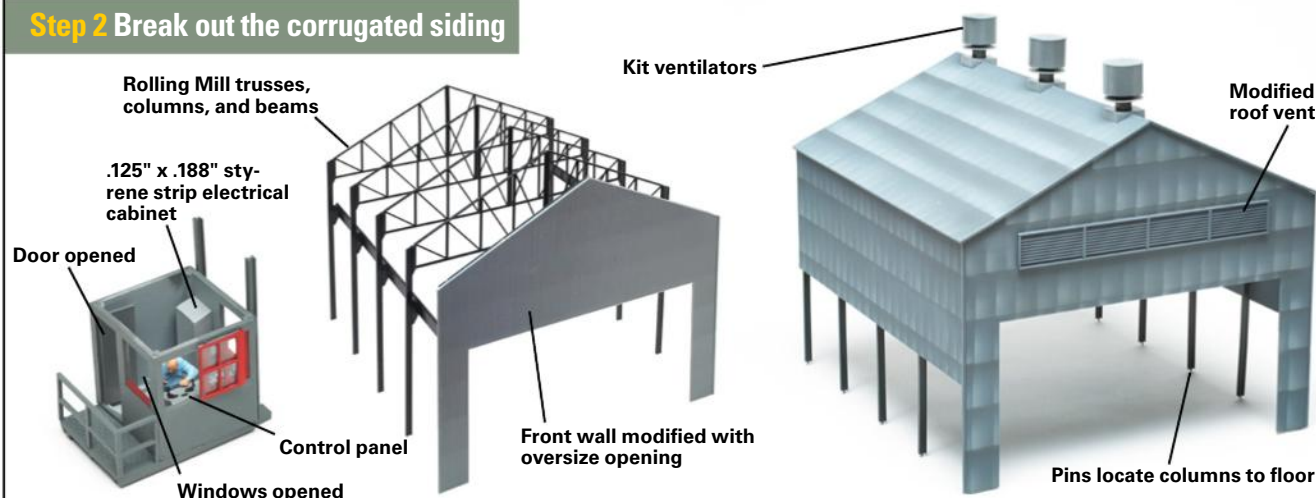
I used pieces of scrap 2 x 3 left over from the benchwork construction to secure the backdrop to the plywood surface of the layout. Where the backdrop reaches the end of the layout, I used a piece of 2 x 3 placed vertically to support the backdrop and the mountain-edge fascia to come. I beveled one edge of the 2 x 3 on a table saw to match the angle of the backdrop across the layout.

With the backdrop in place, I started making structure mock-ups from cardboard. This helped me get an idea of the size of buildings I would need to disguise the opening in the backdrop. I wanted a continuous line of buildings from the layout's edge to nearly the end of the backdrop to reduce the area where the backdrop met the layout surface. This right angle can be tricky to disguise when the view of the layout is from standing height.



STEPBYSTEP

Step 2 Break out the corrugated siding



Once I had the mock-ups, I could start planning the final structures. Images of the actual Eagle Mountain RR from Google Earth helped determine the locations of buildings, and revealed an overhead crane in front of one building and track disappearing into another building. A 1956 U.S. Bureau of Mines report had some shop photos that proved inspirational as well.

Since most of the buildings were corrugated metal construction, we bought a Rolling Mill kit from Wm. K. Walther's Inc. This large building provided plenty of corrugated siding and roofing, and lots of trusses, beams, and detail parts that could be used as well.

The overhead Google Earth views showed that the corrugated steel buildings in the 1956 mines report had been expanded. To give the structures a little variety, we purchased a Pikestuff Milton A. Corp. kit. It too has plenty of panels, this time of more contemporary sheet metal construction.

To the right of the main line disappearing through the backdrop, I built a shop building with a spur entering it. The spur also passes

through the backdrop. On the other side of the main line is an office building.

Both of these structures were kitbashed from Rolling Mill parts. The windows were leftovers from a Walther's Red Wing Mill kit we used on our Beer Line project railroad in the 75th anniversary edition of *Model Railroader*. An addition made of Pikestuff panels fills the area between the office and a large shop structure.

The large shop structure is assembled according to the instructions for the Rolling Mill, with the exception of a large opening in the end to accommodate a Walther's Overhead Crane.

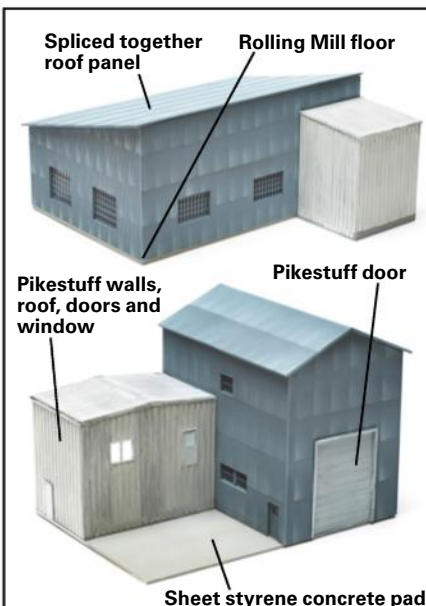
I used four bays of the Rolling Mill structure, including the roof trusses and support columns. The floor is a sheet of .020" styrene with expansion joints scribed in it. The edges and areas under mounting points were thickened with strips of .040" thick styrene strip.

About half of the overhead crane is inside the shop building, so I drilled mounting holes in the floor to match the pins on the inside sets of the crane's legs, which are mounted to the floor. I modified the crane to open the windows in the control cabin, thinking no one would close the windows in the desert. A figure and a few bits of plastic added detail to the interior.

In order to securely attach the columns for the structure to the floor, I drilled no. 60 holes up through the floor into the bottom of the columns and cemented pins made from .040" styrene rod to the columns.

Another Pikestuff addition fills the space between the large shop and the truck repair shop, the last of the buildings placed against the backdrop. The truck repair shop is built on a section of the rolling mill floor. I filled the grooves in the floor with styrene strip and putty.

While I was making these buildings, I was careful to vary how far they projected forward from the backdrop. This gives the scene more visual interest. In order to convey the idea the metal buildings are of the same vintage and construction, I kept the roof angle the same on all of the buildings of the same type. This also made it easier to keep things uniform, as I used the angles Walther's molded into the end wall castings.

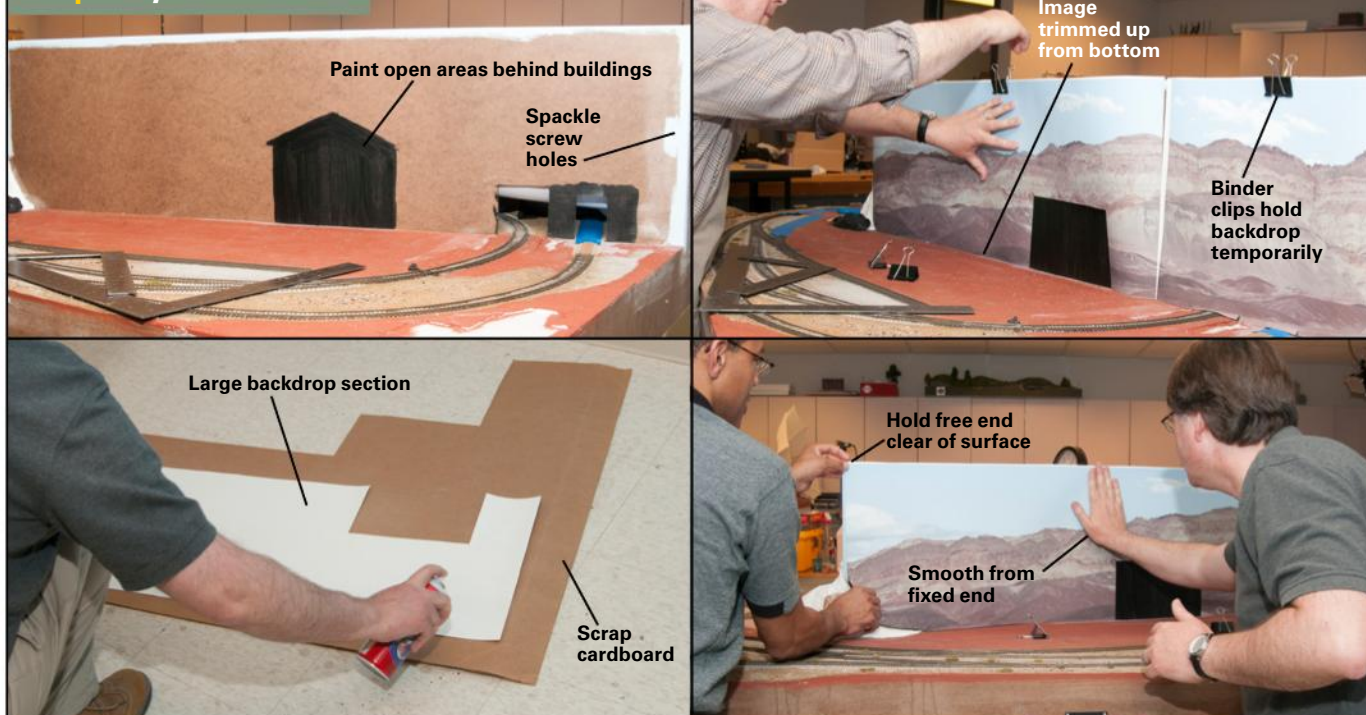


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Subscribers can watch a video of Eric installing the Backdrop Warehouse EZScenes on our website at www.ModelRailroader.com.



Step 3 Beyond the horizon



When I had the buildings finished, it was time to focus on the backdrop. I searched the internet for suitable scenes, and finally found what I was looking for at Backdrop Warehouse. For this project, I selected two EZScenes. These 17 x 40³/₄-inch images were just the right size for our needs. Our backdrop is 15 x 57¹/₄ inches, so I used two matching scenes, which went together well.

I made sure the surface of the tempered hardboard was even, filling a few screw holes with spackle and sanding it smooth. I painted the edges with light blue paint that matched the color of the printed sky.

When the paint was dry, I cut the backdrop scenes to the correct height and held them in place using binder clips. I wanted to place the seam so it was as inconspicuous as possible. The best spot worked out to be above the office building near the backdrop opening.

Once I determined the image placement, I traced the outline of two buildings on the backdrop. I painted the area inside the outline

black. The large shop building and the structure with the track entering it are open at the back, so I didn't want the mountain scene to be visible inside the door openings of the buildings.

I cut the paper backdrop where it goes behind the buildings so the black paint would show, then I trimmed the white border from the overlapping edge. One more test fit to make sure everything would work, and it was time to get out the spray adhesive.

With a large sheet of cardboard on the floor, I placed the smaller backdrop face down on the cardboard. I sprayed the back of the scene with 3M Super 77 Multipurpose Spray Adhesive, then let it get tacky for a few moments.

I carefully carried the sprayed scene to the layout, aligned the bottom edge with the layout surface, then started to apply it to the tempered hardboard


from the bottom up. I let the image flop backward over my hand and smoothed it onto the backdrop, again working from the bottom up.

I made sure the image was aligned with the edges as I'd planned, then pressed it firmly onto the

tempered hardboard, working out from the center to avoid trapping any air. On to the larger piece.

Again, I laid the image face down on the cardboard, being careful not to lay it in any of the overspray from the first piece. Handling this 40³/₄-long piece was going to require some help. Model Railroader Video Plus' Kent Johnson and I each took an end, and keeping the image taut, we brought it up to the backdrop and carefully aligned the edge with the already-applied piece.

The spray adhesive is forgiving enough that we could gently peel it away if we were off with our alignment. With the end attached, I smoothed the piece onto the backdrop as Kent held the free end just off the surface, allowing it fall in place as I smoothed the paper.

Once everything was attached, I came back with a sharp blade in a hobby knife and trimmed the edges of the paper scene flush with the backdrop. I used a section of Rolling Mill girder to frame the top of the opening between the small shop and the office building. Now the trains could exit the scene without having to go through a hole in the sky. 



Can't figure out that electrical problem on your layout? Don Fiehmann offers nine troubleshooting tips.



ELECTRICAL TROUBLESHOOTING

These 9 tips will help you solve many electrical problems on your model railroad

By **Don Fiehmann** • Photos by Bill Zuback

During my career working as an electrical engineer, I had to solve many electronics-related problems. For more than 50 years, I've been able to put my professional background to use in model railroading by developing electronic throttles, writing about direct radio control for scale locomotives, and authoring books on model railroad electronics and Digital Command Control (DCC), including *The DCC Guide: Second Edition* (Kalmbach Books, 2014). One thing I've learned over the years is there's plenty of information

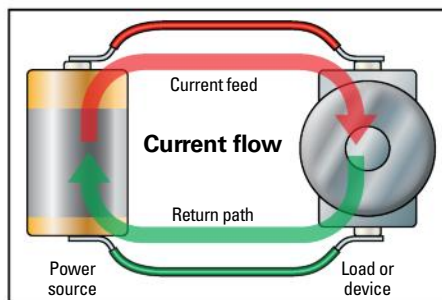
on how things work, but little available on why things don't work.

When troubleshooting electrical issues on a layout, keep safety first. Most model railroad currents and voltages are relatively low. However, high current can cause a shock or worse.

In this article, we'll look at nine ways to diagnose electrical problems on a model railroad. Some are hands-on solutions, while others rely on the expertise of others. Using one or more of these approaches, you should be able to diagnose almost any problem on your layout.

1

UNDERSTANDING THE BASICS



Think of a circuit as a circle. The circuit contains a power source, wiring and connections, and a load or device.

Rick Johnson illustration

Troubleshooting starts with an understanding of electronics basics. There are three parts to a circuit: A power source, a power feed (wiring and connections), and a load or device. Any of these three parts can fail.

- Power source failures can be a dead battery or defective power supply. Recharge or replace the battery as appropriate, following the manufacturer recommendations.

If the power source has failed, contact the manufacturer for return or repair information. This is why it's important to fill out the warranty card.

If powered from a wall plug or power strip, check the switch. Also check fuses and circuit breakers. Sometimes a fuse can look good but be defective. To be sure, check the fuse with an ohmmeter.

- A broken wire or poor connection can cause a failure.

- The device itself can be defective. A burned-out lightbulb or bad motor can cause a failure.

An operating circuit is a closed circuit. An open circuit is one where there's a break in the circle. A short circuit is when the power flow takes a shortcut and fails to reach the output device.

2

ELECTRONIC VERSUS MECHANICAL PROBLEMS



Locomotives almost always stall on this turnout on the Milwaukee, Racine & Troy. The turnout is mechanically sound, so the problem is electrical.

If a turnout isn't operating correctly it could either be a mechanical or electrical problem. A broken linkage is obvious, but if it's an electrical problem it will take more analysis.

Take the turnout shown above on the Milwaukee, Racine & Troy, *Model Railroader's* HO scale layout, for example. At casual glance the turnout looks fine. The switch rod is in good shape and travels through its range of motion smoothly. The points make even contact with the stock rails. There's no paint or scenery glue interfering with electrical conductivity. However, almost all Digital Command Control-equipped locomotives (except those equipped with TCS Keep-Alive or similar capacitors) stall on this turnout. Why? That requires a bit more digging.

We know the turnout works well mechanically, so we'll rule that out. Electrical problems are often hidden, and that's causing the problem here. It could be the phosphor bronze contact strip under the switch rod, a cold solder joint, or a bad electrical connection through the rail joiners.

3

TROUBLESHOOTING PHILOSOPHIES



If a model railroad isn't running properly, check the wiring. Look for damaged wires or changes in how the wiring was installed.

Here are a few thoughts that can help you find a problem.

- If you're having a hard time finding the problem, you may be looking in the wrong place. Think of all the possible causes of the electrical problem, big and small, and work through that checklist.

- Try checking the last place you worked on the layout before the trouble started. Did someone accidentally drive a staple through the wiring? Was there a change in wiring?

- Talk the problem over with someone else. Even if they don't understand the subject, just talking about it will keep you thinking about a solution.

- Sleep on it. You may be sleeping but your brain isn't. You may end up with an epiphany at 2 a.m. However, it may be best to write down the idea and save it until morning. You may introduce more problems to your model railroad working on it in the wee hours of the morning.

- Expect the unexpected. Gee, how did that happen!

4

WAYS TO FIND TROUBLE



Books and magazine articles contain useful information on how electrical-related items should work on a model railroad.

When trouble occurs on a model railroad, we start by thinking of all the complex things that could be wrong. Instead of over analyzing, look for something simple, like a plug that got knocked out of the wall socket or a metal coupler height gauge left on the rails that's causing a short circuit.

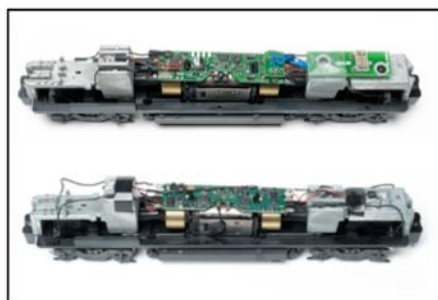
If the simple solution doesn't solve the problem, use this as an opportunity to learn. Read magazine articles and books to figure out how it should work. *Model Railroader* magazine has published many articles on electronics over the years. You can read all the electronics-related stories published in MR in the magazine's online archive at www.ModelRailroader.com/AllAccess.

In addition, Kalmbach Books has titles on model railroad electronics and Digital Command Control. Visit www.KalmbachHobbyStore.com to learn more about these books.

If you can't find the answer in a book or magazine, go back to the product paperwork. Keep instructions, manuals, and exploded-view diagrams in a safe place, as these may be your only sources of information.

5

ANALYZE THE SITUATION



A whiff of smoke indicated the decoder on Atlas HO model (top) was ruined. It was replaced with a TCS A6X board-style decoder. Jim Forbes photos

Here are a few things that can help you analyze the problem.

- Observation and smell. Is the power turned on? Did you smell anything or see smoke when the problem occurred? Are there any blackened or burned parts?
- Substitution. Replace elements of the system until you find the one that's causing the problem.
- The educated guess. You think you know what the problem is because you once had something similar occur.
- The crossed-fingers approach. You fix other problems hoping that it will also cure the latest problem.
- Divide and conquer. Start in the middle, then divide the wiring in half. Continue dividing until the problem is found.
- The scientific approach. Get serious and do some research. Dig out some test equipment to analyze the problem.
- Heat can cause things to fail. The device can return to normal when cool.
- If all else fails, read the instructions. They may contain troubleshooting tips.

6

WIRING AND CONNECTIONS



A quarter across the rails is a way to test electrical connections. If wired properly, the power pack will detect an overload or the circuit breaker will trip.

About 90 percent of electrical problems are caused by poor connections. Wheel-rail contact is the first thing to check.

The next area to look at is wiring and connections. Check for broken wires or bad connections. A cold solder joint connection may look good but still not make a reliable connection.

Connections to the rails can be tested with a simple automotive lamp with a couple of wires connected. Or try the quarter trick, as shown in the photograph above. With the track power on, place a coin on the rails. The booster or circuit breaker should trip or the power pack should indicate an overload.

Rail joiners aren't always reliable and can fail to make connection, which is why some modelers solder them. A feeder wire going to each section of rail is a more reliable solution.

Screw connections to power packs or boosters can loosen over time and need to be tightened.

7

PROBLEMS WITH DEVICES AND LOCOMOTIVES



Before sending your model back to the factory, try resetting the decoder. Here, configuration variable 8 is being set to 8.

When a locomotive stops, go through this checklist to determine what the problem may be.

- Is there an open circuit? If there is, a quick push on the locomotive will determine if it was a contact problem.
- Is there power to the rails? If power to the rails is OK, try another engine.

If a device has voltage and still fails to work, be sure the return (ground) wire and connections are OK and the circuit is complete.

On engines with a Digital Command Control decoder, test the headlight. Is CV19 set to "0"? Try short address 03.

If all else fails, reset the decoder back to its factory settings (CV8 to 8 on many decoders).

- Is there a short circuit? If it's a short circuit, check for a derailment or a turnout lined the wrong way. If lining the turnout doesn't fix the short, remove cars and locomotives from the track to see if that clears the short.

- Did you test the Digital Command Control decoder installation? If you install a DCC decoder or work on an engine with a decoder, always test it on the programming track before running it on the main line. If you put an engine on the main that has a short circuit, it may damage the decoder.

8

WIRELESS HINTS



The tethered Digitrax UT4 throttle can be set up for infrared wireless operation (left), while the CVP9000E uses a radio frequency.

There are two types of wireless connections: infrared (IR) and radio frequency (RF). Infrared is like a TV remote. With IR, you need line-of-sight between the remote and the receiver. Sometimes the beam can be bounced off a wall. Radio frequency is a lot more reliable.

Working with radio waves turns out to be more of an art than a science. Here are a couple of suggestions when installing a wireless system.

- Radio waves don't propagate well through the human body. When installing the DCC transmitter, it should be located in front of the operator. Choose a high location like the ceiling.
- Concrete walls can also be a problem. It's not the concrete itself but any steel rebar in the cement that can attenuate the signal.

Metal objects near the transmitter will also absorb some of the RF energy. Sometimes just moving a few feet one way or the other will improve the signal. If all else fails, try installing a second receiver.

9

WORLDWIDE SOLUTION



The Electronics and DCC section of the *Model Railroader* forums provides a way for hobbyists to find solutions to problems on their layout.

The Internet is a great source for solutions for model railroad problems. The *Model Railroader* forums and DCC Corner columnist Larry Puckett's website (www.dccguy.com) are two places to start. In addition, Yahoo has many groups that can help with most questions. There are groups that focus strictly on wiring and DCC. Some groups specialize in one DCC manufacturer.

To find a group that matches your interest, do a search in Yahoo Groups (groups.yahoo.com). Most groups are open to new members, but some have restricted membership.

These groups span the world. I've seen someone with a problem in Denmark helped by a modeler in Australia. You can search past topics for previously discussed problems and answers. **MR**

Don Fiehmann retired after a 35-year career as an electronics engineer at IBM. He has written more than 50 articles in the hobby press. He also wrote Basic Electricity and Electronics for Model Railroaders and The DCC Guide for Kalmbach Books. The second edition of the latter was published in 2014.



1. An Alco PA diesel in the Atchison, Topeka & Santa Fe Ry.'s warbonnet livery leads the *Texas Chief* past the quarry and waiting no. 4088 at Crusher, Okla. David Kampsnider's 26 x 30-foot layout is set along the Santa Fe main line in 1951.

Santa Fe through **SOUTHERN OKLAHOMA**



2. Eastbound No. 112, *The Kansas Cityan/Chicagoan*, enters the siding at Gene Autry, Okla., which is named for the famous singing cowboy. The layout's scenery models the rolling landscape of the Arbuckle Mountains.

Santa Fe, All the Way

The inspiration for my layout started years before I had the space for it. Along with joining the SFRH&MS in the mid-1980s, I also joined a local modeling group in Denver. Some time later, my wife and I then moved to Washington, D.C., where I participated in several Santa Fe Mini Meets.

Our next move took us to Kansas City. During our four years in KC, I became even more exposed to prototype-based model railroading thanks again to the many Santa Fe modelers in the area. Those local modelers I met were instrumental in helping me outline a list of requirements for a model railroad.

I wanted to build a layout based on an actual Santa Fe prototype in the early 1950s. I wanted to model mainline freight and passenger operations, as well as branchline trains that should offer a lot of switching opportunities. My fellow Santa Fe modelers suggested modeling a section of the Gulf, Colorado & Santa Fe District from Purcell, Okla., south to Gainesville, Texas. I could also have an interchange with the Santa Fe Lindsay District at Pauls Valley, Okla.

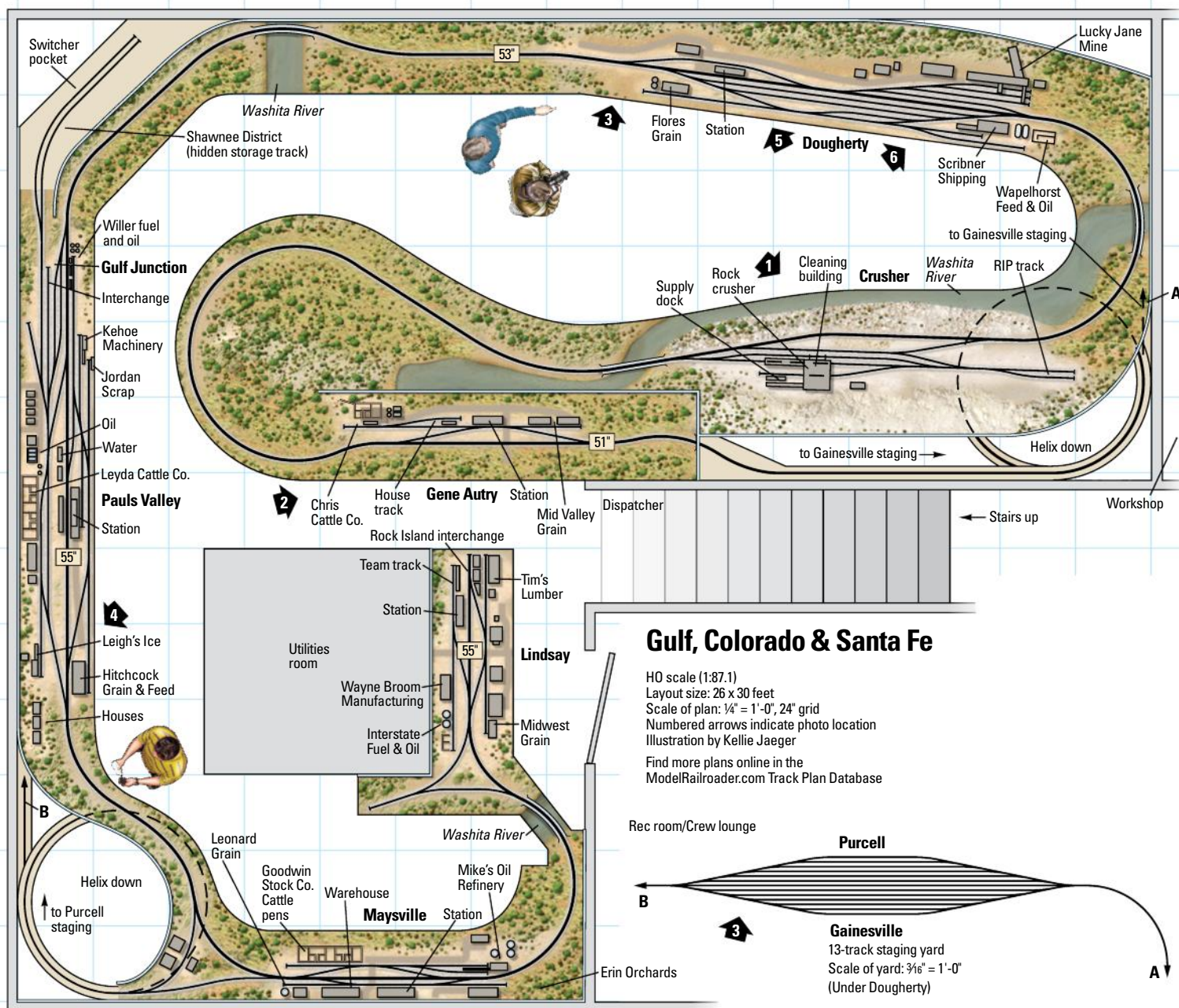
I started researching the prototype. A fellow Santa Fe modeler from KC supplied me with plat maps of all the towns between Pauls Valley and Gene Autry, Okla. I was also part of a group of Santa Fe modelers that made several trips to Oklahoma on the way to modeling

Warbonnet diesels and big steam rule on the HO scale Gulf, Colorado & Santa Fe

By David Kampsnider • Photos by Bob Foltz

As with many model railroaders, my interest in the Atchison, Topeka & Santa Fe Ry. was sparked by photographs of bright red-and-silver warbonnet diesel-electric locomotives fighting up Raton or Cajon Pass. However, it wasn't until I moved to

Denver in the 1980s and joined the Santa Fe Ry. Historical & Modeling Society [Visit the SFRH&MS website at www.atsfr.com – Ed.] that I found my modeling focus along a different mountainous Santa Fe main line. I set my 26 x 30-foot HO scale layout in the Arbuckle Mountains of southern Oklahoma during the Santa Fe's steam-to-diesel transition era.



The layout at a glance

Name: Gulf, Colorado & Santa Fe
Scale: HO (1:87.1)
Size: 26 x 30 feet
Prototype: Atchison, Topeka & Santa Fe Ry.
Locale: Oklahoma
Era: 1951
Style: walk-in
Mainline run: 100 feet
Minimum radius: 34"
Minimum turnout: no. 6 (main), no. 5 (spurs)

Maximum grade: 1 percent (main), 2.2 percent (helix)
Benchwork: 1 x 4 open grid
Height: 51" to 55" (main); 36" (staging)
Roadbed: cork
Track: flextrack (code 83 on main and code 100 for staging)
Scenery: plaster over extruded-foam insulation board and wire screen
Backdrop: pattern felt over tempered hardboard
Control: CVP Railcommand

conventions. Our local guide from Norman, Okla., Stan Hall, helped us follow the route of the old SF main line from Pauls Valley through the Arbuckles to Gene Autry.

These trips resulted in many photographs, but more importantly, provided me with a sense of the scenery and atmosphere of the towns. Most of the rail-served businesses, and the tracks themselves, were gone by then. However, by using my plat maps, we were able to identify the locations of long-gone track alignments, yards, and industries.

In 1996 my wife and I moved back to Denver, and I was ready to turn my

research into a model railroad. I narrowed my layout planning to the following towns: Pauls Valley, which included branches to the Lindsay District and the Shawnee District; Dougherty; Crusher (and its namesake rock crusher at the quarry); and Gene Autry. The Lindsay District would include Maysville, Okla., as well as the interchange with the Chicago, Rock Island & Pacific RR in the town of Lindsay, Okla.

An almost open basement

As we started house hunting in Denver, my first priority, with my wife's permission, was to find a house with a relatively open, unfinished basement. With the assistance of a real estate agent who was also a model railroader, we quickly found a house that met that requirement.

My previous layouts were compact and hadn't progressed very far before I had to move. It was quite a change to plan a model railroad that would fill a 1,000-square-foot basement, but I still had some limitations. As requested by my wife, I allocated a quarter of the space for a recreation room, which I could also use for a train crew lounge during operating sessions. Next, I allocated an area for my workbench and storage. There was also HVAC equipment that needed to be enclosed.

After finishing the rec room and workshop, I had a 26 x 30-foot L-shaped space for my layout. I then designed the track plan, keeping in mind future operating sessions. I avoided locating heavily switched industries or towns directly across the aisle from one another and kept aisles at least 3 feet wide to keep operators from bumping into each other. I also allowed plenty of distance between the towns. I didn't want a train arriving in one town to still have its caboose lingering in the previous one.

Once the track plan was complete, I printed it out full size and laid it out along the floor of the train room. After verifying that track curvature, towns, and everything else made sense, I started building the layout.

A solid foundation

Most of the layout benchwork is made of 1 x 4 open grids cantilevered from the walls. This type of benchwork construction keeps the underside of the layout open for added storage space. The center peninsula is freestanding.

To give the benchwork a finished appearance, I installed a layout fascia made of tempered hardboard. To get a



3. All but four trains originate and terminate at the 13-track staging yard located under Dougherty. Eastbounds arrive from the left in the photo and continue into Gainesville, Texas, staging on the front tracks, while westbounds arrive from the right into Purcell, Okla., staging on the rear tracks.



4. The distinctive wig-wag signal in front of the cupola of a Santa Fe caboose is visible in the foreground, as the Pauls Valley local switcher works the town's industries. David added dedicated switch jobs to both Pauls Valley and Dougherty to make operation more efficient.

smooth, curved fascia, such as at the end of the peninsula, I first sprayed the hardboard with Fantastik cleaner. After letting the liquid soak in for a few minutes, the rigid hardboard became much easier to bend. Black curtains are hung from the bottom of the fascia to the floor, concealing items stored under the layout.

The layout height is 51" at Gene Autry, eventually rising to a maximum height of 55" at Pauls Valley. I installed a tempered hardboard backdrop at 48" above

the floor, and it rises all the way to the ceiling.

Since my layout follows the walls, one problem I needed to deal with was the room's corners. Having two pieces of backdrop meet at a right angle would cause harsh shadows and ruin the illusion of an open sky and distant mountains. To deal with this problem, I coved the backdrop. This technique involved bending the hardboard to a 36" radius in the room's corners.



5. Led by a pair of FT diesels, way freight No. 321 arrives at Dougherty, as GP7 no. 2655 pulls a head-end car to be added to the No. 16 *Texas Chief* when it arrives. Although not prototypical for the location, David added head-end switching tasks to enhance his layout operating sessions.

After installing the backdrop I covered it with pattern felt. This thick paper product is used to make patterns for installing floor coverings and comes in rolls. I made a holder for the pattern-felt roll that I installed on a wheeled stand. As my children applied contact cement on the walls, I rolled out the felt and smoothed it in place with a wallpaper brush. For more than a decade, this material remained intact without any visible cracks.

Careful lighting enhances layout scenery. I have ceiling-mounted fixtures with 30-watt fluorescent bulbs placed on 18" centers that follow the layout below. I also installed lighting valances on the

ceiling that are set back 2" from the front edge of the fascia. These valances direct light on the scenes, and keep it out of the eyes of my operators. I also added light diffusers, like those used in offices to hide overhead lights, to conceal the bulbs from those viewing the layout at the end of the peninsula.

Staging

There were no large classification yards in any of the prototype towns on the modeled part of my layout, so I didn't include one. The towns have just enough tracks to handle the needs of local rail-served industries. This didn't leave me with a lot of options for visible staging or storage tracks.

The only place I could plausibly locate any storage or visible staging tracks was at Gulf Junction, which features an interchange track with the Santa Fe Shawnee District. I still needed more staging if I wanted to host successful operating sessions on the layout.

I added a 13-track staging yard, representing Purcell, Okla., and Gainesville, Texas, under the layout at Dougherty. A helix at Pauls Valley and another at Gene Autry connect the staging tracks to the upper level.

Under protest from friends, I originally located the staging yard 8" below the main level to avoid having to build a helix at each end. My friends were right, and the yard proved nearly impossible to work in such a narrow space. We ended up building the helixes and lowering the staging level to 15" below the main level. It was then much easier to handle trains, especially on the far tracks.

Building the staging yard taught me two valuable lessons. First, even with a 13-track staging yard, I needed more. There's never enough staging on a model railroad. Second, always listen to those



who have more experience than you do, especially in layout planning.

Command control

Track and wiring were finished and trains were running on the GC&SF in 1999, which was before Digital Command Control became widespread in the hobby. When I lived in Kansas City, I was exposed to the CVP Railcommand system, a pre-NMRA-DCC-standard command control system. Railcommand proved very stable, so I incorporated it into my new layout when I moved back to Denver.

I have eight wireless throttles for mainline operations and two tethered throttles that I used for the Crusher Hop and Lindsay District jobs. This limits the layout to 10 working trains at a time, which is a real blessing, as it keeps the railroad from becoming overcrowded. This also keeps my operators from getting overwhelmed.



Meet David Kampsnyder

David Kampsnyder is a lifelong model railroader who lives with his wife in Colorado. He wrote this story before retiring from Lockheed-Martin Aerospace in 2011 and moving into a new home.

Since dismantling his Gulf, Colorado & Santa Fe for that move, David continues to make progress on a new HO scale layout. This model railroad is set in Pueblo, Co., in 1951. The focus of this layout is operation and industrial switching. It also features an interchange with the Denver, Rio Grande & Western.



6. At Dougherty, Alco RS-1 no. 2331 switches Scribner Shipping. David scratchbuilt the Lucky Jane Mine along the backdrop. The structure is named after David's wife, but represents the prototype Southern Rock & Asphalt.

Operating sessions

I use an 8:1 fast clock for my operating sessions. A typical three-hour session equals a 24-hour fast-clock day. For new operators who aren't familiar with the layout, I'll slow the clock to 7:1, which adds a cushion to keep traffic moving.

All the towns have passing sidings that can handle a 20-car freight train. It's up to the dispatcher to arrange any meets. There are four locals that work across the system. They must get out of the way for six passenger trains and four fast freights. The dispatcher can also call freight extras, work trains, and football specials.

Initially I had locals switch Pauls Valley and Dougherty. After a few sessions, I realized these locations had become bottlenecks for traffic flow. To help the railroad run more efficiently I set up dedicated switchers for both towns.

The focus of each session depends on the number of operators. It usually takes eight to 10 operators to run a full schedule. If only six to eight operators are available, we'll focus on the locals. I serve pie at the end of the session to keep operators from leaving early.

Enhancing operations

I include some scenarios that weren't found on the prototype GC&SF, but they add more fun to our operating sessions. Unlike the prototype, the Pauls Valley and Dougherty jobs involve switching out head-end cars on the No. 16 *Texas Chief* and No. 5 *The Ranger*.

At Dougherty and Pauls Valley each freight crew would have to pull a "Chico" card, named after the Santa Fe's Native American advertising mascot. There are 10 cards, and three of the cards indicate that one of the cars in the train has a

hotbox. If a hotbox card is pulled, the switcher crew and the freight crew work together to set out the bad car on the repair-in-place (RIP) track.

If a work train is run, I have another set of cards that identify various tasks that need to be performed. If I have enough operators, another special job I'll call is the Caboose Hop, moving tank cars to Maysville to work Mike's Oil.

Another move

This story reflects my layout as it was for the 14 years of its operation. I retired about four years ago, and my wife and I decided to downsize to a smaller home. This meant dismantling the GC&SF. I know that my regular operators were sad to see it go.

However, I now have a new 15 x 17-foot space in the basement to fill. It should be a lot of fun. **MR**



In 1960, Interstate RR Alco RS-3 no. 36 waits at the yard in Andover, Va. Later that year the engine would be painted for the Interstate's new owner, the Southern Ry. The coal-hauling short line inspired this N scale track plan. Steve Patterson photo

A ROOM-SIZED PLAN for a 1960s coal railroad

The N scale Interstate RR packs two decks and a continuous run in 15 x 15 feet

By Christian Javier

Snaking around the walls of a 15 x 15-foot room and spanning two decks, this N scale track plan focuses on hauling coal through the Appalachian Mountains. The inspiration for the plan are two branch lines of the Interstate RR, a coal-hauling short line with connections to other Class 1 railroads in the South. The plan offers coal operations, an interesting prototype, and the opportunity to model mountain scenery.

The Interstate RR

The Interstate RR was all about one thing: moving coal. Tucked away in the southwest corner of Virginia, this short line made the business of shuttling loads and empties seem easy with its 10 cream-and-orange Alco RS-3 diesels and thousands of two-bay hoppers. Along its main line, tracks branched off into the valleys to serve large coal tipples as well as small truck dumps. The Interstate served as an important connection between corporate partners Louisville &

Nashville (L&N) and Clinchfield (CRR), allowing the L&N to ship coal and bridge traffic from Dorchester Junction to the CRR main at Miller Yard. The Norfolk & Western (N&W) line that met the L&N at Norton followed a similar route, and it too met the CRR. However, the N&W line couldn't handle Plate C and larger cars because of tight clearances in its tunnels, leaving the Interstate as the only route able to meet the L&N's needs. This exchange of traffic provided substantial revenue for the Interstate.

The Southern Ry. purchased the Interstate in 1960. By 1967 little had changed on the Interstate except for the arrival of Southern diesels and new types of hoppers. My track plan faithfully captures operations on the Dorchester and Roaring Fork branches at this time, as well as the interchange at Dorchester Junction involving mainline running for both the Interstate and the nearby L&N. The area modeled is shown in the map on the right.

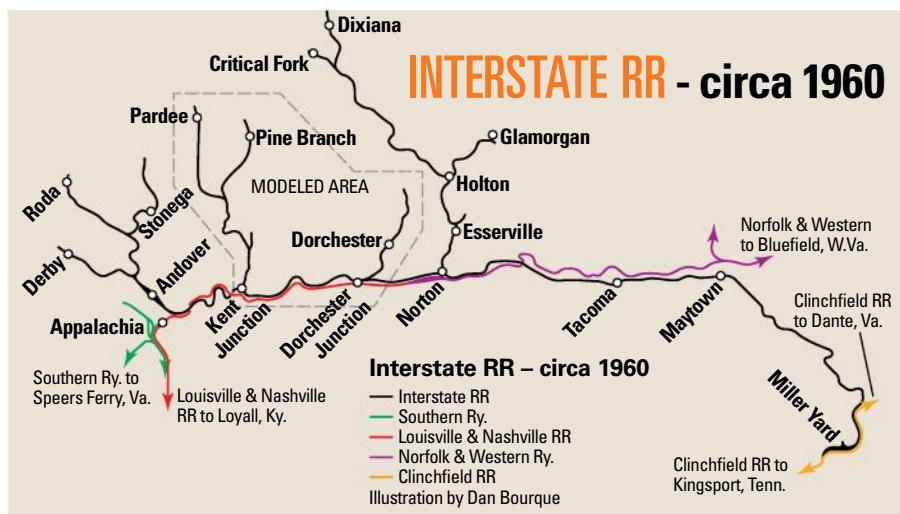
The layout's operation focuses on modeling three prototype trains: the Dorchester and Roaring Fork mine runs out of Andover Yard and the "Hill Crew" picking up bridge traffic at Dorchester Junction. Crews worked the two branches once per day, while the interchange was worked as often as needed. Continuous-run main lines and a common staging area for both east- and westbound trains make it easy to add additional through trains to the traffic mix.

Roaring Fork

The Roaring Fork mine run, referred to as 2nd mine run by Southern train crews, is the busiest job on the layout. The shift begins with loads spotted at the numerous tipples ready to be picked up. A long string of empties would be staged at Andover, along with the motive power and caboose. Because the first loader on the branch, Cane Patch, is a stub-ended configuration, the 2nd mine run would have the empties for Cane Patch blocked next to the locomotive.

At Kent Junction, the crew would leave the rest of the empties on the main west of the wye, taking the empties for Cane Patch past the wye to the east side. The crew would then shove the empties for Cane Patch up the east leg of the wye and return down the west leg to grab the remaining hoppers and caboose waiting on the main. The configuration of the train heading up the branch would be the empties for Cane Patch leading, then the motive power followed by empties for Pine Branch, Pardee, and Whitfield, and finally the caboose.

At Cane Patch, the crew would leave the leading hoppers in the empty tracks, waiting to grab the loads on the return trip. It's important to note that because the branches on the Interstate gained elevation up the valleys they served, empty hoppers were generally placed "above" the tipple, or closer to the end of the branch, so that mine workers could simply roll them under the loaders via gravity. The loaded hoppers would then be spotted "below" the tipple, closer to the main line.



On the prototype, the crew would work either Pine Branch or Pardee next. They would also leave the empties for Pardee and Whitfield at Dunbar, in the old tracks of the derelict wooden tipple.

On the layout, the next town on the operating sequence is Pine Branch. I also wanted to preserve some space between Pine Branch and Dunbar; therefore, the empties would have to be left at the two sidings at Kent Junction. The mine run crew would pull past the two tipples at Pine Branch and drop empties above tracks 1, 2, and 3 of the coal tipple, as well as the two tracks serving the coke tipple. The coke loads from both tracks of the coke tipple would already be staged onto track 3 of the coal tipple before the crew arrived, as they were rolled by gravity under the loader by mine workers. After grabbing the coal and coke loads from below the coal tipple, the crew would head south.

On the way back to Kent Junction the crew would swap loads from the Pine Branch for empties to Pardee. The crew would then work up the branch, placing empties above the Whitfield tipple, and then the Pardee tipple. The reverse would then be performed, but this time

gathering Pardee's loads and then Whitfield's from below each tipple. With loads from Cane Patch added to it on the way back to Kent Junction, the train would rejoin the coal and coke loads from Pine Branch, then return to Andover. For operational variety, some of the coal loads could be sorted and left in the Kent Junction sidings for a "Hill Crew" to pick up.

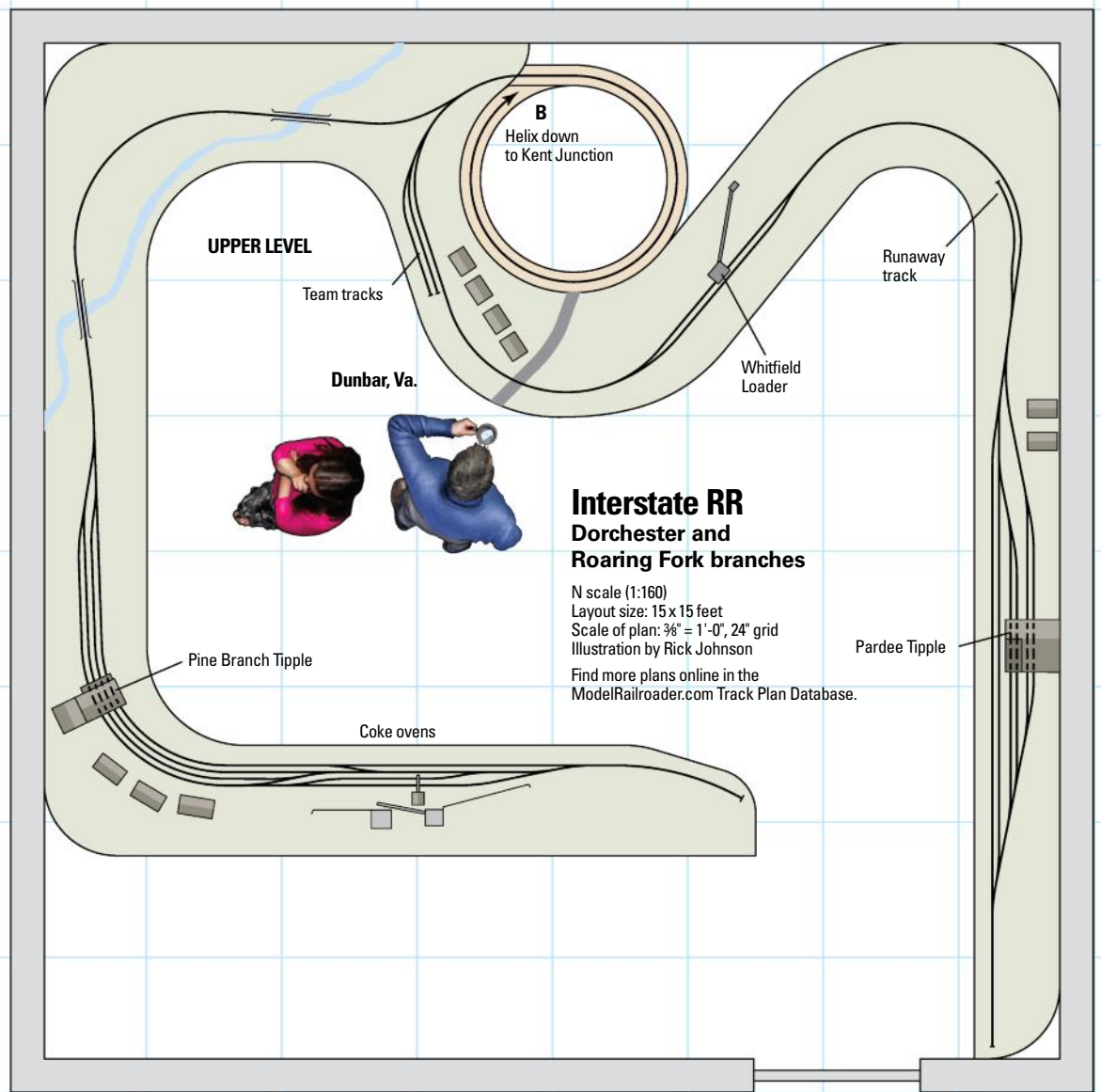
Dorchester and bridge traffic

The Dorchester mine run's operations and the nearby mainline tipple at Blackwood are particularly challenging. Because of the lack of runarounds at the end of the Dorchester Branch, the train of either 1st or 3rd mine run is "borrowed" for this operation, as they primarily served the Glamorgan/Dixiana Branch farther east. The train had to be shoved up the branch, and there was no direct connection between the Interstate main and the branch. The empty hoppers had to be pulled toward the L&N to access the route up toward Dorchester.

The train would arrive at Dorchester Junction from Andover with a string of empties. The train's crew would spend the next few minutes separating the



The interstate RR was an important bridge route for the Louisville & Nashville. Here an F7 and GP9 lead a freight near Appalachia, Va. Ron Flanary photo



train into two halves and then reassembling them to run caboose first to the tipple. The empties have to be left on the main at Dorchester Junction while the crew pulls loads from the Wise Coal & Coke tipple. Once the main tipple had its empties spotted, the few loads from the small Rohr and Robbins tipples could be collected, cleared, and replaced with a few empties. Because of the steep grade, the loaded hoppers would be run six to eight at a time back to Dorchester Junction.

The Blackwood Loader on the main line requires a facing-point operation for the eastbound mine run. Blackwood is worked by spotting a few empties at Dorchester Junction, then exchanging them for the loads on the return trip to Andover.

The L&N track arrangement allows trains to be run continuously. Two

manifest freight trains could represent the two to four time-freights over the L&N's rails toward Norton, Va., while one empty and one loaded coal train could represent the L&N's coal movements. Running each more than once around the layout, while also using them to place cars for interchange at Dorchester, makes for a working interchange, even with the limited staging.

A bonus feature of this layout is the ability to have operating sessions in different eras. By removing the Whitfield Loader, which was built after 1960, the layout could be operated as a pre-Southern Ry. layout with the road's own orange-and-cream RS-3s leading trains. Prior to the 1960s, Clark Siding existed near where the Whitfield Loader would be constructed, so the track would still be accurate for an earlier time period with the loader removed.

▶▶ The layout at a glance

Name: Interstate RR – Dorchester

and Roaring Fork branches

Scale: N (1:160)

Prototype: Interstate RR

Locale: Wise County, Va.

Era: 1967

Style: multilevel walk-in

Mainline run: 125 feet

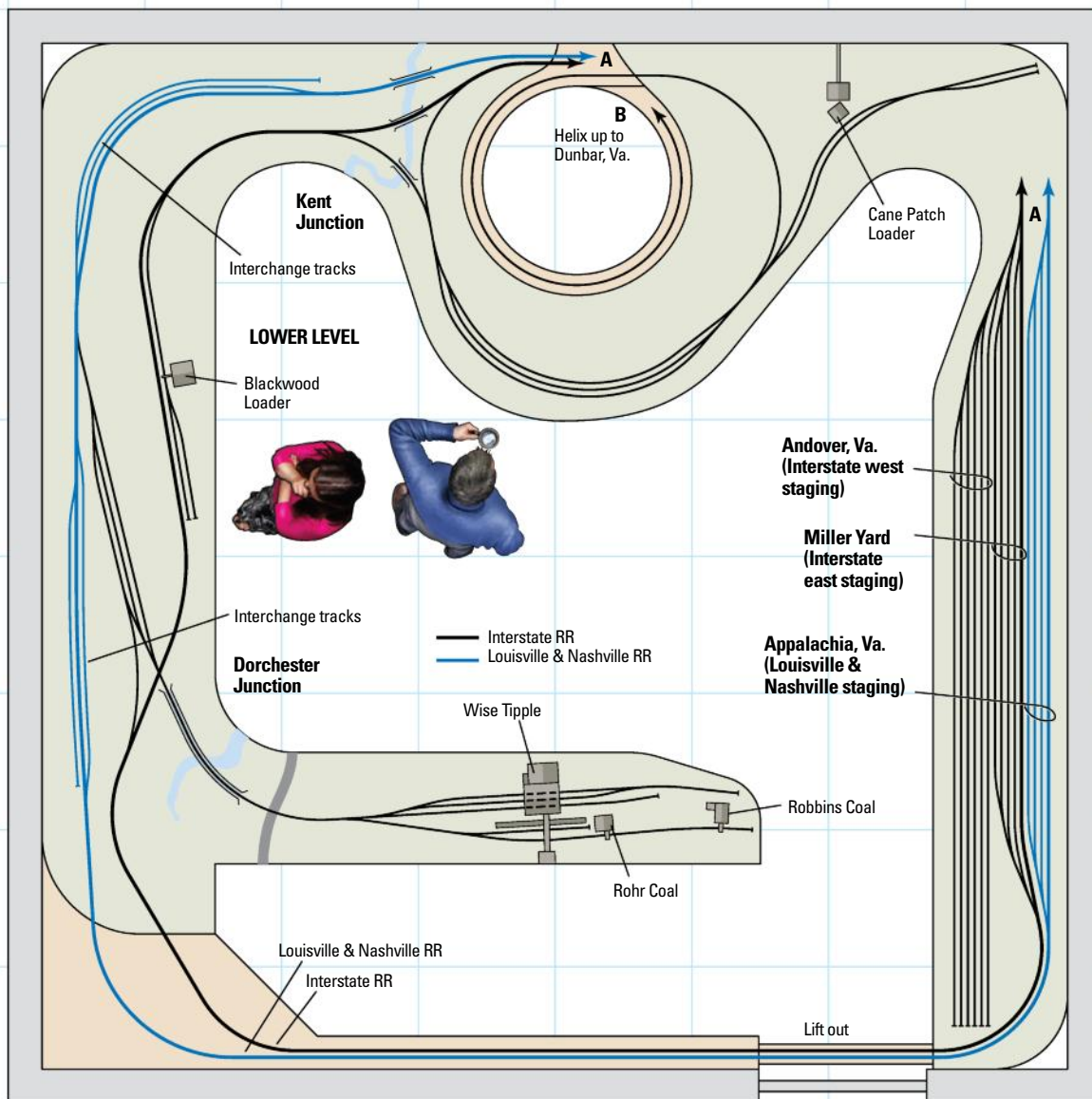
Minimum radius: 18"

Minimum turnout: no. 6

Maximum grade: 2 percent (main)

Modeling

The most challenging aspect of modeling the Interstate would be finding the correct hoppers. A couple hundred hoppers would be needed to accurately represent the various classes used by the



Southern and L&N, many of which aren't available in N scale.

The hoppers used by the Southern during the time period depicted by the track plan consisted of three main types: 100-ton "Big Red" four- and six-bay hoppers, 70-ton triple-bay hoppers, and "Yellow Ball" two-bay hoppers. For a prototypical mix of these hopper types, about half should be Yellow Balls, a quarter Big Reds, and a quarter triple hoppers.

The term "Yellow Balls" refers to old Interstate 50-ton hoppers, second-hand Southern hoppers, war-emergency rebuilds, and ex-Central of Georgia cars. Many of these hoppers had their sides extended to hold extra coal and were in bad condition from abuse on the rotary dumper at the Westmoreland facility.

Atlas 70-ton hoppers make good N scale representations of the triple hoppers used by the Southern in this era.

Adding extra detail parts to match prototype photos would make the cars look even better.

The 100-ton Southern "Big Red" hoppers are by far the biggest challenge. There is currently no hopper available similar to this class, and they would likely need to be scratchbuilt, in both four- and six-bay variations.

For the L&N, Pullman Standard PS-3 three-bay hoppers made up the majority of the fleet. These would need to be built from a hopper of similar dimensions such as Atlas' recently released N scale triple hopper. Other L&N hoppers used on the prototype included two-bay PS-3s as well as 60-ton rebuilds.

For motive power, the Southern used Electro-Motive Division F7 diesels and occasionally EMD GP7s for mine runs. By the 1970s, however, these would be replaced by then new EMD GP38 diesels.

The occasional EMD F3 or GP30 could also be found on the branches.

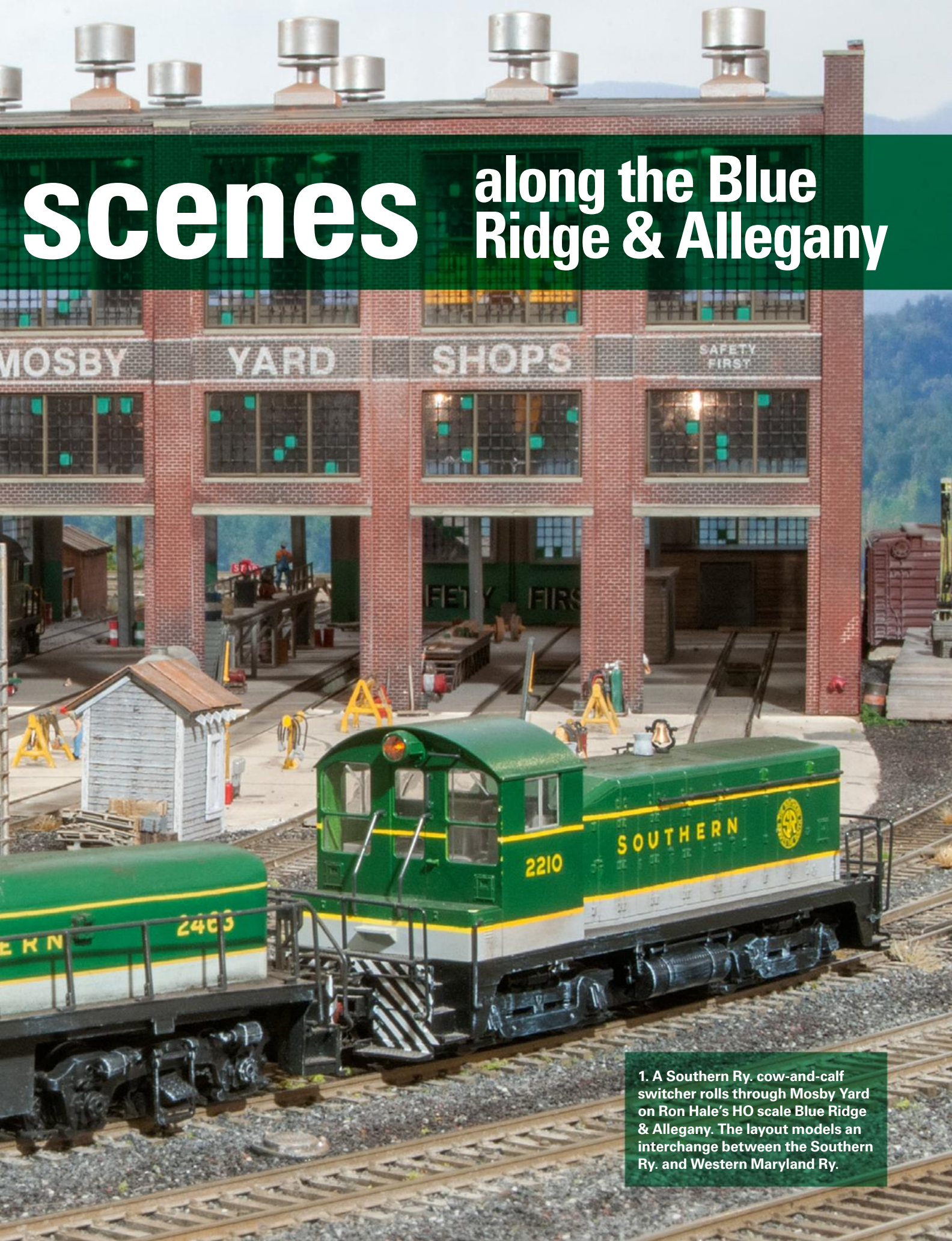
Louisville & Nashville relied on a wide variety of four- and six-axle diesel locomotives from Alco, EMD, and General Electric. These included the Alco FA, RS-3, C-628, and C-630; EMD F7, GP7, GP9, and SD40; and General Electric U25C, U28C, and U30C locomotives. The railroad rarely mixed four- and six-axle locomotives on a train.

Overall my track plan captures the feel of Appalachian coal hauling in the 1960s. By focusing on mine runs as well as interchange and bridge traffic, the N scale Interstate RR Dorchester and Roaring Fork branches offers a lot of operating potential in a small space. **MR**

Christian Javier designed a track plan inspired by St. Petersburg, Fla., in the 1950s for the July 2016 Model Railroader.

Superdetailed





scenes along the Blue Ridge & Allegany

1. A Southern Ry. cow-and-calf switcher rolls through Mosby Yard on Ron Hale's HO scale Blue Ridge & Allegany. The layout models an interchange between the Southern Ry. and Western Maryland Ry.



The Southern and Western Maryland share the rails on this freelanced HO scale layout

By Lou Sassi • Photos by the author

Ron Hale grew up around railroads. A grandfather and an uncle were both railroad men, on the Pennsylvania and Norfolk & Western, respectively. During his childhood in the Maryland suburbs of Washington, D.C., Ron spent a lot of time railfanning with his dad. He was inspired by the Southern Ry. at Ivy City Yard and Alexandria, Va., as well as Western Maryland Ry. trains in Baltimore. A freelanced interchange between those two roads is the main theme of Ron's HO scale Blue Ridge & Allegheny Ry.

A freelanced Appalachian road

Ron's BR&A depicts an imagined Appalachian railroad that ran between Blue Ridge, N.C., and Allegheny, Md. [Not to be confused with the Allegheny

Mountain range. – Ed.] The line went bankrupt during the Great Depression, which resulted in the WM purchasing the northern half of the railroad and the Southern purchasing the southern half. Although it never happened between the two prototype roads, the Southern and the WM interchange freight at the fictional town of Mosby, Va.

The BR&A also interchanges with several smaller railroads at each end and the Clinchfield RR at Hillcrest, N.C. Along its route the railroad serves a variety of trackage industries.

Coal is the most important commodity. There are three coal mines, a coal-processing plant, and numerous small distributors and other coal-related customers along the main line. Coal hoppers make up half of Ron's rolling stock.

The layout is set in 1952, during the steam-to-diesel transition era. At that

2. The Southern Ry.'s *Kudzu Flyer* arrives at Blue Ridge Station led by a streamlined class PS-4 Pacific. Visits to George Sellios' popular HO scale Franklin & South Manchester layout inspired this multilevel city scene.

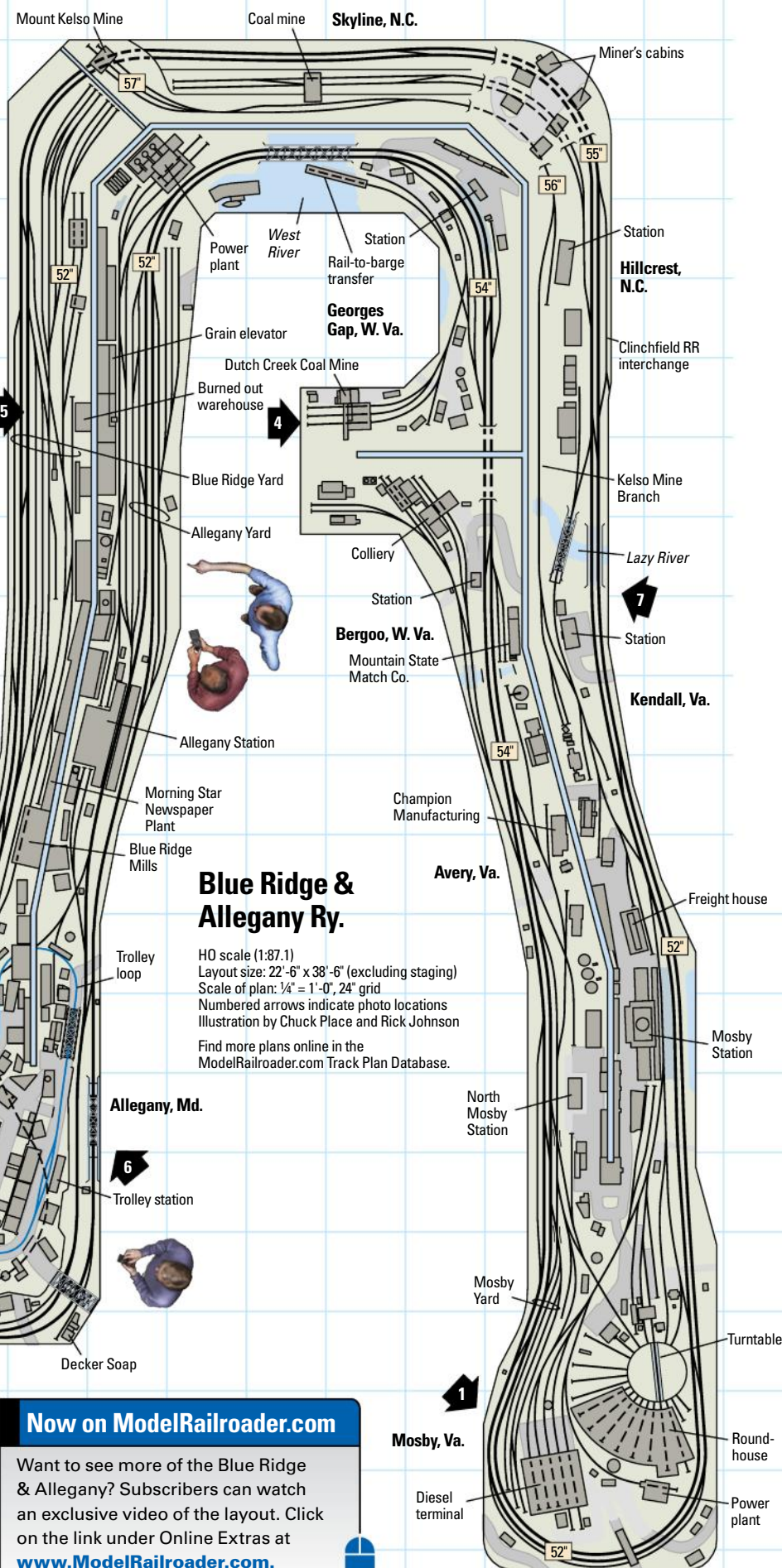
time, steam had only two years left on the WM, and just one year left on the Southern. Ron does his best to only run locomotives that would have been on the prototype during 1952. Occasionally an older steamer will make an appearance, though. "I'm simply improving on the real world!" says Ron.

Getting back to the hobby

Ron has always enjoyed both real and model trains. He recalls his father's American Flyer train set in the basement as well as his first HO scale train set, which he received for Christmas in 1959. However, Ron gave up trains for many years until 1988, when he spotted an issue of *Model Railroader* at a bookstore newsstand. "I was curious to see how the hobby had evolved," Ron said, "After paging through the issue, I was hooked again on model railroading."

► The layout at a glance

Name: Blue Ridge & Allegany Ry.
Scale: HO (1:87.1)
Layout size: 22'-6" x 38'-6"
Prototype: freelanced, inspired by the Southern Ry. and Western Maryland Ry.
Locale: Appalachian Mountains from Blue Ridge, N.C., to Allegany, Md.
Era: 1952
Mainline run: 173 feet
Minimum radius: 32" (main), 28" (branch)
Minimum turnout: no. 6
Maximum grade: 2.3 percent
Benchwork: open grid
Height: 52" to 57"
Roadbed: cork on Homasote
Track: code 83 flextrack
Scenery: Sculptamold and plaster cloth over screen wire
Backdrop: photos on drywall
Control: Digitrax DCC



Now on ModelRailroader.com

Want to see more of the Blue Ridge & Allegany? Subscribers can watch an exclusive video of the layout. Click on the link under Online Extras at www.ModelRailroader.com.

Add staging with a mobile traverser yard



3. Ron's nicely finished crew lounge remains open and uncluttered for visitors or casual train running (top photo), thanks to a mobile staging yard. During operating sessions, the connector is lifted up and the mobile traverser staging yard is wheeled into place (bottom photo).

After holding a few operating sessions, I found that the layout needed a fourth staging yard off the main line at Blue Ridge, N.C. In earlier sessions, we staged cars by hand, but this was a poor solution. Still, I didn't want a permanent addition because it would stand in the middle of my crew lounge.

I discussed this problem with my friend, Doug Miller, a model railroader and retired mechanical engineer. Doug's solution was a mobile traverser staging yard that he designed using a CAD 3-D design system.

Shown in the photos above, the mobile yard has 12 tracks on a 2 x 4-foot traverser table. The traverser can be matched up with any of the six tracks on a drop-leaf connector that comes off the main line.

Rolling stock is added or removed from the 12 staging tracks. The yard-master slides the traverser back and forth and locks it in place with the connector as he builds or disassembles trains. When the operating session is finished, the yard is disconnected and rolled to a storage area and the drop-leaf connector is folded down. – Ron Hale



That same year, Ron built a large layout in the basement of his Maryland home. He enjoyed the railroad until 2007, when he retired to North Carolina. The layout was torn down. Other than locomotives, rolling stock, and some structures, little was saved. "I learned a lot from that layout," Ron adds.

In 2008, a year after his move, Ron started building his BR&A layout.

Building the railroad

When building his home, Ron had an area designed for his model railroad. This space included a wall built specifically to provide backdrops for the layout.

The backdrop consists of enlarged photos attached to drywall that's been painted pale sky blue. Ron's friend, Dave Hull, used Adobe Photoshop



software to adjust colors and remove anachronistic buildings and vehicles from the photos. Ron then had the photos professionally printed on a flexible vinyl. He attached the photos to the dry-wall using double-sided adhesive tape.

After building the open-grid benchwork and laying track, Ron started work on the Appalachian scenery. He made the basic landforms from plaster-soaked cloth strips over wire mesh. For some smaller areas, he used Sculptamold.

Although he used some commercially available products, most of the ground cover is natural materials. These include a variety of real dirt and stones found in the woods around his home.

For background trees, Ron uses Autumn Joy sedum blossoms that his wife grows in their yard. Ron dries the

sedum, sprays it with paint, then sprinkles on ground foam foliage. For foreground trees, Ron uses Scenic Express SuperTrees tree armatures.

Ron models water using Enviro-Tex Lite two-part resin over the painted scenery base. He applies Mod Podge gloss medium to add a choppy texture to the water's surface.

To model waterfalls, Ron drybrushes white paint on clear silicone caulk. Then he applies Mod Podge to the bottom of the falls. After pulling apart white cotton balls, he presses the tufts into the Mod Podge to simulate the frothy white water.

Structure showcase

Most of the structures on the layout are built from craftsman kits. Ron's favorite building material is wood, but

4. Coal is king on the Blue Ridge & Allegany. At Dutch Creek Coal, the company's yellow 45-ton switcher spots a WM hopper for loading.

he has several styrene and acrylic structures on the layout. "Many of my favorite modeling techniques come from the instructions included with craftsman kits from Bar Mills, Fine Scale Miniatures, and FosScale Limited," Ron says.

However, Ron rarely finds a commercial kit that's exactly right for a location, so he usually has to modify the structure. If that approach doesn't work, Ron turns to scratchbuilding.

Many of the buildings have interiors as well as lights. "Details are what bring a structure to life," Ron says.

George Sellios and his HO scale Franklin & South Manchester model

Burning building adventures



5. Ron modeled a burned-out warehouse after seeing a similar structure on George Sellios' Franklin & South Manchester layout. The model shown above is Ron's second attempt.

While watching a model railroading video about the famous HO scale Franklin & South Manchester, I was inspired by how George Sellios modeled a burned-out building. After building the wood structure, he sprinkled it with a bit of lighter fluid and set it on fire. A spray bottle full of water helped control the flames.

"What a great idea!" I thought and built an HO scale wooden warehouse. Then I took the structure outside on our patio, applied a bit of lighter fluid, and struck a match. However, instead of burning slowly, the warehouse exploded in a ball of flame. Within seconds the model was a pile of ashes.

So, I built a second warehouse. This time I cut holes into the structure with a hobby knife and used black powdered pastels to simulate the burnt wood. Although the process wasn't as exciting as my first attempt, I think the second warehouse, shown in the photo above, turned out well. – R.H.

railroad remain an inspiration for Ron. He feels fortunate to have visited the F&SM two times. One of Ron's structures, George's Garage, is based on a gas station on the F&SM, as is the burned-out warehouse shown at left.

Ron has several structures that he feels are particularly successful in evoking a specific place and time. The most prominent of these "signature structures," as he calls them, are the three custom-built train stations.

Blue Ridge Station was built by Depots by John (www.depotsbyjohn.com) and is based on the Southern Ry. station in Manassas, Va. It's a typical mid-sized Southern depot with a witch's hat cupola and beautiful brickwork.

Allegany Station is a model of the Western Maryland depot in Cumberland, Md. Ron and his friend Jeff Springer, who owns Custom Model Railroads (www.custommodelrailroads.com), spent a day photographing and measuring the four-story structure, which is now the Cumberland Visitor Center.

Mosby Station is based on the Southern Ry.'s Asheville Station, which was torn down in 1968. Custom Model Railroads also designed this station using laser-cut and 3D-printed parts.

There are several bridges on the layout, including a 5-foot-long viaduct built from Central Valley and Walthers parts. Ron also kitbashed a pair of deck-truss bridges with Atlas and Central Valley parts. These were inspired by a model he saw at the 2013 National Model Railroad Association convention in Atlanta.

Built for operation

Ron designed the BR&A so crews can follow their trains along the route. The layout is wired for Digital Command Control (DCC) using a Digitrax system and is divided into four power districts.

Block signals regulate traffic flow. The signals are controlled via computer using Java Model Railroad Interface (JMRI) and Bruce Chubb's Computer/Model Railroad Interface (C/MRI) software. Both current and infrared detectors for each signal block provide reliable train occupancy detection without the need for resistors on the rolling stock.

All the mainline turnouts are controlled with Caboose Industries ground throws with auxiliary contacts that also indicate the turnout position to the computer system.

In addition to controlling the signal aspects, a lighted dispatcher's panel also displays occupied blocks as well as turnout indication.



6. The Western Maryland Ry.'s Chickadee pulls out of Allegany Station as the Appalachian Traction trolley passes overhead. The trolley makes a loop between the cities of Allegany and Blue Ridge.



Train movements

An operating session lasts 3½ hours, during which 20 to 22 trains run. The layout follows a 24-hour operating sequence. The trains run in order, although each session begins at a different point in the sequence. Ron generates switchlists with RailOp software.

Most of the trains are mixed freights, although several unit coal trains make an appearance. There's also some passenger traffic, including some en route switching of head-end cars.

The freight trains are 8 to 16 cars with a caboose. The passenger trains are 5 to 7 cars. There are four staging yards on the layout, including a mobile yard at Blue Ridge, as described on page 48.

The ideal number of operators at a session is 12. These include six road crews, four yard crews, a dispatcher, and a hostler. All the operators wear radio headsets and follow the instructions given by the dispatcher from an adjacent room, where he follows the train movements from his panel.

The hostler is based at Mosby Yard, the railroad's major engine terminal and the interchange between the Southern and the WM. All southbound WM and northbound Southern trains terminate at Mosby. For southbound trains,

the hostler replaces the WM locomotive and caboose with Southern equipment. For northbound Southern trains, the opposite occurs. Only the four through passenger trains, the *Chickadee* and the *Terrapin* on the WM and the *Kudzu Flyer* and the *Moonshiner* on the Southern, don't have to switch locomotives.

Lessons learned

While building his layout, Ron has learned about carpentry, electronics, computer programming, and model building. He doesn't consider himself great at any one of these subjects, but is quick to add that he's still learning, thanks to his fellow model railroaders.

"I've found you can always find someone to help you learn a new skill," Ron says. "Model railroaders are usually quite generous with their time."

Ron readily admits building the BR&A had been great fun, albeit with occasional frustrating moments mixed in. The layout has let him focus on things he enjoys, such as model building, studying railroad history, and best of all, spending time with the many friends he's made over the years. **MR**

Lou Sassi is a frequent contributor to Model Railroader and its special issues.

7. A Carolina & Northwestern Alco RS-3 leads a freight over the Lazy River. Ron modeled the falls by drybrushing white paint over silicone caulk. The froth is pulled cotton mixed into Mod Podge gloss medium.



Meet Ron Hale

A retired imagery analyst, Ron Hale lives with his wife, Laura, and their two cats, Trixie and Molly, on a mountainside near Hendersonville, N.C. Ron is an active member of the Apple Valley Model RR Club [see the March 2015 *Model Railroader* – Ed.] and the National Model Railroad Association Southeast Region.

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The *Southern Crescent*, behind an Electro-Motive Division E8, pulls into the Salisbury, N.C., passenger station. Doug Kirkpatrick scratchbuilt the passenger shelter to fit the curved platform. Paul J. Dolkos photo

Build a **curved** passenger platform shelter

A scratchbuilt jig speeds construction of styrene roof supports

By Doug Kirkpatrick • Photos by the author unless noted

As a member of the Northern Virginia Model Railroaders club in Vienna, Va., I noticed that the passenger platform between tracks three and four at Salisbury station was devoid of any structure to protect the paying customers. Part of the reason it hadn't been built may have been because the tracks there make a sweeping curve, requiring a scratchbuilt or heavily kitbashed structure to fit the platform.

I decided it would be simpler to build a structure from scratch. I fabricated two distinctive shelter supports: a peaked design and a flat-roof butterfly design. I temporarily installed both supports on the platform (seen in **fig. 1**) and sought feedback from club members. The club selected the peaked roof design.

Since any type of equipment from heavyweight passenger cars to modern-day Amtrak Superliners can appear on the railroad, I paid special attention to trackside clearances.

Fabricating the supports

For the basic construction material, I chose styrene. The shed is more than 6 feet long, or 560 HO scale feet. If I placed a support every 20 scale feet, it would take 29 supports. To make sure those 29 supports came out the same, as well as to ease fabrication, I built a wood jig.

When I use styrene as the construction material, I make a jig out of wood. When I use wood, the jig is either styrene or some other plastic. This keeps glue that seeps out of the joints from attaching the structure to the jig. I drilled a hole in the jig where the pieces join together so I could push the support from the jig if it got stuck.

I used a NorthWest Short Line Chopper with a preset stop to cut the same piece for all supports at once. This made sure the parts were uniform. I then reset the Chopper for the next piece until all were cut. **Figure 2** shows the parts required, with a vertical post and roof supports in the wooden jig.

Using liquid plastic cement, I assembled one side of the support, making sure the glue set before removing it. The post and roof support are .100" square. At the top, I used a .010" x .250" piece to simulate a gusset. I added a .020" x .080" cross support below. **Figure 3** shows the support just before removing and trimming the excess material.

After removing the post, I flipped it over and trimmed the protruding parts even with the roof line. I then added the cross support to the other side.



Fig. 1 Test subjects. Doug built and temporarily installed two distinctive shelter supports, a peaked design and a butterfly, for the club's consideration.

In order to enlarge the lower section of the support where it attaches to the brick platform, I used short pieces of .010" x .030" styrene on all four sides with a small taper at the top. I added a small gusset or tab at the end of each roof support to help align the horizontal stringers between posts.

I painted the supports before installing them, with the exception of the tops of the rafter where the roof section would be attached (**fig. 4**).

Attaching the supports

Each support was attached to the brick platform with a 1/16" brass pin inserted in the end of the post. This lets the shelter be removed for access to the surrounding area and lets it yield to the occasional accidental bump rather than break. Because the shelter is on a curve, additional stability was built in, thus preventing it from tilting.

The challenge was to ensure that each support was vertical along the entire platform. It was easier to drill a precisely vertical hole in the brick platform than in the end of the post. Using a power drill with a bubble level on its end, I drilled holes 20 scale feet apart along the centerline of the platform.

Each 1/2" long pin was gently pressed into the hole to a depth of 1/4" without glue. A corresponding hole was drilled in the end of each support. The support was then slipped down over the pin. If the support wasn't vertical in all directions, the hole in the support was slightly enlarged to allow for adjustments.

Finally, a small amount of glue was added to each pin to cement it to its post, but not to the platform. I marked each support as to its position and facing on the platform. After the glue dried, I made sure each support could be removed from the platform.



Fig. 2 Mass production. Doug built a wooden jig to assist in building the 29 supports. He cut like parts at the same time to ensure uniformity.



Fig. 3 Ascenders assembled. Doug trimmed the horizontal braces and top gusset plates after letting the glue dry and removing the support from the jig.



Fig. 4 All about that base. After building up the base and installing a pin, Doug painted the supports.



Fig. 5 Stringing along. As Doug tied the supports together with .060" x .100" styrene stringers, the growing structure became increasingly sturdy.



Fig. 6 Needs topping. Each segment of the .020" styrene sheet roof was measured and cut individually. Here, the finished structure awaits rolled roofing.



Fig. 7 Bottoms up. Doug next removed the structure and turned it over to paint the bottom of the roof. The ridge stringers are visible in this photo.



Fig. 8 Roll out. Doug used strips of wrapping paper attached with double-sided tape as rolled roofing. He painted it black and weathered it with drybrushed white streaks.

Tying it all together

Between each support I glued three stringers, one at the ridge and one at each side. Each was fabricated from .060" x .100" styrene. Because the shelter is on a curve, the outermost stringers were slightly longer than the inner ones. Each had to be measured individually.

Being right handed, I started at the far left and worked my way down the platform. After several supports were connected, the structure became more rigid, making subsequent connections much easier (**fig. 5**).

The roof material can be either cardboard or styrene. Cardboard is easier to cut and bend, but requires special glue to hold it to the styrene supports. I elected to use .020" styrene sheet. Each roof section had to be measured and cut individually (**fig. 6**).

Once the styrene roof panels were installed, I carefully removed the entire structure. After making sure that all the roof panels were glued tightly to the supports, I painted the underside (**fig. 7**). If you want to install working lights, now would be the time to add them.

I next adhered double-sided tape to the roof to hold the roofing. Brown wrapping paper cut into scale 4-foot-wide strips makes excellent tar paper. I applied the first strip along the bottom and then worked my way up, using a slight overlap between rows. I finally applied a 3-foot-wide cap along the top.

I painted the tar paper weathered black. I also drybrushed it with Aged White paint to make it appear weathered (**fig. 8**). I added end trim and the station name as a finishing touch. **MR**

Doug Kirkpatrick is retired from NASA and lives in Falls Church, Va., with his wife, Lorraine. His article on the Northern Virginia Model Railroaders club layout appeared in the February 2016 Model Railroader.



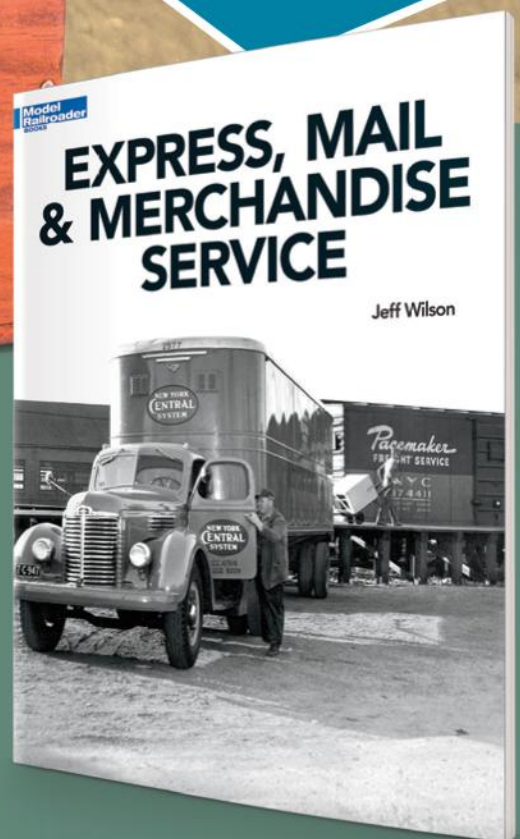
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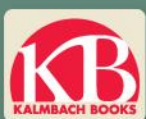
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How to weather a modern unit coal train

Extra grime, decals, and an enhanced coal load give these gondolas a prototypical appearance

By **Pelle Søbørg** • Photos by the author

On my former HO scale Union Pacific Danville Subdivision layout, I had a 30-car unit coal train consisting of Athearn Johnstown America Beth-Gon Coal Porters. When I received the cars seven years earlier, I gave them a light weathering coat to match the relatively clean prototypes I'd seen on trips to the Midwest.

During a recent trip to Nebraska, I noticed the full-sized cars had become much dirtier. They'd also had yellow reflector stripes added, as mandated by

the Federal Railroad Administration (FRA). I thought it was time to update my coal train to a more contemporary look. The update involved three things: A second layer of grime to the carbody, adding yellow decal stripes, and enhancing the coal load. To make the 30-car task more manageable, I worked on five cars at a time.

Adding more grime

Normally I wipe a model clean from fingerprints with a piece a cloth dipped

in plastic-safe thinner or window cleaner before I weather it, but I was afraid this step would damage the existing weathering. Instead, I wiped each car with a soft brush to remove any dust. I also removed the couplers, coal load, and trucks and separated the wheelsets from the trucks.

The weathering process is relatively simple. First, I flipped the cars over and applied thinned (1 part paint to 3 parts thinner) Model Master Skin Tone Dark Tint to the underside, as shown in **fig. 1**.



A pair of six-axle road units leads a 30-car coal train through Daneville on Pelle Søbørg's old HO scale Union Pacific layout. Our contributing editor explains how he weathered the coal gondolas five at a time.

Then I put the car in my homemade jig and gave the sides and ends a couple of coats of the thinned Skin Tone Dark Tint. See **fig. 2**. I applied the color heaviest on the lower third of the gondolas. On full-size cars, the wheelsets stir up dirt and grime that accumulates on this part of the cars, especially around the trucks. I build up the effect in several light coats instead of one heavy coat.

The trucks and wheelsets also received a couple coats of the thinned Skin Tone Dark Tint, as well as some rust-colored powdered pastels. I didn't apply any pastels to the car bodies since they represent aluminum, which doesn't rust.



Fig. 1 More grime. Pelle lightly weathered his coal gondolas seven years earlier, but he added more grime after seeing the prototype cars on a recent trip. He weathered the cars with thinned Model Master Skin Tone Dark Tint.

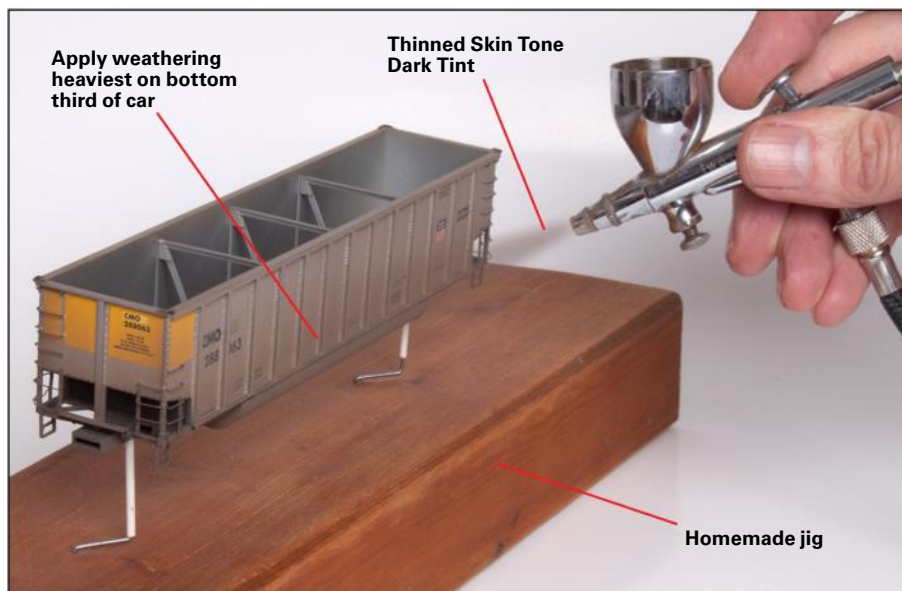


Fig. 2 Sides and ends. To weather the sides and ends of the gondolas, Pelle placed the cars in this homemade jig. He built up the grime in light layers, with the heaviest concentrations on the lower third of the car.

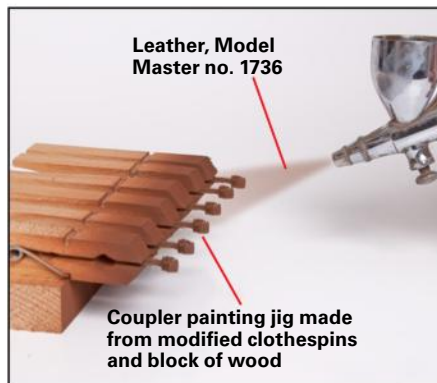


Fig. 3 Rust couplers. Pelle replaced the plastic couplers in the coal gondolas with Kadee scale couplers. Before installing the couplers, he removed the trip pins and weathered them with Model Master Leather.

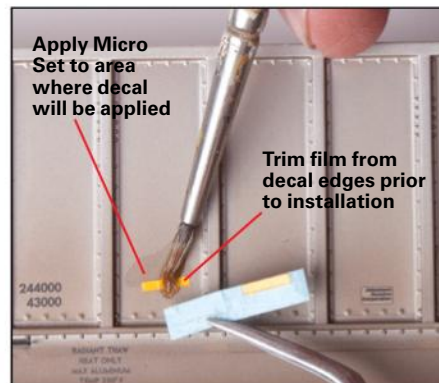


Fig. 4 A modern touch. Reflective stripes have been added to freight cars and locomotives to improve visibility at grade crossings. Pelle re-created this detail on his coal gondolas with Microscale decal stripes.



Fig. 5 Seal the deal. With the weathering complete and the decals added, Pelle sprayed the gondolas with Arcylicos Vallejo Matte Varnish. This step seals the decals and protects the weathering when the cars are handled.

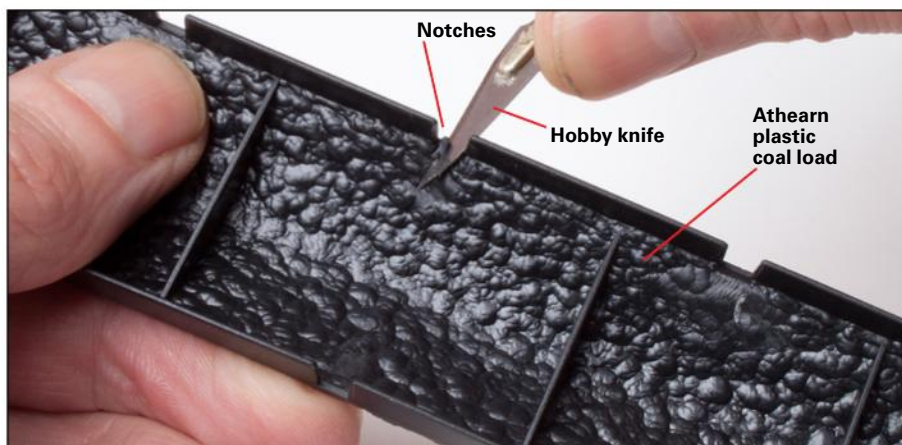


Fig. 6 Deeper notches. Pelle wanted to enhance the Athearn plastic coal loads with Arizona Rock & Mineral fine coal. To make the loads sit lower in the gondolas, he used a hobby knife to make the notches deeper.



Fig. 7 Coal mush. Pelle used a mixture of Arizona Rock & Mineral fine coal, white glue, water, and a drop of dish soap to make a mush that he applied over the plastic load.

I replaced the plastic couplers with Kadee scale couplers. Before installing them in the gondolas, I placed them in a homemade jig and airbrushed the couplers with Model Master no. 1736 Leather, as seen in **fig. 3** on the previous page. You want the paint to be almost dry when it hits the couplers. To do this, hold the airbrush about a foot away. This prevents the knuckle spring from gumming up and gives the couplers a gritty finish.

In compliance

Since I model present day, I needed yellow reflector stripes for the coal gondolas. On the prototype the stripes are added to new and existing rolling stock. Stripes added to older cars stand out as they're much cleaner than the rest of the car. To simulate that look, I applied the Microscale HO scale 4" stripes after I airbrushed the car with thinned Skin Tone Dark Tint. I trimmed the clear film from around each stripe prior to installation so it wouldn't silver (when the clear film turns a hazy color).

I applied Micro Set to the areas where the stripes would be located. This makes it easier to do the final positioning of the decals, as shown in **fig. 4**. Once I was satisfied with the position of each stripe, I applied a drop of Solvaset and let it dry.

Finally, I used an airbrush to spray the cars and trucks with Vallejo Matte Varnish. See **fig. 5**. The Matte Varnish is designed for airbrushing straight from the bottle. If it doesn't flow well, add a few drops of distilled water.

Realistic coal

The plastic coal loads have an authentic profile, but the texture didn't look realistic enough for my taste. To remedy that, I added a layer of fine coal from Arizona Rock & Mineral.

I had to compensate for the added coal by making the notches in the loads a little deeper with a hobby knife, as shown in **fig. 6**. This helps the loads sit lower in the models.

With the loads modified, I mixed some fine coal with white glue, a little water, and a drop of dish soap (the soap helps break the surface tension and makes the "mush" flow more easily).

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Registered users can watch videos of Pelle Søbørg's new and old HO scale layouts in action. Look for the footage under the Videos tab at www.ModelRailroader.com.

I brushed the mush on the plastic loads, as seen in **fig. 7**. I used a fine brush to spread the mush along the edges and in the corners until the loads were completely covered. If you want the load to be removable, apply the coal before you place the loads back in the cars.

With the mush still wet, I sprinkled on a layer of dry coal. Do this over a piece of aluminum foil, as shown in **fig. 8**, or a box lid so you can collect any spilled coal. After the glue had dried, I turned the cars upside down so the loose coal would fall off. Let the loads dry for a day or two before proceeding.

The Arizona Rock & Mineral coal seemed to glisten, so I toned it down by spraying the loads with Arcylicos Vallejo Matte Varnish. See **fig. 9**.

Weathering 30 cars was relatively quick working in assembly-line fashion. The finished results are shown in **fig. 10**. **MAR**

Materials list

Acrylicos Vallejo paint

70.520 Matte Varnish

Arizona Rock & Mineral

1132 fine coal

Microscale Decals

MC-4389 yellow reflector stripes

Miscellaneous

Rust colored powdered pastels

Model Master paint

1736 Leather

2002 Skin Tone Dark Tint



Fig. 8 Adding coal. With the mush still wet, Pelle sprinkled in dry coal. He made a nest from aluminum foil to collect any coal that spilled so he could use it for other loads.



Fig. 9 Shiny no more. Pelle noticed the fine coal glistened under his layout room lighting. To prevent this, he sprayed the loads with Matte Varnish.

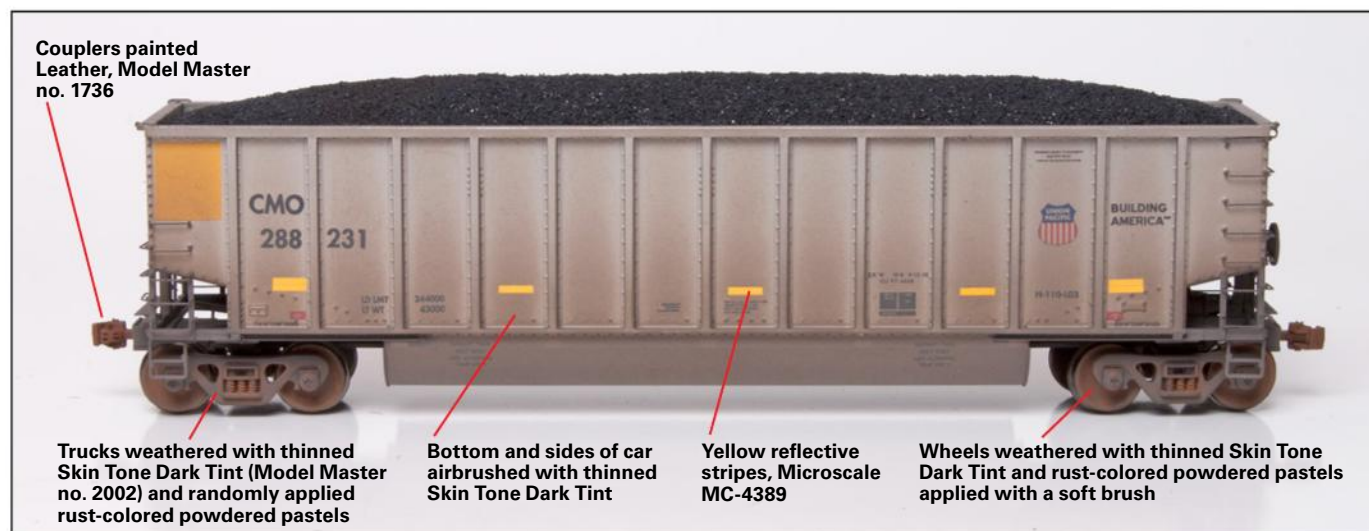


Fig. 10 The finished gondola. Here's an example of one of Pelle's weathered coal gondolas. He was able to weather his 30-car train more efficiently by working on five gondolas at a time.

Quick and easy utility poles

With six parts and some paint, you can model these modern roadside details

By **Pelle Søbørg** • Photos by the author

As I continued work on my new HO scale Union Pacific layout, I noticed one thing was missing from my model railroad: utility poles. To my knowledge, there are no modern poles available in HO scale. Scratchbuilding insulators and cutouts was one possible solution, but that's not how I wanted to spend my hobby time. Instead, I used readily available kits and parts to make realistic utility poles that were quick to build and easy to mass produce.

Quick kitbash

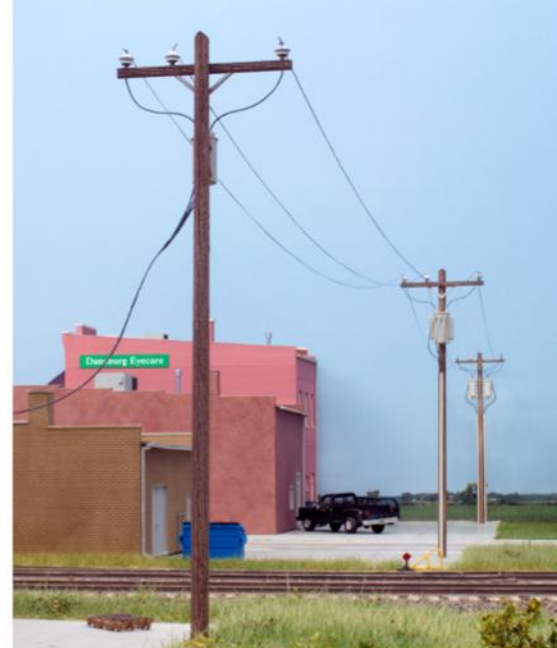
I used the crossarms and transformers from the Wm. K. Walther's Inc. HO

scale utility pole kit. But I didn't use the poles from the Walther's kit because, in my opinion, they looked too heavy. Instead, I used poles from the Rix Products telephone pole kit.

Before attaching the crossarms and transformers to the poles, I dragged a razor saw vertically on the poles to enhance the wood grain detail.

I used .010" brass wire to model the various wires on each pole. Then I attached $\frac{3}{64}$ " styrene rod, with a small hole drilled in the top, for conduit.

To make the poles easier to install, I drilled a hole in the bottom center of each one and added a .028" brass wire.



Modern utility poles add realism to scenes on contributing editor Pelle Søbørg's new HO scale layout. Follow along as he shares his techniques for modeling these lineside details.

See **fig. 1**. I secured the mounting pin with cyanoacrylate adhesive (CA).

Painting and weathering

With the poles assembled and detailed, I used an airbrush to spray them Model Master Camouflage Gray, as seen in **fig. 2**.

After the paint had dried, I mixed a dark brown wash using Vallejo Air Tank

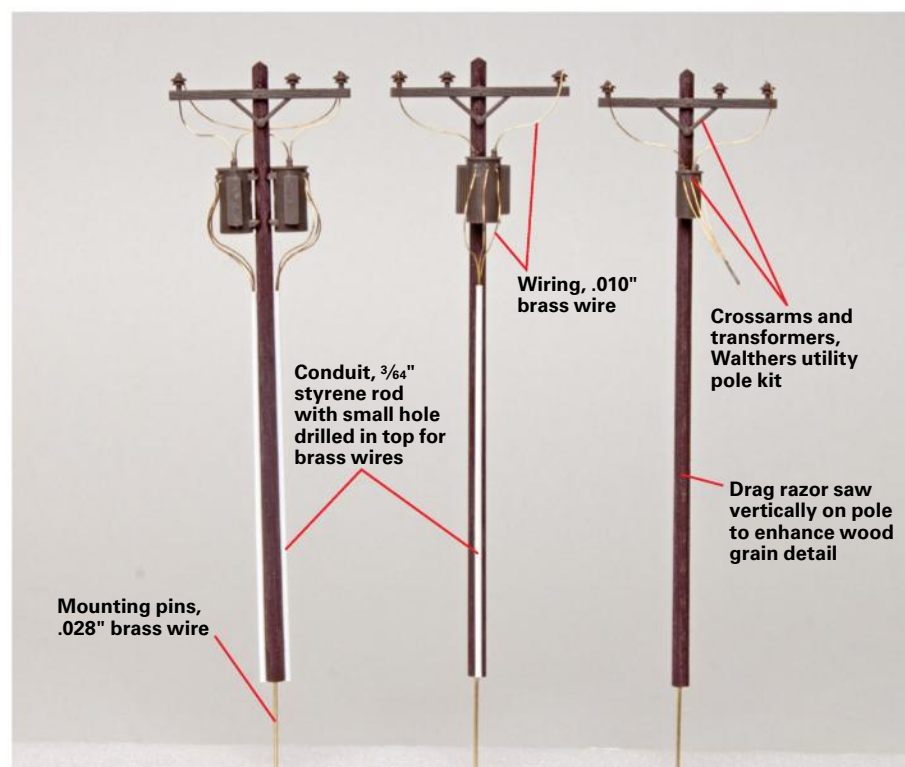


Fig. 1 Detailing poles. Pelle used parts from Rix and Walther's kits to model his utility poles. He further detailed the poles with styrene rod and brass wire.



Fig. 2 Basic gray. After Pelle detailed the poles, he sprayed them with Model Master Camouflage Gray. Pelle used the enamel version of the color (1733), but it's also offered as an acrylic (4766).

Brown, German Gray, and airbrush thinner. I used a ratio of 1:1:4, but you can adjust that if you want the brown lighter or darker.

I applied the wash to the poles and crossarms with a brush. See **fig. 3** below. I was careful to keep the stain off the parts that I wanted to keep Camouflage Gray (brackets, transformers, and conduit).

Finally, I brush-painted the insulators flat white and the wires dark gray, as shown in **fig. 4**.

Installation

I drilled holes for the poles in the layout and installed them. Then I used fine black Berkshire Junction EZ Line to simulate the primary wires on top of the poles. I attached the elastic line with a tiny dab of CA one insulator at a time. You can see the finished poles at top left.

My utility poles might not be totally correct for the modern era, but they look all right. The brass mounting pins make the poles easy to replace should a manufacturer decide to offer contemporary utility poles. **MR**



Fig. 3 Wood wash. Pelle mixed a brown wash using Vallejo Air Tank Brown, German Gray, and airbrush thinner. He was careful to keep the wash off of parts he wanted to keep Camouflage Gray.

Materials list

Berkshire Junction

EZ Line (fine, black)

Evergreen styrene

221 3/64" rod

Rix Products

30 telephone poles

Wm. K. Walthers Inc.

949-4120 utility pole kit

Model Master paint

1733 Camouflage Gray

Vallejo Air paint

041 Tank Brown

052 German Gray

71.061 airbrush thinner

Miscellaneous

.010" brass wire

.028" brass wire

Dark gray paint

Flat white paint

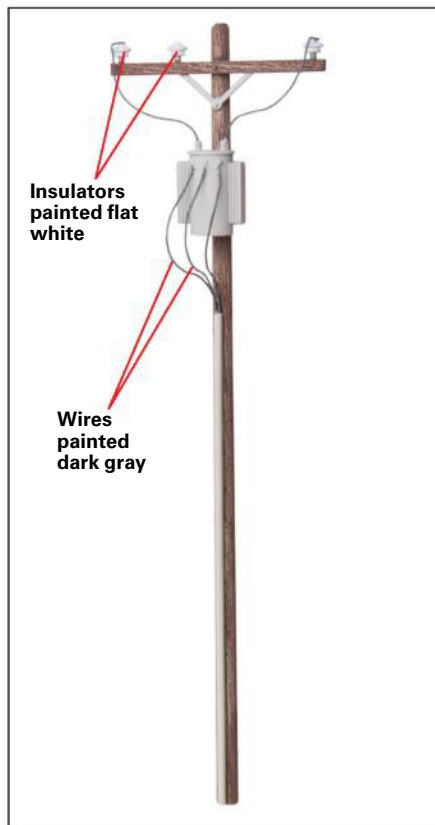


Fig. 4 Finishing touches. Finally, Pelle brush-painted the insulators flat white and the wires dark gray. After Pelle installed the poles on the layout, he attached elastic Berkshire Junction EZ Line to the insulators.

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Remap functions for consistent operation

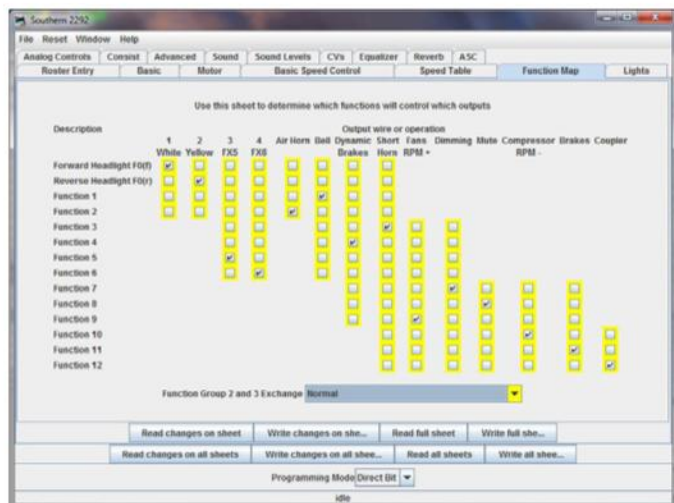


Fig. 1. Old approach. The old SoundTraxx function mapping approach for a Tsunami decoder, shown here in DecoderPro, displays the limited range of function buttons available for various light and sound effects.

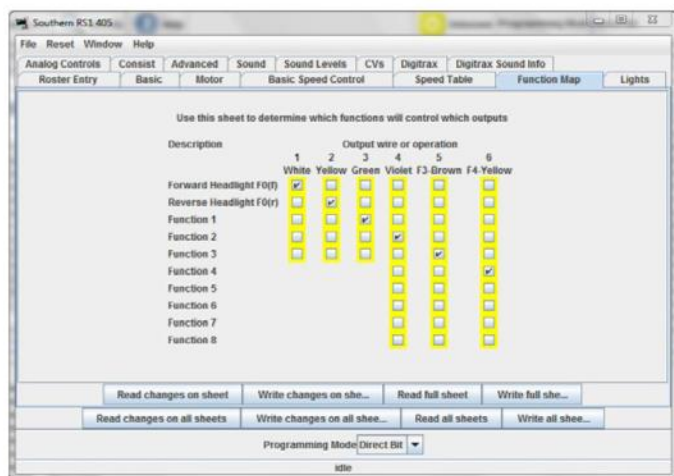


Fig. 2. Digitrax specific. The Digitrax sound decoder function mapping pane in DecoderPro is similar to the one shown in fig. 1, but note there are no sound selections available. Function button assignments for their sound decoders are programmed into the sound project files, which must be edited to change button assignments.

With the current generation of sound decoders, there are so many user-controlled functions it can be difficult to remember which buttons to push on your throttle. There's little consistency from one manufacturer to the next when it comes to which functions and sounds are assigned to throttle buttons above F2.

For example, SoundTraxx uses F11 for brakes, but TCS

uses F6. During an operating session you may get used to using one button for the brake on your first run, then have to re-learn which button to push when you head out with a second train. What are your options for simplifying all this?

Fortunately, Digital Command Control (DCC) decoders support function

(re)mapping to varying degrees. This feature allows you to assign sound, light, and control functions to specific buttons on your throttle.

For example, with the SoundTraxx Tsunami decoder, you could move the brake function from F11 to F6 so it would be the same as your TCS WOWSound decoders. You can also combine functions so they're activated by the same button.

An example of this would be to configure the horn button so it also activates ditch lights or the bell each time it's blown. One limitation of this is that with the SoundTraxx Tsunami approach in DecoderPro, only certain functions can be assigned to a small range of buttons. DecoderPro is a tool in the Java Model Railroad Interface (JMRI) used to program decoders (www.jmri.sourceforge.net). As you can see in fig. 1 and fig. 2, the headlights can only be assigned to F0 through F2 or F0 through F3 depending on the decoder.

Over the years, this function-mapping feature has become more complex as the number of functions has increased. Currently, the NMRA recognizes functions F0 to F28, and most manufacturers provide either detailed manuals or support for them on their websites.

Both Digitrax (www.digitrax.com/support/cv/calculators) and TCS (www.tcsdcc.com) provide programming tools that lead you through the selection process, and then provide the values to be written into the required Configuration Variables (CVs). TCS also offers Audio Assist on its WOWSound decoders. This feature gives voice prompts and feedback to help program sound effects.

When it comes to remapping these functions, I usually turn to DecoderPro, even when using the "legacy" SoundTraxx approach. With DecoderPro you simply click on the check box where the effect and function button intersect (**fig. 1**).

Digitrax has taken a different approach with its sound decoders (**fig. 2**), making sound effect assignments part of the sound project itself. The downside to this approach is you have to edit the sound projects in order to make assignment changes.

With the new SoundTraxx Flex-Map approach in DecoderPro, introduced in the firm's Econami and Tsunami2 decoders, each effect has a drop-down menu allowing you to assign it to one of the 29 (F0 to F28) function buttons (**fig. 3**). If you choose to program the effect using a throttle, you first have to program CV31 to a value of 1 to access the indexed CVs, and then program the desired function button number into the corresponding indexed CV. LokSound also uses indexed CVs, and I recommend using either its own LokProgrammer or DecoderPro.

One thing about DecoderPro is that the computer code for various function-mapping panes appears to be written by different people, and as a result the panes may look a bit different. Some have the effects listed in order and drop-down selection boxes or check boxes for the button numbers (**fig. 3**). Others take the opposite approach, using function number lists with drop-down boxes associated with the effects (**fig. 4**).

The LokSound pane uses a multiple selection approach,

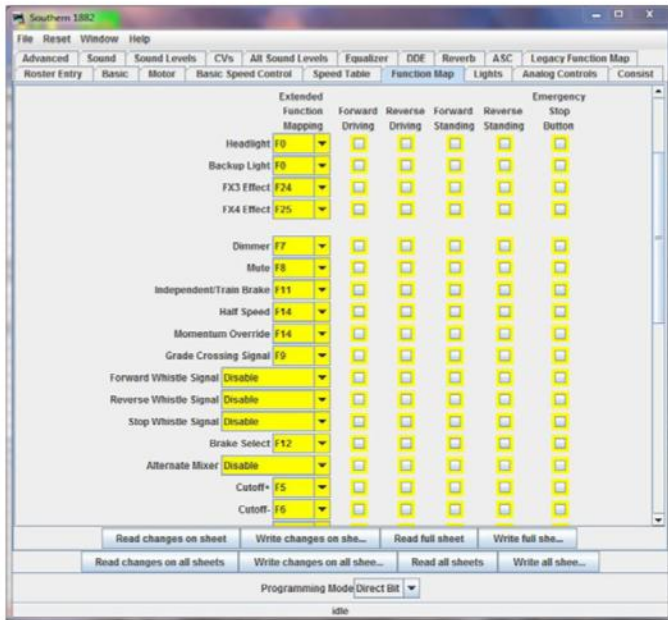


Fig. 3. Many choices. SoundTraxx's new Flex-Map approach, a feature of the new Econami and Tsunami2 decoders, allows you to assign any light, sound, or logical effect to any of the available function buttons. It also allows automatic controls keyed to direction and movement.

with even more flexibility (fig. 5). While this may seem confusing at first, you'll find it's often done to take advantage of unique features of the decoders.

With all the sounds, lights, and controls available, it can be difficult to keep them all sorted out. Therefore, having a logical way to pick and choose among them is important, requiring a systematic approach. My method is to make a table or spreadsheet of the functions offered by the various brands of decoders I own.

Once I have my spreadsheet of available functions, I whittle those down to a common group I think my operators will actually use. Finally, I decide which of those functions will be assigned to the same buttons on my throttles for all my decoders.

This can be complicated by the fact I have a collection

of throttles with anywhere from 13 to 29 function buttons, if you count the ones accessed using a "shift" button.

Because it can be difficult for an operator to hold a throttle and car cards while pushing a shift and function button, I've further narrowed the selections to just those directly accessible on utility throttles. In my case, that's F0-F6. So in this process I've gone from more than 29 possible sound, light, and control functions to only seven.

This may seem like a major waste of all those neat sound and light effects you paid for. However, there are other ways to take advantage of them without pushing buttons. Many decoders offer varying degrees of automatic sound and light effects. For example, with some you can set your brakes to squeal when locomotive speed decreases at a preset



Fig. 4. Drop-down menus. The DecoderPro function mapping pane for MTH decoders presents the function buttons with a drop-down menu of effects next to each. The various function mapping panes look different to take advantage of each decoder's unique features.

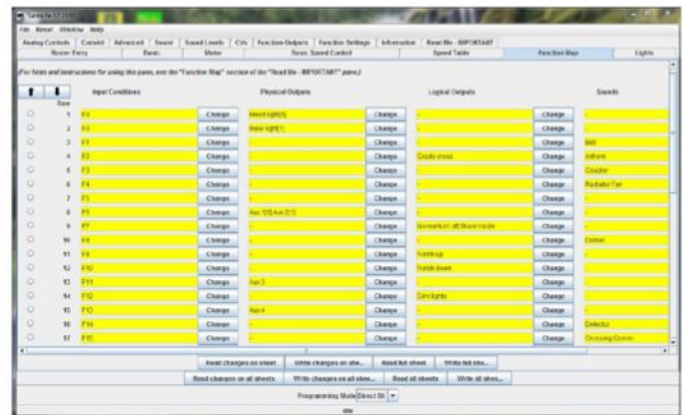


Fig. 5. Another approach. LokSound decoders offer yet another DecoderPro function mapping pane allowing you to change physical, logical, and sound assignments for each button on the throttle.

rate. A sensitivity setting allows you to fine tune this so the brakes stop squealing before the locomotive stops.

Bells and lights can be set to activate when a whistle or horn signal is blown. Effects may also be triggered when locomotives change directions or stop. In many cases, you're only limited by your ingenuity and imagination. For more on

this and other related DCC topics, visit my website at www.dccguy.com. **MR**

Send your questions about Digital Command Control to DCC Corner, *Model Railroader* magazine, P.O. Box 1612, Waukesha, WI 53187, or e-mail dcc@mrmag.com. We regret we can't answer all the questions we receive.



Factory-installed details and ditch lights are welcome additions on Kato HO SD40-2

The Kato mid-production Electro-Motive Division SD40-2 features notable enhancements over the early-production SD40-2 reviewed in our August 1999 issue. Instead of supplying sprues of grab irons and other parts, Kato factory-installed the details on this model. The direct-current (DC) version we tested also features new user-controlled ditch lights. A version with factory-installed DCC sound is also available.

The prototype. General Motors' Electro-Motive Division delivered more than 3,000 SD40-2 diesel-electric locomotives to U.S. railroads between 1972 and 1986. Hundreds more served on Canadian railroads, including variants built by General Motors Diesel Division in London, Ont. Numbering nearly 4,000 units total, the SD40-2 remains GM's best selling locomotive of all time.

Like the SD40 that came before it, the SD40-2 has a turbocharged 16-cylinder 645E 3,000 hp diesel engine. As part of EMD's "Dash 2" product line, the SD40-2 featured some key improvements over its SD40 predecessor, including HT-C high-adhesion trucks and easier-to-maintain modular electrical components.

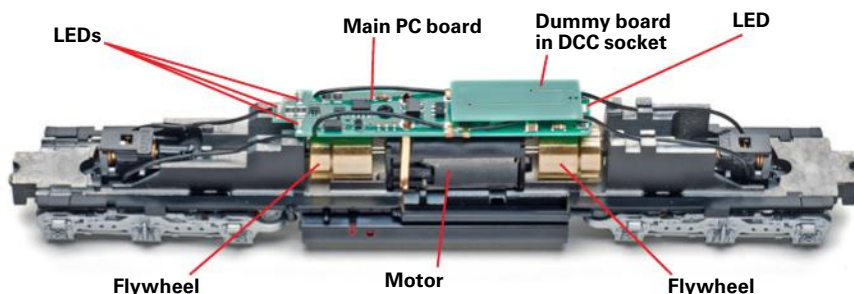
Even after decades of service, many of these second-generation diesel workhorses still haul freight today.

The model. The model's dimensions match drawings in the *Model Railroader Cyclopedia: Vol. 2, Diesel Locomotives* (Kalmbach Publishing Co., out of print). The Kato model is of a mid-production SD40-2, like the prototype for our review sample Atchison, Topeka & Santa Fe Ry. no. 5088. Built in 1979, that locomotive was one of 172 SD40-2s delivered to ATSF between 1977 and 1981.

Some detail changes took place during the SD40-2's long production. The Kato model has many of the spotting features of a mid-production (late 1970s) SD40-2, including louvered air-intake grills and an 88" short hood with a brake wheel. An early-production SD40-2 had "chicken wire" grills and an 81" short hood with a brake ratchet.

Past releases of Kato locomotives required the modeler to do a fair amount of work installing detail parts. I've lost my fair share of Kato windshield wipers. With all the parts factory-installed on the new SD40-2, I didn't have to take out my tweezers once.

The appearance of no. 5088 changed over its career, including horn placement, the addition or removal of a rooftop strobe, and other details. According to prototype photos, the Kato model depicts no. 5088 in the early 1990s with a nose-mounted headlight, the airhorn mounted at the rear of the dynamic brake fan housing, and the correct air-conditioning equipment and antennae



The locomotive's mechanism rests in the center of a die-cast metal frame. Removing the dummy board reveals an 8-pin socket for a decoder.

Now on ModelRailroader.com

Check out a demo of the Kato USA SD40-2 and a Sound Box featuring the new EMD second-generation diesel sound card. Click on the link at www.ModelRailroader.com.

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mounted on the cab roof. The class lights on the short hood had also been plated over at this time.

The model is decorated as it appeared in the 1990s, including the MKM lettering on the cab. While Santa Fe did sell some locomotives to Morrison-Knudsen and lease them back, the railroad retained ownership of its SD40-2s. On the SD40-2 fleet the MKM lettering denotes that a locomotive is covered under a maintenance contract with the firm.

All the other decoration matches prototype photos, including warning stencils and builder's plates. The yellow used on the model has a slightly orange tint that isn't an exact match of the yellow used on the prototype. The yellow used on the handrails, stanchions, and other detail parts is different and appears closer to the prototype color.

Mechanism. After removing the couplers, I squeezed the sides of the body shell inward to release the locking tabs along the sill. I then lifted off the shell.

The dual-flywheel-equipped motor is in the center of the die-cast metal chassis. Universal joints send power from the motor to the truck-mounted gearboxes.

Two screws attach a printed-circuit (PC) board to the top of the motor. Removing a dummy board on top of the PC board reveals an 8-pin Digital Command Control decoder socket. A sound system could be easily added, as there's a built-in speaker enclosure with sound holes in the fuel tank. A version with a factory-equipped ESU LokSound Select decoder and speaker is also available.

There are four light-emitting diodes (LEDs) on the PC board: one on each end for the front and rear headlights and two on the front of the board for the ditch lights. Plastic light pipes direct the illumination to the appropriate lenses in the body shell.

Performance. The Kato locomotive rolled smoothly throughout its speed range from 2 scale mph to 93 scale mph. The prototype could reach 76 mph.

The trucks swiveled freely, and the model easily negotiated 18" radius curves and no. 5 turnouts.

Lighting on the model is directional. In forward the front headlight, number-

► HO scale SD40-2 diesel

Price: \$185 (direct-current), \$285 (Digital Command Control and sound)

Manufacturer

Kato U.S.A. Inc.
100 Remington Road
Schaumburg, IL 60173
www.katousa.com

Era: late 1970s to present

Road names: Atchison, Topeka & Santa Fe Ry.; Burlington Northern

Features

- All-wheel drive and electrical pickup
- Blackened metal wheels, in gauge
- Ditch lights can be set for steady or flashing modes in DC or DCC
- Eight-pin DCC socket
- ESU LokSound Select decoder (DCC version only)
- Five-pole skew-wound motor with dual brass flywheels
- Golden-white light-emitting diode headlights
- Illuminated number boards
- Kato knuckle couplers at correct height
- Minimum radius: 18"
- Weight: 13.9 ounces

Kato HO SD40-2

Drawbar pull	3.8 ounces
	53 HO scale freight cars

Scale speed (DC)	
Volts	Scale mph
2 (start)	2
3	14
6	34
12	93

boards, and ditch lights illuminate. In reverse these lights turn off and the rear headlight shines.

While the locomotive moved forward, I triggered the alternately flashing ditch lights by quickly flipping the direction switch on the DC power pack. I quickly flipped the switch again, and both lights shone steadily.

The Kato mid-production SD40-2 is worth a look for modelers who want to add motive power to a layout set in the late 1970s to the present day. – Dana Kawala, senior editor

Dana Kawala

QUICKLOOK

Second Generation EMD Sound Card for Kato Sound Box

Price: \$29.99

Comments: The Kato Sound Box is an analog sound controller that connects to a direct-current (DC) power pack and works with any manufacturer's locomotives, since the sound plays through the device. The Sound Box uses plug-in cartridges, called Sound Cards, that have sound files for different types of locomotives. (See my review of the Sound Box with



Electro-Motive Division 1st Generation Diesel (non-turbocharged) Sound Card in the June 2015 *Model Railroader*.) Kato recently released new Sound Cards, including one labeled EMD 2nd Generation Diesels with Turbo-charger that proved a perfect match for the firm's HO scale mid-production SD40-2.

The high-quality sound files are provided by SoundTraxx. The sound of the turbocharged 645 diesel was spot on, and I appreciated being able to adjust the engine rpm independently of the locomotive speed. Unfortunately I couldn't adjust individual volume levels. The horn is a bit on the quiet side compared with the engine sounds. Other user-triggered effects include the bell, coupler, and dynamic brake fan.

Additional Sound Cards now available include U.S. Light Steam, FEF-3/GS-4 (Heavy Steam), EMD 1st Generation Diesel with Turbo, EMD 3rd Generation Diesel, and General Electric 3rd Generation Diesel.

The Sound Cards and Sound Box remain a useful option for those who wish to add sound to their model railroads without installing decoders or converting to Digital Command Control. – D.K.



Atlas HO scale GP38 now features factory-installed ESU LokSound DCC

I heard the realistic rumble of the Electro-Motive Division 645 diesel engine when I set the Atlas HO scale GP38 on the rails of our test track. The biggest upgrade of this latest release of the GP38 is that it now comes factory-equipped with an ESU LokSound Select dual-mode decoder that provides realistic sound on Digital Command Control (DCC) and direct-current (DC) layouts.

Senior editor Jim Hediger reviewed the first release of the Atlas locomotive in our January 2001 issue. Atlas is now offering its GP38 in several new paint schemes, and with new numbers for existing schemes.

The prototype. As the horsepower was heated up in the mid-1960s, locomotive builders aimed to produce diesel-electrics that would double the output of first-generation engines. But some railroads didn't want 3,000 hp locomotives and the complexities that went with them, so General Motors' Electro-Motive Division offered the 2,000 hp GP38.

Electro-Motive Division built 727 GP38s between 1966 and 1971. Offered at the same time as the GP40, the GP38 featured a non-turbocharged 16-cylinder 645E diesel engine. The simpler Roots

blower on the engine intake system was a selling feature to cost-conscious railroads because it cost less to maintain and reduced the cost of the locomotive.

In all, 25 railroads, from short lines to Class 1s, ordered GP38s. The GP38 was replaced by the GP38-2 in 1972.

These dependable locomotives often continued their careers with second or even third owners, showing up on the rosters of regionals and short lines well into the 2000s.

The model. Our review sample is painted in RailAmerica's red-and-gray scheme, but unlettered. This allows the model to be finished in any one of the roads that RailAmerica operates, but it's up to the modeler to supply decals. The model is also an early version GP38 with a modified dynamic brake blister to accommodate a paper air filter in place of the original equipment oil-bath air filter.

It's equipped with a 3,600-gallon fuel tank. Atlas offers a 2,600-gallon tank on some models, and it's listed as an available part on the exploded-view diagram. Photos of red-and-gray RailAmerica locomotives had either type of tank. I couldn't find a photo of an RA locomotive with the horn mounted above the headlight. All the photos I saw had horns mounted on the long hood

between the dynamic brake fan and the radiator fans.

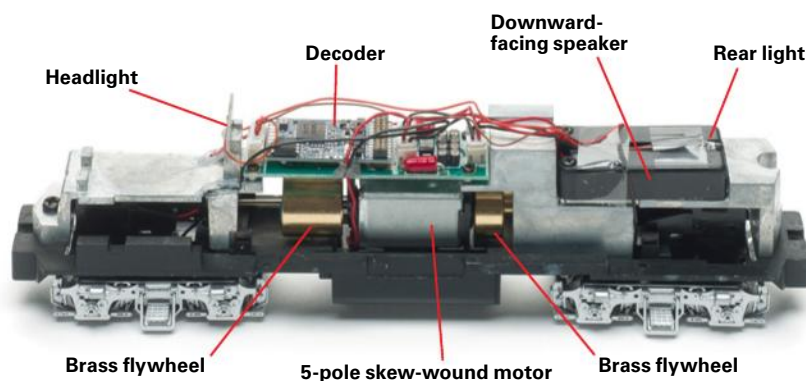
The model is well equipped with separate add-on details, including wire grab irons and lift rings, windshield wipers, cab sunshades, positionable drop steps, see-through end steps, and diamond plate walkways. The model matches dimensions published in the August 1967 issue of *Railroad Model Craftsman*.

The flexible plastic handrails are scale-sized and painted to match the body shell. Paint was applied evenly, with sharp separations between the colors and the white stripe between them. Warning signs on the long hood doors were all legible.

Under the hood. To remove the shell, I took off the couplers and fuel tank (it snaps off, but be careful of the brake piping). Then I used a small screwdriver to separate the body shell from the frame.

Now on ModelRailroader.com

Subscribers can see and hear the ESU LokSound-equipped Atlas GP38 in action hauling freight on the *Model Railroader* staff layout, the Milwaukee, Racine & Troy. Watch the video at www.ModelRailroader.com.



The Atlas Master Gold series GP38 includes an ESU LokSound Select Digital Command Control decoder. A die-cast metal frame supports the motor.

A can motor with two brass flywheels is mounted above the fuel tank area. Plastic and metal driveshafts transmit power to the trucks, driving all eight wheels. Die-cast metal weights are screwed to each end of the frame above the trucks, and a printed-circuit (PC) board is screwed to the weights.

The ESU LokSound Select Digital Command Control (DCC) decoder plugs into the PC board. A downward-facing speaker is mounted to the weight above the rear truck, and the locomotive picks up power from all eight wheels. The engine weighs 13.9 ounces.

Performance. As a dual-mode decoder-equipped locomotive able to run on DC or DCC layouts, the Atlas GP38 performed well on direct current (DC). The LokSound Select decoder played an engine start-up sequence at 6V, and the locomotive started to move at 6.8V at 1.1 scale mph. At 12V, the locomotive reached a prototypical 71 scale mph.

Screeching brake sound effects played when I quickly reduced the throttle setting as the locomotive came to a stop. As long as I kept the Model Rectifier Tech 4 power pack set above 6V, I could switch direction without the decoder replaying the start-up sequence. Only engine sounds and associated random sound effects play in DC. A DCC throttle or analog sound controller such as an MRC Tech 6 is necessary to access further sounds.

On DCC, the locomotive started moving in speed step 1 at 1 scale mph. It reached a top speed of 79 scale mph in speed step 28, within range of the prototype's available gearing.

Thanks to its back-electromotive-force (back-EMF) control, the model rolled smoothly at low speed. Even with a train in tow, the locomotive kept an

HO scale walking pace up a 3 percent grade. The automatic motor tuning feature ensures that the back-EMF settings are adjusted to a particular locomotive and operating environment.

The decoder also features many configuration variables (CVs) for fine-tuning locomotive performance, including setting up custom or preset speed tables.

A feature I really enjoy is the factory-programmed momentum that allows the diesel engine rpm sound to spool up before the locomotive moves, just as it does on the prototype. Although the factory settings were enough for me, there are CVs for further adjusting the acceleration and deceleration and every other aspect of the locomotive's performance. A free user manual is available as a PDF download at www.esu.eu.

Testing the locomotive on *Model Railroader's* club layout, the Milwaukee, Racine & Troy, I had fun switching cars on the Wisconsin & Southern Troy branch. Pressing F7 enables switching mode and doubles the speed steps for precise slow-speed control. It was easy to bring the locomotive up to a cut of cars slowly to couple up smoothly. I also enjoyed using manual notching in the yard, where I could increase or decrease engine rpm using function keys, independently of the locomotive speed.

In addition to the bell and horn, user-triggered sound effects include cab radio communication and a talking defect detector. All the sound effects feature individual volume control and all functions can be remapped to any throttle key.

Although our unlettered review locomotive didn't have a cab number, I tested out the address programming. I easily programmed the decoder for 2- and 4-digit addresses, and then reset everything back to factory defaults. I also

Atlas HO scale GP38

Price: \$149.95, DC, no sound; \$259.95, DCC and sound

Manufacturer

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

Era: 1966-present (depending on paint scheme)

Roadnames: Early version with paper air filter and modified dynamic brake blister: RailAmerica (unlettered), Central Oregon & Pacific, Connecticut Department of Transportation (New Haven), Louisville & Indiana, Terminal RR Association of St. Louis, Vermont Ry. (RailAmerica patchout), and undecorated.

Late version with paper air filter and modified dynamic brake blister: Alaska RR, BNSF Ry., Iowa Interstate, Maryland Midland, Norfolk Southern (horsehead herald, "First Responders" and "Operation Lifesaver schemes"), North Shore, and undecorated.

Features

- 5-pole skewed armature motor with dual flywheels
- Accumate knuckle couplers at correct height
- Detailed cab interior with crew
- Die-cast metal chassis
- Directional LED lighting
- Trainline and m.u. hoses
- Weight: 13.9 ounces

HO scale EMD GP38

Drawbar pull	3.5 ounces
	49 HO scale freight cars

Scale speed (DC)		Scale speed (DCC)	
Volts	Scale mph	Speed step	Scale mph
6.8 (start)	1.1	1	1
8	9	7	14
9	23	14	38
10	39	21	70
12	71	28	79

easily advanced consisted the locomotive for multiple-unit operation.

As Atlas continues to bring out new paint schemes for this model, I'm sure it will prove to be as popular with hobbyists as the prototype was with full-sized railroads. — Eric White, associate editor



▶▶ HO scale Pete's Garage kit

Price: HO, \$29.95; N scale, \$19.95; S, \$34.95; O, \$39.95

Manufacturer

Railroad Line Models

P.O. Box 704

Gorham, ME 04038

www.railroadlinemodels.com

Era: 1920s to present

Features

- Full-color printed paper signs
- Laser-cut matboard, plastic, wood, and peel-and-stick parts
- Simple assembly

Railroad Line Models offers easy-to-build matboard kit

Pete's Garage, one of the initial offerings from Railroad Line Models, is an easy-to-assemble kit that would fit on almost any layout from the late steam era to the present. The laser-cut matboard walls fit together well, and the peel-and-stick doors and windows were easy to paint. The finished model should please beginner and advanced modelers alike. I assembled and painted our HO scale sample in less than 3 hours.

Inside the package. The kit comes in a blister pack with an instruction sheet. Inside the package are four thick matboard walls, laser-etched with a cinder block pattern and notched to fit together at the corners; a sheet of laser-cut doors and windows; clear window glazing; wood roof trim pieces; a cardboard roof; self-stick rolled roofing material; two plastic gooseneck lamp castings; and a small sheet of colorful printed paper signs. Also included is 1/16" square stripwood for framing the large front door.

All that a modeler needs to finish this kit is a hobby knife, fine sandpaper, wood or white glue, a few colors of paint, and a paintbrush – truly an “E-Z Build” kit, as the package proclaims.

Assembly. Since matboard has a tendency to swell and warp with water-

based acrylic paints and glues, I started by spraying those parts with gray auto body primer. This would serve as the base cinder block color for most of the structure and seal the porous surface. The sheet of self-stick door and window parts I sprayed with Cinnamon Rust-Oleum Painter's Touch 2X Satin.

After the spray paint dried, I test-fit the parts and found that the notched ends were a little longer than they needed to be, resulting in raised blocks where they fit into the adjacent wall's notches. It was easy to sand them down to fit flush, and in fact, after sanding they looked much smoother and more masonry-like than the fibrous texture the paint brought out on some of the matboard. Next Railroad Line Models kit I build, I'll hit all the surfaces with a sheet of fine sandpaper before painting.

Though the matboard felt sturdy, I chose to install interior bracing of 1/8" x 1/4" stripwood from my own stockpile in the corners and along the walls.

As the picture on the instruction sheet recommended, I brush-painted the face of the building Reefer White and the lower five courses of blocks Southern Pacific *Daylight* Orange to complement the Cinnamon trim color.

I spray-painted the self-stick rolled roofing material black, then applied it to

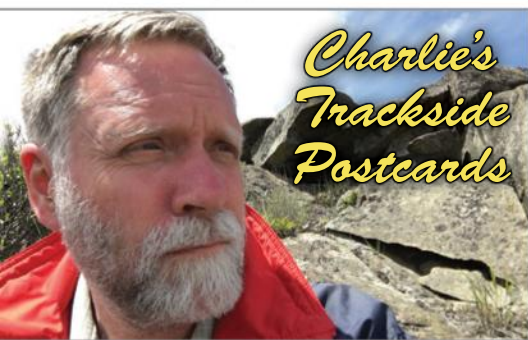
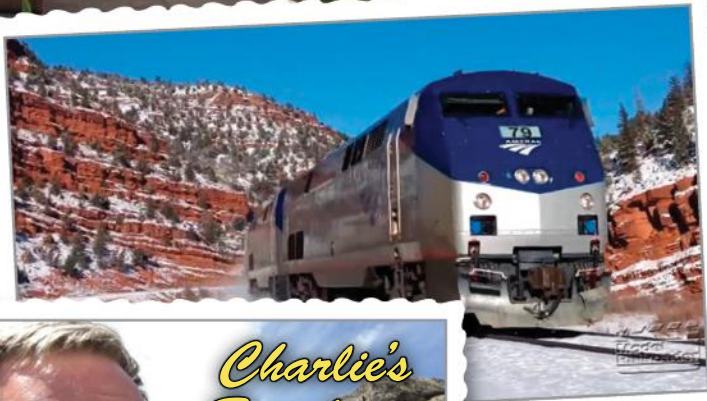
the cardboard roof and glued the roofing material in place. Next came the doors and windows. The final steps were to detail the building with the included gooseneck lamps and paper signs.

Welcome to the hobby. Though we received and built our kit in HO scale, it's also available in N, S, and O scales – good news for those who bemoan the lack of good laser-cut kits in their scales. Railroad Line Models also offers three other laser-cut kits, including a rail-truck transfer platform, a milk-and-produce platform, and a yard foreman's office with shed. I look forward to eventually building them all. – *Steven Otte, associate editor*



The kit contains laser-cut parts in many materials: matboard, plastic, wood, cardboard, and paper.

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PRODUCTREVIEWS

QUICKLOOK

Bachmann Trains N scale heavyweight coach

Price: \$79

Manufacturer

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

Era: 1930s to 1980

Comments: Looking to add a night train to your N scale passenger fleet? Bachmann Trains has released a ready-to-run N scale heavyweight coach with factory-installed overhead interior lighting.

The model is an N scale version of the HO model reviewed in the August 2015 issue. Like the HO version, the N scale coach is an accurately detailed model of a Pennsylvania RR P70 coach as it appeared after updating in the 1930s. The exterior of the car has finely molded rivet seams and other details that match prototype builder's diagrams and photos. Although the car is labeled a 72-foot coach, it actually measures a scale 80'-3¾" from end to end. This dimension as well as the

70 scale foot passenger compartment are correct for the P70 prototype.

Our review sample is decorated for New York Central in the road's 1940s paint scheme. The NYC had similar four-axle heavyweight coaches, but they were longer with an additional set of paired windows on each side. Bachmann is also offering the coach decorated for the Atchison, Topeka & Santa Fe; Baltimore & Ohio; Pennsylvania RR; and Union Pacific. Only the Pennsy is prototypical for a P70 coach, but the model makes a credible stand-in for the others.

Removing the press-fit body shell revealed the one-piece black plastic interior. The placement of the seats matches prototype interior diagrams.

Six screws hold the interior to the plastic chassis. A metal weight sandwiched between the interior and the chassis helps the car weigh in at 1.5 ounces, which is .1 ounce heavier than National Model Railroad Association Recommended Practice 20.1.

All the metal wheels pick up track power. The wheels are pressed into plastic axles to avoid short circuits. Metal strips from the truck sideframes touch contacts on the roof-mounted lighting board when the body is installed. The five surface-mounted light-emitting-diodes (LEDs) provide overhead lighting. A capacitor on the lighting board keeps the light constant during momentary power losses.

The coupler height and the wheel gauge are both within NMRA standards. I appreciated that the car has factory-installed body-mounted knuckle couplers for a prototypical appearance. A pair of user-installed Rapido-style couplers is included for those who prefer that option.

During testing I confirmed the car will easily run through an 11¼" radius, but it looks more realistic on curves of 15" or broader.

Especially for PRR fans, this Bachmann heavyweight would make a useful addition to an N scale passenger or commuter fleet. – D.K.



QUICKLOOK

Walthers HO Gunderson rebuilt 40-foot all-purpose well car

Price: \$39.98

Manufacturer

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

Road names: TTX (DTTX reporting marks with and without "Forward Thinking" slogan under modern TTX logo) and Northwestern Oklahoma (two road numbers). Three numbers per scheme unless noted.

Era: 2008 to present

Comments: A second intermodal car has been added to the Walthers Proto series of HO scale freight cars. The Gunderson rebuilt 40-foot all-purpose well car features die-cast metal construction, etched-metal see-through running boards in plastic frames, wire grab irons, and weld lines on the body.



Our sample is decorated as DTTX no. 455643. The prototype started life as a 48-foot car built in 1994 (part of the DTTX 427000 through 427293 series) and was operated in a drawbar-connected three-unit set.

In 2008, the car was shortened by removing eight feet from the middle. During the rebuild, the fifth-wheel hitches were also removed. After rebuilding, the car was reassigned to the DTTX 455000 through 455881 series. It operates as a stand-alone car.

The Walthers model closely follows prototype data published in the January 2016 *Official Railway Equipment Register* (IHS Maritime & Trade, 2016). A few items were omitted, such as the grab irons on the ends and the lift rings on the sides.

Empty, the well car weighs 4.2 ounces, which is 1 ounce too light per National Model Railroad Association recommended practice 20.1. The body-mounted Proto-Max couplers are at the correct height. The 33" metal wheelsets are correctly gauged.

The car operated smoothly in a train on our Wisconsin & Southern project layout, navigating the no. 5 turnouts and 30" radius curves without incident. I tested 20- and 40-foot containers in the well, and both fit fine.

Kudos to Walthers for releasing the 40-foot version the Gunderson rebuilt well car. The car, along with the 53-foot version I reviewed in the April 2016 issue, will make great additions to any modern-era intermodal train. – Cody Grivno, associate editor

Three kinds of train orders

A reader asked me how to distinguish between three forms of train orders used to move opposing trains over single track. This put me in a dispatcher's shoes, pondering how I would choose from a *right over*, a *time order*, and a *meet*.

These forms differ. A right over order confers superiority. A time order establishes or modifies a schedule. A meet specifies where the trains it addresses must meet. The first two allow dispatchers and crews more flexibility in the movement of trains, while a meet order is rigid and absolute.

Right Over. Let's work through examples of these forms, starting with a right over. Trains No. 9 and No. 10 are first-class trains between stations A and E. No. 10 is superior by direction. They are scheduled to meet at C at 10:00 a.m., but No. 10 is running an hour late. No. 9, the inferior train, must respect No. 10's schedule. If it arrives at C on time, it will see a substantial delay waiting for the overdue train.

Dispatcher (DS) addresses Order No. 4, a Form S-C, to both trains whose movements it affects:

NO 9 HAS RIGHT OVER NO 10 E TO A.

Rule 70 states that one train is superior to another by right, class, and direction. It also states that right, which is conferred by train order, is superior to class and direction.

Order No. 4 makes No. 9 superior to No. 10, allowing it to proceed from C on schedule. The order doesn't hold No. 10 at A but it requires the train to respect No. 9's schedule. If No. 10 makes up time and can clear the main track at B five minutes before No. 9's scheduled arrival there, it may proceed. Most of all, the order makes it possible for No. 9 to arrive at A on the advertised.

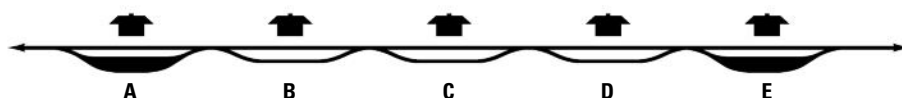
Complications arise. Shortly after 3 p.m., the Chief Dispatcher instructs DS to expedite Extra 27 East from A to E. The extra can't depart A because an opposing second class train, No. 201, superior by class, is overdue there. The yardmaster at E says that No. 201 will be ready to depart soon, considerably late.

DS dictates a Form E time order, Order No. 7:

NO 201 RUN TWO HOURS LATE E TO A.

EASTWARD		North River & Hudson Hudson River Division Time Table No. 33 April 30, 1961	WESTWARD	
First Class	Second Class		First Class	Second Class
10	202		9	201
Daily	Daily		Daily	Daily
A.M.	P.M.		A.M.	P.M.
9.00	4.30	A	11.00	3.00
9.30	5.10	B	10.30	2.20
10.00	5.50	C	10.00	1.40
10.30	6.30	D	9.30	1.00
11.00	7.10	E	9.00	12.20
A.M.	P.M.		A.M.	P.M.

EASTWARD TRAINS ARE SUPERIOR TO WESTWARD TRAINS OF THE SAME CLASS



To move the trains listed in this timetable across the railroad from station A to E (or vice-versa), a dispatcher may have to call upon three types of train orders – right over, time order, and meet – to arrange meets. Illustration by Rick Johnson

This order modifies No. 201's schedule, adding two hours to each time it contains. It allows Extra 27 East to depart A and proceed against No. 201's new, later times.

Order No. 7 must be addressed and delivered not only to No. 201 and Extra 27 East, but also to all other trains inferior to No. 201. Each must receive a copy until No. 201 fulfills its schedule. If the dispatcher or an operator errs and clears another train without it, that train will see delay. It must assume No. 201 will run on its unmodified schedule.

Here's a wrinkle. No sooner than DS completes this order, the yardmaster at E starts spitting fire because a derailment has his yard bottled up. Expecting things to get worse before they get better, he refuses to estimate additional delay to No. 201 and says so in no uncertain terms. Meanwhile, the Chief goes on the warpath about getting the extra moving.

Calm and collected, DS annuls Order No. 7 and chooses a variation of Form S-C for Order No. 9:

EXTRA 27 EAST HAS RIGHT OVER NO 201 A TO E AND WAIT AT:

B UNTIL 3:41 P.M.

C UNTIL 4:21 P.M.

D UNTIL 5:01 P.M.

This order gives Extra 27 East superiority over No. 201 and specifies times at

which it may depart B, C, and D. These times have the effect of a schedule.

No. 201 may proceed against this schedule as soon as it can get out of the yard, but Rule 87 demands it clear the main at least five minutes before the extra's times at any of the intermediate stations.


Order No. 9 affects the movements of only two trains, Extra 27 East and No. 201. It has the same effect as Order No. 7, but it has important advantages. It expedites the extra, calming down the Chief. It also eliminates the need for other trains to have copies, reducing paperwork and the chance of error.

Other options. A Form S-A meet order would also have handled either of the first two situations, as follows:

NO 10 MEET NO 9 AT B.

EXTRA 27 EAST MEET NO 201 AT C.

As I mentioned, however, a meet order is rigid and absolute. Either of these meet orders might have caused additional delays. No. 9 would see delay at B if No. 10 became later. Similarly, if the yardmaster's ominous hunch came true, Extra 27 East might wait indefinitely to meet No. 201 at C.

Getting a handle on such situations, anticipating their consequences hours ahead, and acting appropriately makes a good dispatcher, no matter what scale the railroad he's working. 

TRACKSIDEPHOTOS





Great Model Railroads 2017 features articles, photos, and track plans from 10 spectacular layouts. This month, Trackside Photos highlights five of those layouts. *Great Model Railroads 2017* goes on sale Oct. 18 at your local hobby store. You can also order directly from our Customer Service hotline at 800-533-6644 or from our website at www.KalmbachHobbyStore.com.

◀ Brakes smoke as an eastbound M1a Mountain locomotive eases its train down Horseshoe Curve while railfans watch the action. The iconic scene is the focal point of Dave Johnson's HO scale Pennsylvania RR Pittsburgh Division layout. Dave also shot the photo.

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This month, we're offering free downloadable computer wallpaper from all 10 layouts featured in *Great Model Railroads 2017*. Find them under Online Extras on our website, www.ModelRailroader.com.

TRACKSIDE PHOTOS



► San Bernardino Station hosts the eastbound local from Victorville while the westbound *Super Chief* passes through. Scale Rails of Southwest Florida train club member Stan Seeds scratch-built the station for the club's HO scale layout. Lou Sassi took the photo.

► Denver & Rio Grande Western no. 464, a class K-27 Mikado recently leased to the San Juan del Oro RR, brings a mixed train into town while a freight rumbles by overhead. Eduardo Romo built his 6 x 10-foot HO scale layout after catching the narrow gauge bug on a trip to Colorado. The photo is by Bob Werre.





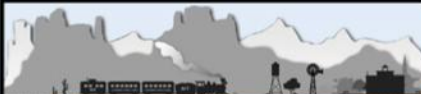
▼ An eastbound freight passes United Grain, an elevator complex that has both its original wooden storage bin and modern steel storage bins, in Agenda, Kan. Ken Jenkins scratchbuilt grain elevators for years before he had space to build his HO scale Rock Island layout. Paul Dolkos shot the photo.



◆ A St. Louis-San Francisco ("Frisco") SW1500 switcher works Kansas City's Central Industrial District, a.k.a. the West Bottoms. The desire to model the area's concrete and brick canyons inspired Jim Senese's HO scale Kansas City Terminal RR layout. Paul Dolkos shot the photo.

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Note to Readers: Show dates, times and locations sometimes change. Confirm the details before driving any distance.

Schedule of Events

CA, SIMI VALLEY: Swap Meet, Santa Susana Railroad Historical Society, Santa Susana Park, 6503 Katherine Rd., October 22, 2016, 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@santasusannadepot.org

CT, WINSTED: Train Show at Whiting Mills by Whiting Mill Shops & Studios, 100 Whiting Street. October 16, 2016, 10:00am-4:00pm. Admission Free. Parking Free. Enjoy train layouts, photos, artists, white elephant train tables sales and more. Handicap accessible. Contact Roger Moreau @ 860-379-3383. Email: sales@rrhobbysupply.com

FL, DEERFIELD BEACH: South Florida Railway Museum Train Show/Museum Open House. Westside Park, 445 SW 2nd Street. Saturday, October 29, 2016, 9:00am-3:00pm. Admission \$2.00. Tables sales: Bill Steffen, 561-441-6952, www.sfrm.org

FL, JACKSONVILLE: TCA Train Show. Morocco Shrine Auditorium, 3800 St. Johns Bluff Rd. Saturday November 19, 2016, 10:00am-3:00pm. Directions: I-95 exit 349 to FL 228 to Beach Blvd. to St. Johns Bluff. Adults \$5.00, under 12 free. Displays, layouts, for "Show Special". Contact Chuck Bryner, Bryner@comcast.net 904-272-7060

FL, OCALA: Lions Semi-Annual Train Show. Ocala National Guard Armory, 900 SW 20th St. Saturday, November 5, 2016, 9:00am-4:00pm. Adults \$4.00, children 12 and under free w/adult. Bring two canned goods and receive \$1.00 off admission. Information: Bob 352-694-6381 or cell 352-208-5284

FL, PORT RICHEY: Toy Train, Collectible and Hobby Show/Sale, 5850 K of C Drive. Saturday, November 19, 2016, 9:00am-2:00pm. Admission: \$5.00 adults, 12 and under free. Vendors, operating layout, Lunch items for sale. Contact Joe, 727-244-1341, visit: www.regalrailways.com for more information.

IA, HAMPTON: NCIMRRC Train Show, Franklin County Convention Center, 1008 Central West, Sunday, October 30, 2016, 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, ST. CHARLES: 25th Annual Chicago Railroadiana and Model Train Show. Kane County Fairgrounds, 525 South Randall Rd. Sunday, October 16, 2016, 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, DANVILLE: Central Indiana Division- NMRA Annual Train Show, Hendricks County 4H Fair Grounds. Saturday, November 19, 2016, 10:00am-3:00pm. Admission \$3.00 adult, \$5.00 family. Operating layouts, clinics, food, dealer tables 8' at \$16.00 Info: gtwfan@bluemarble.net or 812-876-6799. CID website: <http://cid.railfan.net>

IN, EVANSVILLE: Evansville All Gauge Model Train and Railroadiana Show. St. Paul's UCC, 2227 West Michigan Street, Zip: 47712. Saturday, November 12, 2016. Gates open 10:00am-3:00pm CST. Admission \$3.00, under 12 free. Vendors, operating trains, test track, food available. Contact John 812-426-2989

IN, INDIANAPOLIS: The Indianapolis Model Railroad Show and Open House. Manual High School Gymnasium, Saturday, December 10, 2016, 10:00am-3:00pm. Admission \$5.00, children 12 & under free. Boy Scouts in uniform free. Free parking. Naptown & White River Model Railroad Club. Contact: Steve Handly, 317-786-8627, E-mail: naptownmrr@gmail.com

IN, MICHIGAN CITY: Duneland Model RR Club Train Show and Swap Meet. IBEW Building, 301 East 8th St. Sunday, November 20, 2016, 9:30am-2:00pm (Chicago time). Adults \$3.00, youths 6-13 \$1.00, 5 and under free. Contact: Dave Novak at trains86@frontier.com or 219-778-1186.

IN, TIPTON: Antique Toy & Train Show. Tipton 4-H Fairgrounds, 1200 S. Main St., Zip: 46072. Saturday, November 12, 2016, 11:00am-3:00pm. Adults \$5.00, 13-18 \$1.00, 12/under free. 100+ tables, all gauges, kits, free parking, working models, food, drink. Contact: David Moore, 4402 East 100 South, Kokomo, IN 46902, 765-457-1044.

KS, ARKANSAS CITY: Annual Model Train Show. Sponsor: Wichita Toy Train Club, Agri-Business Building, 712 W. Washington Avenue. November 5-6, 2016, Saturday 9:00am-4:00pm and Sunday 10:00am-3:00pm. Admission \$5.00, under 12 free w/adult. Dealers from four states. Information: javen1927@gmail.com or 316-253-5918, also see www.wichitatoytrainclub.org/club-shows-1.html

MA, MARLBOROUGH: Hub Division NER/NMRA. Royal Plaza Trade Center, 181 Boston Post Road West (Rte. 20). December 3-4, 2016, Saturday 10:00am-5:00pm and Sunday 10:00am-4:00pm. Admission \$10.00; Children under 12 and Scouts in Uniform FREE. Admission good both days. Information: Mark 508-528-8587; E-mail TE.info@hubdiv.org; Website: www.hubdiv.org

MD, GAITHERSBURG: 11th Annual Gaithersburg Model Train Show. Montgomery County Fairgrounds (Old Auditorium), 12 miles NW of Washington. Sunday, November 6, 2016, 9:00am-4:00pm. Adults: \$9.00 (under 12 free). Operating layout. Miller, 3106 N. Rochester St., Arlington, VA 22213. 703-536-2954. E-mail: rrshows@aol.com

ME, BREWER: Eastern Maine Model Railroader Club Show. Jeff's Catering in Brewer, 15 Littlefield Way. Saturday, November 19, 2016, 10:00am-3:00pm. Admission \$4.00 for adults, under 12 free. Dealers, silent auction and operating layouts. Geoff Anthony, PO Box 187, Blue Hill, ME 04614, 207-374-2786, dahak@roadrunner.com

MI, EAST LANSING: Lansing Model Railroad Club Show and Sale. Michigan State University Pavilion. Sunday, November 13, 2016, 10:00am-4:00pm. Admission \$6.00, under 12 free. Michigan's largest show: layouts, demonstrations and 500+ tables. Free parking. Flyer, table forms and map www.lmrc.org or call Nathan Carver 517-449-0370.

MI, KALAMAZOO: Southwest Michigan Train Show & Sale. Kalamazoo County Expo Center, 2900 Lake Street. Sunday, October 30, 2016, 10:00am-3:00pm. Admission \$6.00; Children 10 and under free. Presented by Kalamazoo Model Railroad Historical Society. Contact David Hayes-Moats 269-344-0906, www.kmrhs.org

MN, WOODBURY: Newport Model RR Club Flea Market & Train Show. Woodbury High School, 2665 Woodland Drive, Zip: 55125. October 15, 2016, 9:00am-2:00pm. Admission \$5.00. Future Shows: January, 14, 2017, April 29, 2017. Club Address: Newport Train Club, PO Box 0061, St. Paul Park, MN 55071. Contact: Ed, 651-233-3310

MO, CARTHAGE: 33rd Annual Southwest Missouri Railroad Association Show - Swap Meet. Fairview Christian Church, 2320 S. Grand Ave. October 15, 2016, 9:00am-4:00pm. Adults \$3.00, under 12 free. Tables 8' \$12.00 or 6' \$10.00 round tables. Crafters Welcome! Contact Pam Parcell, 417-540-0692, swmra@hotmail.com or 901 East 9th, Joplin MO 64801.

NH, LINCOLN: Ammonoosuc Valley Railway Association 37th Annual Railroad Show. Lin-Wood High School. October 29, 2016, 10:00am-3:00pm. Multiple scale working layouts, dealers, kids activities. Admission \$4.00 adults; \$10.00 family max; under 16 free with adult. For further information 603-747-2269, choochoochas@yahoo.com

NH, ROCHESTER: The Great Northern New England Train Show. American Legion Post #7 Hall, 94 Eastern Avenue. Saturday, November 12, 2016, 10:00am-3:00pm. Admission: \$5.00 per family. Dealer tables \$25.00 (includes entrance fee). All scales, operating layout, raffle, food. Contact Ed Martin, efmterner@aol.com or 603-362-4300.

NM, ALBUQUERQUE: Rails Along the Rio Grande Model Train Show. Sid Cutter Pilot's Pavilion, Balloon Fiesta Park, 9401 Balloon Museum Drive NE, north of Alameda Blvd. (Highway 528). November 19-20, 2016, Saturday 9:00am-5:00pm and Sunday 9:00-4:00pm. Admission \$5.00/person, under 12-FREE. Operating layouts, new/used model trains, accessories. Contact: Pat Hepburn, 505-891-9796, phepburns@aol.com www.railsalongtheriogrande.org

NY, ALBANY: "Great Train Extravaganza." Empire State Convention Center. December 4, 2016, 10:00am-4:00pm. \$7.00 adults, children 12 and under free. Operating layouts. 200+ tables of model trains, train sets, parts, accessories, scenery items, books, videos, DVDs, prints, railroad memorabilia. Educational displays. Clinics. www.gtealbany.com 518-668-9892, trains@gtealbany.com

NY, JAMESTOWN: Upstate New York Chapter TCA Train Show. Jamestown Ice Arena, 319 West Third St. Saturday, November 12, 2016, 10:00am-3:00pm. Adults \$5.00, under 17 free with paid adult. Contact: Chuck 716-390-8216 or E-mail: usnyc2015@gmail.com Web Site: www.upstate-ny-tca.com

NY, KINGSTON: Kingston Model Train and Railroad Hobby Show. Murphy Midtown Center, 467 Broadway. Sunday, October 30, 2016, 10:00am-4:00pm. Adults \$6.00, kids under 12 \$1.00, 11,000 sq. ft. Operating layouts, dealer, vendor tables, Thomas the Tank engine and LEGO trains. Information: www.kingstontrainshow.com or e-mail kingstonmtr@aol.com

OH, MASSILLON: CJ Trains Winter Massillon Train and Toy Show. Knights of Columbus Hall, 988 Cherry Road NW, 44647. Sunday, December 11, 2016, 10:00am-3:00pm. \$5.00 admission, 12 and under free. \$25.00/dealer table, 150' x 8' dealer tables. Jon Ulbricht, 941 Buchholz Drive, Wooster, OH 44691, 330-262-7488, cathjion@ssnnet.com www.cjtrains.com

OH, SPRINGFIELD: Dayton Train Show, Upper Valley Mall in the former Elder-Beerman Dept. Store, 1475 Upper Valley Pike. November 5-6, 2016. Saturday 11:00am-5:00pm and Sunday 11:00am-4:00pm. \$7.00, active military \$6.00, 12 and under free. Rick Lach, PO Box 341233, Dayton, OH 45434, 937-426-2015, chair@daytontrainshow.com

OH, SUGARCREEK: Old Eli's Train & Toy Show. Valley View Church, 2772 Simons Dr. NW. Saturday, October 29, 2016, 10:00am-4:00pm. Adults \$4.00, children under 12 free! \$10.00/table advance, no refund, 125+ tables available. Contact: Galen Eli Hoover, PO Box 45, Mt. Hope, OH 44660, Phone: 330-763-1184.

OH, VANDALIA: Crossroads Railroad Club Annual Open House, 304 N. Dixie Drive, Zip Code: 45377. November 12-13, 2016, Saturday 11:00am-5:00pm and Sunday noon-4:00pm. Admission: Free! Refreshments. Contact: Ralph Daniels, 937-439-4083, E-mail: ralphdaniels@woh.rr.com

PA, HORSHAM: 11th Annual Main Street Hatboro Train Show. Keith Valley Middle School, 227 Meetinghouse Rd. Saturday, December 3, 2016, 9:00am-3:00pm. \$5.00 adults, under 12 free. 145+ vendor tables in cafeteria and gym. Contact Al Zollers, azollers06@verizon.net or Joe Lutz J040440@verizon.net or www.hatborotrainshow.org

SC, CHARLESTON: Charleston Area Model Railroad Club Annual Train Show. Danny Jones Armory Park, 5000 Lackawanna Blvd., North Charleston, SC. November 19-20, 2016, Saturday 9:00am-5:00pm and Sunday 10:00am-4:00pm. Adults \$5.00, kids 12 and under free. For table information contact the club at trainshow@chamrc.com or www.chamrc.com

SC, COLUMBIA: South Carolina Trade Shows. Jamil Temple, 206 Jamil Road, Zip: 29210. Saturday, December 10, 2016, 9:00am-3:00pm. Admission \$5.00, under 12 FREE. Over 250 tables of Model Trains. Contact Todd Pletcher, 843-307-8674, www.SouthCarolinaTradeShows.com

SC, MYRTLE BEACH: GSMRRC 7th Annual Myrtle Beach Train Show. Inlet Square Mall, Unit 45, 10125 Hwy.17 ByPass, Murrells Inlet, SC 29576, 843-651-6990. November 12-13, 2016, Saturday 10:00am-5:00pm; Sunday 10:00am-4:00pm. Adults \$5.00, 12/under free. Vendors, Operating Layouts, Door Prizes, (32,000 sq. ft. available). Contact Joe Corsetti, 843-236-9148, yrusoslo728@aol.com

TN, JACKSON: (GM&OHS) Gulf, Mobile & Ohio Historical Society Annual meeting, convention and train show. Comfort Inn and Casey Jones Museum, 30 Casey Jones Lane. (US 45 bypass I-40). October 21-23, 2016. Railroadiana show Saturday 9:00am-3:00pm at museum, Admission \$6.50, senior 50+ \$5.50, children 6-12 \$4.50. Info: www.gmoahs.org or www.caseyjones.com

TX, NEW BRAUNFELS: Annual Fall Model Train Show. New Braunfels Civic Center, 390 S. Seguin Ave. October 29-30, 2016. Saturday 10:00am-5:00pm, Sunday 10:00am-4:00pm. Adults (over 14) \$8.00, children (5-13) \$2.00. 275+ tables, layouts including Legos, silent auction, refreshments, O&S scale trains, museum. Info: www.nbrmm.org Jim Edmondson 830-629-2071

VT, BARRE: Vermont Rails Show, Barre Auditorium, 20 Auditorium Hill, Interstate 89, Exit 7. Saturday, November 5, 2016, 10:00am-4:00pm. Adults \$5.00, children 6-12 \$1.00, children under 6 free. Sponsor: NWV Model Railroad Association. Contact Ron Piro, 802-598-0905, www.nvrrailroad.org

WA, KENT: Boeing Employees Model Railroad Club Annual Swap Meet, 525 4th Avenue North, Kent Commons. November 12, 2016, 9:30am-4:00pm. \$8.00 admission, under 16 free. Ed Sherry, 550 SW Colewood Lane, Normandy Park, WA 98166; 206-244-3884; swapmeet@bemrcr.com

WI, LA CROSSE: Burlington Route Historical Society Annual Railroad Sale & Swap Meet. Days Inn, 101 Sky Harbour Drive, Airport Exit 2. October 30, 2016, 9:00am-3:00pm. Admission \$5.00, under 12 free. All Scales: Model, Toy & Antique Trains, Memorabilia and much more. Information: 608-781-9383 donanthony052@centurytel.net

WI, MILWAUKEE: Trainfest, at Wisconsin State Fair Park. November 12-13, 2016, 9:00am-5:00pm. 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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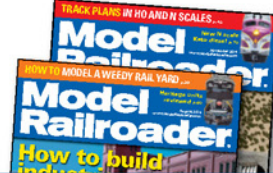
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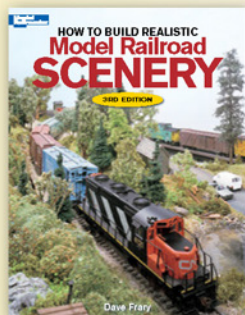


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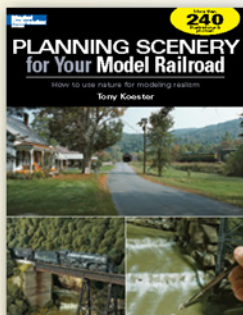
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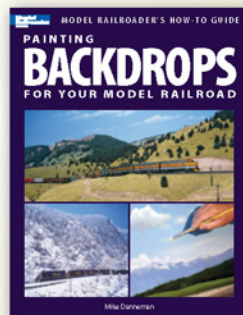
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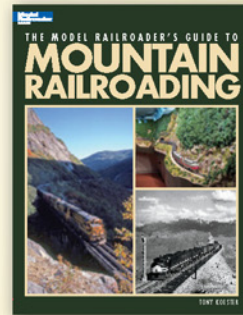
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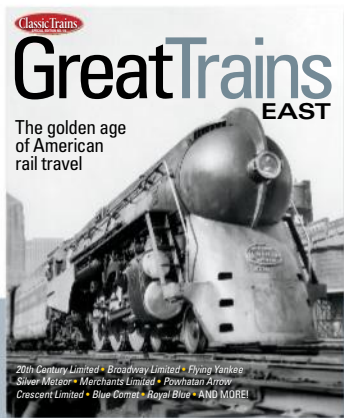


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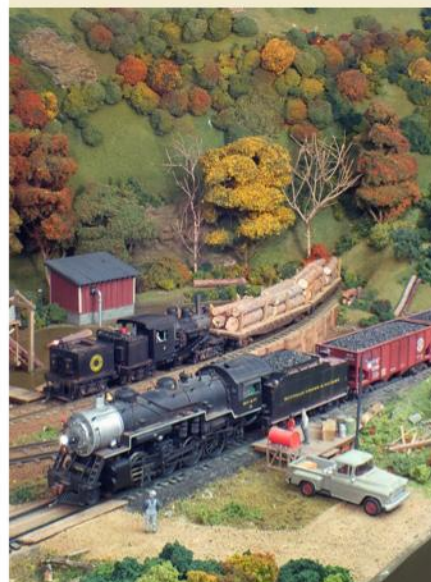
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Beyond running trains



General yardmaster Jim Dalberg (left), yardmasters Jim Leighty and Todd Sullivan, and hostler Joe Lombardi are having a great time at Ted Pamperin's C&O operating session, but only Jim has a throttle in his hand. Dave Olesen photo

I suspect that newcomers to our hobby think of model railroading in one of two ways: building models of structures or rolling stock, or “hands-on” running trains. It’s only when they walk a bit deeper into the woods that other opportunities begin to show themselves.

To be sure, some of us never move on to other goals. We remain satisfied by building models and seeing our trains strut their stuff on our layouts.

In fact, the term “layout” is indicative of this approach. I seldom refer to the Nickel Plate’s St. Louis Division that resides in my basement as my “layout.” It’s my railroad, and I’m not even sure about the “my” part. If I’ve done a good job of replicating in miniature what once existed along portions of that division, it’s not something I can claim as mine. It belongs to history.

I can’t even claim that it’s “my railroad” in an operational sense. I can provide guidance as defined by my knowledge of what actually happened on the prototype in the era I’ve elected to model. But the railroad truly belongs to my operating crews when the fast clock starts ticking away the minutes of a simulated day in Nickel Plate country circa 1954. Without their concerted involvement, the railroad is an expensive, dust-gathering display.

It takes about 18 to 20 operators to bring the St. Louis Division’s Third Subdivision back to life. Perhaps six of them will actually be running trains out on the Third Sub, but most of them will have other duties to perform. To wit, we need a dispatcher to keep things moving in an orderly manner and two operators to work with him to alert train crews to


his amendments to their published schedules. A chief dispatcher works with a general yardmaster at Frankfort, Ind., to decide whether sections of scheduled trains or extra trains will be needed to keep the yard fluid. That’s five crew members right there.

Frankfort’s general yardmaster works with east- and westbound yardmasters and the roundhouse foreman to be sure trains move in and out of the two yards efficiently. He also keeps an eye on the Commercial Engine and Bean Plant jobs. The tally is now up to nine. And there’s a separate crewman who brings trains into and takes them out of Frankfort on the three staged divisions that radiate out of the city. That’s 10, and we haven’t moved a train over the Third Sub yet.

Add a yardmaster and roundhouse foreman at the other end of the subdivision in Charleston, Ill., and we have a dozen guys and gals employed. Only now can we start to assign road crews, preferably two to a train: one to focus on the schedule and train orders, the other to orchestrate en route switching. There are typically five scheduled freights, several sections, maybe an extra or two, and one passenger train to find crews for during the noon-to-midnight or mid-night-to-noon operating cycle.

What do I do? Model railroads can be rather complex machines with layers of instructions to deal with even when everything is working well. Keeping everyone clear as to what’s expected and fixing minor glitches – there are always annoyances – is my job. Once in a great while, I’m asked by the chief dispatcher to run a train when we are short of road crews. The pained look on his face makes it clear that I’m his last resort.

So there I stand after spending a decade and a half of time and a lot of money on a model railroad that I don’t even get to operate. I’m sure that’s how many of you may view the situation. But I can assure you that this is exactly how most owners of sizable home layouts interact with their railroads. They build them to see a specific time and place come back to life.

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