

**SPECIAL
TRACK ISSUE!**

Varney kit built to 2017 standards p.24

**Review: Atlas
transit set** p.60

July 2017
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Track & turnouts

- Ballast & weather track p.36
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ADVICE**
on every
page!

PLUS

**Add DCC sound
to a Life-Like
E6 diesel** p.58

**HO scale urban
waterfront
layout** p.42



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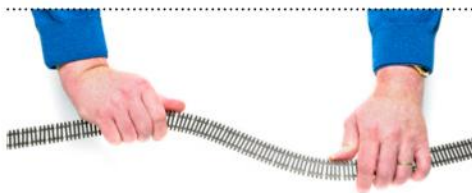
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SPECIAL TRACK ISSUE

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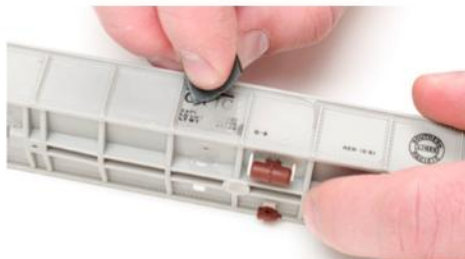
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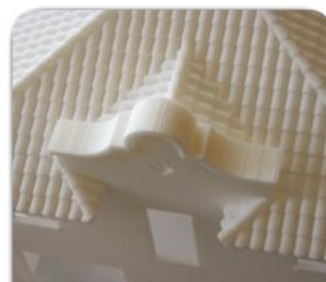
Modeling from memories

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On the cover: A track gang works on the railroad in the 1960s. This month's focus is on track for your layout.

Bill Zuback photo



Next issue

In August, learn how to model a large HO scale structure using 3-D printing, visit the relocated Hoosac Valley RR and a Z scale layout in France, and more!



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If You Want Amazing Track, You Want Atlas!

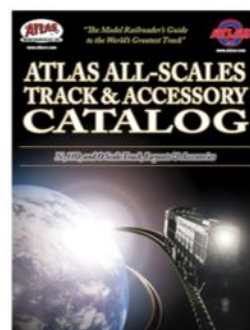


One of the biggest choices you'll make when building your first layout (or even your fiftieth) is also the most important building block. You'll want something that is reliable so you can spend more time running trains and less time troubleshooting and realistic enough to make people wonder if they're looking at an actual railroad. That's why you need Atlas track.

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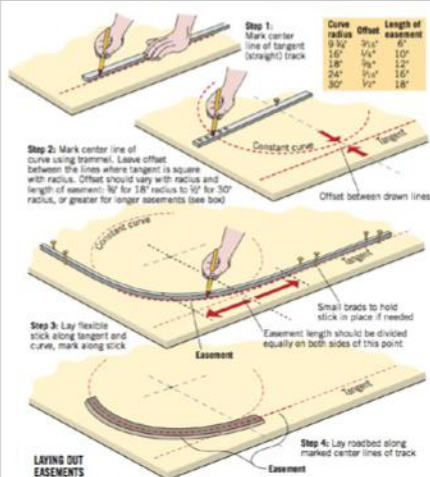
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Looking for more ideas, tips, and step-by-step projects? Click on the Videos tab at www.ModelRailroader.com. You'll find hundreds of videos on all aspects of the hobby, including techniques for laying and ballasting model railroad track. For immediate access to even more in-depth videos, be sure to sign up for Model Railroader Video Plus!

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Click on the **How To** tab at the MR home page to browse dozens of online articles and tips, including this handy technique for making smoothly flowing curves in model railroad flextrack.

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MR VIDEO PLUS



Handlay a turnout

On page 32 contributing editor Tony Koester shows how to improve ready-built turnouts. If you're an MR Video Plus subscriber, you can watch Tony show you how to handlay a turnout in this two-part video.



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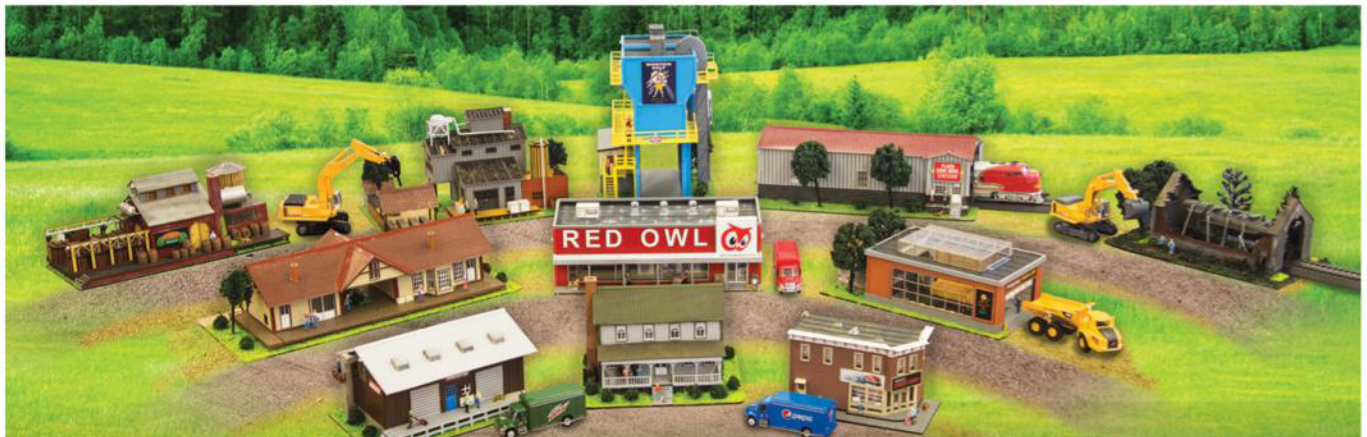
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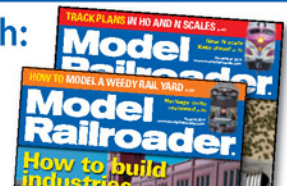
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Keeping your hobby hoard manageable

I've had the sobering

experiences of cleaning out a basement and a full house of two friends who had died. One was a longtime model railroader and the other was a collector of odds and ends.

Both jobs were initially overwhelming, almost to the point of tears. Far too much stuff that might have been useful, but in the end wasn't, now had to be sold, given away, or simply thrown out.

But in the end, piece by piece, day by day, the jobs were completed.

Both experiences led me to take a hard look at my hobby hoard, and all the other adjacent stuff I've accumulated over several decades.

I'm no different than other model railroaders. I've never met a tool I didn't like. I stare at plastic packaging material and think about its scratch-building potential. I save parts from broken projects.

I save scraps of decals. I save short pieces of wire. The list goes on and on and on.

But those two cleaning experiences have opened my eyes. Here's what I learned.

First, you don't have to clean up all at once. Do a little at a time, but don't stop. My goal now is to toss, sell, or give away at least one thing in my basement each week.

Second, get rid of anything that's been boxed up for so long that you don't remember the last time you opened it. Give it to friend, or even better, a new model railroader who will enjoy it. (If you were enjoying it, the item wouldn't still be in the box.)

Third, be practical when buying parts and supplies. My model railroad friend bought literally hundreds of detail parts to stockpile for future use, only to find years later that newer locomotives – which he also bought – came

with those details installed, straight out of the box.

Fourth, don't even joke about leaving the task to your spouse or your children. You do not want them to have the two eye-opening experiences that I had.

And lastly, keep a supply of black plastic garbage bags handy. The urge to clean will strike at any time.

Something we didn't have the heart to toss into a black plastic bag while cleaning the basement was an unbuilt Varney gondola kit.

The unassuming HO scale model was manufactured in the 1950s (?), and its plastic pieces and instruction sheet sat unmolested in a red cardboard box for decades.

I brought it to our offices, stared at the box for a week or two, and inspiration struck.

I asked associate editor Cody Grivno if it could be



built to today's modeling standards instead of those of the 1950s. Cody said sure, and his work is on page 24 in this month's issue.

Finally, who built this month's cover diorama?

None other than Cody, who has an affinity for the Great Northern Ry. and its successor, the Burlington Northern RR, and sneaks them into scenes whenever he can.

NEIL BESOUGLOFF

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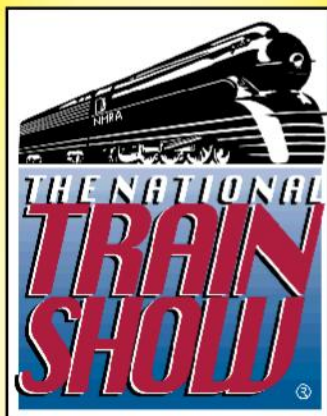
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Electro-Motive Division SD40-2 diesel locomotive. Athearn offers this six-axle road unit decorated for Burlington Northern (American Revolution Bicentennial paint scheme in one road number and Cascade Green), Chicago & North Western (Falcon Service and as-delivered schemes, two numbers each), Norfolk & Western (high short hood), Missouri-Kansas-Texas, and Southern Ry. (high short hood).

Each paint scheme is offered in four numbers unless noted. The HO scale Ready-to-Roll locomotives have prototype-specific details, all-wheel electrical pickup, and see-through dynamic brake and radiator fans. Direct-current model with eight- and nine-pin plugs for Digital Command Control decoder sell for **\$134.98**. Models with RTR Sound are priced at **\$184.98**. Athearn Trains, 888-959-2307, www.athearn.com

Gulliver's Gate opens

A new HO scale model railroad exhibit opened in April. Gulliver's Gate, a football field-sized display in New York's Times Square, features well-known scenes from around the world and fictional locations.

The exhibit showcases several modes of transportation, including more than 10,000 vehicles, many of which operate; a working airport; and a 475-foot main line. In addition,

visitors can be scanned and have a figure made that will be permanently added to the exhibit.

Gulliver's Gate is at 216 W. 44th St. in Manhattan. Hours are 9 a.m. to 10 p.m. daily, with last entry at 8:30 p.m. Admission is \$36 for adults and \$27 for children 12 and under and senior citizens 65 and older. For more information, visit www.gulliversgate.com.



A New York, New Haven & Hartford commuter train hustles past a station on the recently opened Gulliver's Gate HO scale exhibit in New York. Photo courtesy Gulliver's Gate/Pascal Perich

HO scale locomotives

- **Electro-Motive Division GP40-2 diesel locomotive.** Burlington Northern (white face), Canadian Pacific (beaver herald), Chessie System (Baltimore & Ohio and Chesapeake & Ohio reporting marks, two road numbers each), Conrail, Union Pacific, and Western Pacific (green and orange). Three numbers per scheme unless noted. Five-pole motor with dual flywheels, 8- and 9-pin plugs for Digital Command Control decoder, and Celcon handrails. \$99.98. January

2018. Roundhouse line. Athearn Trains, 800-338-4639, www.athearn.com

- **Electro-Motive Division GP39-2 diesel locomotive.** New paint schemes: CSX (dark blue and yellow), Delaware & Hudson (blue, gray, and yellow), Reading (green and yellow), Union Pacific (red sill stripe), and Wisconsin & Southern (35th anniversary lettering, one road number). Two numbers per scheme unless noted; also available undecorated. Drill-starter points for grab irons, die-cast metal underframe, and Accumate couplers. Direct-current model with

eight-pin plug for Digital Command Control decoder, \$149.95; with dual-mode Digital Command Control and sound, \$239.95. Fourth quarter 2017. Trainman line. Atlas Model Railroad Co., 908-687-0880, www.atlasrr.com



- **Electro-Motive Division F3 diesel locomotive.** Bangor & Aroostook



(A unit, solid blue); Boston & Maine (A units in two schemes and B units in blue-and-black scheme, one road number each); Jersey Central Lines (solid green, A unit and one B unit); New York, Ontario & Western (A unit); Rock Island (ex-Union Pacific B unit, one number); Southern Ry. (A unit, tuxedo scheme); and Union Pacific (B unit rebuild, one number). Direct-current model: A unit, \$199.98; B unit, \$189.95. With dual-mode ESU LokSound Select Digital Command Control and sound decoder: A unit, \$299.95; B unit, \$289.95. October 2017. Bowser Manufacturing Co. Inc., 800-327-5126, www.bowser-trains.com

• **Electro-Motive Division GP9 diesel locomotive.** Bangor & Aroostook (red, gray, and black), Burlington Northern, Grand Trunk Western (red, white, and blue), Milwaukee Road ("The Milwaukee Road" herald only), and Southern Pacific (black widow scheme). Four road numbers per scheme (two each in direct current and Digital Command Control). Railroad-specific details, light-emitting-diode headlights, and Proto-Max couplers. Based on Phase I prototype. Direct-current model, \$199.98; with dual-mode ESU LokSound Select Digital Command Control and sound decoder, \$299.98. April 2018. Walther's Proto. Wm. K. Walther's Inc., 414-527-0770, www.walther's.com

HO scale freight cars

• **Assorted freight cars.** Atchison, Topeka & Santa Fe 50-foot riveted-side boxcar with Youngstown doors, \$17.98. Baltimore & Ohio 36-foot

double-sheathed boxcar with fish-belly underframe, wood doors, and wood ends, \$17.98. Columbus & Greenville; Duluth, South Shore & Atlantic; and Genesee & Wyoming 40-foot boxcars (single car, \$17.98; three-pack, \$52.98). Grand Trunk Western Pullman-Standard 4,750-cubic-foot-capacity three-bay covered hopper, \$19.98. Detroit, Toledo & Ironton American Car & Foundry three-bay Center Flow covered hopper, \$18.98. Missouri Pacific 36-foot double-sheathed boxcar with fish-belly underframe, wood doors, and steel ends, \$17.98. Norfolk & Western 40-foot single-sheathed boxcars, two-pack (one each with wood and metal

ends), \$34.98. Union Pacific 41-foot steel gondolas (single car, \$17.98; three-pack, \$52.98). Injection-molded plastic kits with plastic wheelsets and Accumate couplers. Accurail, 630-365-6400, www accurail.com

• **40-foot boxcar.** Baltimore & Ohio (Sentinel Fast Freight Service); Central RR of New Jersey (red with Statue of Liberty herald); Gulf, Mobile & Ohio (mineral red with black ends); Great Northern (orange with black roof and ends and "See America First, Glacier National Park" herald); Nickel Plate Road (brown with black roof and ends); New York Central (New York Central System herald); Pennsylvania RR

HO and N scale



Clean-Up Clips and test tracks. New from GoodDealsDCC.com are Clean-Up Clips (\$19.95) and test tracks in N (30" with code 80 rail, \$34.95) and HO (36" with code 100 rail, \$39.95) scales. The clips hold a sheet of isopropyl alcohol-soaked paper towel (not included) for cleaning wheels on locomotives and freight cars. The test tracks are DC and DCC compatible and feature PVC construction, soldered rail joiners, non-marring feet, and wired connectors. GoodDealsDCC.com, 224-703-0111, www.GoodDealsDCC.com

N scale



Electro-Motive Division SD40-2 diesel locomotive.

InterMountain is offering this road unit in new paint schemes, including GATX Capital Corp.; Atchison, Topeka & Santa Fe; Burlington Northern (white face scheme); CSX (dark blue and yellow); Iowa, Chicago & Eastern; Norfolk Southern; and Union Pacific. Each road name is offered in four road numbers. The N scale model features railroad-

specific details, a die-cast metal frame, and separately applied grab irons. Direct-current models list for **\$139.95**. Models with an ESU LokPilot motor-only Digital Command Control decoder retail for **\$189.95**. Versions with an ESU LokSound DCC and sound decoder sell for **\$249.95**. InterMountain Railway Co., 303-772-1901, www.intermountain-railway.com

(keystone herald); Rock Island (blue with "The Rock" lettering); and Southern Pacific (two-tone gray express scheme). Three road numbers per scheme. Separately applied brake wheel, 50-ton Bettendorf trucks with 33" metal wheels, and body-mounted McHenry scale couplers. January 2018. Roundhouse line. Athearn Trains, 800-338-4639, www.athearn.com

- **Trinity 5,161-cubic-foot-capacity**

three-bay covered hopper. ADM Milling Co. (WHTX reporting marks), BNSF Ry. (Burlington Northern; Chicago, Burlington & Quincy; Northern Pacific; and Spokane, Portland & Seattle heritage schemes, one road number each), CSX (CSXT Grain Express logo), Ferromex, Illinois Central, and Kansas City Southern (*Southern Belle* scheme). Three numbers per scheme unless noted. Separately applied

end cages, etched-metal crossover platforms, and body-mounted McHenry scale couplers. \$42.98. Ready-to-Roll. Athearn Trains, 800-338-4639, www.athearn.com

- **FMC 5,503-cubic-foot-capacity double-door boxcar.** Amador Central; Longview, Portland & Northern; and Southern Pacific. Four road numbers per scheme; also available undecorated. Positionable doors, wire grab irons, and X-panel roof. \$42.95 (undecorated, \$33.95). Master Line. Atlas Model Railroad Co., 908-687-0880, www.atlasrr.com

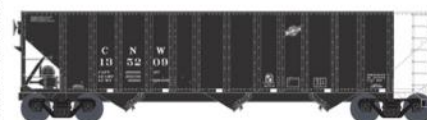
CMW, Round 2 enter licensing deal



Classic Metal Works/CMW Holdings Ltd., producer of the Mini Metals line of HO and N scale vehicles, has entered into a five-year licensing agreement with Round 2 LLC. After that term CMW Holdings Ltd. may agree to re-lease to Round 2 or sell the Classic Metal Works brands and its assets to Round 2.

William J. Giacci, president and CEO of Classic Metal Works, announced that finding contract manufacturers in China, coupled with high prices and late shipments, led CMW Holdings Ltd. to look for a business partner.

Giacci will continue to be the managing partner for CMW Holdings Ltd. He will be a product development, marketing, and sales consultant to Round 2. Mini Metals will continue to be packaged under the Classic Metal Works brand.



- **100-ton three-bay hopper.** Chicago & North Western (black with white end and green with yellow end); Detroit & Mackinac (red in three road numbers, white in five numbers); Lycoming Valley (three numbers); New York, Susquehanna & Western (CSX patchout); Pittsburgh & Lake Erie; Reading & Northern (blue and red ends, four numbers each); Reading Co. (speed lettering); Rock Island (black with "The Rock" lettering, three numbers); Southern Pacific (speed lettering); Wisconsin Central (Lake Erie, Franklin &

Continued on page 14

Showcase



1 4-6-6-4 Challenger. This Athearn Genesis HO scale model is decorated for Northern Pacific and Spokane, Portland & Seattle. The model (\$629.98) has a SoundTraxx Tsunami sound decoder. Athearn, www.athearn.com

2 Super 'Phatic! Deluxe Materials sells this water-cleanup glue, designed for balsa and hardwood, carbon

fiber, and foam. A 1.7-ounce bottle sells for \$8.99. Deluxe Materials Ltd., www.deluxematerials.co.uk

3 PS-1 40-foot mini-Hy Cube boxcar. Tangent Scale Models offers this HO scale boxcar lettered for Chicago, Burlington & Quincy and seven other roads. The model (\$44.99) has Barber S-2-A trucks, wire grab irons, and Kadee scale couplers.

Tangent Scale Models, tangentscalemodels.com

4 89-foot bi-level open auto rack. St. Louis-San Francisco (Frisco) is the latest paint scheme on this Micro-Trains car. The N scale auto rack lists for \$29.95 and has truck-mounted Magne-Matic couplers, a die-cast metal underframe, and plastic wheelsets. Micro-Trains Line Co., www.micro-trains.com

5 Water Waves and Water Ripples. Add detail to your water scenes with these two Woodland Scenics products. Water Waves can be used to simulate splashes, waves, and ripples. Water Ripples can be used to simulate wind-swept water surfaces. The 4-fluid-ounce bottles have a manufacturer's suggested retail price of \$15.99 each. Woodland Scenics, www.woodlandscenics.com

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HO scale



Red Owl grocery store. Menards offers this factory-painted and assembled model. The HO scale Red Owl has more than 25 light-emitting diodes, three rotating roof vents, and eight figures. The structure, which measures 4 $\frac{3}{4}$ " x 9 $\frac{5}{8}$ " x 3 $\frac{3}{8}$ ", is based on prototype in Eau Claire, Wis. Lighting requires 4.5V AC to DC power adapter (sold separately). The building retails for **\$69.99** plus shipping, or it can be shipped free to your local Menards store. Menards, www.menards.com

Continued from page 12

Clarion RR Co. patchout, four numbers). Six numbers per scheme unless noted. Roller-bearing trucks and interior and slope-sheet braces. \$25.95. December 2017. Bowser Manufacturing Co. Inc., 800-327-5126, www.bowser-trains.com

- **Old-time log flatcar set.** Cast-resin kit with load yokes and assembly hardware. Does not include load, grab irons, or detail parts. Two-car set, \$24.99. Concept Models, www.con-sys.com



- **40-foot PS-1 boxcar.** Chesapeake & Ohio. Features no. 2100 scale couplers and two-piece self-centering trucks. \$36.95. Kadee Quality Products Co., 541-826-3883, www.kadee.com



- **50-foot 100-ton four-bay hopper.** Chicago, Burlington & Quincy; Clinchfield; CSX; Denver & Rio Grande Western; Soo Line; and Union Pacific (Missouri Pacific reporting marks). Two road numbers per scheme. New

slope-sheet braces, brake gear, and die-cast metal underframe; 36" metal wheels on plastic axles; and Proto-Max couplers. \$27.98. Walther's Mainline. Wm. K. Walther's Inc., 414-527-0770, www.walthers.com



- **Trinity 30,145-gallon tank car.** Trinity Industries Leasing Co., Bunge Corp., Endesa S.A. De C.V., General American Marks Co., and General Electric Rail Services Corp. (NATX marks). Two road numbers per scheme. See-through etched-metal walkways and end platforms, metal wheels, and Proto-Max couplers. \$44.98. Walther's Proto. Wm. K. Walther's Inc., 414-527-0770, www.walthers.com



- **United States Railroad Administration steel automobile boxcar.** Michigan Central, New York Central, and undecorated. Cast-resin kit with one-piece body, decals, and Yarmouth Carmer uncoupling levers and etched-bronze

stirrup steps. \$41 (undecorated, \$40). Westerfield Models, 303-658-9343, www.westerfieldmodels.com

HO scale details and accessories

- **40-foot corrugated intermodal container with flat panel.** American President Lines, TransAmerica, Mitsui O.S.K. Lines Ltd. (MOL), NYK, "K" Line, and XTRA. Three-pack, \$32.98. January 2018. Athearn Trains, 800-338-4639, www.athearn.com
- **20-foot high-cube municipal solid waste containers.** New paint schemes: Allied Waste Industries (10,000-series and Sajo Transport), OVAU, and USA Waste Services (double zeros and orange stripes). New road numbers: DSEU. Two sets per paint scheme. Mounting pegs for 85-foot trash flatcars and see-through forklift pockets. Four-pack, \$24.95. Third quarter 2017. Trainman line. Atlas Model Railroad Co., 908-687-0880, www.atlasrr.com



- **Custom lighted vehicle.** River Point Station Ford F-350 hi-rail pickup. Painted white but unlettered and with CSX, Norfolk Southern, and other railroad heralds. Features 14 light-emitting diodes with four different light patterns, strobe-flashing headlights and taillights, four flashing grill lights, and six flashing lights in rear window. 9V to 12V DC. \$85. East Coast Circuits, 201-506-1448, www.eastcoastcircuits.com



- **Massey Ferguson 830 combine.** Hand-painted model with etched-metal parts. \$66.89. Produced by Artitec, available from Reynauld's Euro Imports, 630-365-6340, www.reynaulds.com
- **International maintenance-of-way utility trucks.** Crew bus, \$17.98;

4300-series crew cab dump truck, \$11.98; 4300-series single-axle dump truck, \$11.98; 4300-series utility truck with drill, \$17.98; 4900-series open stake-bed utility truck, \$11.98; and 7600-series utility truck with bucket lift, \$17.98. Plastic and die-cast metal construction with decals for 16 railroads. SceneMaster line. Wm. K. Walther's Inc., 414-527-0770, www.walther's.com

- **Sheet steel piling harbor wall.**

Injection-molded plastic kit. Includes two sets of pilings and concrete walkways. Builds up to 20 $\frac{1}{4}$ " of wall. \$17.98. SceneMaster line. Wm. K. Walther's Inc., 414-527-0770, www.walther's.com

N scale locomotives

- **Alco C-628 and C-630 diesel locomotives.** New paint schemes. C-628: Delaware & Hudson, National Railways of Mexico, and Southern Pacific (demonstrator patchout). C-630: Canadian Pacific; Duluth, Missabe & Iron Range; Family Lines (Louisville & Nashville

reporting marks); Minnesota Commercial (one road number); and Western New York & Pennsylvania (one number). New numbers. C-630: Union Pacific. Two numbers per scheme unless noted; also available undecorated (C-628 in Phase I, IIA, and IIB; C-630 in one version). Golden-white light-emitting-diode headlights, painted safety rails, and blackened metal wheels. Direct-current model, \$129.95; with dual-mode Digital Command Control and sound decoder, \$239.95. Master Line. Atlas Model Railroad Co., 908-687-0880, www.atlasrr.com

N scale freight cars

- **SIECO 50-foot boxcar.** Atlantic & Western Ry. (Apalachicola Northern patchout); Chattahoochee Industrial RR (reporting marks only); Canadian Pacific (P&LE patchout); Toledo, Peoria & Western; Pickens RR; Raritan River; and Sabine River & Northern (reporting marks only). Three road numbers per

scheme. Screw-mounted trucks and McHenry couplers. \$23.98. January 2018. AthearnN. Athearn Trains, 800-338-4639, www.athearn.com

- **50-foot double-door boxcar.** New paint schemes: Denver & Rio Grande Western, Kansas City Southern, Michigan Northern, Pennsylvania RR, and Wabash (New Jersey, Indiana & Illinois reporting marks). New road numbers: Canadian National. Two numbers per scheme unless noted; also available undecorated. \$22.95 (undecorated, \$15.95). Trainman line. Atlas Model Railroad Co., 908-687-0880, www.atlasrr.com



- **General American Transportation Corp. 4,180-cubic-foot capacity Airslide covered hopper.** Denver & Rio Grande Western; ADM Milling Co. (gray); Atchison, Topeka & Santa Fe (gray with black billboard lettering); BNSF Ry. ("Buffer SVC Only" lettering);



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HO scale



Atchison, Topeka & Santa Fe Topeka class Bx-94 and Bx-97 boxcars. New from Moloco are a class Bx-94 boxcar painted Mineral Brown with "Super Shock Control" slogan (one road number), a Bx-97 car in the 1988 Mineral Brown repaint scheme (three numbers), a Bx-94 car in the red repaint livery (TS 5-78, two numbers), and a Bx-94 in the 1989 repaint scheme with a 24" circle-cross herald (three numbers). The HO scale cars are \$53 plus \$9.99 shipping and are available direct or select retailers. Moloco, www.molocotrains.com

Brach's Candy; Burlington Northern (Cascade Green); Chessie System (Chesapeake & Ohio reporting marks); General American Transportation Corp. (light blue); Milwaukee Road (gray); Missouri-Kansas-Texas (red); and Union Pacific (silver with red lettering). Roller-bearing trucks, Fox Valley Models metal wheels, and body-mounted couplers. \$19.95. December 2017. Bowser Manufacturing Co. Inc., 800-327-5126, www.bowser-trains.com



• **Assorted freight cars.** Pennsylvania RR 50-foot round-roof boxcar, \$21.75. Norfolk Southern two-bay covered hopper, \$27.40. TTX 70-foot Husky-Stack well car (two road numbers), \$27.90. Injection-molded plastic models with plastic wheelsets and Magne-Matic couplers. Micro-Trains Line Co., 541-535-1755, www.micro-trains.com

N scale passenger cars



• **80-foot heavyweight diner.** New paint scheme: New York, New Haven &

Hartford (no. 5242). Injection-molded plastic interior, plastic wheelsets, and body-mounted Magne-Matic couplers. \$29.95. Micro-Trains Line Co., 541-535-1755, www.micro-trains.com

• **60-foot arched-roof baggage-express cars.** Canadian National (Maple Leaf herald); Delaware, Lackawanna & Western; Erie Lackawanna (maintenance of way, one road number); Illinois Central ("Mail Storage" lettering in one number and "Magazine Loading" lettering); Southern Pacific (original doors in three numbers, ply-metal doors in two numbers); Southern Ry. (maintenance of way in one number and green with black roof); and Union Pacific (Armor Yellow and Harbor Mist Gray, five numbers). Heavyweight trucks, metal wheels, and underbody detail. \$36.59. Wheels of Time, www.wheelsotime.com

N scale structures

• **Small freight house.** Laser-cut wood kit with Tichy Train Group windows and paper corrugated roofing. Based on Canadian National design. Footprint is 2 1/4" x 2 5/8". \$24.99. RSLaserKits, www.rslaserkits.com

N scale details and accessories

• **20-foot high-cube municipal solid waste containers.** New paint schemes: Allied Waste Industries (10,000-series and Sajo Transport), OVAU, and USA Waste Services (double zeros and orange stripes). New road numbers: DSEU. Two

sets per paint scheme. Mounting pegs for 85-foot trash flatcars, see-through fork-lift pockets, and fire port on one side. Four-pack, \$22.95. Trainman line. Atlas Model Railroad Co., 908-687-0880, www.atlasrr.com

O scale passenger cars

• **Pullman Bradley passenger cars.** Boston & Maine (maroon and gold); Kansas City Southern (*Southern Belle* scheme); Long Island Rail Road (dark gray and white); New York, New Haven & Hartford ("401 Green" and white); and Southern Pacific (silver and red). Four road numbers per scheme; also available painted dark green and black but unlettered. Detailed interior with seating, separately applied metal grab irons, and positionable doors. \$139.95. Atlas O, 908-687-9590, www.atlaso.com

O scale structures



• **Old homestead.** Factory-painted and weathered structure with printed interior; rusty propane tank; old barrels; and six separate accessories, including an outhouse, mailbox, and water pump. Includes two interior light-emitting diodes and one porch light. Lights are compatible with Just Plug Lighting System. \$139.99. Built-&-Ready Landmark Structures. Woodland Scenics, 573-346-5555, www.woodlandscenics.com

Z scale locomotives



• **Electro-Motive Division GP30 diesel locomotive.** New paint scheme: Conrail. Three road numbers. Directional light-emitting-diode headlights, prototype-specific details, and AutoLatch couplers. American Z Line, 614-764-1703, www.americanzline.com

- **Electro-Motive Division SD45 diesel locomotive.** New paint scheme: Denver & Rio Grande Western (large RIO GRANDE speed lettering). Four road numbers. Injection-molded plastic model with can motor, dual flywheels, traction tires, directional light-emitting-diode headlights, AutoLatch couplers, and optional pilot and plow. American Z Line, 614-764-1703, www.americanzline.com

- **General Electric P42 diesel locomotive.** Amtrak (phase 4 scheme in four road numbers, phase 4 Northeast Corridor scheme in two numbers). Traction tires and directional light-emitting-diode headlights. Designed for Digitrax and TCS drop-in Digital Command Control decoders. American Z Line, 614-764-1703, www.americanzline.com

Z scale freight cars

- **Trinity 17,600-gallon corn syrup tank car.** New paint scheme: DuPont Ti-Pure. Injection-molded plastic model

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

Z scale passenger cars



- **Amtrak Amfleet II cafe.** Phase 4b paint scheme. Two road numbers. Detailed interior, clear window glazing, metal wheels, and AutoLatch couplers. American Z Line, 614-764-1703, www.americanzline.com

Electronics/controls

- **Eight-function, MTC 21-pin HO scale decoder.** Item EU821. Designed for Bowser's updated line of diesel locomotives that require additional light outputs. \$42.95. Train Control Systems, 215-453-9145, www.tcsdcc.com

Decals

- **HO scale decals.** Baltimore & Ohio class P-11 flatcars, \$6. New York Central System 50-foot boxcars built between 1939 and 1946 (letters three cars), \$9. Pennsylvania RR (PRR) class FM flatcars and DD1-A containers, \$6. PRR class G22 gondolas and HB1/HB1A containers (letters two cars), \$8. PRR class X26C and X29B rebuilt boxcars (each set letters one car), \$5 each. Sets letter two cars unless noted. Speedwitch Media, www.speedwitchmedia.com

DVDs

- **Garden Railways: The Complete Collection.** Includes 192 complete issues from 1984 to 2015, plus 9 bonus issues of GR's predecessor, the *Sidestreet Banner* newsletter. Includes access to 128 full-size drawings. Basic installation requires 2 GB of available hard drive space; full installation requires 9 GB. \$89.95. Kalmbach Publishing Co., 800-533-6644, www.KalmbachHobbyStore.com 

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The road name on the side of this Canadian National ballast hopper isn't misspelled. Many CN cars have the French spelling "Canadien" on one side and the English spelling "Canadian" on the other. John Neary photo

Where is Canadian spelled with an "e"?

Q In the November 2016 issue, there's an advertisement for 59-foot cylindrical hoppers. The main picture shows a CN model with the spelling "Canadien National." At first I thought it was an error, but an image search showed pictures of the prototype with this spelling. I assume this spelling is used in the French Canadian region?

Kirk Olson, Howell, Mich.

A It's used everywhere. Since Canada is officially a bilingual nation, many Canadian National cars have the English spelling "Canadian" on one side and the French "Canadien" on the other. All such cars bear both spellings; which you see depends on not what part of the country you're in, but which side of the car you're on.

Q I have just acquired a Digital Command Control system. I'm running a direct-current layout and haven't converted all my engines to DCC decoders. Can I connect my system and convert the layout to DCC and still run DC trains, or should I wait and convert all my engines first? To do the latter will take much time and money! I'm eager to start DCC, but have concerns. Thank you.

Jim Burton, St.-Hubert, Que.

A Generally speaking, no, you can't run DC engines on a DCC system. (Technically speaking, it can be done, but only on some systems, with only one locomotive at a time, and at risk of damaging the motor.) However, most DCC decoders today are "dual-mode," meaning they can be run on DC layouts. So if you still want to run your DC locomotives now and then, I'd suggest connecting both your old power pack and your DCC system to the layout through a double-pole, double-throw (DPDT) switch, so you can flip the switch to determine how you

want to run the layout that day. Isolate some engine storage tracks with a power cutoff switch so you can park your DC locomotives there without damage during your DCC sessions.

Q For HO scale, what is the minimum centerline-to-centerline clearance that I should use between tracks on a dual-track main line? Are the clearances different for yard tracks?

Ronald Kell

A Although prototype railroads typically space their tracks on 13-foot centers (about 1 $\frac{3}{4}$ " in HO scale), model trains need more clearance due to our tighter curves and the need to sometimes reach in with our 12"-to-the-foot fingers to place or rerail cars. Layout planning guru John Armstrong recommended a minimum of 15 scale feet between track centers, more on curves. That's about 2" in HO scale, 1 $\frac{1}{8}$ " in N scale, 2 $\frac{7}{8}$ " in S scale, and 3 $\frac{3}{4}$ " in O. Add about 20 percent to that distance on curves to allow for overhang. Since we

do more "manual switching" in yards, adding up to $\frac{1}{2}$ " for finger clearance, regardless of scale, might be prudent. National Model Railroad Association Standard S-8 goes into more detail for track spacing in all scales. Go to www.nmra.org to find a list of NMRA standards and recommended practices.

Q Why don't they make dummy locomotives any more? It would make running a train with more than one engine easier and less expensive.

Jan Faro, Delft, Netherlands

A Dummy locomotives were more popular back when it was difficult to get multiple locomotives to run well together at the same speed. Now, with today's better motors and drivetrains, and DCC speed-matching, multiple locomotives can be operated together much better, giving model railroaders the actual benefit of multiple motive power, not just the appearance. And a second powered locomotive that can be used on its own is much more useful than a dummy that can only be used with another engine. These factors made demand for dummy locomotives fall, so few are made these days.

Q I've been trying to get my HO scale freight cars to the correct weight according to National Model Railroad Association Recommended Practice 20.1. My questions are: where do you put weight on empty open-top cars like gondolas, hoppers, and flatcars? What do you use for weight?

Mark Kruplack, Broomfield, Colo.

A Generally, weight goes in the underframe. Cars with fish belly underframes often have hollow spaces not visible when the car is on the track. These spaces can be filled with fine lead or steel shot secured with glue. [See this month's Step By Step on page 24. – Ed.]

Cars often come with sheet-steel weights that fit between the floor and the underframe. Replacing these weights with ones cut from lead sheet is another easy way to boost car weight. You can find thin sheet lead sold online by metal dealers and scientific supply houses; a quick Amazon.com search turned up many offerings. Just remember that lead is toxic, so always wear rubber gloves when handling it and dispose of any scraps responsibly.

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The orange-and-yellow cylinders sticking up between the rails in this photo are Pinch Point Clearance Markers, used to mark where a train can stop without fouling the adjacent track. The painted rails likely serve the same purpose. Cindy Lund photo

Q Can somebody there can tell me what I'm looking at in this photo? It appears to be yellow paint markings of some kind on the rails, and some orange and yellow things sticking up next to the tracks. This photo was taken in Helper, Utah. Thanks!

Steve Moore, West Jordan, Utah

A My guess is the yellow stripes painted on the web of the rail indicate where to stop a train so it doesn't foul the adjacent track. The orange-and-yellow things sticking up in the gauge of the rail are Pinch Point Clearance Markers, produced by Rail Solutions of Oregon. http://rso-oregon.com/safe_products.html. – Cody Grivno

Q Years ago, in the 1950s and '60s, the Eric Fuchs store in Boston had a huge operating model railroad in the window. It had an operating waterfall using real water. Are there any articles on how to build one? I'm just getting back into the hobby after a long layoff and am interested in the possibility of using real water.

Bob Cusack, Nahant, Mass.

A We published an article on using real water in an HO scale harbor in October 1954, and author Lee Vande Visse used "live water" in the creeks on his O scale layout, detailed in August 1991. But that's all I could find in our archive.

Live water features may be common on outdoor garden railways, but they're rare on indoor scale models. Not just because of the difficulties of preventing leaks, mildew, evaporation, soaking into scenery, etc., but because water doesn't "scale" well. Water-modeling materials like resin, plastic, and glass have a higher

refraction index, so in shallow depths, the way they bend light looks more real than the real thing.

Q I'm looking for information on how rock salt was carried by rail from the mine to its destinations, and what those destinations may have been. Specifically, I model 1954, so I'm most interested in information from the transition era. However, I'd also like to know how it's done now. At a guess, I would think open hoppers may have been used, but due to salt's reaction to water I'm not sure. What information can you provide, and where might I find more information?

Dylan Myers, Grand Rapids, Mich.

A Salt is often carried in covered hoppers to protect it from the weather. In your time period and earlier, though, salt was commonly packaged in sacks, boxes,

and barrels that were shipped in boxcars. Author Jeff Wilson put extensive research on the salt industry into chapter 2 of his book *The Model Railroader's Guide to Industries Along The Tracks 4* (Kalmbach Publishing). In addition to information about how salt is mined, moved, refined, and used, the book also has chapters on coal gas, brick making, stone quarrying, lumber, and waterfront operations. You can pick up a copy at the Kalmbach Hobby Store, www.kalmbachhobbystore.com.

Q I'm ready to build my first model railroad that's not on an entirely flat surface, and that led me to my question. Looking for a video on how to make cookie-cutter subroadbed, I found the video on the Virginian RR project railroad. Those track plans showed the points to set the yardstick to transfer the radii of the curves. The track plan I'm using doesn't show those curve centerpoints. Is there a simple way to transfer the curves on this plan to the plywood?

Patrick Hinchey, Springfield, Ohio

A The simplest way to transfer track plans to benchwork is by the squares. Our track plans are laid out on a grid, usually 12" or 24". If you make a photocopy of that track plan, you can use a pencil and a straightedge to extend the grid lines across the surface of the layout. Then measure in from whichever corner of your benchwork matches the origin point of the grid on the track plan, and pencil in the grid full-scale on



Model Railroader Video Plus producer David Popp demonstrated how to transfer track plans to benchwork in a recent video on the Canadian Canyons project railroad. Subscribers to MRVP can watch at www.MRVideoPlus.com.

the plywood. This will let you locate key features, like yard ladders, turnout frogs, crossing diamonds, and the like on your benchwork. Once those key points are located, simply connect the rest with flextrack. You should be able to locate curves by finding the points where they cross the grid, even if you don't have their exact centers.

Q When painting an O scale figure, how do you save the paint job? After painting, when I just lay the figure down, the paint comes off! Besides laying it on cotton, what can I do?

Craig Burton, Rutland, Vt.

A The paint you're using may not be compatible with the material the figures are molded in, or there may be mold release on the figures from the casting process. Both inhibit paint adhesion.

Before painting, drill holes in the figures' heels and glue in mounting pins made of brass wire. Scrub the figures with dish-washing liquid and an old toothbrush, then let them air dry. Handle them by the pins when painting to keep skin oils off of them, then stick them upright in a block of foam to dry.

Q I recently purchased an EMD SD70ACe locomotive by Walthers. I can't control its speed. It either goes too fast or not at all. I'm using a Digitrax DCC system. The locomotive is programmed to address 8314, which is its cab number. Can you please help?

Charles Felts, Boise, Idaho

A Digital Command Control-equipped locomotives come from the factory programmed to address 3. Since yours is set to 8314, someone has reprogrammed it. Whether that was you, a friend of yours, or the guy at the hobby shop, I'm willing to bet something went wrong in that process. Try resetting the decoder to factory specs. Put it on your DCC system's programming track and follow the decoder manufacturer's instructions for resetting it. Usually a reset involves programming Configuration Variable 8 (CV8) to a value of 8, then turning your DCC system off and on again, but check your manual to be sure. You'll have to reprogram the locomotive's address after that, as it will revert to address 3.

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



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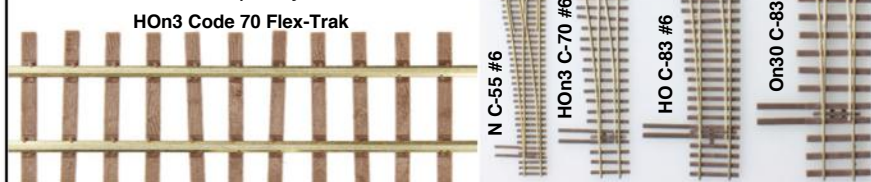


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Derailments of the curious kind

Several months ago, my operations chief Gordy Spiering and I were orbiting a couple trains on my N scale layout for a group of visitors and the same boxcar kept derailing at the west end switch in the town of Tehachapi.

In a situation like that the show must go on, so I pulled the car out of the train and waited until the visitors had left and the dust had settled to try to solve the problem. I put the car back where it had been, right behind the engine, and ran up the hill. The car derailed again in the same way at the same spot. That's a good thing – the most difficult problems to solve are those that occur inconsistently.

The curious thing, though, was that when I backed the train up a few feet and ran at the turnout again, the car would cruise right on through. Then I'd run the train around the layout again and the car would derail at that same spot.

Finally that little light bulb above my head blinked on. The car was coming off the track at the turnout because it had derailed somewhere farther back. I've learned from experience that a car can run a considerable distance with a wheelset off the rails before the car finally comes off the track, usually at a turnout.

Sure enough the wheels were actually derailing at the switch exiting the Tehachapi Loop. Now I knew where the problem was, but I still didn't know what was causing it. I can't honestly say that I ever did. I watched that wheel climb up and out again and again, finally replaced the coupler, and all was well.

As I've stated before, I body-mount all my couplers, and I usually re-use the cut-off, truck-mounted couplers to save money. [Read more about Jim's adventures with couplers

in the July 2014 and May 2013 N Scale Insight columns. – Ed.] I use Micro-Trains brand exclusively because I find them to be reliable and readily available. Studying the coupler I'd removed, I could see that the knuckle didn't have as much side-to-side swing as my other M-Ts did. I suspect the culprit might have been an older version. Ordinarily this wouldn't be a problem, but here it was because the car was right behind the engine.

Longer can be better. Let me explain. Micro-Trains gives you two options on its 1015/1016 couplers. (The 1015 is the universal coupler you can use on just about any locomotive or car.) For locomotives, I used the short shank versions, figuring they looked more realistic, which they did. With my fairly generous 18" minimum radius curves I figured they would operate just fine. I was wrong.

The medium-length couplers work better because of the longer reach of the shank. Because the pivot point for locomotive trucks is often an inch or more inboard, the rear end swings a long way out on a curve. With a short shank, this wide swing tends to pull the car behind the locomotive off the track.

A longer shank allows the coupler head to shift toward the middle of the track, relieving sideways pressure.

With cars, the kingpins are usually nearer the end of the car and the length of the coupler shank isn't a factor.



X marks the spot where the switch rod used to be. After several years of sporadic derailments at this turnout, Jim Kelly relocated it a few inches from the curve so engines would get a short straight before entering the turnout. Roen Kelly photo

Even so, I would never install short couplers on long cars like 89-foot flats where the kingpin is a considerable distance inboard.

I could've used that offending car elsewhere in the train and it would've worked fine, but I don't want a railroad with a lot of restrictions about which cars can go behind locomotives. If you're trying to run prototypically, there's already enough of that kind of thing. For example, you don't run cars loaded with gasoline or other hazardous cargo right behind the locomotive.

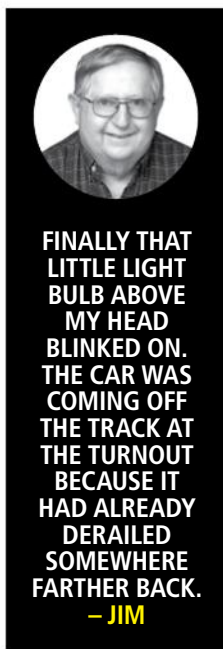
Other derailment causes. The number one cause of derailments on my layout is low-hanging coupler pins. I don't know how I manage to put cars out there without checking pin height, but I sometimes do. My standard is to clear the Micro-Trains height gauge and to clear it by a little extra. I don't do any uncoupling over magnets, so the

pins don't need to be at the correct height for magnetic uncoupling. Some modelers don't like the appearance of the pins and clip them off short, but they resemble air hoses well enough to suit me. Don't pull them out altogether, or the coupler won't work.

Give turnouts a fighting chance. Lots of derailments can be avoided before you ever run a train just by doing a good, careful job of laying track. The photo shows one of several locations that were prone to derailments because I wanted to make a passing track as long as possible. To achieve that end, I would lay track directly from a curve into the heel of a turnout.

The result was just enough derailments to drive me crazy, and I'd file and bend track to no avail. Finally, having pretty much filed the turnout to death, I'd replace it and move it so a locomotive had several inches of straight track to sort itself out before entering the turnout. It all goes back to that temptation to try to squeeze in a little too much.

With a bit more tinkering, I should banish most of the derailments from my layout. That should keep the operations chief happy. **MR**



FINALLY THAT LITTLE LIGHT BULB ABOVE MY HEAD BLINKED ON. THE CAR WAS COMING OFF THE TRACK AT THE TURNOUT BECAUSE IT HAD ALREADY DERAILED SOMEWHERE FARTHER BACK.
— JIM

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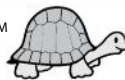
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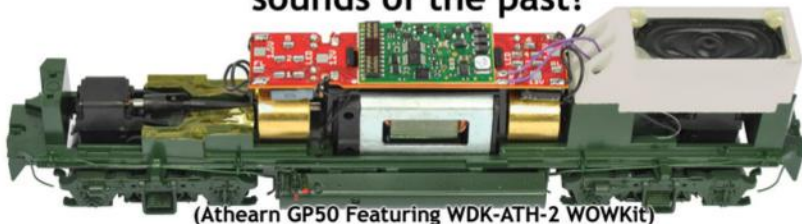
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Upgrade a Varney gondola kit

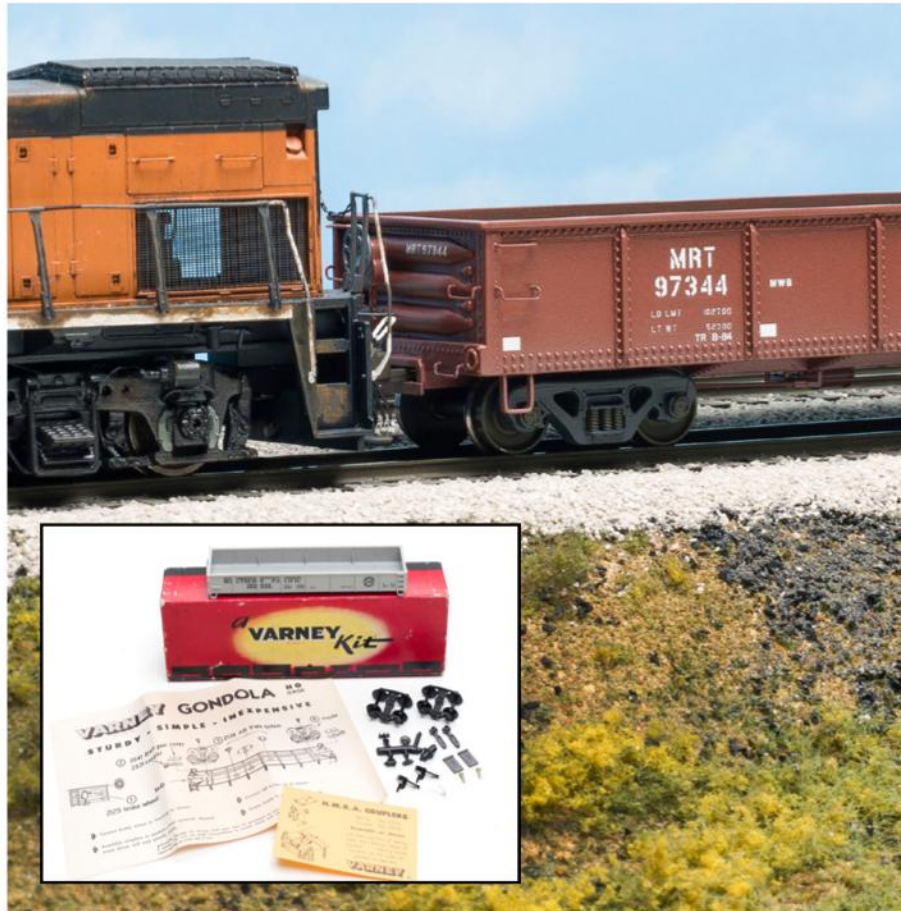
I've had plenty of interesting assignments for *Model Railroader* in my 15 years with the magazine, but upgrading a Varney gondola kit to today's standards ranks as one of the more memorable. Neil Besougloff found the kit, virtually untouched from the day it left the factory, in a friend's basement.

The injection-molded plastic kit dates to the 1950s. There wasn't much to the kit: A one-piece plastic body, sprung metal trucks with plastic wheelsets, dummy knuckle couplers, horn-hook couplers with centering springs, draft-gear box covers, a sprue with five detail parts, and two screws.

Though this kit is rough when compared to today's models, I wanted to give the gondola a new lease on life. With some new details, a paint job, and decals, the gondola looks pretty good.

We're blessed with well-proportioned and detailed models today, but yesterday's models still have a place. With a bit of work, those kits of old can become proud members of your fleet.

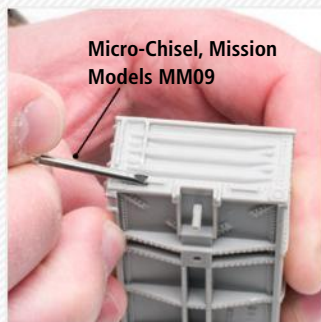
Wire grab irons, improved underbody details, and new trucks are some of the upgrades Cody Grivno made to this Varney gondola kit. The contents of the kit are shown in the inset image. Bill Zuback photos



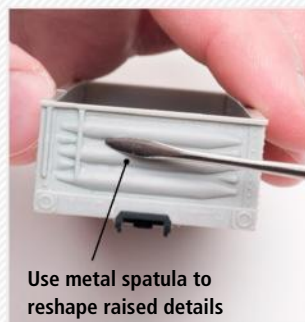
STEP 1 OUT WITH THE OLD



Remove stirrup steps with sprue cutter



Micro-Chisel, Mission Models MM09



Use metal spatula to reshape raised details



New draft-gear box

The Varney gondola was a product of 1950s technology. When compared with today's freight cars, the stirrup steps are grossly oversized, the molded grab irons are too thick, and the rivets rival those found on a

battleship. To remedy the first issue, I used a pair of sprue cutters to remove the stirrup steps. After trimming the steps, I removed any remaining plastic with a sanding stick.

Next, I used Mission Models Micro-Chisels with

1mm and 2mm tips to remove the molded grab irons. I shaved the plastic in several light passes. Don't try to remove the molded grab irons in one pass, or the chisels may wander off course and gouge the plastic.

Removing the molded details on the car ends required a variety of tools. I used sprue cutters to make rough cuts, such as removing large chunks of the hand brake. Then I used the Micro-Chisels, dental probes, and

metal spatulas (the latter shown in the third photo from left) to reshape the raised details on the car ends.

The Varney car had draft-gear boxes, but they weren't compatible with the Kadee couplers



STEP 2 IN WITH THE NEW

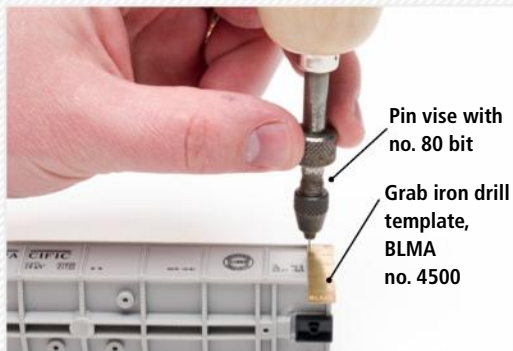
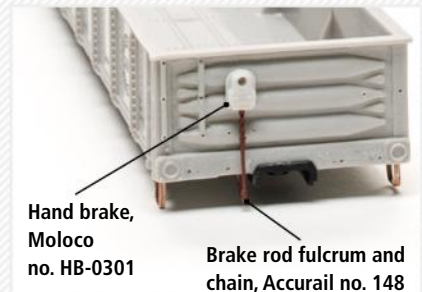
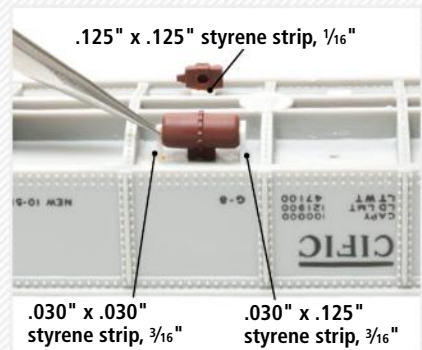
There are plenty of plastic stirrup steps available. I used A-Line item no. 29000 instead. I find that the formed-metal parts hold up better to normal car handling.

After marking the locations for the four stirrup steps (one on each corner), I drilled holes with a no. 76 bit in a pin vise. I secured the steps with medium-viscosity cyanoacrylate adhesive (CA).

The brake details included with the kit were OK, but since I was upgrading the model, I replaced them. I selected Accurail's 41-foot gondola floor and underframe detail kit (no. 148).

I first removed the raised mounting holes for the original brake details. Then I installed the air reservoir and triple valve. I used $\frac{3}{16}$ "-long pieces of .030" x .030" and .030" x .125" styrene strip as brackets for the air reservoir. I attached the triple valve to a $\frac{1}{16}$ "-long piece of .125" x .125" styrene strip.

On the B end of the car, I installed an Ajax hand brake from Moloco set no. HB-0301. Then I added the handbrake rod fulcrum and chain from Accurail's 41-foot gondola detail set.



I wanted to install. After removing the molded boxes, I installed Kadee plastic draft-gear boxes.

Finally, I drilled holes (lots of them!) for the wire grab irons. Fortunately, I had a BLMA

no. 4500 (now Atlas item no. BLMA4500) grab iron drill template. Once I had the template in position, I drilled the holes with a no. 80 bit in a pin vise. Work slowly and let the bit do the work.

STEP 3 PRIMER, PAINT, DECALS



The Varney gondola was molded in gray plastic and lettered for Southern Pacific. With no paint to strip, all I had to do was remove the lettering with 600- and 1,500-grit sandpaper.

I washed the gondola in warm water with dish soap added to remove skin oils, sanding residue, and other impurities.

STEP 3 PRIMER, PAINT, DECALS (CONT'D)

Then I rinsed the model and let it air dry.

To ensure the final color would cover evenly, I spray-painted the gondola with Rust-Oleum Painter's Touch 2x Flat Gray Primer (no. 249088).

Some of the rivets were damaged when I was removing the molded details. However, I was able to replace them easily with rivet decals from Archer Fine Transfers set no. AR88015. The cast-resin rivets are printed on clear decal film.

I applied the rivets like regular decals directly on the primer. After all of the decals were on the model and the setting solution had dried,

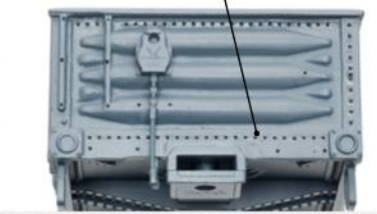
I sprayed the gondola with another coat of primer.

I let the primer dry until there was no discernible paint odor. Then I air-brushed the gondola Model Master Oxide Red Flat (no. 4882). This is a fairly typical color used on cars in maintenance-of-way service.

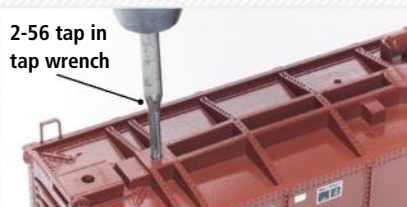
I let the Oxide Red dry thoroughly before applying Model Master no. 4638 Clear Gloss. This provides a smooth, glossy surface for the decals.

I used an assortment of decals to letter the gondola. The Milwaukee, Racine & Troy herald is from a custom decal set; the rest of the decals are from Microscale.

Rivets, Archer Fine Transfers no. AR88015



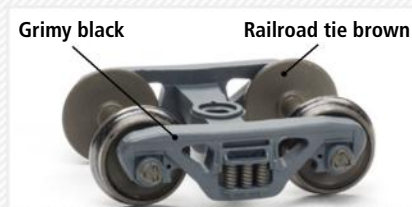
STEP 4 TRUCKS, GRAB IRONS, AND WEIGHT



I replaced the kit's sprung, die-cast metal trucks with Atlas 70-ton roller-bearing trucks (no. 180000). Though each bolster had a hole, it was too small for the 2-56 x 3/16" screws I used to secure the trucks. After enlarging the holes with a no. 50 bit, I threaded them with a 2-56 tap.

The Atlas trucks feature plastic sideframes and chemically blackened metal wheels mounted on plastic axles. After cleaning the wheels with 70-percent isopropyl alcohol, I used a Microbrush to paint the faces, backs, and axles Model Master Railroad Tie Brown (no. 4885).

I airbrushed the sideframes with the same company's Grimy Black

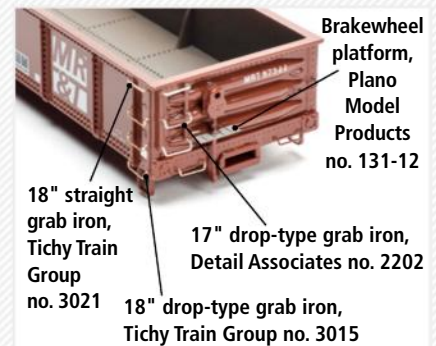


(no. 4887), masking the axle sockets beforehand. I brush-painted the springs and bearing caps Railroad Tie Brown to help those details stand out.

I used Tichy Train Group nos. 3015 (drop-type) and 3021 (straight) 18" grab irons on the majority of the car. The stiles on the end ladders were narrower, so I used Detail Associates no. 2202 17" drop-type grab irons in those locations. I brush-painted the grab irons with Reefer Gray (used as a primer) and Oxide Red.

I also installed a Plano Model Products brakewheel platform. I left the etched-metal part unpainted.

Like most open freight cars, the Varney gondola was too light based



on the National Model Railroad Association's recommended practice 20.1. To partially remedy this, I filled the opening between the center sills with Deluxe Materials Liquid Gravity (no. BD38). I secured the steel balls with the same firm's Rokat Card Glue (no. AD57). See bottom photo, opposite.

Even after adding Liquid Gravity, the car was still 2.3 ounces underweight. A load can bring the car to the recommended 3.8 ounces.

STEP 5 WEATHERING AND FINAL DETAILS

I wanted the gondola to look like it was recently repainted. I lightly weathered the underbody and lower portion of the sides and ends with thinned Model Master Reefer Gray (1 part paint, 9 parts 70 percent isopropyl alcohol).

I then applied blue painter's masking tape along the top of the car and weathered the interior with full-strength Grimy Black, thinned Rust, and thinned Oxide Red.

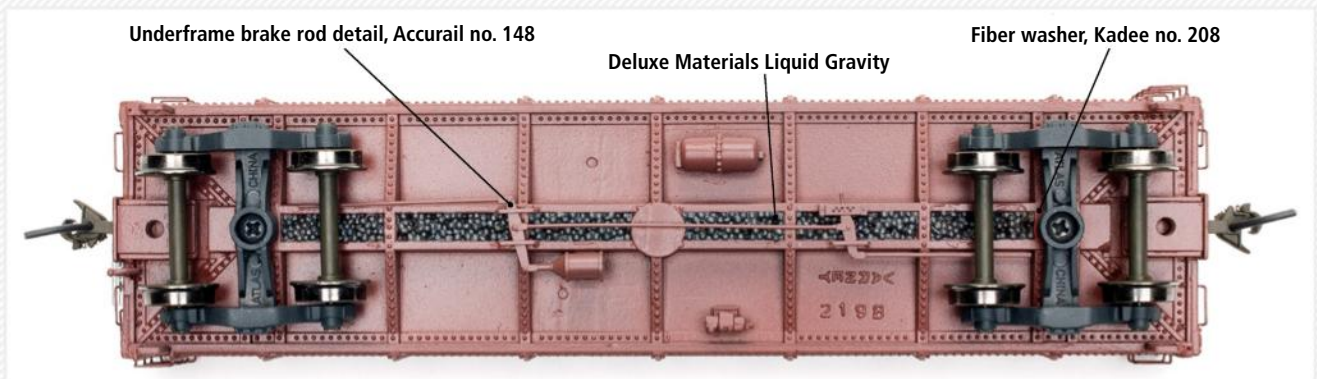
With the weathering completed, I sprayed the entire car with Model Master Clear Flat (no. 4636).

While researching maintenance-of-way gondolas, I came across a prototype photo of a Norfolk & Western gondola with a primer gray brake wheel. I liked the look, and spray-painted the Kadee no. 2025 brake wheel with Rust-Oleum Painter's Touch 2X Flat Gray Primer.

I'd known about underset- and overset-shank couplers for a long time, but never had a need to use one, until now. First, I installed the trucks, adding a Kadee no. 208 fiber washer between the truck and bolster. Then I set a Kadee no. 147 medium underset-shank coupler into each draft-gear box. Bingo! The coupler was at the correct height.

Finally, I added the Accurail underframe brake rod detail (no. 148) to the gondola with CA. This one-piece plastic casting includes the brake cylinder, lever support brackets, and cylinder and dead levers.

Now the Varney gondola is ready for a new life on our Milwaukee, Racine & Troy HO scale layout. The next time you come across a vintage kit, don't be so quick to dismiss it. Instead, see it as the possible starting point for your next project. **MR**



Track 101



Laying track on a model railroad is a lot easier for us than it is for our HO scale track crew. This article tells you the basics.

Understanding the basics of sectional, flex, and handlaid track

By **Steven Otte** • Photos by Bill Zuback unless noted

Like many model railroaders, you may have started out in the hobby with an oval of track that came in a train set. But when watching a train go around and around the same loop got boring, it was time to add some new track.

But where to start? As seen in ❶, there are thousands of track products of all scales sold in hobby stores, some of which might work together and others that obviously won't. Should you choose sectional track or flextrack? What about handlaying? How do you choose a turnout? Will you need a decoder ring to figure out rail codes?

This article will cover all that for you, and more. To keep things simpler, we'll examine only two-rail track used with scale model trains, not the three-rail variety commonly used by toy trains (though many terms are the same).

Defining our terms

Before we get into the different types of track, you need to understand the terms used to describe track. The most important of these are scale, gauge, and code. All three refer to size, but in different ways.

Many modelers use the words "scale" and "gauge" to mean the same thing, as in, "HO gauge track." But there is a difference between the terms.

Scale means the proportion of the track relative to the full-size prototype: N scale track is 1/160th the size of full-size track, for instance.

Gauge, on the other hand, is the distance between the rails, measured in scale units. HO scale track, at .65" between the rails, and N scale track, with a gauge of .35", are both standard gauge, corresponding to 4 feet, 8½ inches on the prototype.

Where this can get confusing is when people talk about "narrow gauge" – prototype railroads that built their track to a gauge smaller than the standard. Typical narrow gauges ranged from 24 to 36 inches. Modelers often use standard gauge track of a smaller scale to simulate narrow gauge track – HO scale (1:87.1) to model 30" gauge in O scale (1:48), for instance. The conversion isn't exact, but the availability of parts like locomotive mechanisms more than makes up for the minor discrepancy in size.

Rail code is an absolute measurement, referring to the height of the rail in 1/1000 of an inch. Code 70 rail (.070" high) would be appropriate for a branch line or spur in HO scale, while the same size would suit a heavy main line in N. Modelers often mix rail of different codes to represent different parts of their system – heavier rail on main lines, lighter on sidings and spurs.

Types of track

Many people start out in this hobby with a train set that comes with track, power pack, locomotive, and cars all in one box. More than likely, that track is sectional, meaning it comes in pieces of fixed geometry, sometimes with plastic roadbed attached, as seen in ②.

Sectional track components, which are also sold individually, are designed to snap together. This makes it easy to set up on a tabletop or floor and simple to try out different configurations.

Though it's easy to use, sectional track has its drawbacks. Since it comes in a finite number of sizes and shapes, it's not as versatile for building to a custom track plan. Also, the large number of connections between sections make it less electrically reliable.

These days, most sectional track comes with molded plastic roadbed textured to look like ballast. Sold under brand names like Atlas True-Track, Bachmann E-Z Track, and Kato Unitrack, these track components are easy to snap together and apart, and have a realistic ballast profile. They come with attached rail joiners, small metal pieces that keep rail aligned and conduct electricity. Sectional track with attached roadbed is usually compatible only with other components from the same brands.

The next step up in realism is flex-track. Flextrack comes in longer sections, usually either 36" or 1 meter (39.37") long, made with molded plastic ties that are connected on alternating sides so they can bend around curves (see ③ on the next page). Flextrack can also be cut to any length needed, making it more versatile when fitting a particular space.

Flextrack, and the other track components designed to be used with it, does not come with attached roadbed.

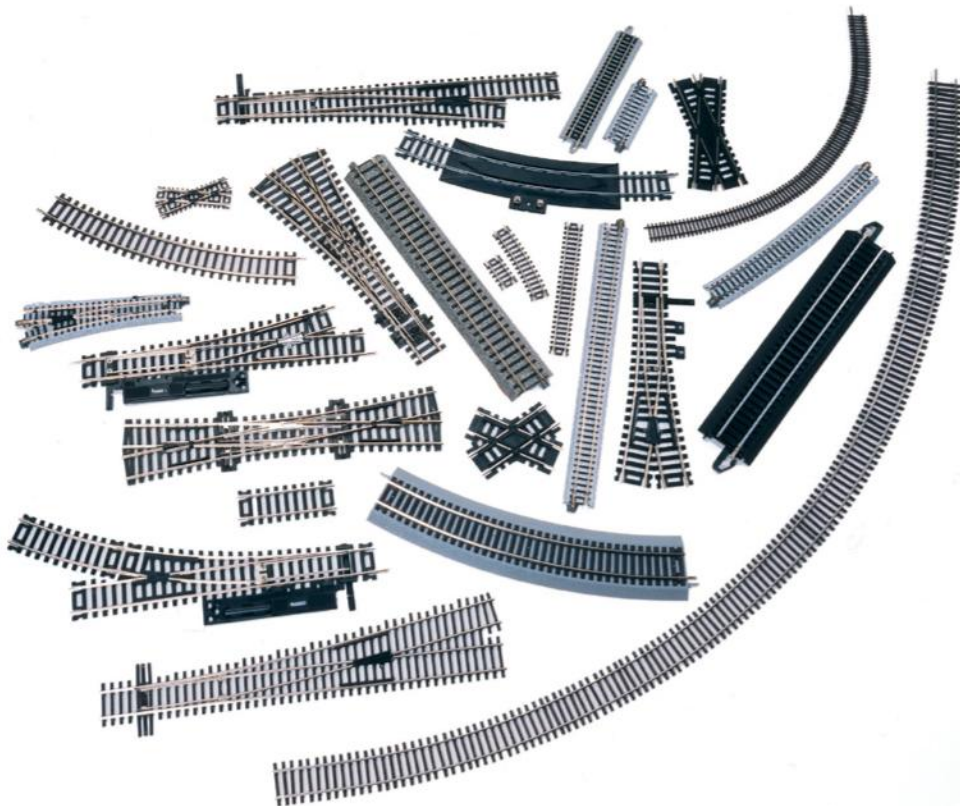
Instead, modelers install roadbed made of cork, foam rubber, Homasote, or other materials along their route before gluing or tacking their track on top of it.

Modelers often mix and match track components of different brands and even different rail codes to achieve the realistic look they want.

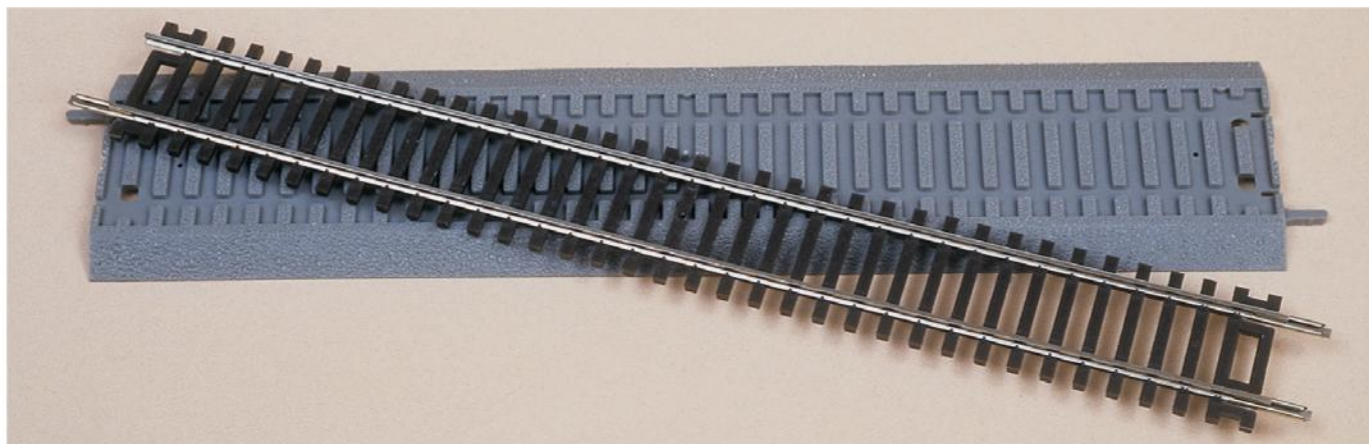
It's also possible to mix and match sectional and flextrack on the same layout. If your track plan requires a curve that exactly follows a particular radius, it may be more convenient to lay that curve with sectional track. Likewise, a layout built mostly from sectional track might call for a compound curve that would be

easier to make from flextrack. All you have to do to mix the two is use roadbed under your flextrack of the same height as the roadbed under the sectional track.

Hobbyists who seek the ultimate in realism, need to build custom turnouts and crossings, or enjoy the hands-on aspect of it may choose to handlay some or all of their track. These builders cut, stain, and glue down wooden ties, drive miniature spikes to hold their rail, and use jigs to solder together their own turnouts, like the one in ④ on the next page. Such craftsmanship takes dedication, but it's not as hard as it sounds, and for many, the task is its own reward.

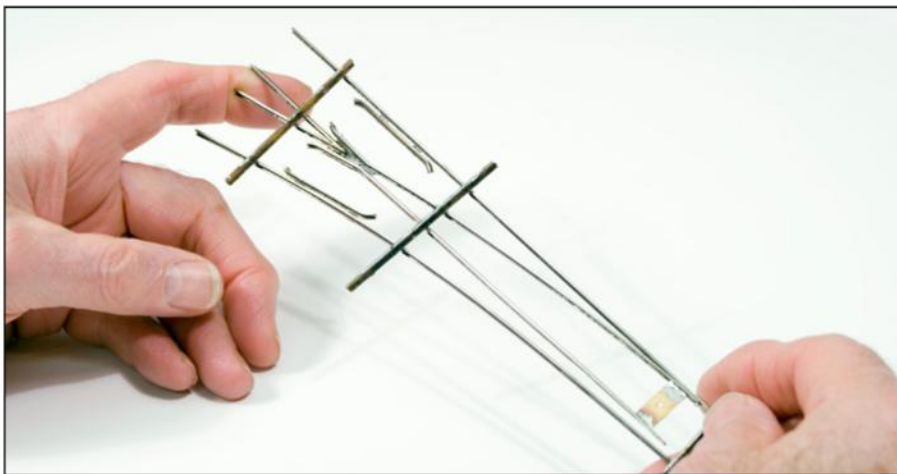
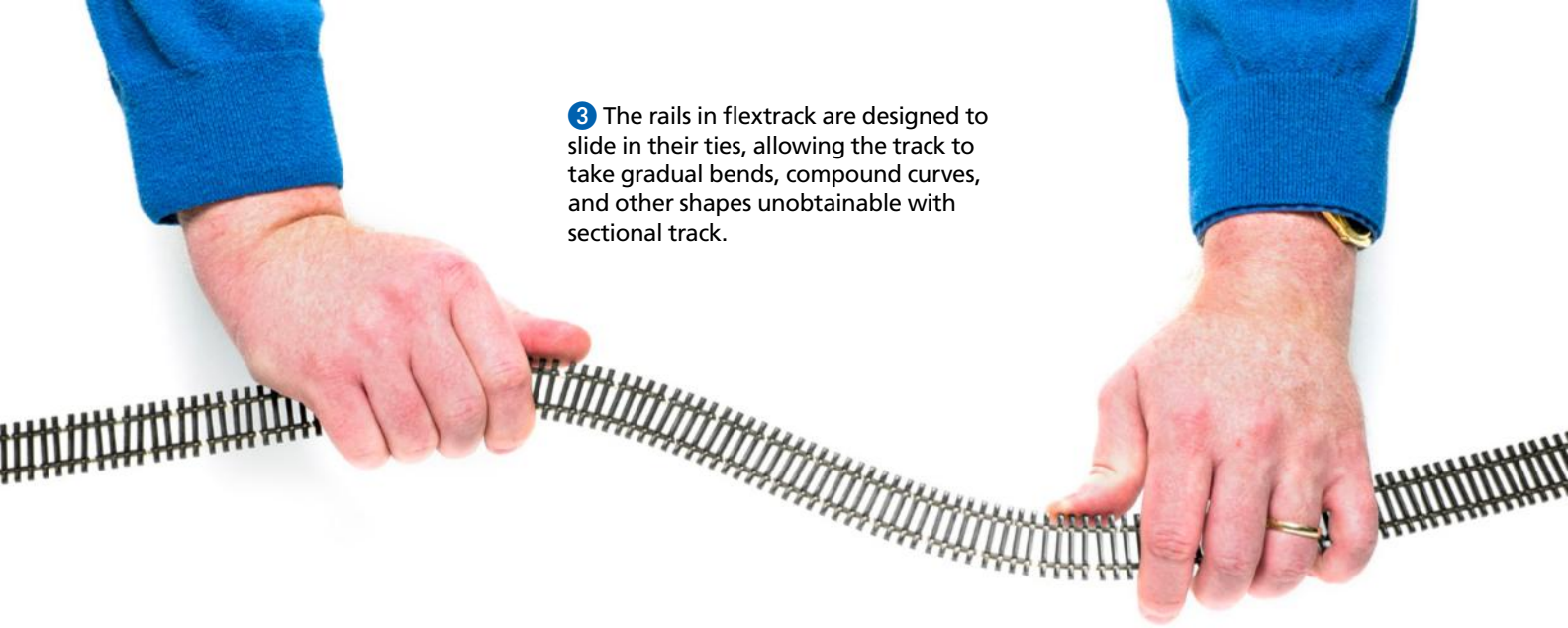


① Model railroad track comes in a dizzying array of sizes, types, and configurations. But figuring out what components you need isn't difficult.

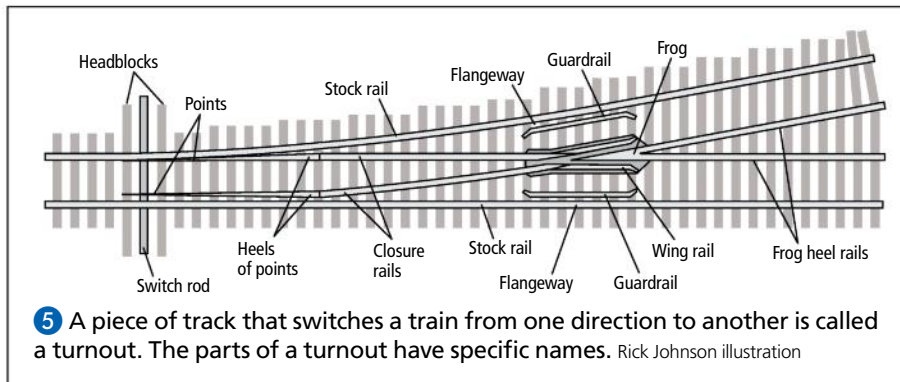


② Sectional track is designed to snap together in a variety of arrangements. Sometimes it comes with molded plastic roadbed, like this Atlas True-Track.

3 The rails in flextrack are designed to slide in their ties, allowing the track to take gradual bends, compound curves, and other shapes unobtainable with sectional track.



4 Some hobbyists handlay track and scratchbuild turnouts because they need a commercially unavailable track configuration, want a more realistic looking layout, or simply enjoy the challenge. John Pryke photo



5 A piece of track that switches a train from one direction to another is called a turnout. The parts of a turnout have specific names. Rick Johnson illustration

Turnouts and other components

Browsing the track section of your local hobby store or searching for track at a manufacturer's website reveals a dizzying array of products. What's the difference between them, and how do you know which to use where?

Beyond straight track and curves, there are two other basic track components. Where two tracks cross over each

other but remain separate, that's a crossing. Where one track becomes two, allowing a train to take either route, that piece is called a turnout.

No matter their shape or configuration, turnouts all have several components in common, as shown in 5:

- **points**, movable rails that shift to select the route the train will take;
- the **switch rod**, which connects and moves the points;

- **closure rails**, the inner rails that extend from the points;

- the **frog**, the solid piece where the closure rails cross;

- and **stock rails**, the unbroken outer rails on either side of the turnout.

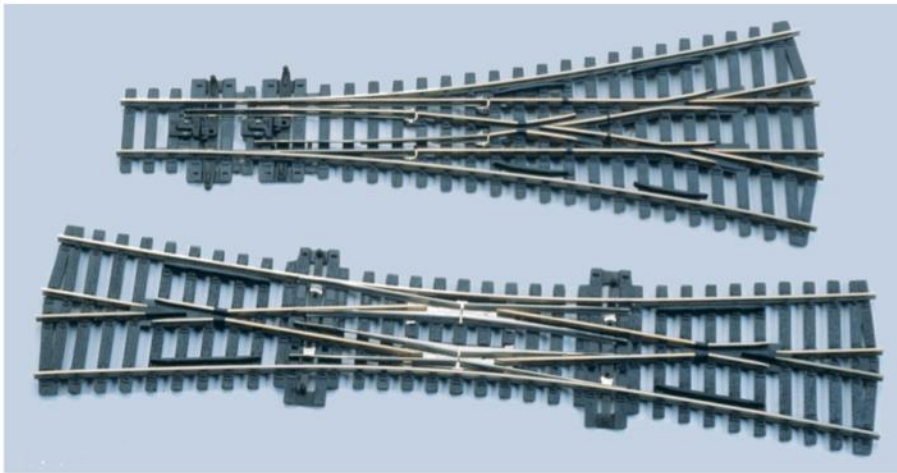
Turnouts can be right-handed or left-handed, depending on which direction the diverging (curved) route branches off. If there is no straight route, and both branches curve away equally from the center line, that's a wye turnout.

The frog number tells you how sharply the diverging track angles away from the straight track. This number tells how many units of distance the rails take to diverge by one unit. For example, if the frog rails are one scale foot apart six scale feet from the frog, that's a no. 6 turnout. Common sizes of model railroad turnouts are no. 4, no. 5, no. 6, and no. 8. These are quite sharp compared to those on the prototype, which range from no. 12 to no. 20 and up.

Turnouts designed for use with sectional track systems are sometimes designated with a substitution radius, rather than a frog number. The rails on these turnouts (Atlas Snap-Switches are one example) curve throughout the turnout, so the geometry of both routes are identical to other curved and straight track components made by that manufacturer.

Wyes, which curve away in both directions, add their angles; common sizes are no. 2, 2½, 3, and 4 (to match up with the angles of regular turnouts).

In addition to the regular right- or left-handed turnouts, there are a number of more unusual ones used by the prototype in special circumstances, such as yard throats or industrial districts with tight clearances. Two of these are shown in 6. These include three-way turnouts, where one track becomes three, and



6 Specialty turnouts exist for special situations, such as these HO scale three-way (top) and double-slip (bottom) turnouts.

single- and double-slips, in which trains have a choice of routes when approaching from either direction. Such complicated trackwork was rare on the prototype, but not unheard of.

A term being heard more often when describing turnouts and crossings is “Digital Command Control-friendly.” What it refers to is the tendency of a locomotive to cause a short circuit when its wheels unintentionally bridge two oppositely wired rails, usually adjacent to the points. A DCC-friendly turnout is configured to make that less likely. The term is a bit of a misnomer, though, because short circuits are bad news for direct-current layouts as much as they are for DCC, and any turnout that works for DC will work for DCC, too.

Handling and cutting track

Unlike the curves of sectional track, which are fixed to a specific radius, flex-track can be bent to non-standard curve radii, parabolic curves, or other complex shapes. Flextrack rails are held in place only by plastic spike heads molded into the ties. This allows one or both rails to slip in the ties so the track can be bent to follow any curve desired. (Within reason, of course; most cars and locomotives have a minimum curve radius they will traverse.)

Though flextrack’s rail has a bit of spring to it, if bent too far it can retain a bend – or even kink. Don’t bend flex-track before use or store it in a bent position.

When flextrack bends, one or the other rails has to slide through the spike heads on the ties. On some brands of flextrack, one rail is designed

to more readily slide than the other.

Look at the underside; if there are more gaps between the ties under one rail than the other, put that rail toward the inside of the curve so tie spacing remains even.

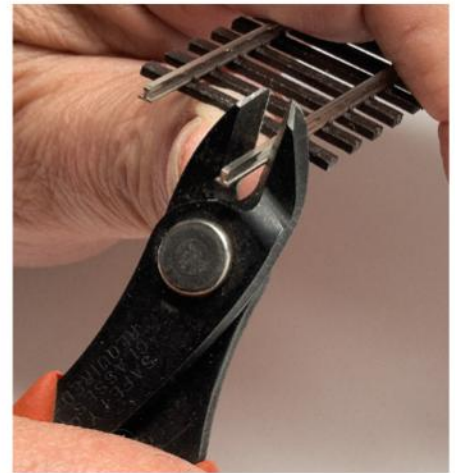
At some point, you’ll find it necessary to cut a piece of track. There are several methods to do this, but you must do so precisely and safely. The old woodworker’s adage “measure twice, cut once” is just as important when you’re dealing with track.

The fastest and perhaps easiest way to cut track is with a rail nipper, as in **7**. Though rail nippers may look similar to cutting pliers you’d find in the hardware store, those will leave a bevel on both cut rail ends, requiring you to file the ends flat before slipping on the rail joiners. Rail nippers, however, have one beveled side and one flat side that leaves a straight cut on one side of the rail, with minimal cleanup needed.

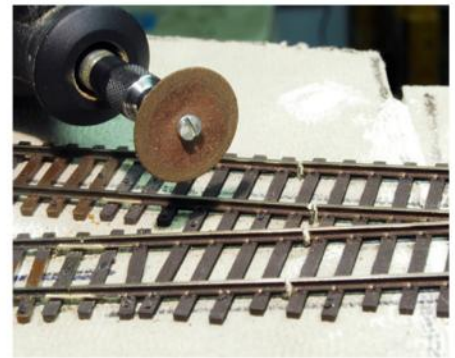
When using a rail nipper, be sure to wear eye protection. Tiny bits of rail can go ricocheting around the room, potentially causing injury.

Track can also be cut with a razor saw, a fine-toothed hobby saw often fitted to a plastic handle. The biggest hazard with this approach is that the saw’s teeth can snag on the rail, pulling it out of the fragile plastic clips that hold it to the ties. Once that happens, flextrack is practically impossible to reassemble. Use a light touch with the finest-toothed saw you can buy. If you’re cutting at your workbench, clamp down your track with a piece of wood to keep the rail from rolling as you saw back and forth.

Finally, a cutoff disk in a high-speed rotary motor tool – see **8** – can be used to cut



7 Rail nippers make it easy to get a clean, flush cut. Point the cut end away from your face and wear eye protection in case of a ricochet.



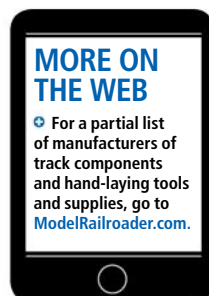
8 A cutoff disk in a motor tool is handy for cutting insulating gaps in rail. Always wear eye protection, as the disks can throw sparks and fragments or even shatter during use. John Pryke photo

rail. Wear eye protection when using any motor tool, as the cutoff discs can throw off sparks or even shatter.

Whatever method you use to cut track, you’ll probably need a set of jeweler’s files to dress the rail ends and remove burrs.

And when cutting flextrack to fit a particular space, don’t forget that the rail on the outside of the curve will be longer than on the inside. Curve the track to fit and carefully mark both rails before cutting either one.

Installing, wiring, and maintaining track are subjects for other articles. If you need more guidance, look up the Expert Tips section of our website, at mrr.trainers.com/videos/expert-tips. There you’ll find lots of videos not just about cutting track, using rail joiners, and weathering rails, but also on lots of other topics. Even more helpful how-to videos can be found on our streaming video service, Model Railroader Video Plus, at www.mrvideoplus.com. **MR**





SPECIAL TRACK ISSUE

Upgrading older

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

Model turnouts face one challenge not shared by their prototypes: the need to provide an electrical path from power supply to locomotive motor. With the advent of Digital Command Control (DCC) systems, the ante has been raised a bit.

With conventional direct-current (DC) power, a momentary electrical short usually isn't noticeable, as the amount of current supplied is only enough to run one train. But with DCC, the power supply must be large enough to handle all of the locomotives on a layout or section of the railroad, so even a momentary short can cause big problems. Digital Command Control

command stations and boosters are therefore equipped with fast-acting electronic circuit breakers to prevent catastrophic meltdowns.

Keeping the two flavors of electricity (plus and minus voltages) separate in a turnout isn't particularly hard. But if the frog isn't isolated from the points, a large separation (air gap) is required between each point and its adjacent stock rail (see

"Turnout terminology" on page 34). Otherwise, a metal wheel passing through the open side of a switch (the moving part of a turnout) might brush against the open point and cause a short.

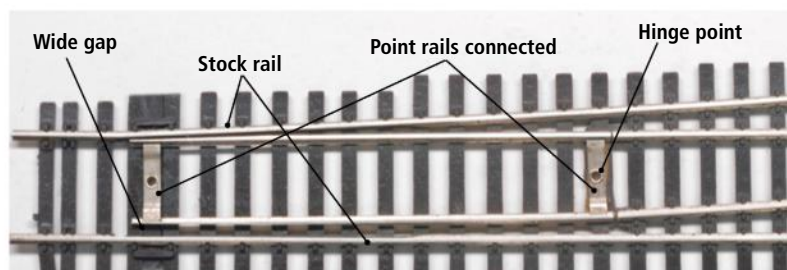
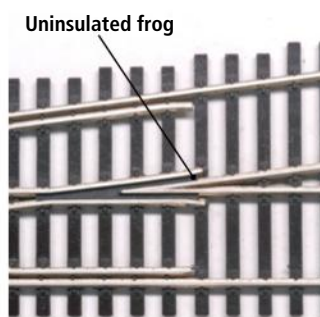
Long ago, the National Model Railroad Association (NMRA) established standards for turnout dimensions. These standards take into account the need to keep the back of a wheel from brushing against a point rail of opposite polarity. But by modifying the turnouts so the points are always the same polarity as the adjacent stock rail, the gap between the points and stock rails can safely be reduced.



A modified Shinohara no. 8 turnout, front, shows the subtle but important upgrades that improve both the appearance and the electrical performance of the otherwise well-engineered turnout: gaps cut on both sides of the frog, points soldered to closure rails at the National Model Railroad Association's flangeway standard distance, and a new switch rod. Tony Koester explains how he modified these turnouts for his HO scale Nickel Plate Road St. Louis Division layout.

STEP 1 SHOCKING TURNOUT

The **unmodified turnout** has an uninsulated (no gaps) frog, shown at right, and hinged points with brass strips that connect the point rails in two places shown below. The distance from each point to its adjacent stock rail must therefore be wider (to avoid short circuits from the backs of metal wheels bridging the gap) than is possible when the frog is insulated and each point is the same polarity as its adjacent stock rail.



turnouts

Improve their performance and appearance

From handlaid to commercial

I handlaid all the visible track and turnouts on my former layout, the HO scale Allegheny Midland. It was relaxing, if somewhat time-consuming. But for my Nickel Plate Road St. Louis Division layout, a friend convinced me that Micro Engineering's code 55 and 70 flextrack would save time and offer better detailing – tie plates and four spikes per tie – compared to handlaid track.

Micro Engineering also offers no. 6 turnouts in code 70, the proper rail size for the NKP main line. But they don't offer no. 8 turnouts, which I felt was the

minimum I should use on the main, especially for crossovers. The only commercial code 70 no. 8s I could find at the time were those made by Shinohara. With the clock ticking – I'd agreed to host busloads of visitors during an NMRA national convention in Philadelphia – I used MR's listing of Leading Model Retailers in the back of the magazine to round up 50 of the needed no. 8s.

One problem: Those somewhat dated turnouts were built with power-routing points, and the point rails were soldered together. This allowed power to only flow along the route lined through the

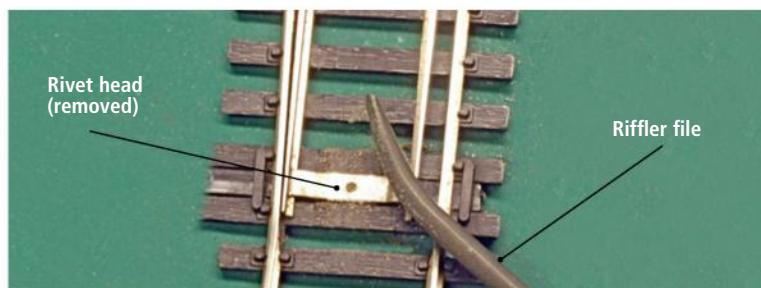
turnout – an advantage in DC operation, as the turnout can act like an electrical switch and turn track power on or off.

The frog and closure rails were also soldered together. The points were hinged and spaced a considerable distance away from the stock rails to preclude metal wheels bridging the gap. Hinged points may be prototypical, but they can create electrical continuity problems and even get out of alignment. With HO turnouts larger than no. 5 and rail smaller than code 100, hinges aren't really needed.

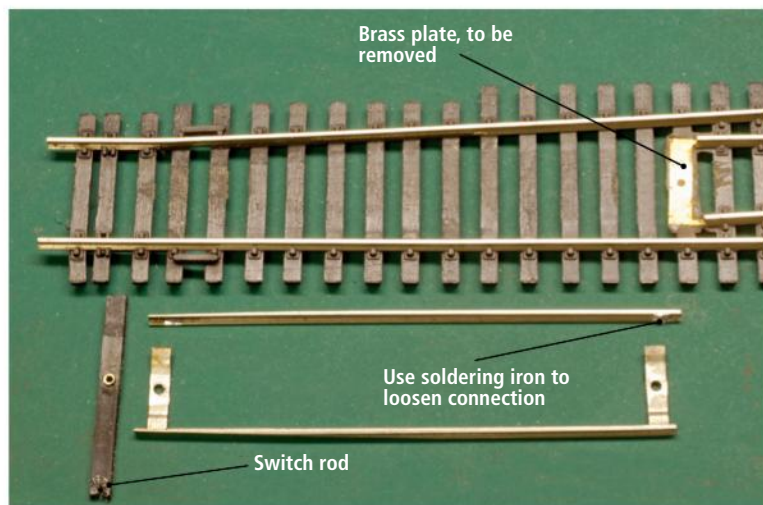
Fortunately, both problems are easy to fix, as shown in the following steps.

STEP 2 GETTING TO THE POINTS

Using a curved riffler file (modelers should have a set of them, available from Micro-Mark), I filed off the heads of the two rivets connecting the two metal bars that hold the points to the plastic switch rod and pivot point, then popped the points loose from the switch rod and turnout ties.

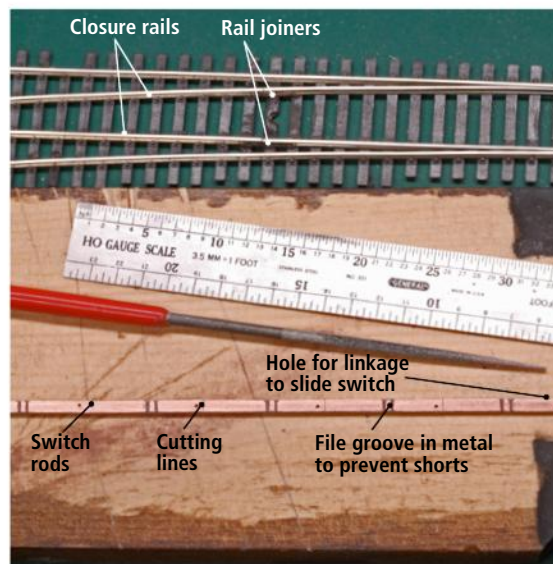
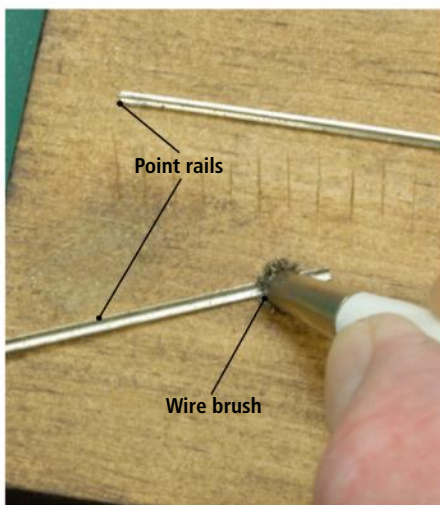


STEP 3 BREAKING AND POLISHING



Heat from a small soldering iron quickly separated the points from the metal crossbars, above. The brass plate under the hinges must be pried loose and the underlying tie cleaned up.

I then filed off solder residue and smoothed the tapered end of the points. A wire-brush “pencil,” right, polished the blunt and tapered ends to ensure a good solder joint when the points were reinstalled.



STEP 4 COMING TOGETHER

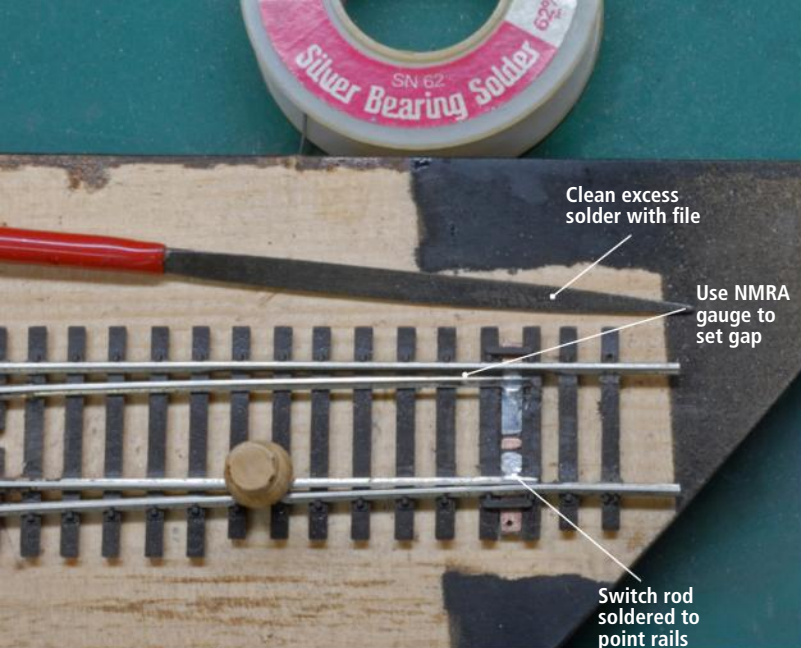
I slid the points into rail joiners and then onto the closure rails. I soldered the points to the closure rails with silver-bearing solder, which makes a much stronger joint than tin solder. It's available at many electronic, hardware, or big-box stores.

I made new switch rods from Clover House no. 267 printed-circuit (PC) board tie strips. They were a tight fit, so I smoothed the edges. I cut mine the same length as the ties to attach them to a micro single-pole double-throw (SPDT) slide switch that moves the points and powers the frog. To prevent a short circuit when using PC-board ties, I filed two grooves, one for backup, in the switch rods parallel to and midway between the rails.

Turnout terminology

In model railroad terminology, a “turnout” is the complete assembly of rails, frog, switch, and guardrails. A “switch” is the moving assemblage of points and switch rod (throw bar). You can’t “throw a turnout,” as it’s spiked down. Nor can you have, say, a “no. 8 switch,” as the switch assembly doesn’t include the frog.

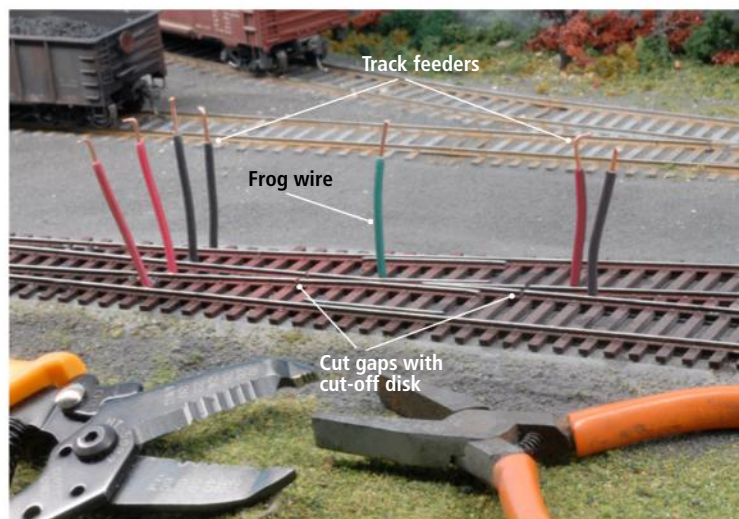
The turnout’s frog number is the ratio of rail spreading beyond the frog. A no. 8 frog (or turnout) has the rails spread 1 foot apart at a distance of 8 feet from the point (toe) of the frog. A no. 4 turnout is therefore much sharper than a no. 8. See more about turnouts in Steven Otte’s introduction to track on page 28. – Tony Koester



STEP 5 SOLDERING ON

I pinned the turnout to a piece of wood with a thumbtack, slid the switch rod under the points, pinned one point down well away from the stock rail, and soldered the point rail to the switch rod. Some solder flowed under the point toward the stock rail, so I used a fine file to remove it.

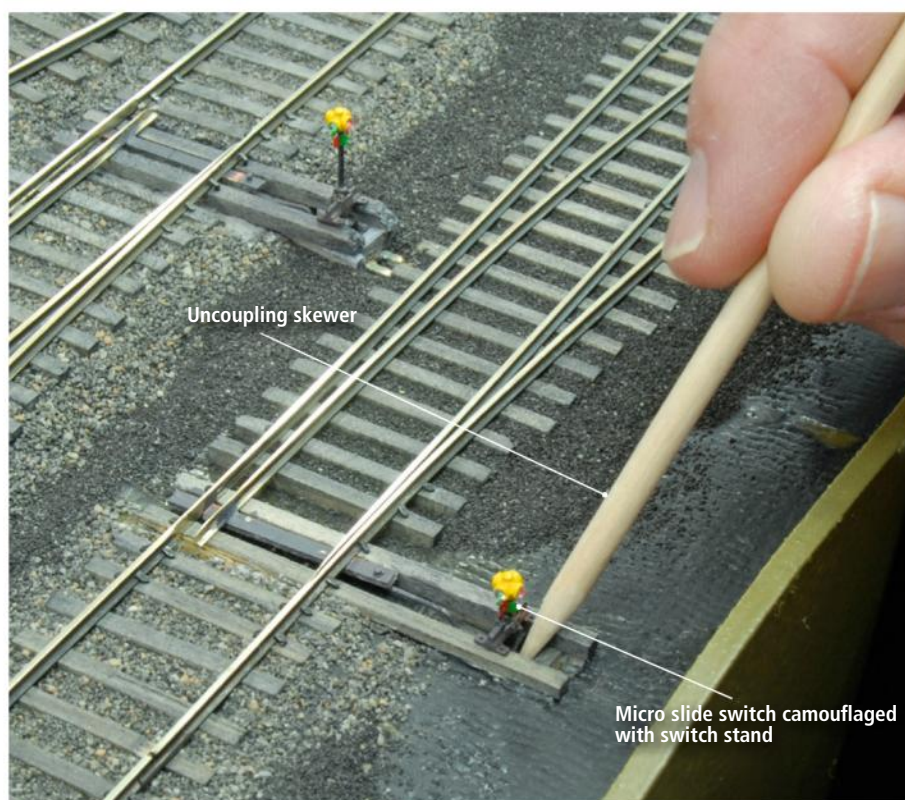
Next, I positioned the other point away from its stock rail to the NMRA's narrower flangeway standard using the NMRA standards gauge middle flangeway tab, pinned the point rail down, and soldered it to the switch rod. [Tony used an older NMRA standards gauge. On Mark IV and later gauges, use the right side tab for checking the flangeway. He also set his point rails using the flangeway standard instead of the point standard to achieve tighter tolerances. – Ed.]



STEP 6 PUT IT IN ISOLATION

The frog must be electrically isolated from all other rails. I put on safety goggles and used a thin cut-off disk in a motor tool to cut gaps. I inserted thin strips of Plastruct dark gray ABS plastic in the gaps and secured the plastic with cyanoacrylate adhesive (CA).

Each combined point/closure rail must be connected to the proper bus. On my layout, I use black wire for the back ("black in back") rail and red for the aisle-side rail. The frog is connected with a green wire ("frogs are green") to a micro SPDT switch inserted between the head blocks to change the polarity as the switch is lined.



STEP 7 HIDDEN CONTROL

My neighbor and fellow modeler

Perry Squier also uses micro SPDT switches, but he trims the top of each switch knob and hides it under an NJ International switch stand glued to the head blocks. Mine are just painted brown, as seen in the photo on page 32. An uncoupling skewer slid under the stand moves the slide switch.

If I were using a switch motor or servo mounted under the subroadbed, I'd make the PC board switch rod the same length as the head blocks – the long ties that support the switch stand. The hole for the actuating wire would be drilled under the switch stand's location, not between the running rails where it could be seen and interfere with passing equipment. 

MORE ON MRVP

Model Railroader Video Plus subscribers can see video of Tony handling a turnout at MRVideoPlus.com



SPECIAL TRACK ISSUE

BALLASTING

main lines & sidings

The flagman holds no. 10 as minor repairs are made on the main line in Kingfield on Lou Sassi's On30 Sandy River & Rangeley Lakes layout. The lead to the Peerless Tanning Co. is in the background, and the narrow gauge to standard gauge transfer siding is in the foreground. Lighter rail and less well-kept ballasting helps distinguish the sidings from the main.

Use these techniques to simulate the different levels of maintenance railroads applied to various types of track

By Lou Sassi • Photos by the author

Even on a narrow gauge railroad such as my On30 Sandy River & Rangeley Lakes, there's a distinct hierarchy between mainline and secondary tracks. I distinguish between sidings and mainline track by ballasting each differently. I like to keep my mainline rail well ballasted so it looks relatively better maintained, while I prefer to make sidings appear less well kept.

I use Micro Engineering On30 flex-track on Homabed brand Homasote roadbed. The roadbed is glued to my layout surface, a sandwich of 2" white Styrofoam on 2" extruded-foam insulation board. I described preparing and laying track in the June 2014 *Model Railroader*, and explained the benchwork construction in the July 2014 MR. This month, I'm going to explain how I ballast track.

While my ballast is simply medium and coarse gravel I found in a gravel bank many years ago close to my old home in upstate New York, it's the same consistency as commercial varieties I've seen in hobby shops, so the gluing procedures I use should work regardless of which ballast you use.

Main lines

No matter which rail I'm ballasting, main line or siding, I usually finish the surrounding scenery before ballasting the track. In the case of main lines, once the Homabed roadbed and track are glued down (Step 1 in ①) I paint the surface of the Styrofoam with Pittsburgh Paints "Tobacco Brown" (that's Step 2).

Next I apply "ground goop" [Lou describes his recipe for ground goop in the March 2015 MR. – *Ed.*], and add dirt, foam, static grass and any other scenic materials that suit my fancy, up to the edge of the right-of-way (Step 3).

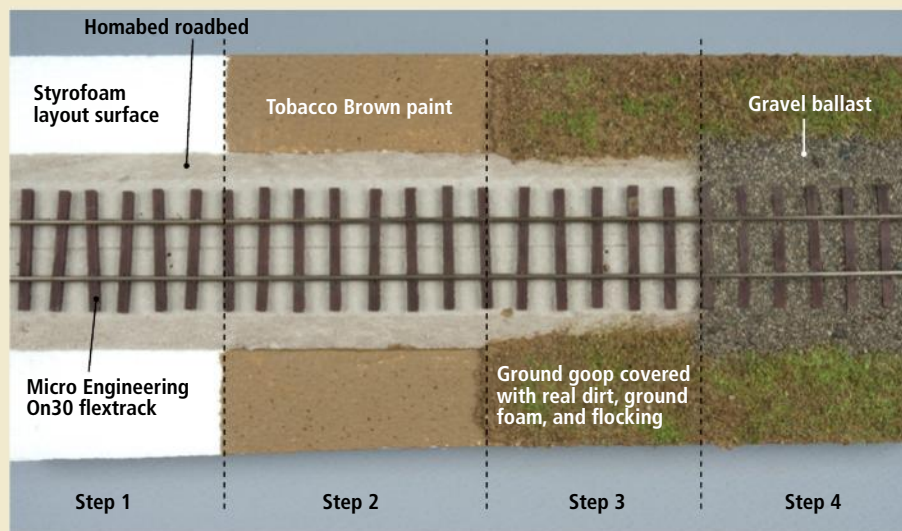
If I'm dealing with mainline track, I just add ballast, which I glue in place by first saturating it with 90 percent rubbing alcohol, then applying a mixture of 1 part white glue to 2-to-3 parts water with an eye dropper, shown in ② and in Step 4 of ①. The rubbing alcohol saturates the ballast and breaks the surface tension of the glue, allowing the glue to soak in much better.

Sidings

When it comes to sidings, I take a slightly different approach. After gluing down my roadbed and rail (Step 1 in ③), but before finishing the scenery up to the tracks, I apply DAP lightweight spackle to each side of the Homabed to eliminate the incline between it and the surrounding ground, seen in ④ on the next page, and finished in Step 2 of ③.

Once the spackle has dried, I paint it and the surrounding Styrofoam "Tobacco Brown" (Step 3). After applying ground goop and ground cover up to the ties (Step 4), I apply the same ballast I did for the main line (Step 5) but this time, on top of the ballast, I add coarse, medium, and fine textured dirt I've run through kitchen sieves (Step 6).

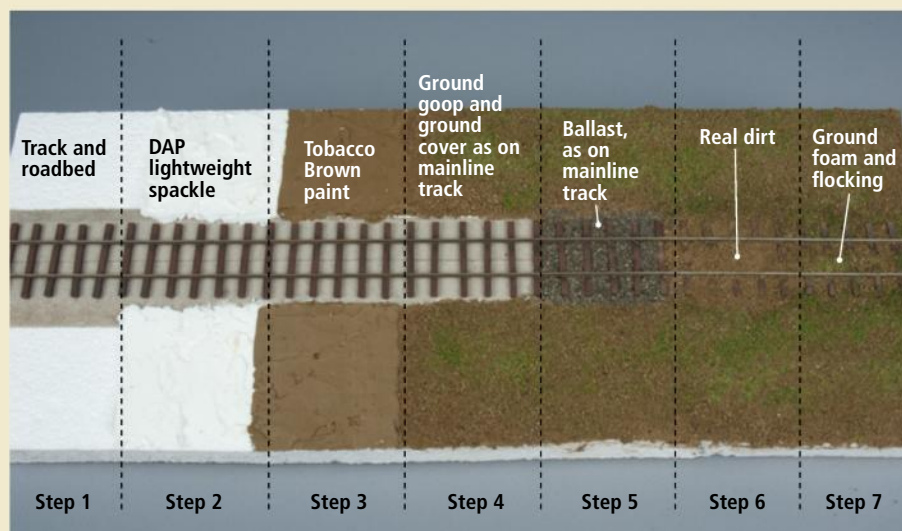
The three sieves I use are shown in ⑤ on the next page. The amount of dirt I apply depends on just how well (or poorly) maintained I want the siding to look. (The better the maintenance, the more ballast and the less dirt.)



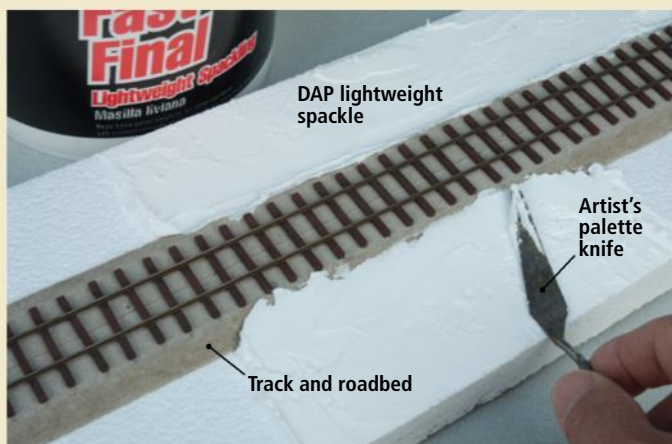
① **Four steps for mainline ballasting.** Lou lays his track on Homabed Homasote roadbed, which is attached to the Styrofoam surface of his layout with white glue. He follows this with a layer of "ground goop," scenery products, and ballast.



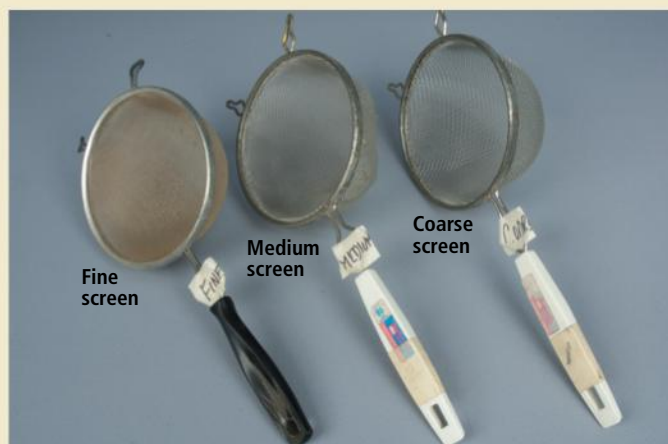
② **Securing ballast.** Lou applies 91 percent rubbing alcohol with an eye dropper followed by 1 part white glue, 2 parts water to keep the ballast in place.



③ **Seven steps for siding ballasting.** After laying the track, Lou feathers in the roadbed with lightweight spackle. After applying ballast, he adds a layer of dirt, ground foam, and flocking to simulate a weed-grown siding.



4 Trowel it on. Lou spreads spackle from the top of the Homabed to the surface of the surrounding scenery.



5 Grading dirt. Lou uses these three kitchen sieves to filter coarse to fine dirt.



The well-ballasted main line is evident as Forney no. 8 rolls past the Texaco Station in Kingfield with a short freight in tow on a warm summer afternoon in 1935.



The siding to Peerless Tanning in Kingfield is a bit better maintained than the transfer siding in the photo on page 36, but it's still not up to mainline standards.



6 Materials. Lou uses a range of materials to get the effects he's after. The dirt and gravel came from near his former home in upstate New York.

When I'm happy with its appearance, I wet the ballast and dirt with alcohol and apply the same white glue mix as I did on the main line. After the white glue has been applied, I immediately sprinkle on Woodland Scenics T-49 Fine Blended Turf ground foam and Scenic Express EXP-881-B Summer Lawn Blend flocking (Step 7 in **3**). Just how much of these materials I apply depends on how poorly maintained I want the siding to look, just like the dirt. The materials I used are shown in **6**.

Rail matters, too

I use different size rail to help distinguish between types of track, as well. Most of my sidings are code 70 and the main line is code 83.

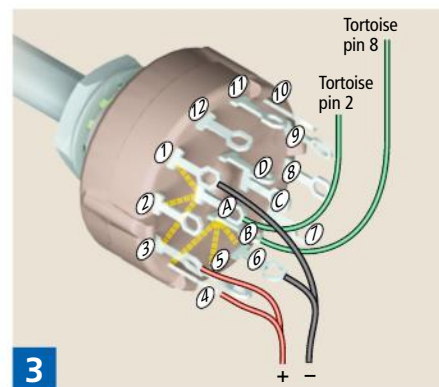
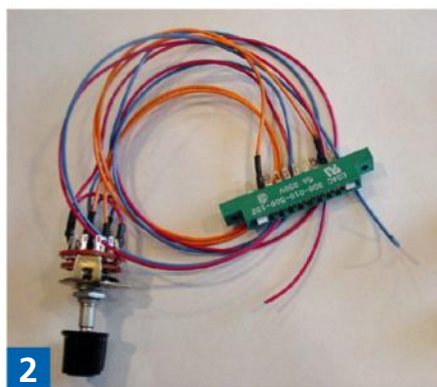
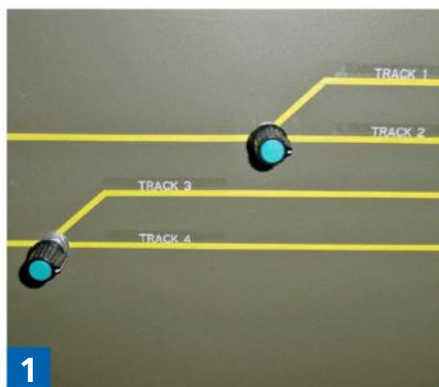
By varying the rail size and ballasting techniques, I can represent the type of service the track is in, and it prevents my right-of-way from becoming too monotone, making it much more interesting. **MR**

Lou Sassi is a prolific modeler and contributing editor who has written dozens of stories for Model Railroader and its special issues for nearly 30 years.

SIMPLE route selection

A rotary knob makes controlling switch motors intuitive

By **Pete LaGuardia** • Photos by the author



As a member of a round-robin operations group, I've had the chance to observe many different model railroads. The most popular methods to control turnouts on most of these layouts are manually, using ground throws, or with Tortoise by Circuitron switch motors controlled by double-pole, double-throw toggle switches.

When I moved to a new home, I finally had a 30 x 30-foot space in which to build my own layout. Based on my experience, I didn't want to use ground throws. I think they look oversized in the scale environment I want to model. But I also didn't want to use toggle switches to control switch motors because their operation can be counter-intuitive. On some layouts, the toggles are set to move horizontally, and on others, vertically. Regardless of their orientation, toggle switches don't visually indicate the direction of the turnout, especially if the turnout is angled differently on the layout from its representation on the control panel schematic.

I wanted to draw the track schematic on my fascia and add the switch motor

controls at the turnout locations. But I wanted the operator to be able to look at the fascia, understand where he is, and know at a glance which route the turnout was lined for. The solution I came up with uses a rotary switch with a black knob as a pointer.

With the rotary switch mounted at the turnout's location on the fascia track plan, operators can turn the switch to select a route.

The switch I used was a three-position, four-pole switch. This means that the four poles can be connected to any of three outputs. All four make contact simultaneously. By bridging two sets

1 Unsatisfied with toggle switches that didn't indicate the position of the turnouts they controlled, Pete LaGuardia hooked up his switch motors to rotary switches that let train operators intuitively select their routes.

2 Wiring the rotary switch to a snap-on edge connector made installation easy.

3 This diagram shows how Pete wired the rotary switch. Rick Johnson illustration

of contacts, it was easy to use two of the switch's poles to reverse the polarity to the switch motor. The switch's unused center position serves as an "off" to guarantee break-before-make operation.

Though only two poles of the switch are needed for this installation, the other two can be used for functions such as powering the turnout frog or driving lineside signals.

This approach also makes installation easy. By adding an edge connector to the switch-motor contacts, I was able to do all the wiring on my workbench and simply plug the mounted switch into the Tortoise motor. Installation was literally a snap. **MR**

Materials list

Futurlec (www.futurlec.com)
ROTP4P3 Four-pole, three-position rotary switch
KNOB12 Black knob and pointer

Digi-Key (www.digikey.com)
EDC305200-ND 20-pin female edge connector

Model tracks



Tracks embedded in dirt and cinders were common at locomotive terminals during the steam era. Kim Nipkow explains how he captured that look on his HO_{n3} Cumbres & Toltec with terrarium sand and potting soil for cactus plants.

Combine terrarium sand and cactus potting soil to get realistic results

By **Kim Nipkow** • Photos by the author

During the steam era, tracks in locomotive servicing terminals were embedded in dirt and cinders, and covered with ash, grease, and slag. The sight and smell of such a yard can be experienced today at the Cumbres & Toltec Scenic RR.

Since I model the modern-day tourist railroad in HO_{n3},

I needed to re-create the appearance of the tracks around the enginehouse and coal tower at the railroad's Chama, N.M., terminal.

I experimented with mixing different materials together to capture that look. I tried combining finely sifted earth and Arizona Rock & Mineral's Cumbres & Toltec ballast. The results were

pretty good, but the material was missing a grayish tint.

Then I noticed a pot of dry cactus potting soil in our house. The potting material was just what I was looking for. The cactus earth had brown, black, and gray particles. I sifted it to remove the coarser materials, yielding a ground cover that looked right for HO scale.

Though terrarium sand and cactus potting soil may not be typical model railroad scenery materials, I like the variegated look of the combined materials.

Kim Nipkow lives in Switzerland. His article "3 ways for realistic rocks" appeared in the January 2016 Model Railroader.

in dirt and cinders

STEP 1 TERRARIUM SAND

First, I applied terrarium sand between the tracks and in the gauge of the rails to fill in gaps in the cork roadbed and provide a base layer of ground cover.

I like terrarium sand because it has some coarser granules that will show through the final layer of scenery. Though I sprinkled the sand in the gauge of the rails, I kept it away from the working parts of turnouts. I made sure the sand was as level as possible before proceeding.



STEP 2 CACTUS POTTING SOIL

Next, I used a homemade shaker to apply the potting soil for cactus plants. I applied the material until almost all of the terrarium sand was covered. As you can see in the left-hand photo, I covered some of the crossties completely and left others exposed. If you're in doubt about the "right" look, refer to prototype photos.

When applying the potting soil for cactus plants, I was careful to keep the material out of the web of the rail. I applied the cactus potting soil sparingly around switch rods, frogs, and guard rails. A small brush makes it easy to clean stray granules from these areas, as seen in the right-hand photo. I also ran a test car to make sure the track and turnouts were free of debris that could cause derailments.

STEP 3 SECURING THE SCENERY

With the terrarium sand and cactus potting soil in place, I secured it to the layout. I started by wetting the scenery materials with a water and isopropyl alcohol mix (one part alcohol to three parts water). This helps break the surface tension of the scenery materials. I applied the solution with a pipette held close to the layout. If you hold the pipette too high, craters may form when the solution hits the scenery.

With the scenery wet, I applied diluted white glue (one part white glue, two parts water, and a few drops of liquid dish soap). I used a pipette to apply the diluted glue. Once I could see white between the granules, I knew the scenery materials were thoroughly saturated.

I let the glue dry for a day. Then I ran a test car through the finished scene one more time, checking for granules that floated into the web of the rail, guardrails, and frogs. I also tested each turnout to make sure the switch rod moved smoothly through its full range of motion.

Finally, I cleaned the tops of the rails with alcohol and a piece of cloth. Then I tested a locomotive. I kept cleaning the track until the engine ran smoothly.

Terrarium sand and potting soil for cactus plants aren't items you're likely to find in the scenery aisle at the hobby shop. However, the two materials make the tracks on my HOn3 version of the Cumbres & Toltec Scenic RR look just like they do in Chama, N.M. **MR**



A RAIL-MARIN



E SHOWCASE



The 12 x 17-foot HO scale Claremont Docks RR combines memories and modeling interests

By Howard R. Lloyd

Photos by the author

MY FASCINATION WITH TRAINS dates to the late 1940s when I was a young boy living in the Greenville section of Jersey City, N.J. Often, my grandfather would walk me to Bayside Park, where once I had my fill of the playground apparatus, we would go next door to the Van Nostrand Place station of the Central RR of New Jersey (CNJ). There, we would climb the steps of the pedestrian bridge over the multiple tracks and stand in the middle to watch trains. When I started work on the 12 x 17-foot HO scale Claremont Docks RR, I wanted to combine those childhood memories with my interest in rail-marine modeling.

The CNJ, which had a large presence and extensive terminal facilities in Jersey City, didn't lend itself to the small harbor-side switching layout I wanted to build. After studying a 1942 Army Corps of Engineers map, I selected the Lehigh Valley RR (LV). The LV main line, as well as its National Docks branch, ran parallel and very close to the CNJ at Van Nostrand Place. I recall strings of coal hoppers behind small LV diesels rumbling by on the half-mile-long steel trestle that spanned CNJ's nearby classification yards.

A spur came off the National Docks branch and went to a small LV harbor-side terminal popularly referred to as

1 Dock workers are busy loading cargo onto a deck lighter as 0-6-0 no. 2608 pulls an empty boxcar away. The action takes place on Howard Lloyd's HO scale Claremont Docks RR. The 12 x 17-foot model railroad combines childhood memories with Howard's interest in boat modeling.



2 Fairbanks-Morse H10-44 no. 11 brings a transfer run past the Claremont Storage Co. The four-story brick structure is one of two buildings that serve the boat basin.



3 Track laborers watch as Claremont Docks switchers pass each other. Howard modeled the bulrushes (foreground) using raffia, a fiber material sold at craft stores.

Black Tom. This finger of land jutting into New York Harbor could be modeled with reasonable selective compression. It had what I wanted: A boat basin served by both a multistory brick warehouse and a large corrugated metal freight shed, a terminal grain elevator, and a tank farm. These three signature elements, the Van Nostrand/Bayside Park area, and the steel trestle were the perfect ingredients for a model railroad.

With the structures selected, I turned my attention to the track plan. I wanted continuous running, so I created a loop rather than a more prototypical linear configuration. Information on Black Tom was hard to find, but I did have Army Corps of Engineers and Sanborn Fire Insurance maps. Also, I had prototype photos of three of the five signature

elements I wanted to model. I couldn't plausibly claim I was building the prototype. Rather, I was using the prototype to create a representation that pleased me.

Setting the stage

The benchwork is cantilevered off the wall with L girders, joists, and risers as needed to vary the elevation. There's little variation in elevation except for the trestle and the bluff above Bayside Park. Ground level is 53".

The fascia is 1/8" hardboard, as is the 24" valance suspended from the ceiling. The valance, featured in the June 2012 issue of *Model Railroader*, serves to partially conceal the layout lighting as well as to direct the viewer's eyes to the layout. The viewing window is 19" high, except

in a few areas where I added extensions to discourage wandering eyes.

I hung single-tube fluorescent lamps on the ceiling over the layout and used Excella full-spectrum tubes. I spaced the lamps about a foot apart, which was a mistake. The light level is only marginally sufficient. I should have used more lamps.

Capturing the waterfront look

Most of the layout is flat. Much of the ground started out as pieces of 1/2" plywood screwed to the joists. The earth's minor undulations were made using Lou Sassi's "ground goop," featured in the several issues of MR, most recently March 2015.

After the ground goop was applied, I used different shades and sizes of ground foam from Woodland Scenics, Heki, and others. Then I added tufts of static grass from Scenic Express.

I tried several methods and materials to make bulrushes (tall, thick marsh grass). The material that worked best was raffia, a natural fiber material often used for craft projects. Eventually I could make a respectable clump in under two minutes. There are several hundred clumps of bulrushes along the long wall behind the grain elevator.

I modeled the water using a multi-step process. First, I sealed the 1/2" plywood with latex house paint. Then I covered the painted plywood with plaster mixed with water to a consistency that will flow using a brush. I used the brush to shape the plaster into gentle swells.

After the plaster dried, I painted it with black, dark blue, and dark green acrylic craft paints. I blended the colors in a mottled pattern. I brushed in a strip of phosphorescent light green where the water came up to the bulkhead.

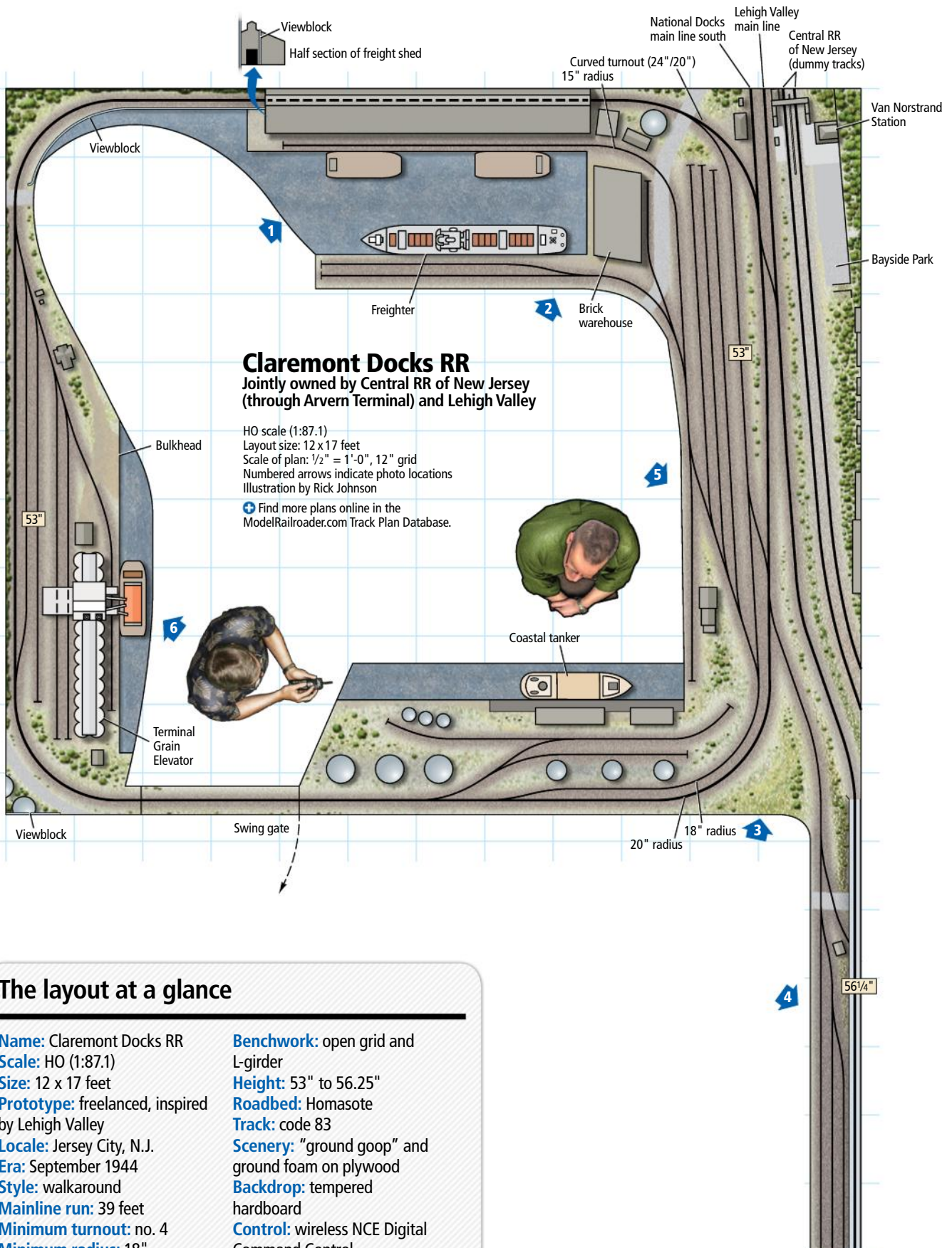
To make the water look wet, I applied several coats of gloss medium.

Focus on structures

I enjoy scratchbuilding structures and creating scenes. The Van Nostrand station/Bayside Park scene is based almost entirely on memory.

However, my memory was an insufficient basis to build the station. At the time I couldn't find prototype photos. However, I had a decades old, scratch-built model of the Pennsylvania RR's station at Collingswood, N.J., and used that as a substitute. I built the pedestrian bridge from a kit.

The prototype Bayside Park was large, but I only had room for a small



The layout at a glance

Name: Claremont Docks RR

Scale: HO (1:87.1)

Size: 12 x 17 feet

Prototype: freelanced, inspired by Lehigh Valley

Locale: Jersey City, N.J.

Era: September 1944

Style: walkaround

Mainline run: 39 feet

Minimum turnout: no. 4

Minimum radius: 18"

Maximum grade: 3 percent

Benchwork: open grid and L-girder

Height: 53" to 56.25"

Roadbed: Homasote

Track: code 83

Scenery: "ground goop" and ground foam on plywood

Backdrop: tempered hardboard

Control: wireless NCE Digital Command Control



Meet Howard R. Lloyd

Howard's first article for *Model Railroader*, "Norwood store and rooms" appeared in the January 1970 issue. He and Melinda, his wife of 51 years, live near San Jose, Calif. They have two adult children and three granddaughters. Howard is a federal judge with chambers in San Jose.

playground and the suggestion of a promenade that circled the park. The building flats at the edge of the bluff are along Garfield Avenue, which was the western boundary of the park.

I didn't have room to do justice to the steel trestle. I built a truncated version from Central Valley bridge girders and various manufacturers' through and deck girder bridge kits. The approach abutment is styrene sheet.

I had pictures of Black Tom's two pier sheds from the 1960s. I used features from each to build my single 54" long pier shed. The walls are .060" styrene laminated with Campbell corrugated siding. I secured the siding panels with Bron "Killer Red" double-sided tape. The windows are commercial castings; the doors are scratchbuilt.

The prototype grain elevator, built in 1918, is pretty small as terminal elevators go. Even so, it was too big to model full

size. I reduced the number of silos from 33 tall ones to 20 not-so-tall plus a proportionately smaller work house.

I had some decent photos of the prototype, which showed me enough to build a credible model. Except for three Walthers grain elevator kits, which I purchased for the silos, I scratchbuilt the structure from styrene.

I placed the work house between the row of silos rather than at the end as on the prototype. I made this modification so there would be sufficient room on the two tracks passing through the receiving shed to spot six loaded boxcars (three on each) in front of the shed and six empties beyond it. I also installed two dummy car pullers.

Don't forget the boats

Another of my interests is modeling boats. I like the synergistic relationship



4 New Jersey Central caboose 91382 marks the end of a train passing on the steel trestle above while a Claremont Docks steam engine switches the yard below. The trestle is based on a Lehigh Valley prototype in Jersey City, N.J.

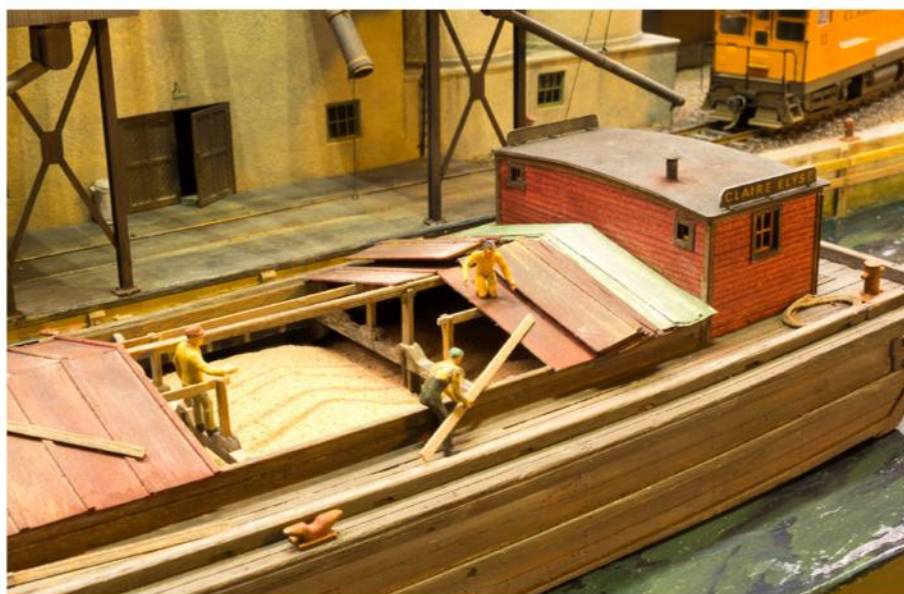
between freight railroads and working boats.

The grain boat *Claire Elyse* shown in **6** started out as a Frenchman River kit for a deck lighter (think of that as a floating flatcar). I cut a big hole in the deck of the hull casting to open up the “hold” and converted it into a grain carrier using plans that appeared in issue no. 25 of *Transfer*, the publication of the Rail-Marine Information Group.

I scratchbuilt the stick lighter loading large crates in the ship basin from plans in issues 21 and 22 of *Transfer*. The deck lighter shown in the basin (**1** on page 42) is an American Model Builders kit, and the tiny tug is a Model Expo 1:96



5 Avern Bay Terminal Alco RS-1 no. 100 hustles past the Armstrong-Victor building. The two tracks with the tan ballast are cosmetic and don’t connect with the rest of the layout.



6 Workers finish putting the covers over the cargo hold on the *Claire Elyse*. Howard converted the Frenchman River kit into a grain hauler using plans published by the Rail-Marine Information Group.

scale kit with extra detail. The big freighter, the S.S. *Mileva*, started as a 1:96 scale Dean’s Marine kit, but I modified it substantially with many added details.

The tank farm and more

I’ve been working on the Claremont Docks for more than 10 years, and it will surely be several more before I build the fifth and final signature element, the tank farm. What will I do then? Probably build more boats.

I’m working on an armed trawler using a Lindberg North American Trawler kit as the starting point. During World War II, the U.S. Navy requisitioned many fishing trawlers and converted them into escorts and picket boats.

The variety of rail-marine modeling is what makes working on the Claremont Dock RR so enjoyable. If I get tired of working on freight cars, I can switch to structures. If I need a break from that, I can work on boats. The skills needed for each are largely the same. 



Motor no. 5 is pulling a loaded gondola from the coal dock spur on James Cordaro's Sommerburg Electric Traction Co., or SETCo. He uses single-point turnouts on his HO scale traction layout. Follow along as he shares his construction techniques.

SPECIAL TRACK ISSUE

BUILD A SINGLE-POINT TURNOUT

The prototype helped trolley lines save money

By James F. Cordaro • Photos by the author

SINGLE-POINT TURNOUTS were commonly used for prototype streetcars and light traction. There were four reasons the prototype used these turnouts: simplicity, reliability, tight turning radius, and low cost. Low cost was nearly everything to a struggling traction company.

These turnouts aren't common in HO scale, so I built my own. I've been building them for years for my Sommerburg Electric Traction Co., or SETCo. I use them on my layout

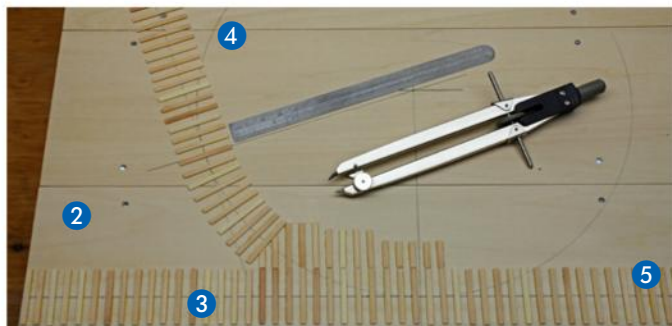
because the tight radii look more prototypical for streetcars than commercial HO scale double-point turnouts. I'll show you step by step how I build turnouts for my layout.

James Cordaro is a retired materials engineer living in Ridgecrest, Calif. He previously ran his own paint manufacturing company. His interests include model railroading, art, and reading history. This is his first article in Model Railroader.

STEP 1 LAY OUT THE TURNOUT AND INSTALL TIES

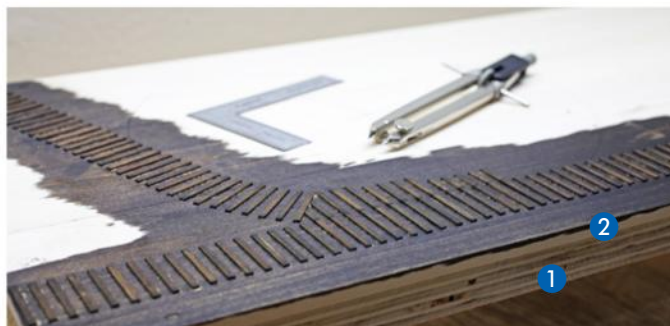
I built this turnout at the workbench to add to my layout later. The subroadbed is a piece of $\frac{3}{4}$ " BC plywood (1). I used $\frac{1}{4}$ " x 4" x 24" basswood (2) from Midwest Products as the roadbed, laminated to the plywood using yellow carpenter's glue and a few $\frac{3}{4}$ " wire nails. Basswood holds spikes very well. I lay wood ties directly on top of the basswood.

First I made a centerline mark (3) using a straightedge for the straight route. Then I drew the centerline (4) of the radius with a compass. It's a scale 35 feet. This is just under 5" radius for an HO turnout.



Next, I laid the ties along the centerlines I drew, securing them with yellow glue. I used Mt. Albert HO scale 4" x 9" x 8'-6" contour ties (5). [Fast Tracks Hobbyworks (www.hand-laidtrack.com) recently purchased Mt. Albert Scale Lumber. – Ed.] I prefer these low-profile ties because there's less chance of splitting when I spike the rail down.

I didn't worry about the lengths of the ties around the turnout. I took care of that in Step 5. I gently sanded the tops of the ties with 220-grit sandpaper to remove any high spots. Then I stained the ties with Minwax Dark Walnut stain.



STEP 2 LAY THE FIXED RAILS

I used Micro Engineering code 70 un-weathered and weathered rail and Walthers Code 70/83 spikes, with a spike every fifth tie (1). Each turnout has four rails, A, B, C, and D, that I spiked down in the same order.

Rail A is the straight, non-diverging stock rail. I stopped spiking two ties before where the radius begins so it doesn't interfere with laying the fixed point rail (C). I started spiking again about seven ties down from the approximate location of the frog. This clear area will get a guardrail later.

Rail B is the diverging stock rail. Starting with straight rail, I kept rails A and B in gauge using three-point rail gauges. I used one set of spikes every fifth tie until I got to two ties before the radius began (2), and stopped spiking.

I held the rail in place with needlenose pliers at the last set of spikes before the curve, then bent the rail to a close approximation of the path of the ties around the turnout. I went well past the frog's approximate location and began spiking the rail again. The first spike is set in the first tie that's at an angle on the turnout (3). A guardrail will be glued in the area without spikes later.

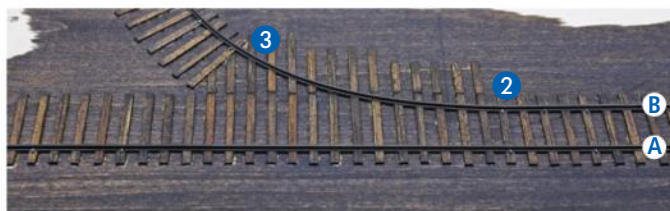
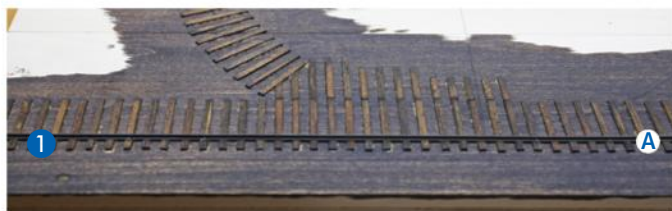
Rail C is a little bit more complex. This is the diverging rail that makes up the fixed point, closure rail, and half of the frog. I bent a piece of rail until it followed the curve of rail B.

I continued bending it past the portion where rail B straightens out. This gave me a curved point. I cut the end of the rail off near the spot in the curve just where it begins to run wider than gauge, determined by using a National Model Railroad Association (NMRA) standards gauge.

I filed that end of the rail to a flat point (4). The point of rail C is about one flangeway width from rail A and in gauge with rail B. With both set, I spiked the rail in place.

I drove a pair of spikes into each tie, moving the gauge as I went around the curve. Around a curve this sharp, it's better to be a little wide than a little too tight.

The last rail, D, is the outer frog rail for the straight route. It's a piece of rail with the end filed at an angle to match the curvature of rail C. I tried to get this frog rail as close to rail C as possible, but without touching (5). That simplified wiring for two-rail operation. I stopped spiking this rail two ties before the frog to avoid damaging the frog.



STEP 3 BUILD AND INSTALL THE MOVABLE POINT

The movable point pivots on a brass rod in a brass bearing. To locate the hole for the bearing, I laid a straightedge along the centers of rails **B** and **D**, then counted four ties to the right of the frog and marked that spot between two ties. Putting the pivot point here makes it easier to drill the hole, but will require an extra piece later.

I drilled a $\frac{1}{8}$ " diameter hole for the bearing **1**, making sure it was as perpendicular to the roadbed as possible. I can compensate for a slight angle later. I used a countersink bit on the underside of the subroadbed to create a surface to secure the bearing in the hole with epoxy.

The bearing is $\frac{1}{8}$ " outside diameter, $\frac{3}{32}$ " inside diameter, and 2" long to fit through my roadbed and subroadbed. I pushed the tubing flush with the level of the roadbed, and epoxied it to the subroadbed from below.

The movable point is three parts. The first is a section of un-weathered rail **2**, cut a little long and filed to a point on one end **3**. I kept checking to make certain it fit closely into the web of rail **B**. I marked the spot on the point rail that aligns with the center of the bearing, and discovered the center of my bearing was $\frac{1}{32}$ " too far from rail **A**. I compensated for this when I attached the point rail to the pivot rod.

I cut a 3" long $\frac{3}{32}$ " diameter brass rod for the pivot and filed both ends square **4**. I soldered one end to the point rail's pivot point with the joint offset by $\frac{1}{32}$ " to compensate for the location of the bearing.

To compensate for a bearing hole that wasn't drilled exactly perpendicular to the roadbed, I heated and loosened the solder joint, adjusting the angle of the joint so the rail would sit flat on the ties. This may take more than one try. It didn't matter if the point swung up or down against the ties across the turnout, as it only had to move about $\frac{1}{16}$ ".

The point rail requires a "filler" rail **5** to guide the car onto the diverging route. This is a departure from the prototype. I modified the design of my turnout to simplify construction and improve reliability.

I gently filed a flat area on the side of the point rail so the filler rail could lie flat against the point. Then I cut a piece of non-weathered filler rail about $\frac{3}{4}$ " long and filed one end to a flat point. This piece is soldered to the point rail opposite the fixed point **6** of rail **C**.

I filed the filler rail at the bottom so it fit against the web of rail **B** when the point rail is closed. On some turnouts, I had to heat the solder and slightly adjust the position of the filler so the point fit flat against the ties. To finish the point rail assembly, I cut off the excess just beyond the pivot and filed it flush with the pivot rod **4**.

I installed a stop **7** to limit the swing of the point rail. The back of the point rail will guide the wheels onto the diverging route. To find the maximum swing of the point rail, I inserted a flangeway tab from my standards gauge between the point rail and rail **B**. This gave me a rough idea, but not the exact spot where the swing should stop.

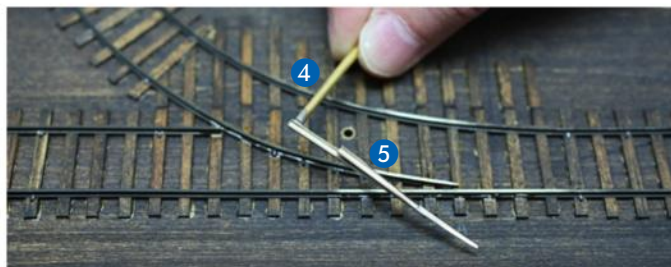
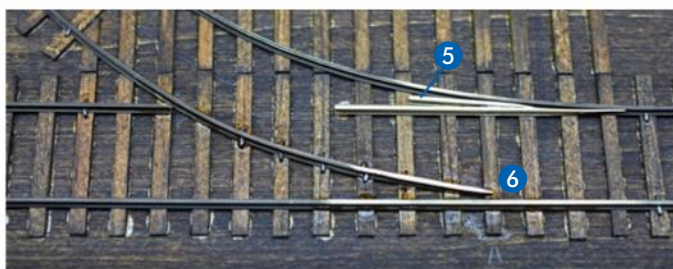
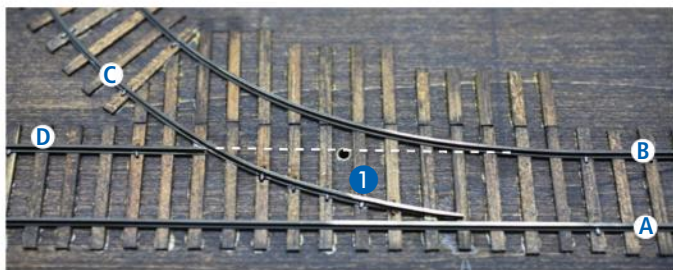
To find the exact spot, I ran a truck **8** back and forth through the turnout, adjusting the position of the point rail slightly as I went. Eventually, I found the sweet spot where the truck didn't bump as it entered the diverging route.

I marked the position of the point rail on the tie below the end of the filler rail carefully. The stop is a piece of $\frac{1}{32}$ " x $\frac{1}{8}$ " brass about $\frac{3}{8}$ " long. I bent about $\frac{1}{8}$ " of the end upward and filed it to fit the web of the point rail. I glued the stop to the marked tie using gel-type cyanoacrylate adhesive (CA). I'm not fond of how the stop looks, but it operates reliably.

The straight closure rail **9** between the point and the frog is about $\frac{3}{4}$ " long. It fits between the point rail's pivot and where rail **C** crosses rail **D** to create the frog. The pivot end was cut flat and the other end was filed at an angle to match the curve of rail **C**.

The flat end was as close to the pivot as possible, while still allowing the point rail to move. The gap between the angled end and rail **C** was the width of the NMRA flangeway standard **10**, and possibly a little more.

I soldered a wire to the closure rail, then glued the rail in place with CA gel. Now it's time to cut the frog.



STEP 4 FROGS, GUARDRAILS, AND WIRING

Cutting the frog is the one step where I can ruin the turnout, so I have to be careful. I used a motor tool with a cut-off disk to make a cut into rail **C** that's parallel with the straight route. I was careful not to let the spinning disk touch the straight rails.

After cutting partially into the web of the rail, I used jeweler's files to widen the slot and file the web of the rail down a bit more. I left some web remaining instead of filing down to the flange to maintain strength in the rail.

I made sure not to cut through the rail flange **1**. This would break electrical continuity in rail **C**, and the closure and point of the rail would eventually shift out of alignment, ruining the turnout.

To finish the frog, I added a coat of medium CA as an insulator **2**. Otherwise, as a car traverses the frog, its metal wheels short circuit the gap between rails **C** and **D**. I coated the tops and edges of the rails around the frog about $\frac{1}{8}$ " in each direction. For stubborn turnouts, I use a thin layer of 30-minute epoxy. As the coating wears, it can be replaced.

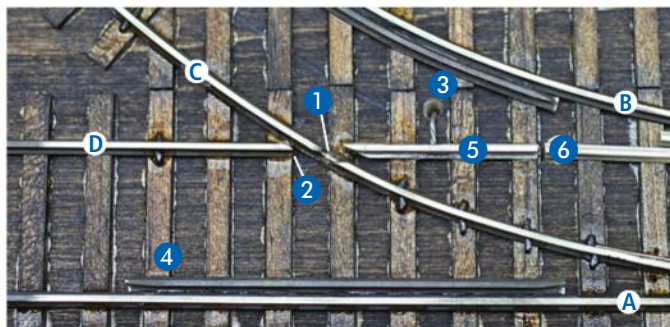
I made guardrails along rails **A** and **B** about 2" long to guide the wheels through the frog. I curved the guardrail **3** for the diverging rail, then sharpened the rail ends to points to prevent wheel flanges from catching.

I like to have the guardrail extend well beyond the frog, as it helps the truck to track better over the frog. I centered

the guardrail across from the frog and glued it to the ties using CA gel.

The guardrail for rail **A** was a piece of straight weathered rail **4** with its ends sharpened. It was also glued in place with CA. The flanges of the rails touched when the guardrails were mounted.

To wire the turnout, I soldered a jumper from rail **A** to rail **C** for one side of the circuit. For the second side of the circuit, I soldered a wire to rail **D** and the straight closure rail **5**, the brass bearing **6**, and to rail **B**. I don't solder to the pivot itself, as this would restrict the movement of the point rail. There's enough electrical continuity between the bearing and the pivot.



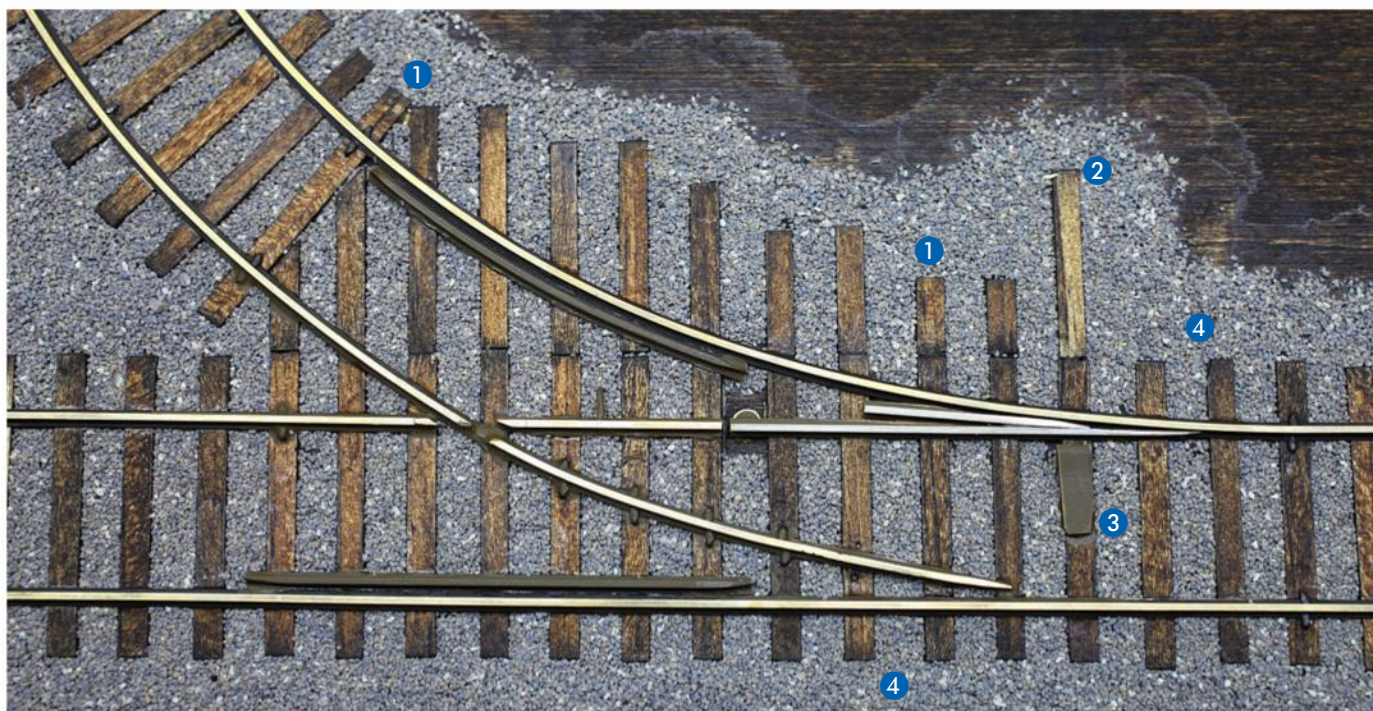
STEP 5 FINISHING TOUCHES

To finish the turnout, I trimmed the ties to length **1** and extended one tie to mount a scale switch stand **2**. I touched up any scratched or damaged ties with stain.

Then I painted the metal parts with Floquil Rail Brown **3** (Model Master's Railroad Tie Brown is a good stand-in for the discontinued Floquil color). I sprayed the turnout with Testor's Dullcote to hide the CA and epoxy, then buffed the Dullcote off the top of the rails, except at the frog.

I removed the point assembly and applied a blend of Woodland Scenics ballast **4**. I use Woodland Scenics ballast around turnouts because it's made from crushed walnut shells, and it's easier on files when I'm fine-tuning the rails for operation.

With everything complete, I installed the turnout on the model railroad. These simple, inexpensive turnouts go a long way to set the scene for my traction layout. 





Gary Butts scratchbuilt this manually operating switch stand out of brass components. An under-the-layout mechanism moves the switch points and toggles power to the turnout frog and points.

SPECIAL TRACK ISSUE

How to build an operating switch stand

A flick of the finger reliably moves switch points and sets frog polarity

By Gary Butts • Photos by the author

While pursuing the National Model Railroad Association Civil Engineering Award, I developed these manually operating target switch stands.

Although my HO scale Gary & Sandy RR used flextrack, commercial turnouts, and twin-coil switch machines, I had to prove that I could handlay track and build turnouts for the merit award.

Since I was already handlaying track on a new module, I scratchbuilt the switch stands as well. Made from brass, these realistic-looking switch stands are sturdy enough to set the switch points with the flick of a finger.

For each switch stand, the motion of the turnout throw arm follows 90 degrees of revolution, showing a red target to the engine crew when the points are set for the diverging route. The edge of the target shows when the points are set for the normal (through) route.

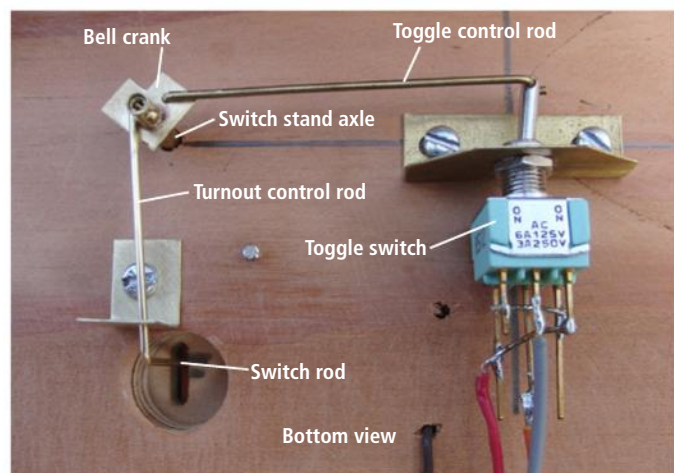
In addition to providing the linkage connecting the switch stand to the switch rod, an under-the-layout mechanism, shown in ① at left, also controls a double-pole double-throw (DPDT) toggle switch connected to the track bus wires, turnout

frog, and switch points. This toggle switch ensures that the frog and point polarity matches that of the selected route. The toggle also provides extra tension on the switch points to help hold them in the selected position.

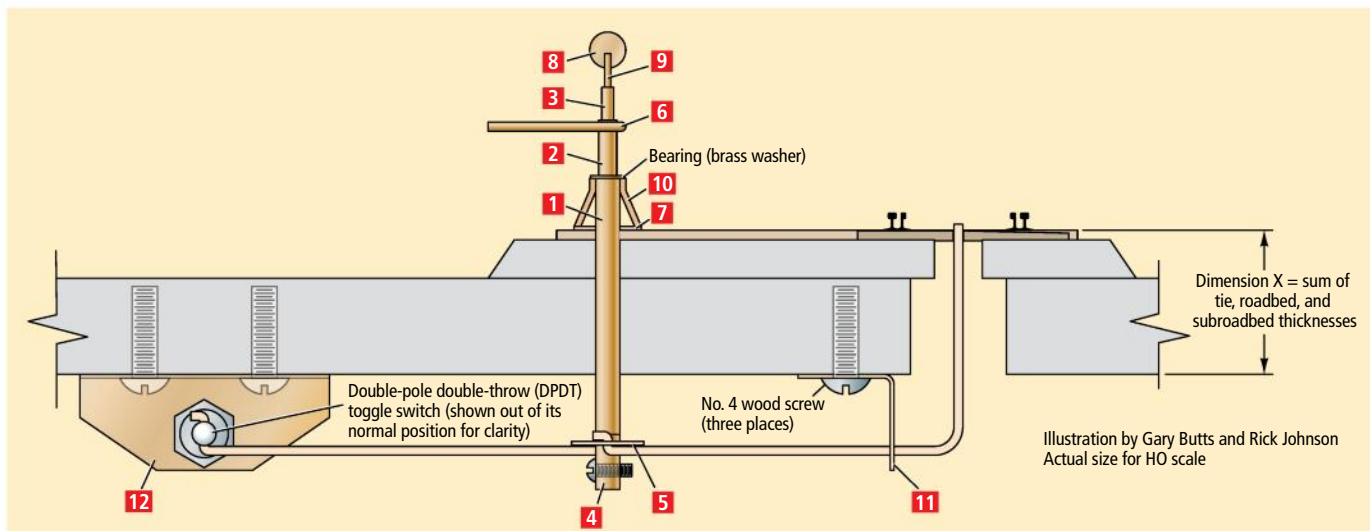
Follow along as I describe how to build one of my brass switch stands. A detailed assembly drawing and illustrations and descriptions of each brass component is shown on the next page.

Layout prep

Preparing the layout for one of my manual switch stands is essentially the same as for a slow-motion switch machine. First I drilled a .052" (no. 55) hole in the center of the turnout switch rod and made a 1/8" x 3/8" slot in the roadbed and subroadbed. When the turnout is



① **Reliable operation.** An under-the-layout mechanism provides reliable mechanical and electrical operation. The bell crank at the bottom of the switch stand actuates the turnout switch rod and a toggle switch that sets the correct polarity.



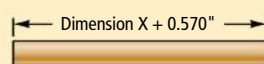
installed, the turnout's switch rod will conceal this slot from above. I made sure the slot provided enough clearance for the control rod to easily move the points. A larger access hole in the subroadbed under the switch rod slot ① makes it easier to install the control rod from the switch stand mechanism.

Next I drilled a $\frac{1}{8}$ " hole through the roadbed and subroadbed on either side of the switch rod. This hole is for the switch stand assembly. The location and distance from the switch rod depends on the desired location of the switch stand on the layout.

Brass components

To build the switch stand, first I measured the combined thickness of the subroadbed, roadbed, and turnout ties, which give me the dimension "X" referred to in the component drawings at right. This dimension must be greater than $\frac{1}{2}$ " for the switch stand to function smoothly.

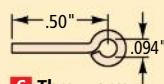
Next I cut a length of $\frac{1}{8}$ " outside diameter (o.d.) brass tubing .570" longer than dimension X to form the axle housing (part no. 1). The axle (part no. 2) is cut from $\frac{3}{32}$ " o.d. tubing .605" longer than the axle housing, or 1.175" longer than dimension X. The target sleeve (part no. 3) is a .750" length of $\frac{1}{16}$ " o.d. tubing, and the bell crank



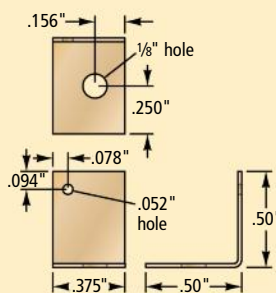
1 Axle housing
 $\frac{1}{8}$ " (Outside diameter) x .014" (wall) brass tubing



3 Target sleeve
 $\frac{1}{16}$ " x .014" brass tubing



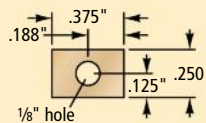
6 Throw arm
.047" brass rod



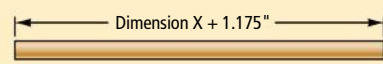
11 Control rod guide
.020" brass shim stock



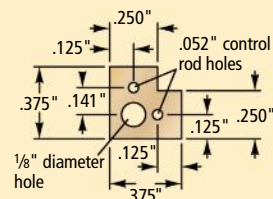
4 Bell crank hub
 $\frac{1}{8}$ " x .014" brass tubing



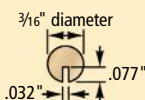
7 Base plate
.020" brass shim stock



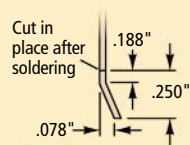
2 Axle
 $\frac{3}{32}$ " x .014" brass tubing



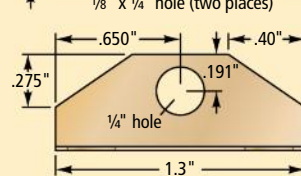
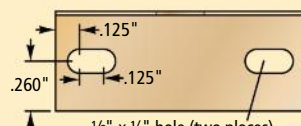
5 Bell crank
.020" brass shim stock



8 Target
.020" brass shim stock



9 Target mast
 $\frac{1}{32}$ " brass rod



12 Toggle switch mount
.020" brass shim stock

hub (part no. 4) is a .313" length of $\frac{1}{8}$ " o.d. tubing.

I formed the housing braces (part no. 10) by bending a 3" length of .047" brass rod. Starting .188" from one end, I bent the rod out .078". I left the excess rod in place to make it easier to hold the braces while soldering.

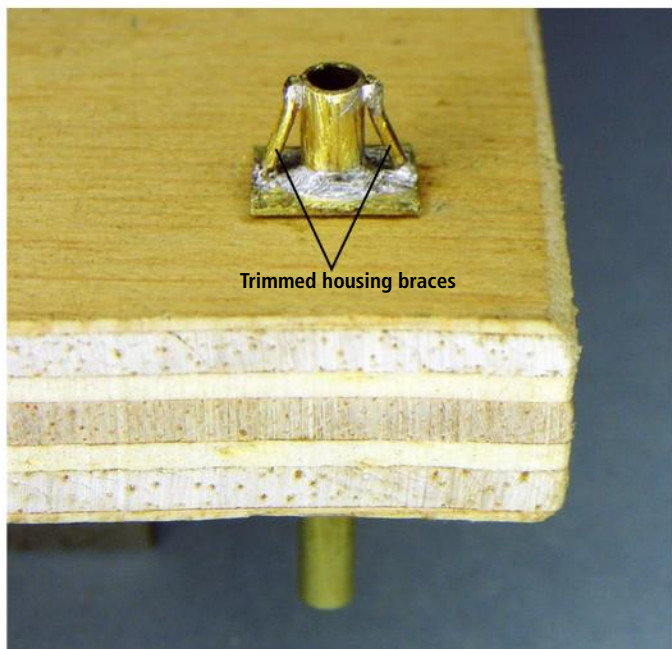
The throw arm (part no. 6) is also made of .047" rod.

I made the eye in this part by rolling its end around a $\frac{5}{64}$ " drill bit. The target stanchion is cut from $\frac{1}{32}$ " rod.

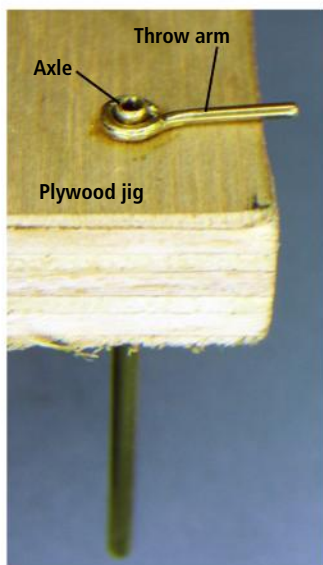
All the remaining parts are made from .020" thick brass shim stock. I laid out the parts on the brass sheet

using a scribing tool and a steel ruler. To make the scribe lines easier to see, I first colored the surface of the brass with a felt-tip marker.

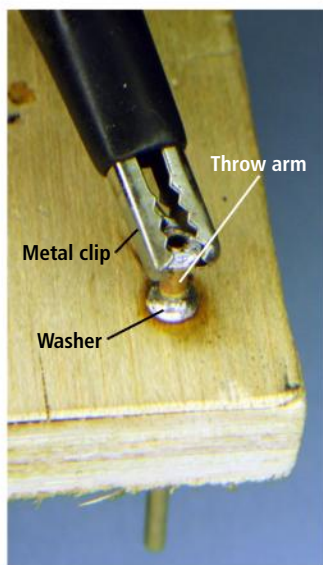
The positions of the .052" holes in the bell crank (part no. 5) must be measured accurately to ensure sufficient range of motion for the points



2 Axle housing. Gary used a jig to solder the axle housing to the base plate and the braces to the housing. He then trimmed the excess brass rod from the braces.



3 Throw arm and axle. Gary made another soldering jig for the axle assembly by drilling a $\frac{3}{32}$ " hole through a scrap of plywood. First he soldered the throw arm to the end of the axle.



4 Top axle bearing. Next Gary soldered the axle bearing, a modified brass washer, $\frac{5}{16}$ " below the throw arm. A metal alligator clip provided a heat sink to keep the solder from the previous joint from re-flowing.

and the toggle switch. For all the required holes in the sheet components, I used guide-lines and a center punch to make accurate drilling starter points. Although the target (part no. 10) could be cut and filed, I found it easiest to form this part with a $\frac{3}{16}$ " diameter sheet metal hole punch. The

notch in the target for the mast can be cut with a razor saw or a cutoff wheel in a motor tool.

As shown in the part drawings, the control rod guide (part no. 11) and the toggle switch bracket (part no. 12) must be bent 90 degrees. An easy way to form

this bend is by holding the part along the fold line with a large pair of needlenose pliers, then rolling the part against a solid surface, such as a tabletop.

I suggest using a small pencil-type soldering iron (50 to 75 watt) or a resistance soldering setup for this project. A large amount of heat isn't needed.

Axle housing

To aid in keeping the axle housing square, I made a soldering jig by drilling a $\frac{1}{8}$ " hole through a scrap piece of plywood **2**. The wood should be $\frac{1}{2}$ " to $\frac{3}{4}$ " thick. I used a twist drill bit because it makes the hole slightly undersized so it would hold the axle housing tightly at the proper height.

I inserted the base plate, making sure the axle housing extended $\frac{5}{16}$ " above it. I then soldered the parts together.

Next I tinned the ends of the axle housing braces. Using the long end of the part as a handle, I soldered one brace to the base plate. When soldering the braces, avoid letting the iron linger too long on the axle housing to avoid re-flowing the base plate solder joint. Another option to avoid this mishap is to use a metal alligator clip attached to the housing as a heat sink.

I repeated the process for the other brace, then trimmed off the excess rod. With both braces in place, I filed the tops flush with the top of the axle housing. Photo **2** shows the finished part.

Throw arm and axle

Using a jewelers file, I enlarged the hole in a no. 2 brass washer so it fit snugly over the axle. This modified washer is the top axle bearing that rides against the axle housing. I lightly sanded the top of the washer, the eye of the throw arm, and $\frac{3}{8}$ " of one end of the axle to remove any

oxidation and prepare the parts.

As with the axle housing, I made a soldering jig out of scrap wood. In this case, the fixture had a slightly undersized $\frac{3}{32}$ " hole to match the axle diameter. I aligned the eye of the throw arm with the hole, then inserted the axle, shown in **3**. Making sure about $\frac{1}{32}$ " of the axle end protruded from the eye, I soldered the parts together.

After removing the throw arm/axle from the fixture, I placed the washer over the fixture hole. Then I inserted the axle through the washer and back into the fixture. I positioned the axle so that the throw arm was $\frac{5}{16}$ " above the washer and soldered the washer to the axle. As shown in **4**, I used an alligator clip as a heat sink. Since the underside of the washer is a bearing surface, I made sure to file away any trace of solder.

Bell crank

For the bell crank assembly I used the same $\frac{1}{8}$ " soldering fixture as with the axle housing. I positioned the components in the jig so that the bell crank hub extended $\frac{1}{16}$ " above the bell crank and about $\frac{1}{4}$ " below the crank. The soldered parts are shown in **5**.

It's important to ensure that the correct side of the bell crank is facing up toward the $\frac{1}{16}$ " top end of the bell crank hub. The switch stand is designed so that the toggle switch control rod is 90 degrees from the switch point control rod. However, the holes for these rods aren't equidistant. This distance is .141" between the center-points of the toggle switch control rod hole and the axle hole. For the turnout point control rod, this distance is .125". If the part is flipped, the switch stand may not function properly.

The switch stand can be used on either side of the

track. Since the .125" control rod hole must face the track, the .141" toggle control rod will then be located either in front of or behind the switch stand axle. Using photo 1 as a reference, I suggest double-checking the location of the switch stand on the layout and the location of the toggle switch under the layout prior to soldering the bell crank assembly together.

Bell crank hub and axle key

The switch stand's rotational motion is transferred to the bell crank, and in turn to the control rods, via a keyed connection that attaches the axle to the bell crank housing and keeps the parts in proper alignment. With the axle housing in place, I put the bell crank housing on the bottom of the axle. Then I positioned the throw arm so that it was parallel to the .141" toggle switch control rod hole on the bell crank. I used a drill bit as a spacer under the throw arm as well as a weight to keep the axle from rotating.

Measuring .090" from the end of the bell crank hub, I drilled a no. 61 hole completely through the hub and axle. Next, I tapped the hole for 00-90 threads, as shown in 6.

I finished the keyed axle and bell crank assembly by inserting a 3/16"-long 00-90 screw into the hole. After testing to make sure the axle rotated freely, I removed the screw and disassembled the parts to get them ready to install on the layout.

Target and toggle

After cleaning the notch in the target with sandpaper, I inserted the target mast and soldered it in place. A soldering vise (two pairs of locking tweezers would also work) helped keep the parts aligned. Next, I cemented the mast into one end

of the target sleeve using 5-minute epoxy, leaving 1/8" of the mast exposed 7.

I drilled a no. 55 hole through the toggle lever of the DPDT switch 1/16" from the end. This part is brass, so it was easy to drill through. The lever also rotates in the switch housing so that it's easy to position the hole to connect to the control rod during final installation. A 1/8" drill turned by hand worked well to remove burrs and sharp edges from the hole. Photo 8 on the next page shows the end result.

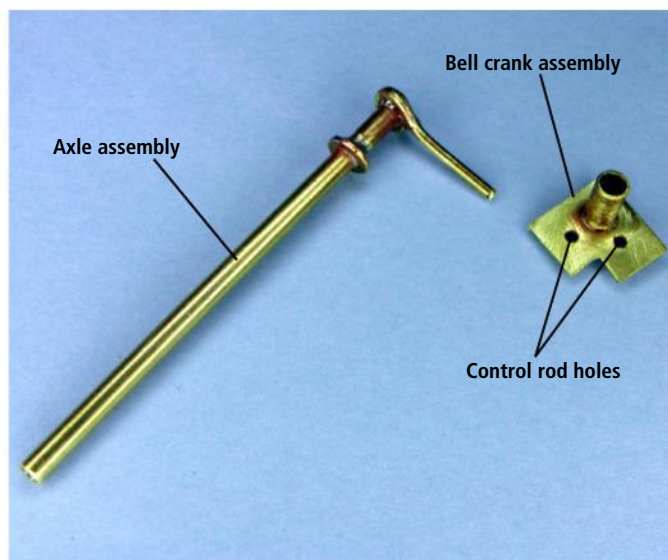
Switch stand installation

After painting the axle housing a grimy black color, I installed it into the 1/8" hole previously drilled in the layout scenery. I used white glue to hold it in place, making sure not to get any glue inside the axle housing tube. The base should be square with the turnout's head block ties and the housing braces should be parallel to the track, as shown in 9 on the next page. I then let the glue dry completely.

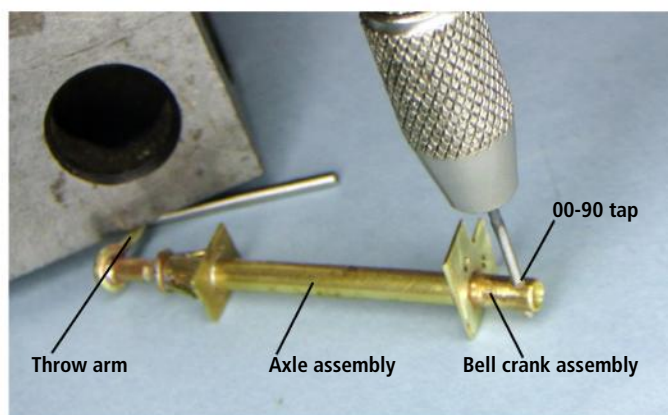
Next I applied a drop of light oil to the axle and inserted it into the axle housing. Then I turned the axle so that the throw arm pointed away from the track and mounted the bell crank assembly to the axle end below the layout using the 00-90 screw. This connection is shown in 1 on page 52.

Toggle switch bracket

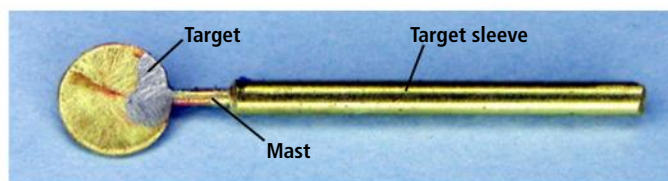
To locate the toggle switch bracket, I drew a line on the bottom of the layout base starting at the axle and running parallel to the track. Then I placed the toggle switch bracket about 3" along this line and marked the center between the bracket mounting holes, as shown in 10 on the next page. Using these guidelines I drilled two no. 44 holes for the no. 4 bracket mounting screws.



5 Bell crank. It's important to remove any excess solder near the control rod holes in the bell crank. This ensures that the rods won't bind when the switch stand is operated.



6 Keyed connection. After inserting the axle into the bell crank hub, a drill bit and a weight kept the switch throw arm and axle in alignment with the toggle switch control rod hole. Gary then used a 00-90 drill and tap to make the threaded hole for the key screw in the bell crank hub.



7 Target assembly. The target is soldered to the target mast, then glued into the target sleeve. For brass parts Gary used either 5-minute epoxy or white glue.

Before mounting the bracket, I carefully measured the distance from the center of the axle to the midpoint guideline between the bracket mounting holes. This measurement provides the distance needed for the toggle switch control rod.

I made the control rod out of .047" brass rod, leaving an

extra 1/2" at each end. Then I made sharp right angle bends at each end, making sure the distance between the two bends matched the distance between the axle and the toggle switch bracket noted above.

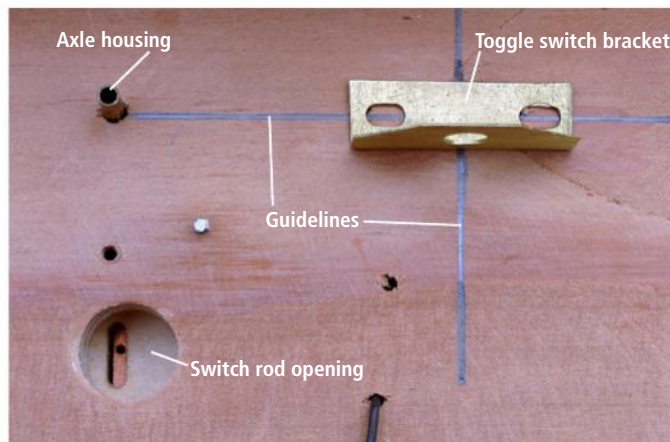
I formed a Z bend on the end that would connect to the bell crank by first inserting



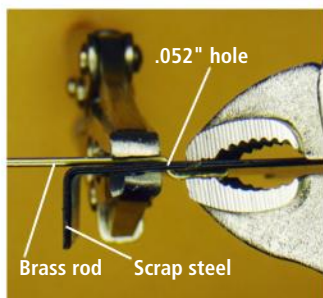
8 Toggle preparation. Gary drilled a no. 55 hole through the toggle switch. The part is made of brass and was easy to drill through. He then removed any burrs and made sure the brass control rod fit securely.



9 Axle housing installation. It's easier to paint the axle housing prior to installing it on the layout. After the paint dried on the housing, Gary glued it into the $\frac{1}{8}$ " hole previously drilled into the scenery base.



10 Toggle switch bracket. Guidelines help properly orient the toggle switch bracket under the layout. One line starts at the hole for the axle and runs parallel to the track. Gary then used the bracket to determine the center point and made another guideline perpendicular to the first.

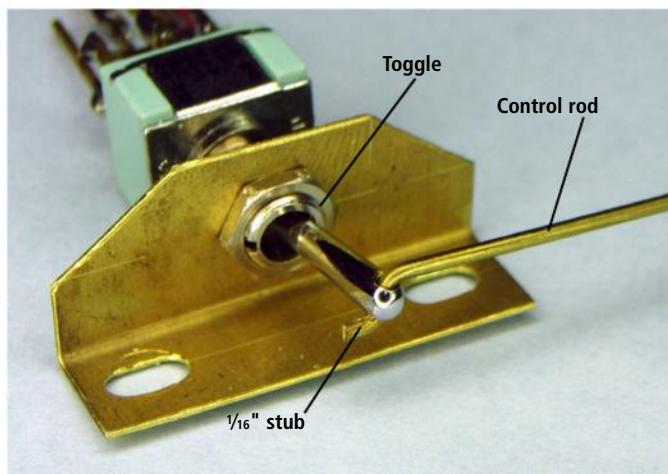


11 Control rod Z bends. To form the Z bends at one end of each control rod, Gary used a scrap of sheet steel with a .052" hole drilled through it as a jig. He then bent the wire with two pairs of locking pliers. The sheet steel resists bending, making a tighter Z bend in the rod.

the end of the rod through a .052" hole drilled through a scrap of 20 gauge sheet metal. Then I used two pairs of pliers to make the tight bend shown in 11.

Next I screwed the toggle switch into the bracket and inserted the other end of the control rod into the hole previously drilled through the toggle 12. I then made a Z bend and trimmed the rod, leaving a $\frac{1}{16}$ " stub. Then I inserted the other end of the rod into the bell crank.

After rotating the bell crank 90 degrees away from the track, I mounted the toggle switch bracket with the control rod toward the bottom of the toggle. Then



12 Toggle control rod. For the control rod end that connects to the toggle, Gary inserted the control rod through the hole, then made the Z bend. He cut off the excess rod, leaving a $\frac{1}{16}$ " stub to prevent the rod from coming loose.

I adjusted the toggle switch position by loosening the screws and moving the bracket in its mounting slots. The toggle switch control rod hole should be in line with the switch rod slot when the toggle is halfway through its range of travel (sticking straight out).

Turnout control rod

To locate the turnout control rod guide, I drew a line from the axle hole to the turnout switch rod access hole. Then I marked a point $\frac{3}{4}$ " from the center of the access hole and $\frac{3}{16}$ " to the outside of the line. Then I drilled a no. 44 hole for the

drilled in the turnout switch rod. With the control rod now secure at both ends, I secured the control rod guide with a no. 4 screw.

Some final adjustments

I moved the toggle switch lever and bent the vertical section of the turnout control rod until there was even tension in both point positions. The toggle switch's over-center force give the points a "snap" action.

With the mechanism operating smoothly, I set the turnout to its normal (non-diverging) position and glued the target assembly in place on the axle with fast-cure epoxy. A small electrical clip on the target sleeve kept it at the correct $\frac{1}{16}$ " above the top of the axle while the epoxy cured. It's important to remember that the target should be edge-on from the engineer's perspective for the normal or through route.

Satisfied with the mechanism's operation, I painted and weathered the switch stand and finished wiring the turnout. I hope this project has inspired you to take control of the turnouts on your model railroad. **MR**

Gary Butts lives in California. This is his first article for Model Railroader.

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Dual engines with a WOWSound decoder



Southern E6a no. 2800 heads south with *The Southerner* on Larry Puckett's Piedmont Southern railroad. This month, Larry shows you how to get the sound of an E unit's dual diesel engines running in and out of sync with one another using a TCS diesel WOWSound decoder.

One of the interesting features

of Electro-Motive Corp. (EMC) and Electro-Motive Division (EMD) E-units was their use of dual diesel engines to get the horsepower needed for fast acceleration of long passenger trains.

With two 12-cylinder 567A diesel engines, they could be synced and sound like one loud locomotive, or they could get out of sync a touch and sound like a pair of locomotives running together. So short of installing two sound decoders, how do you duplicate this with your

models? Train Control Systems (TCS) has provided a way to make it sound as if two engines are growling away in your favorite E unit, and you can control how far out of sync they are.

I installed a WOWSound version 4 decoder in an older Life-Like Proto 2000 E6a, which is similar to the recent Walther's Proto DC models. The Walther's model is easier to work with since it has a 9-pin socket, as well as holes in the standard 8-pin plug arrangement for an

8-pin socket or for soldering the wires from the decoder.

With the older Life-Like model there are two approaches, the easiest being to add an 8-pin plug to the decoder and plug it into the socket in the model. The downside to this approach is finding a place to put both the decoder and the speaker. Although there's a slot in the weight for a decoder, the WOWSound decoders are a bit too long to fit.

I chose the second approach, removing the locomotive's circuit board and hard-wiring the decoder in its place. After I removed the screws that hold the circuit board in place, I marked all the wires with masking tape, then disconnected them.

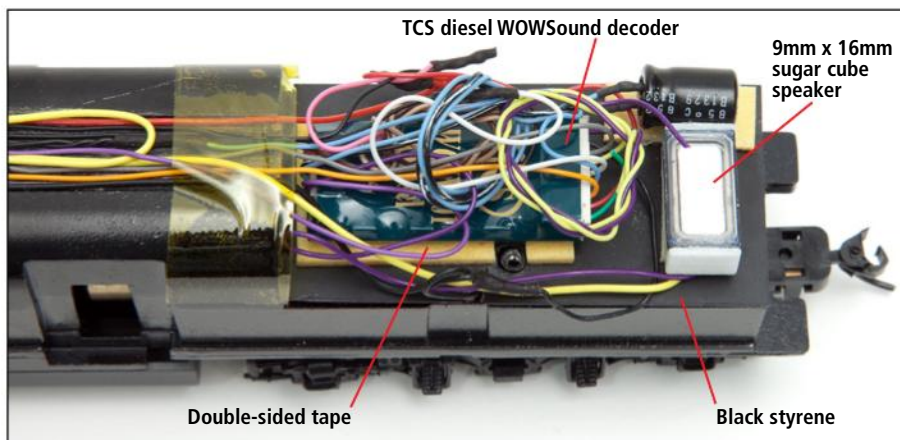
Life-Like wasn't all that particular about the color of the wires used, and the colors generally don't match the National Model Railroad Association (NMRA) standard. See "NMRA DCC wiring code" on the next page. Fortunately Life-Like did mark the "+" and "-" motor wires on the circuit board.

I cut a rectangle of black styrene sheet sized to fit in place of the circuit board and attached it to the chassis with double-sided foam tape. I used the same tape to attach the decoder and capacitor to the styrene sheet ①. Because of the model's heavy weight, 12-wheel electrical pickup, and long wheelbase, a TCS Keep-Alive capacitor circuit isn't necessary.

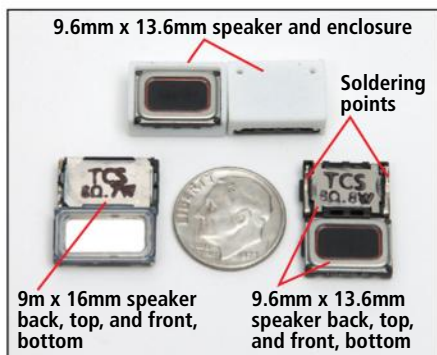
Since I was mimicking the sound of dual diesel engines, I installed dual speakers. I selected a pair of the new TCS WOWSound sugar cube speakers. The 9mm x 16mm, 8Ω, 0.7 watt speakers put out 97 dB each ②. I wired these in series giving 16Ω impedance, the preferred WOWSound configuration. (For more on speaker choices and installation see the May 2016 DCC Corner).

The WOWSound sugar cube speakers are available with a 3-D-printed enclosure that provides an excellent fit ②. The TCS stock number for the speaker and enclosure kit is UNIV-SH5-C. The small spring clips on the speaker serve as solder points.

I marked the holes and also the wire contacts on the speaker as "+" and "-" to prevent any wiring mixups. Their actual polarity isn't marked and it really doesn't matter as long as you're consistent.



① **Decoder location.** Larry installed a piece of black styrene in place of the original circuit board, then attached the WOWSound decoder, capacitor, and speaker to it using double-sided foam tape. It's a good idea to paint the side of the foam tape black so it won't be visible through the side window of the locomotive shell.



2 Sweet sound. TCS offers two sugar cube speakers, shown here. The 9mm x 16mm version has a much lower 300 Hz frequency than the 9.6mm x 13.6mm one at 700 Hz. The plastic enclosures are necessary for good sound output.

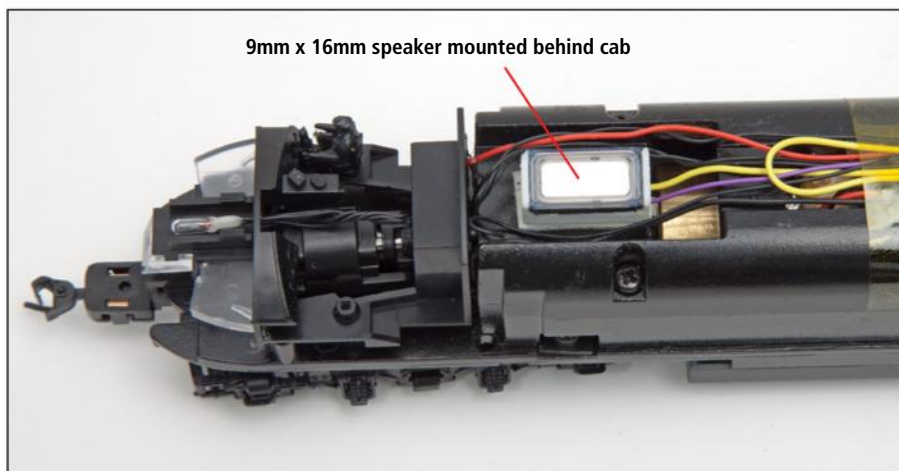
For series wiring, one purple wire from the decoder is attached to the "+" contact on one speaker, and the other purple wire goes to the "-" contact on the other speaker. I then ran a yellow wire between the other two contacts. In hindsight, one speaker would've been enough.

Although the enclosures provide a good fit, they still need to be sealed for the best sound. I used gap-filling cyanoacrylate adhesive (CA) applied to the gap between the speaker case and the enclosure. Don't get CA on the speaker diaphragm, the flexible joint between the speaker cone and frame. I installed the speakers using double-sided foam tape, with one on the styrene sheet behind the decoder **1** and the other in the slot behind the cab **3**.

There are two settings for sound synchronization provided in WOWSound diesel decoders. First there's a configuration variable (CV) setting to turn on the dual prime mover option, and a second which sets the notch-up time delay for the two diesel engines. Both these settings are controlled using indexed CVs 201, 202, 203, and 204.

Calculating the values for these settings requires choosing from among several options and adding up their individual digital values. These are in a table in the Diesel Programming Guide available as a download on the TCS website. Look for the table under USER OPTIONS. The time delay programming settings are in a second table under DUAL PRIME MOVER DELAY toward the end of the manual.

If calculating digital CV values isn't for you, go to the TCS website and use the online WOWSound Guided Programmer



3 Extra loud. Larry placed a second speaker in the slot behind the locomotive cab. In hindsight, one speaker probably would have been adequate.

NMRA DCC wiring code

Red	from right-hand rail power pickup
Orange	from decoder to motor brush "+"
Black	from left-hand rail power pickup
Gray	from decoder to motor brush "-"
White	front headlight(s) "-" power sink
Yellow	rear headlight(s) "-" power sink
Blue	common "+" headlight(s)/function(s) power source
Black with white stripe	common "-" power sink
Manufacturers use additional colors for extra outputs	

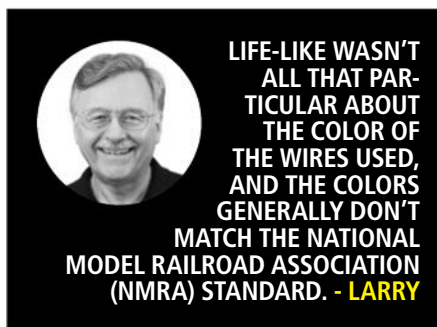
(www.tcsdcc.com/Customer_Content/Technical_Info/WOWSound/Diesel/guided_programming_diesel_vers4.php) to get the values. Make sure to use the programmer for the correct decoder version. If you use Java Model Railroad Interface's DecoderPro, it will calculate and enter the values for you.

Activating the dual diesel engine feature is a simple on or off selection, but the delay factor requires a little more thought. The time delay is calculated as CV value/2. A value of 1 will result in a notch up delay of 1/2 second, and a value of 4 will result in a 2 second delay. The

maximum value is 20 and the default is 5. The final result will be the sound of two engines notching up as you increase the throttle setting, with the chosen time delay separating them. For models, a 1 to 2 second delay seems realistic.

I replaced the factory installed bulbs with Miniaturics 14V 30mA bulbs (no. 18-014-10). With 14V on the DCC tracks, the bulbs only see about 12V. I wired the headlight to the blue and white decoder wires to operate on function 0. For the Mars light I wired the bulb to the pink and blue wires for F4 activation. I used DecoderPro to program the lights.

With all the wiring and programming done, I popped on the shell and gave the E6a a test run. The dual speakers are a bit of overkill. But they do create a stereo effect that seems to enhance the volume – a lot. Hopefully my description of the programming options will be enough to get you started. But for more details, visit the TCS website (www.tcsdcc.com) and my website (www.dccguy.com). 





Atlas HO scale NJ Transit commuter train

Over the last several years the sleek Bombardier ALP-45DP locomotive and matching multilevel trailers and cab cars have become a common sight for northern New Jersey-area commuters. Thanks to Atlas, fans of modern mass transit can add accurate models of these state-of-the-art trains to their HO scale fleets. Our product review samples included an ALP-45DP locomotive that came factory-equipped with a dual-mode ESU Lok-Sound Select decoder.

Prototype. Entering revenue service in 2012, the Bombardier ALP-45DP provides NJ Transit passengers a one-seat ride between New York City's electrified territory into Pennsylvania Station and NJT's various diesel-only lines. Previously, passengers had to change trains or wait while crews swapped an electric locomotive for a diesel-electric or vice versa.

The ALP-45DP (American Locomotive Passenger, 4 axle, power class 5, Dual Power) can operate as either a straight electric or diesel-electric locomotive. In electric mode a pantograph collects alternating current from overhead wires. In diesel-electric mode, twin Caterpillar diesel engines generate electricity for the traction motors. Switching between modes takes less than 2 minutes.

The NJ Transit ALP-45DP locomotives operate in push-pull service using multilevel trailers and cab cars also built by Bombardier. Agence Métropolitaine de Transport, the transit agency that serves the greater Montreal area, also uses Bombardier ALP-45DPs and cars.

The Atlas ALP-45DP. The main dimensions of the Atlas model match those of the prototype, including the scale 44"-diameter wheels. The well-defined molded details, including grills

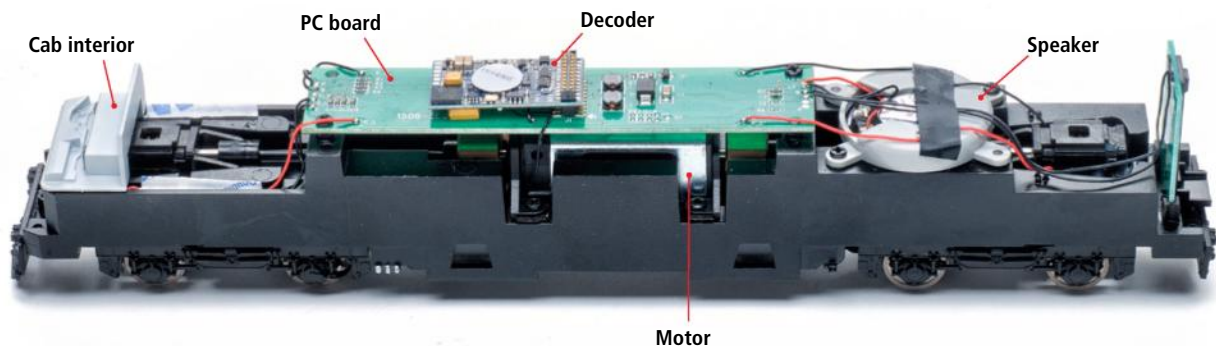
and fuel and sand filler hatches are properly placed according to prototype photos.

There's clear plastic glazing in all the windows. The windshields reveal a cab interior with simplified control panel detail molded in front of where the engineer would sit. The seat backs are molded details painted black. Those who want to add a train crew will need to use half figures (with no legs) to fit the space.

The non-operating pantograph is made of plastic with a metal shoe. A latch holds the sprung pantograph in the down position. When I flipped the latch with my fingernail, the pantograph sprang to the raised position.

The model features many other separate, factory-applied detail parts, including windshield wipers, air horn, rooftop antenna, and cab door handrails.

The front handrails and grab irons are user-installed, as shown in a printed instruction sheet. The included drilling



The Atlas locomotive's mechanism, including a dual-flywheel-equipped motor, ride on a heavy, die-cast metal chassis.



Facts & features

Price (multiple road numbers available):

Locomotive: \$279.95 (DCC sound), \$169.95 (DC, no sound)

Cab car: \$99.95

Trailer (versions available with or without toilet): \$84.95

Trailer with safety slogan: \$89.95

Three-pack (includes cab car, trailer with toilet, trailer without toilet): \$269.85;

Three-pack (includes locomotive (DC), trailer, and cab car): \$354.85

Manufacturer

Atlas Model Railroad Co.

378 Florence Ave.

Hillside, NJ 07205

www.atlasrr.com

Era: 2012 to present day

Road name: NJ Transit, Agence métropolitaine de transport (AMT), Bombardier demonstrator (locomotive only)

Locomotive features

- All-wheel drive and electrical pickup
- DCC ready with 8-pin socket and 21-pin plug (DC version)
- Dual-mode ESU LokSound Select decoder that operates on DCC and DC layouts (DCC version)
- Kadee metal knuckle couplers at correct height
- Light-emitting diode (LED) headlights, ditch lights, and marker lights
- Minimum curve radius: 22" (24" recommended)
- Weight: 1 pound 4.4 ounces

Trailer features

- Kadee metal knuckle couplers at correct height
- Metal wheels in gauge
- Minimum curve radius: 22" (24" recommended)
- Overhead interior lighting
- Weight: 7 ounces (.25 ounce too heavy per NMRA Recommended Practice 20.1)

Additional cab car features

- 21-pin plug for DCC decoder
- LED headlight, ditch lights, and markers
- Sound file available from ESU
- Speaker enclosure
- Weight: 7.3 ounces (.5 ounce too heavy per NMRA RP-20.1)

template snaps on the model's nose to ensure that the no. 80 holes that I had to drill were properly positioned. However, modelers should ignore the hole marked "06" on the top of the template; it has no corresponding part. Although the installation isn't too difficult, it's tedious. I would have preferred that all the details be factory installed.

The locomotive's paint scheme matches its prototype. The violet and orange stripe along the sides is especially well done. I think that painting the model silver rather than plating it was a wise choice by Atlas to capture the look of the prototype's aluminum body.

Mechanism. Removing the press-fit locomotive body shell reveals a die-cast metal chassis. Driveshafts connect the dual-flywheel-equipped motor to the truck-mounted gearboxes. The main printed circuit (PC) board is attached to the frame above the motor.

The ESU LokSound Select decoder is plugged into a 21-pin plug atop the PC board. A well enclosed 28mm round speaker provides clear, undistorted sounds even at full volume.

The model's heavy frame and all-wheel-drive mechanism contribute to its 4 ounces of drawbar pull. The locomotive has more than enough power to haul a typical eight-car consist.



PERFORMANCE TESTS

DRAWBAR PULL	4 ounces 18 HO scale passenger cars
SCALE SPEED (DC)	
VOLTS	SCALE MPH
7 (start)	2
8	13
10	60
12	115
SCALE SPEED (DCC)	
SPEED STEP	SCALE MPH
1	2
7	15
14	35
28	90

DCC and DC performance. On our DCC test track, the ALP-45DP started moving at 2 scale mph and attained a 90 scale mph top speed at step 28. The speed curve, acceleration and deceleration momentum, and every other aspect of the decoder can be fine-tuned using configuration variables (CVs). An extensive programming manual is available as a free download on the Atlas website.

From the Atlas website I also downloaded the function list specific to the ALP-45DP. In addition to triggering the bell, horn, and lights, I could use my DCC throttle to switch between diesel and electric mode and turn on the air conditioner sounds. There are also coupler clank, sanding valve, and brake sound effects.

The engine sounds, bell, and horn are spot-on when compared to prototype videos. The distinctive sound of the modified Nathan K5LA air horn is especially noteworthy.

Like other sound-equipped models, the LokSound equipped ALP-45DP took



Both the top and bottom interior levels of the trailers and cab cars feature overhead lighting. Several surface-mount light-emitting diodes (LEDs) are attached along the length of each light board. All the cars' metal wheels pick up track power.

a lot of power to start moving on our DC test track. At 6V the lights turned on and diesel engine sounds started. At 7V the model rolled smoothly at 2 scale mph and accelerated to a 115 scale mph top speed at 12V. The locomotive headlights and markers operate automatically according to the direction of travel.

Other sound effects can be triggered on DC layouts with an analog sound programmer, such as the MRC Tech 6. For those with access to a DCC system or a Tech 6, changing the value of CV13 toggles between diesel (160) and electric (40) prime mover sounds in DC mode.

Multilevel cars. The trailers and cab car match the dimensions of Bombardier builder's diagrams. The window arrangements, placement of details, and paint schemes match prototype photos.

All the models feature clear printing and properly placed warning stencils. The cars' silver paint and striping also perfectly matches the locomotive's decoration. Cars are available in multiple road numbers, including those with special safety slogan paint schemes, such as WATCH THE GAP and ALWAYS EXPECT A TRAIN.

When the prototype cars are coupled, the diaphragms should touch. When the models are coupled, there is a scale 18" gap between the diaphragms of the adjoining cars. This extra space along with sprung draft gear boxes is necessary for the cars to negotiate 22" minimum radius curves.

The body shells are press-fit and easy to remove, which makes it easy to add passenger figures. Both the top and bottom levels are one-piece gray plastic castings. The seat detail is well defined with correctly shaped seat backs and arms. The cab car includes an operator's compartment with a seat and control panel.

The top and bottom levels of each car feature overhead lighting provided by surface-mount light-emitting diodes (LEDs) attached to printed circuit boards. The lighting board for the bottom level is mounted on the floor of the top level. All-wheel electrical pickup on each car kept the lights shining steadily even as I ran the train through a yard ladder and over crossings. The interior lights operate on DC and DCC layouts.

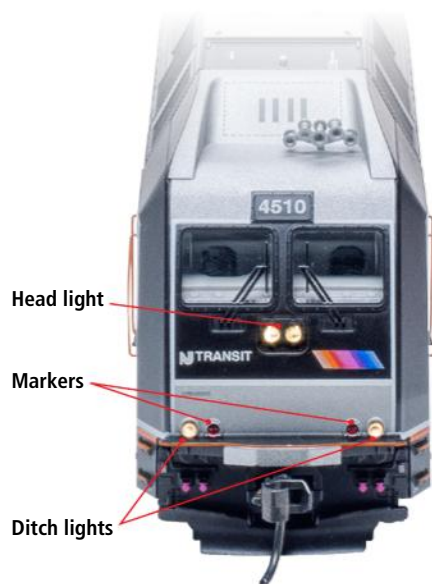
The cab car also features operating headlights, ditch lights, and markers. On DC layouts these lights operate according to direction. On a DCC layout the lights are always on, unless a decoder is installed.

There's a 21-pin DCC plug on the upper PC board of the cab car. A small jumper board must be removed before installing a decoder, such as a 21-pin

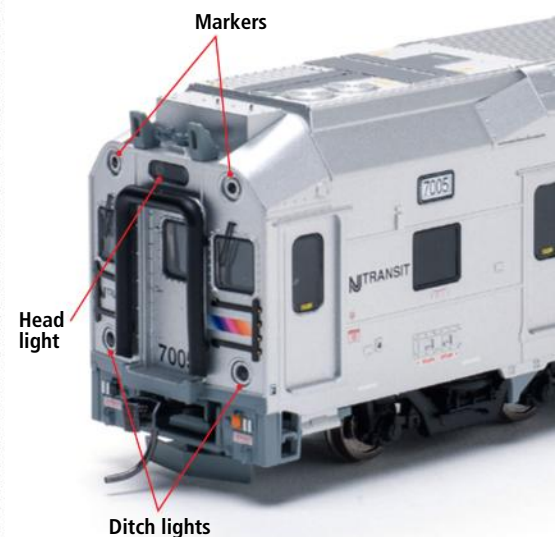
ESU LokSound Select. ESU has released a cab car sound file that includes station announcements, horn, bell, and door sounds. For more information, click on Downloads at www.esu.eu/en/start. Note that Lokprogrammer software is required for those who want to use the file on a LokSound Select decoder.

Sound holes are arranged in a $\frac{5}{16}$ " x 1" rectangle on the car floor behind the operators cab. This would be an ideal application for a compact "sugar cube" speaker. Soldering connections for the speaker wires, marked LS+ and LS-, are located above the sound holes on the upper level PC board.

The Atlas ALP45-DP with matching trailers and cab car would be the highlight of a modern, commuter-themed model railroad. – Dana Kawala, senior editor



The ALP-45DP features operating lights in DC and DCC mode. This photo shows the out-of-the box model without the optional front handrails added.



The cab car features an illuminated headlight, as well as ditch lights and red marker lights. This car also includes a 21-pin DCC plug and space for a speaker.



Rapido HO New Haven cars

Weather or no, go Rapido. With its highly detailed New York, New Haven & Hartford RR 8600-series coaches, it seems the Canadian manufacturer has adopted the popular New England railroad. Now, the company that brought you the New Haven's unique Electro-Motive Division FL9 offers postwar rolling stock for it to pull.

Although the New Haven was a small railroad by Class 1 standards, it had a significant passenger business. To serve its clientele, the railroad ordered new cars from Pullman-Standard in 1945, including 103 coaches. The cars were built at Pullman's Worcester, Mass., plant, and delivered in 1947 and 1948.

Rapido's cars continue a pattern of excellent detail. Pipes, conduits, tanks, and generators festoon the bottom of the cars, and stand out on the de-skirted models. Especially well-done are the compressors, which show a spoked drive wheel behind protective screening.

The interiors also get lots of attention, with see-through armrests on the seats, mirrors on the end bulkheads, and ash-tray stands in the smoking section.

All dimensions on the models are exact or within scale inches of drawings in *The Official Pullman-Standard Library*, Vol. 10, by W. David Randall (1991, Railway Production Classics).

The cars are painted in a distinctive metallic finish Rapido says is the correct color temperature for New Haven cars. Color separations were all sharp, and lettering was clear and easy to read.

The cars will operate on 22" radius curves. The models looked much better, of course, on broader radius curves. Being pulled by a Rapido FL9 (reviewed in the February 2016 *Model Railroader*), the cars had no trouble negotiating the no. 5 and no. 6 turnouts.

Facts & features

Price: \$99.00

Manufacturer

Rapido Trains Inc.

500 Alden Road, Unit 21

Markham, Ontario, L3R 5H5, Canada

www.rapidotrains.com

Roadnames: New York, New Haven & Hartford (McGinnis with or without skirts and as-delivered scheme with skirts); Massachusetts Bay Transportation Authority (without skirts); and Penn Central (without skirts). Also available painted silver but unlettered.

Era: 1947 to 1984, depending on livery

Features

- Blackened metal wheelsets, in gauge
- Metal knuckle couplers at correct height
- Separate grab irons, factory-installed
- Sprung diaphragms with end gates
- Weight: 7 ounces, matches National Model Railroad Association Recommended Practice 20.1

The constant lighting circuit kept the interiors bright on direct-current and Digital Command Control. The lights came on under DC testing at 5V.

Getting into the interiors was simple: I slipped a thumbnail between the body shell and floor, and pulled on the trucks to gain access. I didn't have to search for hidden screws.

For an expanded review, including extra photos, visit the Product Reviews page at www.ModelRailroader.com.

The New Haven Railroad Historical and Technical Association is working with Rapido to bring out parlor cars that match the 8600-series coaches. I'm looking forward to seeing another excellent addition to the Northeastern passenger fleet. — *Eric White, associate editor*



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WalthersMainline HO covered hopper

A 59-foot cylindrical covered hopper has been added to the WalthersMainline family of HO scale products. The ready-to-run car features an injection-molded plastic body with separate end sheets and one-piece end cages. The underbody is a separate piece with freestanding out-let gates and brake appliances.

North of the border. The 4,550-cubic-foot-capacity cylindrical covered hopper was the car of choice for Canada's government and the Canadian Wheat Board. Over a 13-year period (1972-1985), the two agencies ordered more than 17,000 cars. The provinces of Alberta and Saskatchewan also purchased 1,000 and 100 cars, respectively. The covered hoppers were divided almost evenly between Canadian National and Canadian Pacific.

Marine Industries Ltd., Hawker Siddeley Canada Inc., and National Steel Car Corp. (NSC) all built 4,550-cubic-foot-capacity cylindrical covered hoppers. The Walthers model is based on those built by NSC. National Steel Car Corp. produced 59-foot cylindrical covered hoppers from November 1972 until September 1994.

The model. Our sample is decorated as CNWX 109904, part of the 109899 through 110316-series of covered hoppers built for the Government of Canada by NSC in 1983. This covered hopper is a phase 8a car with 13 body panels, 16 running board brackets, sloped jack pads, and angled end panels.

The body, hatch cover hinges and latches, and running board supports are a single casting. The trough-style hatch

covers and end sheets are separate castings secured with glue from the inside.

Four screws, two above each truck, secure the body to the underbody. A sheet steel weight is held between the two pieces by these.

The horizontal portion of the end cage is secured to the body with two pins. In addition, the running boards are tacked to the top of the end cage. Gentle prying with a single-edge razor blade or no. 17 blade will separate the glue joint.

The model has see-through plastic running boards. The .020"-thick casting was free of flash in the grating. The corner grab irons are molded.

The paint is smooth and even, with crisp separation lines between the red and black. Lettering placement matches prototype photos in Darrell W. Sawyer's eBook *Freight Cars Illustrated: Volume 3, National Steel Car Covered Hoppers* (FCIX, 2006). The model's dimensions follow drawings in the March 1992 *Railroad Model Craftsman*.

The Proto-Max metal knuckles are painted black with chemically blackened knuckle springs; the trip pins are unpainted. The couplers are about .030" too low. However, the trip pin clears the front plate on the Kadee no. 205 height gauge, and the couplers engage effortlessly. Styrene shims could be used to bring the couplers to the correct height, but I didn't have any problems with the car as I pushed and pulled it through the no. 5 turnouts and 18" radius curves.

Walthers has hit a sweet spot with its Mainline-series cylindrical covered hop-

Facts & features

Price: \$29.98

Manufacturer

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

Era: 1972 to present

Road names: First run (trough hatch covers unless noted) – Government of Canada (CNWX and CPWX reporting marks), Canadian Wheat Board (CNWX and CPWX marks), Heritage Fund (ALNX and ALPX marks). Second run – Canadian National (round hatches), Canadian Pacific (round hatches), Pillsbury, Potash Corp. (round hatches), and Saskatchewan Grain Car Corp. (SKNX and SKPX marks). Four road numbers per scheme; also available undecorated.

Features

- 36" metal wheels on plastic axles, correctly gauged
- Minimum radius: 18"
- Painted Proto-Max metal couplers, .030" too low
- See-through plastic running boards
- Weight: 5.2 ounces, .3 ounce too heavy per National Model Railroad Association Recommended Practice 20.1
- Wire grab irons

per. The model may not have the etched-metal running boards and wire grab irons. But this car will stand up to routine handling without shedding parts. – *Cody Grivno, associate editor*

QUICKLOOK

Woodland Scenics HO Just Plug vehicles

Price: \$29.99

Manufacturer

Woodland Scenics

P.O. Box 98

Linn Creek, MO 65052

www.woodlandscenics.com

Era: 1940s to 1950s

Comments: As a modeler who has burned out more lightbulbs and light-emitting diodes (LEDs) than he has successfully wired, I was pleased when Woodland Scenics came out with its Just Plug lighting system. By taking all the calculations of voltage and resistance out of electronics, the manufacturer made adding illumination to a layout close to foolproof.

The newest addition to the Just Plug series is a line of illuminated HO and N scale vehicles. Depicting various common vehicles of steam-to-diesel transition-era vintage, these autos and

trucks have working headlights and taillights. Some models have additional lights, like the police sedan's blinking red beacon.

A dozen vehicles are offered in both scales. We evaluated four HO scale models: the Police Car (pictured), Comfy Cruiser (a blue hardtop coupe), Cool Convertible (modeled top down), and Heavy Hauler (a red stakebed truck). All are models of cars and trucks produced in the 1940s and 1950s.

Since cars with their lights on are usually being driven somewhere, the vehicles are modeled with drivers.

Each vehicle comes attached to about 3 feet of magnet wire and includes a Linker Plug, a 2-foot-long pair of wires that includes a dropping resistor, a push-button attachment for



the magnet wires, and a plug that goes into a Just Plug Light Hub (sold separately, \$16.99). No soldering is necessary. The police car's blinking beacon is wired separately from its other lights, so it can be controlled separately with another Linker Plug.

I plugged in and tried all four vehicles, and they all worked. The headlights are quite bright for their size, but can be dimmed using the knob on the Light Hub.

Woodland Scenics' Just Plug vehicles are just the thing to add some light and life to your HO or N scale layout. – Steven Otte, associate editor

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QUICKLOOK

Fox Valley Models N scale 7-post boxcar

Price: \$19.95

Manufacturer

Fox Valley Models
P.O. Box 1970
Des Plaines, IL 60017
www.foxvalleymodels.com

Era: 1964 to present

Road names: Wisconsin Central, Burlington Northern, BNSF Ry. (post-2005 scheme), Great Northern (Glacier Green), Montana Rail Link, Soo Line (three paint schemes). Three road numbers per scheme.

Comments: Fox Valley Models has released a new run of 50'-6" N scale boxcars based on prototypes built by the Soo Line at its North Fond du Lac, Wis., shops. The model has a one-piece plastic body with an X-panel roof, see-through etched-metal crossover platforms, and a separately applied brake wheel. The ladders and grab irons

are molded. The plastic underbody has molded crossties, crossbearers, center sills, and brake appliances.

Soo Line built its seven-exterior-post boxcars between 1964 and 1979. An article on these boxcars was published in the Spring 1999 issue of *The Soo*, published by The Soo Line Historical & Technical Society.

Our sample is lettered as Wisconsin Central no. 20315, part of the railroad's 20300 through 20396 series of boxcars. The WC acquired these 100-ton cars, built in 1977, from Soo Line.

The model is decorated in its original WC scheme with a WISCONSIN CENTRAL LTD. herald (a WISCONSIN CENTRAL SYSTEM herald was applied during a later repaint). The block-style WISCONSIN CENTRAL lettering was used on early repaints, but the typeface is too bold when compared to prototype photos.



The body-mounted couplers are at the correct height. The 33" metal wheelsets are in gauge. The car weighs 1.2 ounces, which is .4 ounce too light per National Model Railroad Association Recommended Practice 20.1.

The trucks are on 40'-10" centers, accurate for cars built in 1964. The X-panel roof is correct for cars built in 1969 and between 1971 and 1979.

I tested the boxcar on our N scale Salt Lake Route layout. The boxcar smoothly navigated no. 6 turnouts, a double crossover, and 11" radius curves while being pushed and pulled.

Depending on the paint scheme, the Soo Line-built 7-exterior-post boxcar is appropriate for any time from the mid-1960s through today. – Cody Grivno, associate editor



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Put Rule 93 to work on your railroad

"Yard Limits" are two simple words with an important meaning. The term seems to designate a yard's physical boundaries, but it carries many layers of information as important to engine and train movements as signal indications at a busy tower.

While signaling technology in our hobby is advancing rapidly, most layouts don't use signals. We'll simplify this discussion by considering only "dark," or unsignaled, main tracks.

Let's start by defining a yard as a system of tracks used to make up trains or store cars. Though a main track may run through a yard, it's not part of the yard.

Movements on main tracks and in yards are controlled differently. A dispatcher (DS) controls main track movements. Under timetable-and-train-order (TT&TO) rules, a movement could begin only after receiving a clearance card issued by DS. The clearance allowed a regular train to operate according to the times in its schedule. For an extra train, a train order specifying the extra's movements accompanied the clearance. Today's track warrants and Form D's have their origins in train orders.

Movements in a yard are under the control of a yardmaster (YM), not a DS. Movements are not scheduled. Many movements are not even really trains because they're made without markers.

The DS and YM use two independent systems

of movement authority. Yard operations, however, often use the main track. A through freight stops on the main and the yard crew needs to hustle out to pull a block off the rear end. A local switcher needs to cross over the main to spot a car at the freight house. It's easy to see how expediting such frequent movements can bedevil a DS.

Rule 99 provides an alternative. The switch crew sends out flagmen to protect the movement, prepared to stop trains approaching on the main track. The main line's speed limit determines how far the flagmen must go.

Flagging every such move would slow yard operations and wear out flagmen. Picture Flagman Frank, sagging onto a bench in the shade of the West End shanty, mopping his face and exclaiming "gotta be a better way."

A Baltimore & Ohio rule book from 1890 in my collection hints at just such an improvement. Rule 434 refers to "switching engines, using tracks in regular yards within designated yard limits." The rule allowed them to move without DS authority, but did not specify the protection required. Rulemaking evolved, leading to Rule 93 in a 1913 New York, Ontario & Western rule book: "Within yard limits the main track may be used, protecting against first class trains. Second class and extra trains must move within yard limits prepared to stop unless the



The Gunn yard job pulls a cut while the power for the Grand Rapids industry job holds the main on Bob Hanmer's Great Northern layout, set in Minnesota's Mesabi Iron Range. Rule 93 lets the yard job do its work without special clearance from the dispatcher. Bob Hanmer photo

main track is seen or known to be clear."

The rule evolved further. Various rule books specified that yard limit signs indicate yard limits and that the timetable also list them. "Restricted speed" was defined: proceed prepared to stop short of train, engine, obstruction, or switch not properly lined. It limited speed to a maximum, typically 20 mph. Restricted speed makes an approaching train responsible for avoiding a collision.

These rules continue in similar form today in Northeast Rules Advisory Committee (NORAC) Rule 93 and General Code of Operating Rules (GCOR) 6.13. However, both now require that DS authorize every main track movement.

The logic of these rules easily applies to layout operations. Consider a transition-era Hudson Yard with four yard tracks, an unsignaled main track, and

industry tracks on the opposite side of the main.

Can YM send the yard job onto the main freely? Rule 93 allows this, provided no first class trains are due. The yard job also bears responsibility, obliged to clear the times of first class trains.

A first-class train approaches Hudson Yard. The dispatcher controls the main track, and Rule 93 applies. The schedule gives the train full authority to proceed.

A local freight arrives on the main track, preparing to tie up in the yard. Whether a regular train or an extra, it needs YM's permission to do so. It must move at restricted speed, prepared to stop.

Establishing yard limits could simplify operation of a branch or switching district. Prototype practice contains examples of yard limits governing an entire branch on which no regular trains are scheduled and busy industrial areas. Look for ways to put Rule 93 to work on your model railroad. **MR**



**THE DS AND YM
USE TWO
INDEPENDENT
SYSTEMS OF
MOVEMENT
AUTHORITY.
YARD
OPERATIONS,
HOWEVER,
OFTEN USE THE
MAIN TRACK.
— JERRY**

Shay no. 11 passes the coal loader, but the wood-burning steamer won't be stopping to fill up. *Model Railroader* contributing editor Lou Sassi shot the photo on the large scale narrow gauge layout built by the Florida-based Sundance Central club. The layout was featured in the December 2012 MR.

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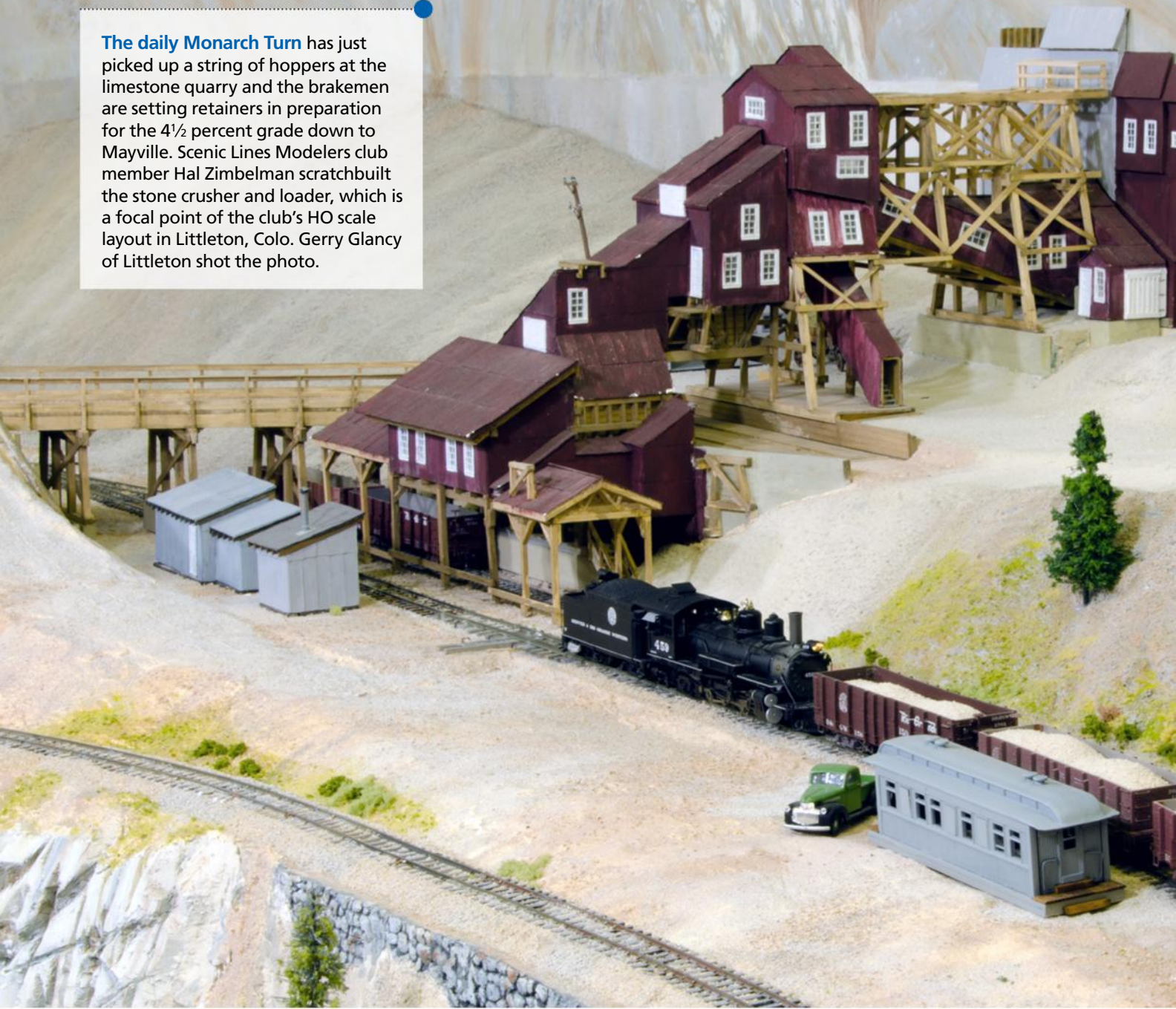
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The daily Monarch Turn has just picked up a string of hoppers at the limestone quarry and the brakemen are setting retainers in preparation for the 4½ percent grade down to Mayville. Scenic Lines Modelers club member Hal Zimbelman scratchbuilt the stone crusher and loader, which is a focal point of the club's HO scale layout in Littleton, Colo. Gerry Glancy of Littleton shot the photo.



New York Central GP7 no. 5709 leads a morning run over the trestle on the way to Tupper Lake. John Diamond of Bellevue Hill, N.S.W., Australia, photographed the scene on his HO scale Tupper Lake & South Junction RR. John built the bridge from a Campbell kit and the station behind the combine from a Bar Mills kit.





A train rumbles overhead on the Brooklyn Elevated Subway, rattling windows in the nearby buildings. David Gale of Matthews, N.C., photographed the scene on his O scale layout. The elevated structures are by Bridgeboss. David matched their color to a paint chip from an actual Brooklyn subway.



An 0-4-0 Camelback retrieves empty hoppers from the coal trestle as evening settles over Hudson engine terminal. The action takes place on the freelanced HO scale Bavarian & Hudson RR belonging to Bob Hausen of Watermill, N.Y. Bob scratchbuilt the coal trestle and also shot the photo.





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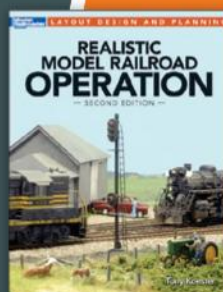
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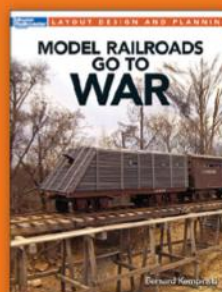
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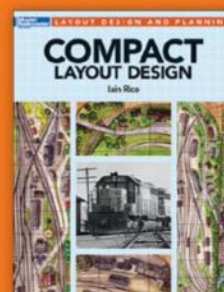
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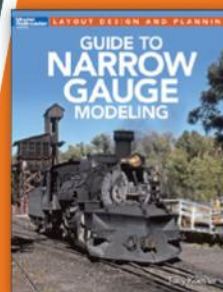
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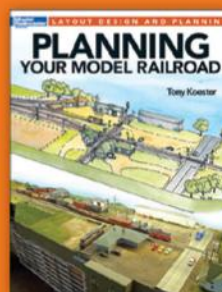
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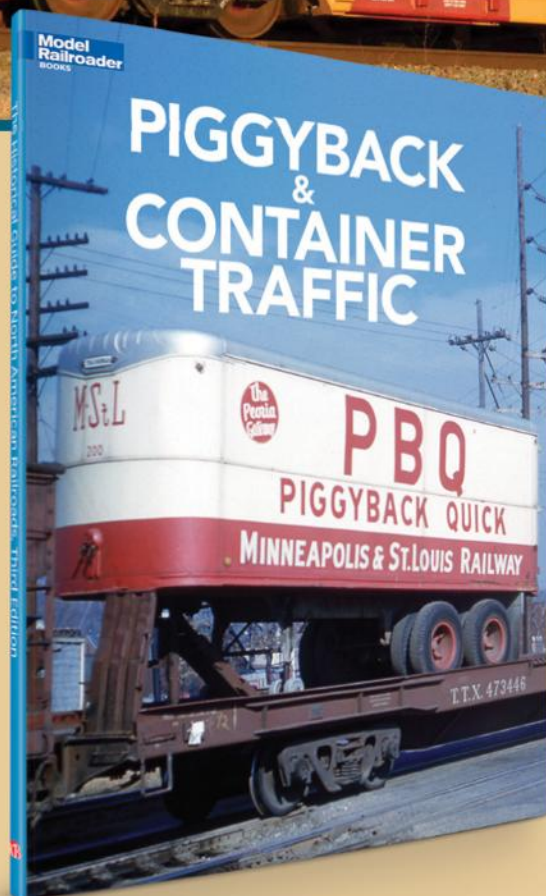
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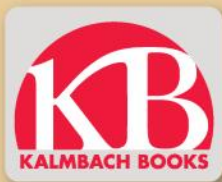


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AZ, PRESCOTT AREA: Beat the Heat Model Trains Swap Meet. Liberty Traditional School, 3300 N. Lake Valley Rd., Prescott Valley. Saturday, August 12, 2017, 9:00am-1:00pm. Adults \$5.00, children 12 and under free. Presented by: The Central Arizona Model Railroad Club. Contact: Dick Gage, 802-272-1352

CA, SAN CARLOS: European Train Enthusiasts (<http://www.ete.org>) EUROWEST at Hiller Aviation Museum, San Carlos Airport, 601 Skyway Road, Zip: 94070. July 22-23, 2017, Saturday 10:00am-5:00pm and Sunday 10:00am-4:00pm. Layouts, clinics, vendors, raffle. Admission (<http://www.hiller.org>) includes Air Museum, free parking. Contact Jens Ullmann: eurowest@ete.org

FL, DELAND: 60th Florida Rail Fair. Volusia County Fairgrounds (Tommy Lawrence Arena), 3150 E. New York Ave. (SR 44 and I-4). Saturday, July 8, 2017, 9:00am-4:00pm. Adults: \$7.00 (under 12 free). Operating layouts. Miller, 3106 N. Rochester St., Arlington, VA 22213, 703-536-2954. E-mail: rrshows@aol.com

FL, ORLANDO: NMRA 2017 Orlando National Convention. Rosen Plaza Hotel, 9700 International Drive, Zip: 32819. July 30 - August 5, 2017, 8:00am-11:00pm each day. Admission: See website, www.nmra2017orlando.org Contact: Gilbert Thomas, 8119 Woodvine Circle, Lakeland, FL 33810, 863-412-3090, E-mail: Thomas_12399@msn.com

FL, TALLAHASSEE: 26th Annual Big Bend Model Railroad Association's Show & Sale. North Florida Fairgrounds, 441 Paul Russell, Buildings 2 (Thomas) & 4. Saturday, June 24, 2017, 9:00am-4:00pm; Admission \$6.00, children 12 & under & scouts in uniform free. Information: Andy Zimmerman, 850-524-4399, E-mail: GNTrainman@comcast.net Website: www.bbmra.org

IL, GALESBURG: Galesburg Railroad Train Show. Returning to new location: Galesburg High School Fieldhouse, 1242 W. Dayton St. June 24-25, 2017, Saturday 9:00am-4:00pm and Sunday 10:00am-3:00pm. Admission \$5.00, under 12 free. Free parking and shuttle bus to depot museum area. Info: 309-221-3909 E-mail: cobra@grics.net

IL, GREENVILLE: American Heritage Railroad Train Show @ American Farm Heritage Museum 1-70 @ IL Rt. 127 (Exit #45). Saturday, June 10, 2017, 10:00am-4:00pm. Admission: \$4.00, under 12 FREE. Train ride with paid admission. Operating layouts. Dealers welcome \$15.00 per table. Contact Jim @ 217-825-6230.

IL, ST. CHARLES: 41st Annual Kane County Railroadiana and Model Train Show. Kane County Fairgrounds, 525 South Randall Rd. Sunday, June 11, 2017, 10:00am-3:00pm. Admission: \$6.00 w/tax. Tables \$60.00. For information: 847-358-1185, RussFierce@aol.com or www.RRShows.com

KS, KANSAS CITY AREA: Turkey Creek Division Train Show Swap Meet. Shawnee Mission High School cafeteria 7201 Johnson Dr., Overland Park, KS. Saturday, July 29, 2017, 8:00am-3:00pm. Admission \$6.00, under 12 free. Layout tours 3:30pm-8:30pm. Vendors and Registrants contact Larry Alfred, captlalfred@gmail.com 913-782-6584. Go to: www.tc-nmra.org for forms.

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

NE, DESHLER: Train Show & Open House, Spring Creek Model Trains, 304 E. Bryson Ave. July 1-2, 2017, Saturday 9:00am-5:00pm and Sunday 10:00am-4:00pm. Special guest clinics: Pelle Soeberg, Doug Geiger, Chris Brimley. Manufacturers: Scale Trains, Athearn, Intermountain, Rapido. Check details on our website: www.springcreekmodeltrains.com

NE, DESHLER: Train Show & Open House, Spring Creek Model Trains, 304 E. Bryson Ave. Show Location: 4th & Race St. July 1-2, 2017, Saturday 9:00am-5:00pm and Sunday 10:00am-4:00pm. Admission: \$6.00; 12 and under FREE. Special guest clinics and manufacturers. Check website for details: www.springcreekmodeltrains.com

WA, BREMERTON: Bremerton Northern Model Railroad Club Annual All Scale Swap Meet. West Side Improvement Club, 4109 West "E" Street. June 17, 2017, 10:00am-3:00pm. General \$5.00, children under 12 free. POC: Bill Hupe, 360-621-5041, whopay@tscnet.com

WI, LA CROSSE: Rail Fair, Copeland Park, Rose & Clinton Streets. July 22, 2017, 10:00am-4:00pm. Admission \$5.00, under 12 free. Railroad Show, Sale & Exhibition. Model Toy & Antique Trains & Memorabilia, Railroad Exhibits & Displays. Information: 4000 Foundation, PO Box 3411, La Crosse, WI 54602, 608-781-9383

WI, WAUPACA: WAMR 28th Strawberry Fest Model Railroad Show & Model Contest. Waupaca Recreation Center, School/State/Badger Sts. June 17-18, 2017, Saturday 10:00am-5:00pm and Sunday 10:00am-3:00pm. FREE. Many layouts/vendors/swap tables. Roger Hildebrandt, 7693 Evergreen Dr. East, Waupaca, WI 54981, 715-258-8218 or check club website: www.wamrld.com

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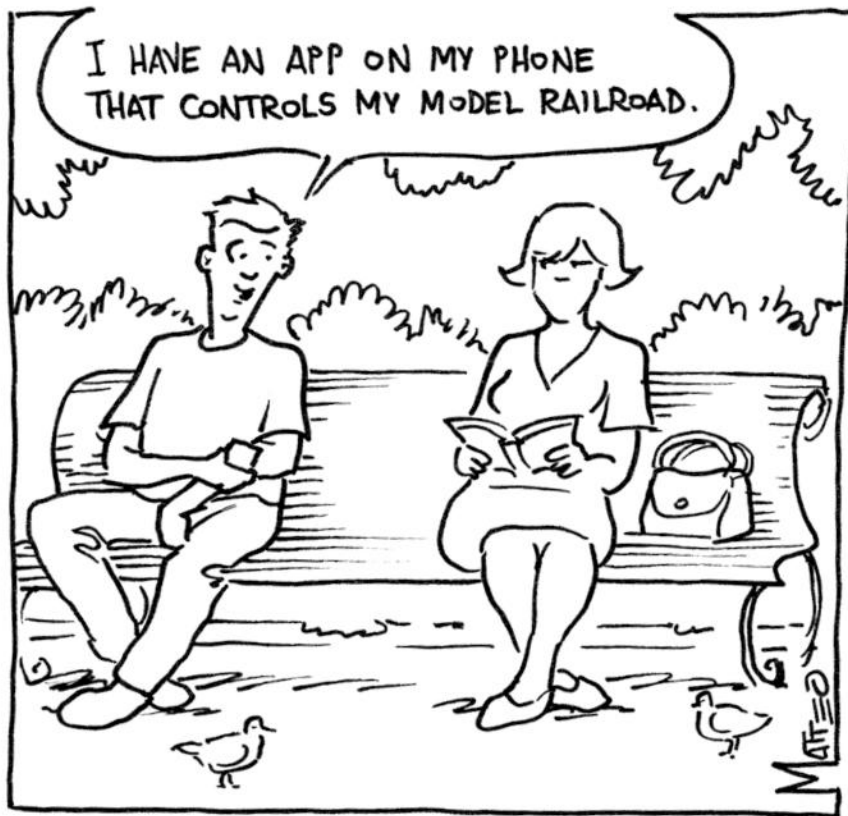
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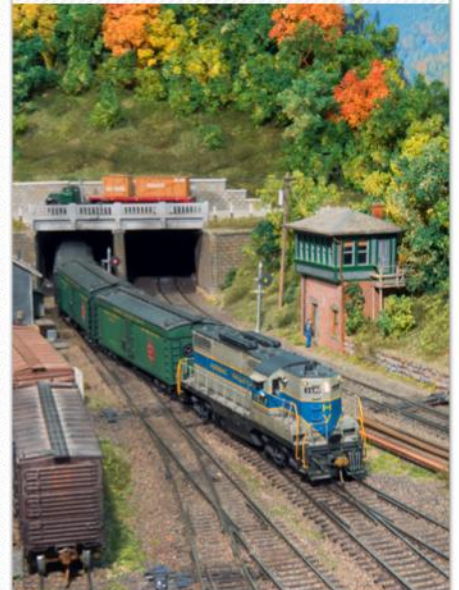
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Modeling from memories

I guess all of our modeling is “from memories” in one way or another. Some are actual reminiscences; others we wish we had but were denied because it happened long ago or out of our reach.

My entire circa-1954 model railroad is a memory of sorts. Some of those memories are from first-hand experiences in or near my 1950s hometown. The sprawling Frankfort, Ind., yard is backdated from personal visits in the 1960s. Other sections of the railroad are based on research conducted in more recent times, but I still rely on my memory, hit and miss though it is, to fill in between the lines of documented history.

I once wrote about a trip that Jim Boyd, Steve King, Allen McClelland, and I made to the Virginias to gather photos and information for our Appalachian coal haulers. We were in Bluefield, W.Va., walking along the high retaining wall on the southern border of what was then Norfolk & Western’s yard and engine terminal.

Jim, Steve, and I edged along the top of the wall, not noticing a big dog chained behind an Exxon station. By the time Allen started across a narrow space between said dog and the wall, “Fang” woke up with a start. Allen froze, and Fang just stared at him. Allen then started edging slowly toward the now-fascinated rest of us, as the dog started edging toward Allen. The edging became a quick-step developing into an all-out footrace.

The chain saved the day as – whang! – the dog’s pursuit came to an abrupt halt. I modeled this scene on the Allegheny Midland at the moment when Allen and the



Wayne Sittner takes his modeling to a higher level by modeling specific figures from his past – here himself as he parked his Christmas-gift bike long enough to look for soft-drink bottles to turn in for the deposit money. Wayne Sittner photo

dog both realized they had a mutual problem to resolve.

Several of the usual suspects recently reminisced about life in the good ol’ days, sharing tales and even photos of “the way things were.” What’s now a vacant parking lot in Wilkes-Barre, Pa., was once a teeming railroad yard with a brick depot and freight house. It’s hard to imagine that much steel, brick, and mortar could be so utterly gone.

Walt Kierzkowski shared color photos of the old American Auto department store in downtown Scranton, Pa., just down the street from today’s Steamtown. At Christmas, the windows of such stores were filled with Lionel trains racing around ovals of track, just like in Jean Shepherd’s *A Christmas Story*. Like Jean, I lived in the Midwest and don’t share any of the specific memories of the Northeast-bred group, but I could easily relate to them.

Wayne Sittner, whose modeling has graced these pages from time to time, brought us

back to railroading in miniature by sharing the above photo of a scene from his childhood: “In 1956, I spotted a Roll-Fast bike in the Kingston, Pa., American Auto store, and that bike became my Christmas present that year. I still have the bike, and it was such a part of my adolescence that I just had to model it to go with one of my portrait figures. It started as a Preiser model. In the scene, I’m looking for bottles to return for the 2-cent refund.”

Wayne is a retired art teacher, and his considerable skill is complemented with another attribute: the power of observation. His modeling goes far beyond that needed to model a specific place and time. He invariably takes the viewer on a colorful trip to the past while simultaneously triggering

one’s own memories related to scenes he’s modeled.

The late John Coots, creator of the Scale Structures Ltd. line of structure kits and myriad detail parts to complement them, was a strong advocate of scale model railroading as an artform. Those who followed his lead – George Sellios of Fine Scale Miniatures and Art Fahie of Bar Mills Models come to mind – surely saw the art potential in their line of structures.

Often it’s the little things that make all the difference. They help tell a story and thereby convey a sense of time and place that transcends merely good modeling. A kid with his bike looking for bottles to earn enough money to buy an ice cold Coke on a hot summer day is the perfect example. MR



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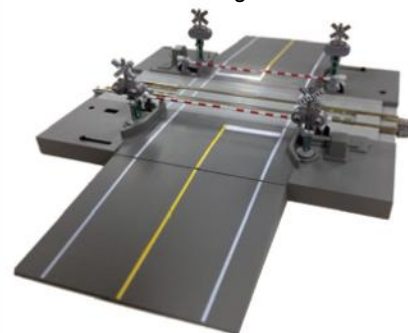


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