

OPEN AUTO RACKS OF THE 1960s-'70s p.50



**Atlas GP39-2
diesel tested** p.60

November 2018
www.ModelRailroader.com

MODEL RAILROADING IS FUN!

Model Railroader

Ride along on a mine run

Working a day on a busy Reading Co. division p.42

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John Armstrong
layout down
under** p.32

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**BONUS
ONLINE
CONTENT
CODE PG. 4**

Vol. 85 • Issue 11



Corn Stalks #0595552 (HO)/#0595553 (O)



Flowering Hedges #0595510 (HO)



Hay Bales #0595582 (HO)/ #0595583 (O)



Sunflowers #0595523 (HO)

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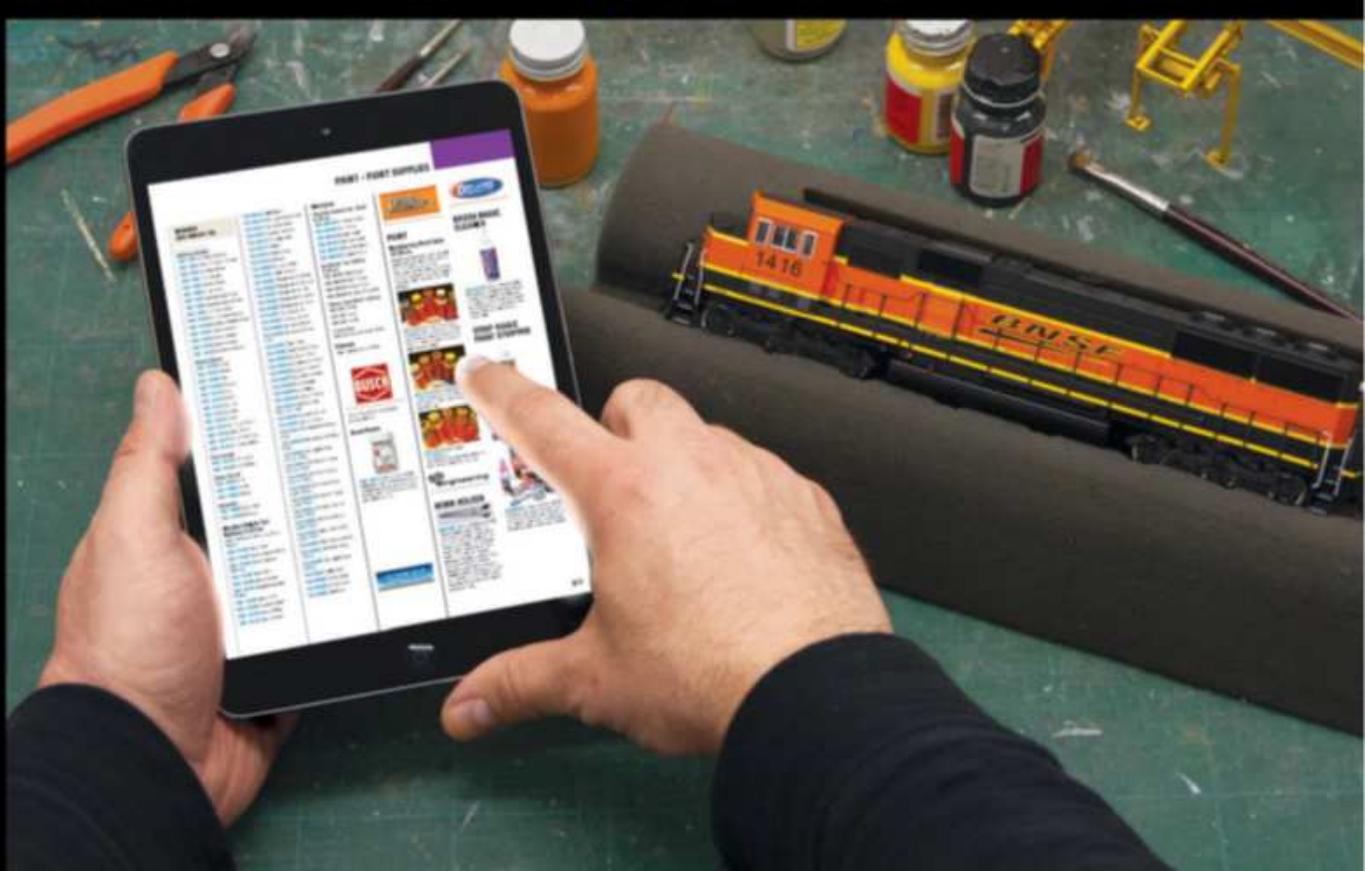
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by Jim Hertzog

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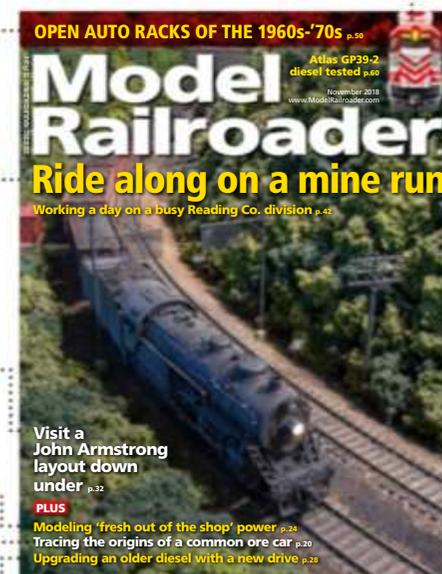
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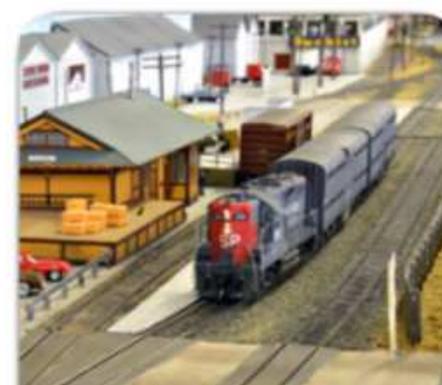
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On the cover: Moving coal is a daily activity on Jim Hertzog's HO scale Shamokin Division model railroad.
 Mike Rinkunas photo



Next issue

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MREXTRA

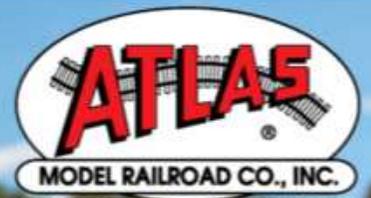
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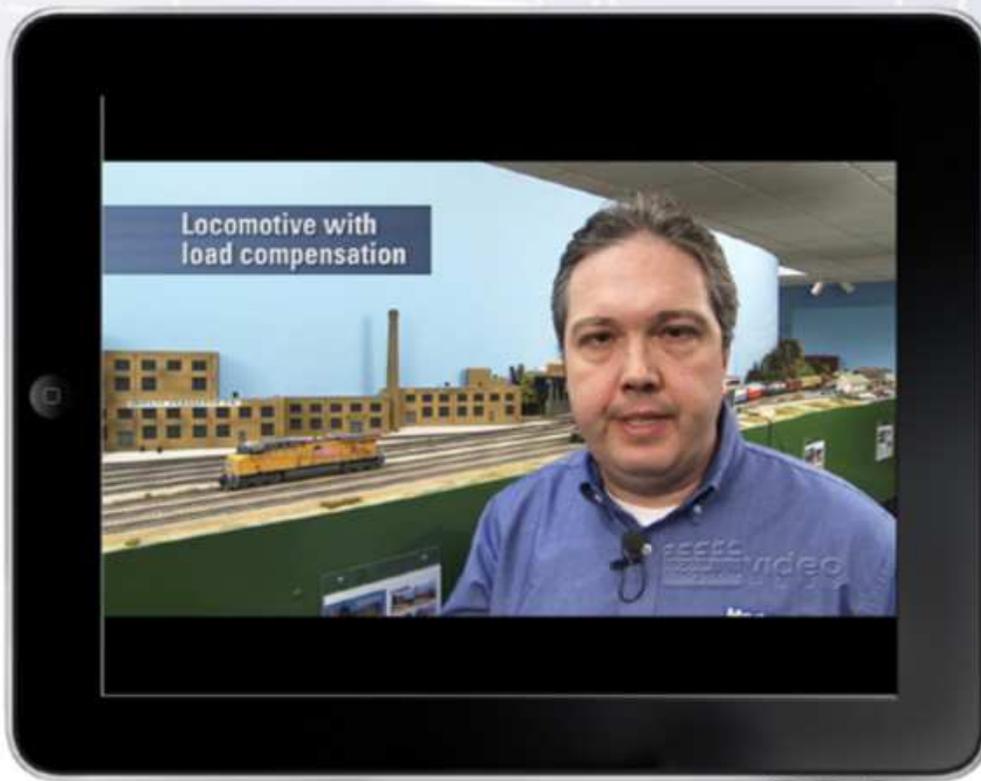
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Link. Look. Learn more!

The content you see in the printed pages of this issue is only part of the story. Subscribers to the Model Railroader Video Plus website can tell you that inspiring insights, helpful instruction, and an introduction to a wide array of hobby topics are just a mouse click away! After reading this issue of *Model Railroader*, which highlights topics related to DCC, layout design, locomotive detailing, and modeling, simply open up any web browser and click on the links listed below to preview how MRVideoPlus.com provides additional coverage!

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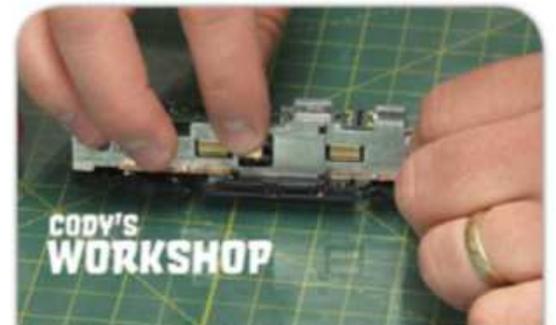
► Dana Kawala explains back-electromotive-force (back-EMF) control and how it functions.
MRVideoPlus.com/DCC13



Hal Miller and the late Andy Sperandio discuss John Armstrong's clever concepts.
MRVideoPlus.com/RND23



David Popp walks you through the process of kitbashing a depot from a Walthers structure.
MRVideoPlus.com/RMRS1



Cody shows how to upgrade the decoder in an N scale diesel, and then add details.
MRVideoPlus.com/WRK30

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But even better, there are times you'll find that MRVP brings you top-notch

content even before you see it in print! As just one specific instance, you can enjoy watching the MRVP Exclusive

Layout Visit video of Ken Thompson's BN HO scale layout long before it appears in the *Great Model Railroads* 2019 magazine. If you

haven't discovered it already, MR Video Plus truly has something for everyone – take a closer look today!



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National Train Show 2018 special online extras

Staff members from *Model Railroader* magazine and MR Video Plus attended the National Train Show in Kansas City, Mo., back in August. Visit www.ModelRailroader.com to watch video highlights from the show, including a record-breaking T-Trak modular layout. You'll also find a full listing of the new model railroading products featured at the show.

GET MR IN YOUR INBOX



New Layout Video

Featured on the cover of the September issue, Jim Babcock's HO scale railroad models describe scenes along the Baltimore & Ohio Pittsburgh & Western Sub. In this short video, you'll see some of the action on this exceptional model train layout.

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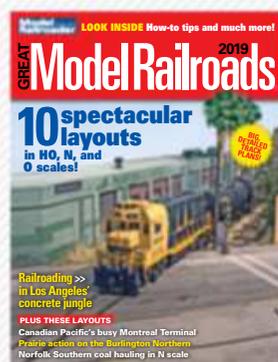
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GREAT MODEL RAILROADS



Bonus computer desktop collection

This month you can download computer desktop wallpapers for each of the 10 featured model railroads in this annual special issue.



BONUS ARTICLE



The HO scale Shamokin Division

In this month's cover story, Jim Hertzog describes how he re-creates some of the Reading Co.'s mine runs in the 1950s on his HO scale Shamokin Division. See the beginnings of this spectacular model railroad in this online bonus article from *Model Railroad Planning 1998*.



LEGENDARY LOCOMOTIVES

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Starting 2011, an introduction of interesting paint schemes came from both the Norfolk Southern and Union Pacific. These special paint schemes honored veterans of the armed forces for both railroads. Norfolk Southern SD60E #6920 "Honoring Our Veterans" introduced 2011, and Union Pacific SD70ACe(SD70AH) #1943 "The Spirit" in 2017. Norfolk Southern also debuted "Honoring First Responders" SD60E #9-1-1 in 2014. These colorful and unique locomotives have been seen from coast to coast in a variety of service. Athearn™ brings these Legendary Locomotives to you, in HO scale as Genesis™.



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SERIOUS FUN™

Up to date in Kansas City. Or not.

In August, several of us went to the National Model Railroad Association Convention in Kansas City, Mo. If you've never been to KC, put it on your list.

Cody Grivno and I went via Amtrak, which was its own adventure and another story for another day. The



An iconic view during a late summer sunset in Kansas City, Mo. In addition to the new, there was plenty of old.

Reader's Digest version is: if you want to experience what can go wrong on a Class 1 railroad, travel by rail. If you host operating sessions on your railroad, you'll get ideas for numerous traps to spring on your unsuspecting crews.

That said, hats off to the Amtrak folks who run at the mercy of the freight carriers. They did a great job of keeping us updated on why our return train was stuck in the traffic caused by a locomotive fire the night before.

If Chicago is the head of railroading in the United States, Kansas City is certainly its heart. At the center of the city is the restored union station that opened in 1914. If you have even a passing interest in trains, it's worth checking out the walkway over the busy tracks outside the station. The volume of traffic is nothing short of amazing.

We visited that train-watching spot several times during the show, and it was like being in a time warp. We saw consists from multiple railroads with lots of shiny new power. But we also saw locomotives that were common 25 years ago that I figured had long since been retired – old Santa Fe locomotives in blue and yellow; Burlington Northern engines in Cascade Green and black; Union Pacific in Armour Yellow that was way past its expiration date.

All of this, of course, led me to think, "Man, what a great time to be modeling the present day!" Pretty much anything power-wise from the last 30 years is fair game to run. That adds to the color along with the myriad intermodal containers on stack trains. Equipment is readily available, too.



By a fairly large margin, the 1950s-'60s is the most popular time frame in which many of us set our railroads. But anyone who thinks all the personality went out of trains after that should look again.

To borrow a line from the musical "Oklahoma!", everything's up to date in Kansas City. But it's even more fun and interesting when it isn't.

Model Railroader

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HO scale



Pennsylvania RR class K4 streamlined 4-6-2 Pacific steam locomotive. Bachmann is offering this Pennsy classic in four road numbers. The HO scale Spectrum line class K4 Pacific features a Train Control Systems dual-mode sound decoder with Audio Assist, a Keep-Alive capacitor for uninterrupted operation, an all-metal chassis, blackened metal wheels and side rods, a die-cast metal trailing truck, separately

applied parts (injectors, pump, and piping), and E-Z Mate mark II couplers. The 4-6-2 has a manufacturer's suggested retail price of **\$469**. Bachmann, 215-533-1600, www.bachmanntrains.com

Locomotives, electronics big in Kansas City

Two trends at the 2018 National Train Show were locomotives (both steam and diesel) and electronics. The three-day show was held the second weekend in August at Bartle Hall in downtown Kansas City, Mo.

Bachmann Trains unveiled its Pennsylvania RR class K4 streamlined 4-6-2 Pacific steam locomotive in HO scale (above). The Spectrum line model features a dual-mode TCS WOWSound sound decoder with Audio Assist and a Keep-Alive capacitor.

Walthers showed a pre-production sample of its new Mainline series chopped-nose GP9 (below). The newly tooled model will be offered in six road

names (four road numbers each) and feature a Proto-series mechanism.

Following the prototype's lead, Athearn continues to add new schemes to its HO scale Genesis Series Norfolk Southern SD60E diesel locomotive. The "Honoring Our Veterans" scheme is shown on page 14.

In addition, Broadway Limited Imports had samples of its N scale Electro-Motive Division SD40-2 diesel locomotive (page 16). The model features the company's Paragon3 sound decoder with Rolling Thunder.

Several innovative electronics-related items were also displayed at the show. SPROG DCC displayed its Pi-SPROG

Digital Command Control system (page 14), Digitrax showed its HO and N scale signaling kits (page 16), SoundTraxx had its Dash 2 series of Tsunami2 sound decoders (page 16), and WiFi Model Railroad LLC demonstrated LocoFi, a WiFi enabled sound decoder (page 18).

We couldn't fit all of the announcements and photos from the show into print. Visit www.ModelRailroader.com to read the two-part show report and watch video coverage from the show.

Next year, the National Train Show heads to Salt Lake City. The show will be held July 11-13 at the South Towne Expo Center. Visit www.nationaltrainshow.org for more information.

HO scale



Electro-Motive Division Phase II GP9 diesel locomotive. This road switcher, scheduled for release in May 2019, will be decorated for Burlington Northern, Canadian Pacific, Chicago & North Western, Milwaukee Road, Norfolk Southern, and Wisconsin & Southern in four road numbers per scheme. Direct-current models with a 21-pin plug for Digital Command Control decoder sell for **\$139.99**. Versions with a dual-mode ESU sound decoder are priced at **\$199.99**. Wm. K. Walthers Inc., 414-527-0770, www.walthers.com

HO scale freight cars



• **Union Pacific class CA-4 caboose.** "Make Courtesy Contagious" slogan. One road number. Injection-molded plastic body; metal frame and floor; separately applied running boards, ladders, and grab irons; interior details; and clear window glazing. NEM couplers can be replaced with other brands. \$59.99. Märklin Inc., 573-365-9522, www.marklin.com



HO scale passenger cars

- **Missouri Pacific River Eagle.** 1940 six car set: Electro-Motive Corp. E3A diesel locomotive and American Car & Foundry (ACF) lightweight cars: baggage; baggage mail; 76-seat coach; 56-seat chair; dining-bar-lounge; and 1-drawing-room, 25-seat parlor observation. 1950 six-car set (de-skirted ACF lightweight cars): baggage; baggage mail; 76-seat chair; 56-seat chair; dining-bar-lounge; and 1-drawing-room, 25-seat parlor observation. Electro-Motive Corp. E3A, ACF lightweight cars, and Pullman lightweight dome coach also available as separate sale items. Factory-painted and lettered brass models with interiors. Prices to be announced. The Coach Yard, www.thecoachyard.com

HO scale structures

- **Bridge Street Tower.** Craftsman kit with laser-cut wood and photo-etched brass parts and nickel-silver rail. Based on prototype in Grand Rapids, Mich. Base is 7/8" square. 5 5/8" tall. \$74.95. Alexander Scale Models, 269-944-5129, www.alexanderscalemodels.com
- **Union Transfer Co.** Laser-cut wood low-relief kit with cast-metal details. Includes signs and number decals for doors. Footprint is 8 1/2" x 2 1/2". \$27.95. Monroe Models, 320-250-5610, www.monroemodels.us

HO scale details and accessories



- **Gantlet bridge ties with stringers.** Injection-molded plastic. Works with Micro Engineering code 70 and 83 rail (rail not included). Enough material for 25 scale feet. \$11.95. Central Valley Model Works, 805-489-8586, www.cvmw.com



- **Industrial HVAC units.** Large HVAC air handler (4 1/8" x 2 1/4" x 2"), \$24.99;

HO scale



Electro-Motive Division SD40T-2 diesel locomotive. ScaleTrains.com unveiled pre-production samples of its next model. The HO scale SD40T-2 (spring 2019) will be decorated for Southern Pacific and Denver & Rio Grande Western. Direct-current models with a 21-pin connector will sell for **\$169.99**. Models with an ESU LokSound sound decoder featuring Full Throttle, two sugar cube-style speakers, and two PowerPak super capacitors will be priced at **\$259.99**. ScaleTrains.com Inc., 844-987-2467, www.scaletrains.com

N scale



General American 4,180-cubic-foot-capacity Airslide covered hopper. Atlas announced this bulk commodity hauler in Kansas City. The N scale General American Airslide covered hopper will be offered in three body styles (1965-66 with high-mounted brake wheel, 1966-68 with low-mounted brake wheel, and 1970-80 with end changes). Road names, features, release date, and pricing for the Master Line car will be announced at a later date. Atlas Model Railroad Co., 908-687-0880, www.atlasrr.com

N scale



2017 Operation North Pole Christmas train. A pre-production sample of this gallery bi-level cab coach was shown by Kato. The N scale 2017 Operation North Pole Christmas train includes a gallery bi-level cab coach (*Chicago Dogs*), four gallery bi-level coaches (*Rosemont, Allstate Arena, Donald E. Stephens Convention Center, and Lifesource*), and Metra Electro-Motive Division F40PH diesel locomotive. The set (**\$260**) includes bookcase-style packaging with specially designed slipcover. A portion of the sales of the sets will be donated to Operation North Pole to subsidize wrapping of future Operation North Pole trains. Kato USA Inc., 847-781-9500, www.katousa.com

HO scale



Norfolk Southern SD60E diesel locomotive. Athearn had a pre-production sample of this six-axle road unit. Direct-current models will retail for **\$249.98**. Versions with a dual-mode SoundTraxx Tsunami2 sound decoder will sell for **\$339.98**. Athearn Trains, 800-338-4639, www.athearn.com

Multiple scales



Pi-SPROG full package. Included in this package (**\$170**) is a Pi-SPROG One DCC interface with 2.5-amp DCC output; a Raspberry Pi 3B+; power supplies; and an SD card with the current Raspbian Stretch system, JMRI DecoderPro and PanelPro, and preset Wi-Fi network. SPROG DCC, sprog.us.com

medium-long HVAC air handler (4½" x 1½" x 1½"), \$22.99; and roof-mounted large HVAC unit (5" x 2.5" x 1.5"), \$24.99. All kits are 3-D printed in gray ABS plastic and come with choice of end panel.

Dimensional Modeling Concepts, www.dmcrrproducts.com

- **Gooseneck lamp.** Factory-assembled and lit with warm white nano light-emitting diode. Includes resistor and bridge rectifier. Ready to connect to 7-19V AC, DC, or Digital Command Control. \$7. Evan Designs, 888-764-2610, www.modeltrainsoftware.com

- **1941-1946 Fruehauf 32-foot furniture vans with curb-side door.** Allied Van Lines, Bekins Van Lines, and Mayflower Transit Co. Cast-resin kits with decals for trailer and tractor. \$20.95. Sylvan Scale Models, 519-294-6601, www.sylvanscalemodels.com

N scale passenger cars



- **Lightweight passenger cars.** Pullman-Standard 14-roomette, 4-bedroom sleeper: Missouri-Kansas-Texas *Texas Special* (James Bowie, William B. Travis, and David Crockett. \$43 each; three-pack, \$119). Pullman-Standard 10-roomette, 6-double-bedroom sleeper: Atlantic Coast Line (*Glynn County* and *Polk County*, \$42 each), Northern Pacific (nos. 364 and 365, \$39.90 each), and Union Pacific

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<p>November 24-25 • Collinsville, IL Gateway Center</p>			<p>Feb. 9-10 • Council Bluffs, IA Mid-America Center</p>			<p>November 24-25 • Edison, NJ New Jersey Expo Center</p>								
<p>December 1-2 • Fort Wayne, IN Allen County War Memorial Coliseum</p>			<p>Feb. 23-24 • Novi, MI Suburban Collection Showplace</p>			<p>December 1-2 • Timonium, MD Maryland State Fairgrounds</p>								
<p>December 15-16 • Overland Park, KS Overland Park Convention Center</p>			<p>DuPage County Fairgrounds 9am-3pm County Farm & Manchester, Wheaton, IL 60187 Largest Monthly Train Show in the US</p>			<p>December 8-9 • Lebanon, PA Lebanon Valley Expo Center</p>								
<p>December 29-30 • Grayslake, IL Lake County Fairgrounds</p>			<table border="1"> <tr> <td>Sep 9</td> <td>Oct 14</td> <td>Nov 11</td> </tr> <tr> <td>Dec 9</td> <td>Jan 13</td> <td>Feb 10</td> </tr> </table>			Sep 9	Oct 14	Nov 11	Dec 9	Jan 13	Feb 10	<p>December 15-16 • Chantilly, VA Dulles Expo Center</p>		
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(Pacific Coast, \$39.90). Pullman-Standard 64-seat coach: Great Northern (nos. 1110 and 1209, \$39.90 each). Ex-Wm. K. Walther's Inc. tooling. Cars feature metal wheels, clear window glazing, and Accumate couplers. RailSmith Models, www.railsmith.net

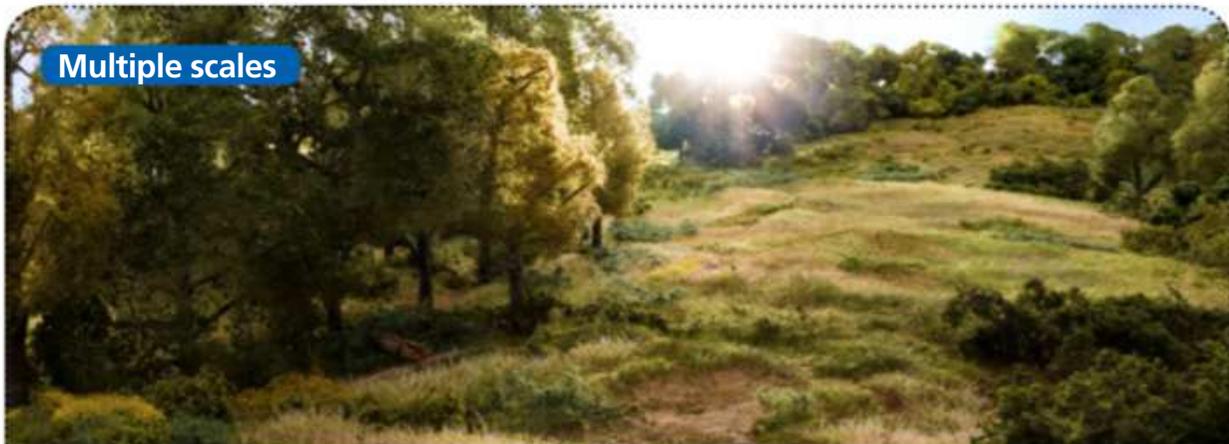
N scale structures

- **Texas & Pacific Marshall, Texas, depot.** Laser-cut medium-density fiberboard kit with peel-and-stick parts, laser-cut plastic details, acrylic window glazing, and instructions. Measures 5 1/2" x 6". \$99 plus shipping and applicable taxes; international orders contact manufacturer for shipping rates. Red River Models, www.redrivermodels.com

N scale details and accessories

- **Flatrack containers with collapsible ends.** Injection-molded plastic construction. 20- and 40-foot standard height and 40-foot high-cube versions. Road

Multiple scales



Field System. The Field System includes static grass (four lengths and four colors, \$4.99 each), Static King static grass applicator, field grass (tall grasses and weeds, \$4.99 each), briar patch (brambles and thickets), plant hues (for adding highlights and shadows), flowers (for extra color and interest, \$4.99), and three new scenery adhesives. Release dates and some pricing to be announced. Woodland Scenics, 573-346-5555, www.woodlandscenics.com

names, pricing, and release dates to be announced. Jacksonville Terminal Co., www.jtcmmodeltrains.com

S scale freight cars

- **40-foot steel rebuilt boxcar.** Norfolk Southern ("Honoring Our First

Responders" and "Honoring Our Veterans". Model features hi-rail wheels, American Flyer-compatible couplers, and mounting pads for scale couplers. Code 110 33" insulated metal wheelsets and Kadee-compatible couplers sold separately \$59.95. MTH Electric Trains, 410-381-2580, www.mthtrains.com

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N scale



Electro-Motive Division SD40-2 diesel locomotive. Pre-production samples of this six-axle road unit were shown by Broadway Limited. The N scale SD40-2 is decorated for Burlington Northern (as-delivered scheme); Atchison, Topeka & Santa Fe (blue-and-yellow warbonnet); and six other railroads in two road numbers per scheme. An undecorated model is also available. The SD40-2 (\$249.99) has a dual-mode Paragon3 sound decoder featuring Rolling Thunder, injection-molded plastic body, and die-cast metal chassis. Broadway Limited Imports, 386-673-8900, www.broadway-limited.com

Scenery

• **Timber deck planking.** Flexible vinyl sheets. Factory-weathered wood color. Includes peel-and-stick adhesive sheet. Decking can be cut with scissors or no. 11 blade. Includes installation and painting/weathering instructions.

Sheets measure approximately 3³/₄" x 11³/₄". Three sizes: .080" x 2" planks (small) for HO and N scales, .100" x 3" planks (medium) for HO scale, and .160" x 3" planks (large) for HO and O scales. Two-pack, \$19.99. Chooch Enterprises Inc., 425-273-4794, www.choochenterprises.com

Electronics/controls

- **SN2AB N scale mainline signaling kit.** Two single head A signals, two single head B signals, 4 SMP1s, eight spacers, and eight screws. Makes all signals plug-and-play with small 10-pin connectors. Mounting board and hardware included. Current-setting resistors built into the board. \$25. Digitrax, 850-872-9890, www.digitrax.com
- **SoundTraxx Tsunami2 EMD-2 digital sound decoders.** Includes eight new diesel engine sounds (567 12 cylinder no transition, 567C 16 cylinder non-turbo, 645E 12 cylinder non-turbo, 645E 12 cylinder turbo, 645F 16 cylinder turbo, 645E 20 cylinder turbo, 710G 12 cylinder, and 710G 16 cylinder). Decoders feature more than 50 sound effects, including engine startup, bells, and air horns. Also contains Reactive Diesel Dynamic Digital Exhaust. TSU-1100, \$129.95; TSU-2200, \$124.95; TSU-21PNEM, \$109.95; TSU-PNP, \$109.95; and TSU-4400, \$179.95. SoundTraxx, 970-259-0690, www.soundtraxx.com

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N scale



Bethlehem 3,600-cubic-foot-capacity quad hopper with coal load.

Tangent Scale Models entered the N scale market with this new hopper. The quad hopper (\$32.95) is decorated for Union Pacific in 12 paint schemes (one to 12 numbers per scheme). The hopper has body-mounted draft-gear boxes with Micro-Trains compatible couplers, 36" metal wheelsets, and interior bracing. Tangent Scale Models, 828-279-6106, www.tangentscalemodels.com

HO scale



General Steel Industries 53'-6" bulkhead flatcar. ExactRail had pre-production samples of its next freight car. The HO scale 53'-6" flatcar with 42-foot truck centers and end-of-car cushioning will be decorated for Chicago, Burlington & Quincy; Burlington Northern; and Rock Island. Versions with 43'-3" truck centers without end-of-car cushioning will be lettered for Chicago Great Western. Price and release date have yet to be announced. ExactRail, 866-945-1701, www.exactrail.com

- **Traxx ID beta kit.** Provides real-time tracking of 25 railcars at 3 industries or sidings. Combine with Traxx Operations (sold separately) and Traxx Inventory (free) software. Includes Raspberry Pi+ case (used as access point), Raspberry Pi power supply, Ethernet cable, 20 NFC tags, five 25mm tags, three MFRC522 RFID read/writer, three 8266 WiFi modules, three 12VDC to 5VDC converters, three seven-pin to 4+3 pin wire harnesses, one MFRC522 installation template, installation instructions, and bag of screws and spacers. \$179.99. TrainTraxx, 210-474-6554, www.traintraxx.com

- **LocoFi.** WiFi-enabled sound decoder for HO scale diesel locomotives. Combine with LocoFi smartphone controller app to get multi-user, multi-train wireless control of direct current (DC) locomotives. National Model Railroad Association-recommended color-coded wire connections. Decoders have dual microcontrollers

with pluggable microSD card that can be loaded with non-proprietary sounds. Compatible with 9-24V DC or Digital Command Control. Printed-circuit board measures 3.44" x .67", speaker measures 1.02" x .59" x .28". \$140 (quantity discounts available). WiFi Model Railroad LLC, www.wifimodelrailroad.com

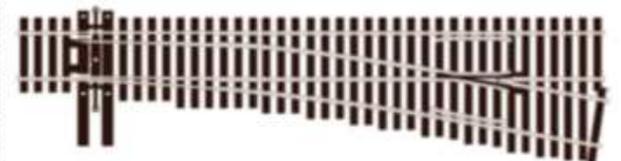
Tools

- **The Lumber Store rotating storage rack.** Laser-cut wood kit with materials to build a 12" x 12" rotating rack. Base kit (\$44.95) includes 25 14" long x 1" diameter clear plastic tubes and 25 self-adhesive labels. Stocked kits include plastic tubes with labels and 12 16" pieces of each size of stripwood. HO scale: 1 x 2 through 4 x 12, \$149.25; 6 x 6 through 12 x 24, \$218.10. O scale: 1 x 2 through 4 x 12, \$195.80; 6 x 6

through 12 x 24, \$273.80. S scale: 1 x 2 through 4 x 12, \$195.80; 6 x 6 through 12 x 24, \$268.50. Fast Tracks Hobbyworks Inc., 888-252-3895, www.handlaidtrack.com

- **TK3200 Pro-Modelers tool kit.** Model 2175ET sprue cutter, model 9180ET scissors for cutting photo-etched parts, and model 450 TweezerNose pliers. High-carbon steel construction with non-glare finish, Light-Touch return springs, and Xuro-Rubber soft cushioned rubber grips. Includes canvas storage pouch with two open spaces for holding other tools. \$69. Xuron Corp., 207-283-1401, www.xuron.com

Track



- **HO scale code 70 track.** No. 6 turnouts (left and right) and flextrack (36" lengths). Track and turnouts feature nickel-silver rail and injection-molded plastic wood ties. Turnouts have solid machined point blades, over-center spring, and Unifrog (stock rails are wired to closure rails at factory, which in turn are connected to the corresponding frog rail. Turnout, except for tip of frog, is completely live with no extra wiring required). Prices to be announced. Pritchard Patent Product Co. Ltd. (Peco), +44 0 1297 21542, www.peco-uk.com

Decals

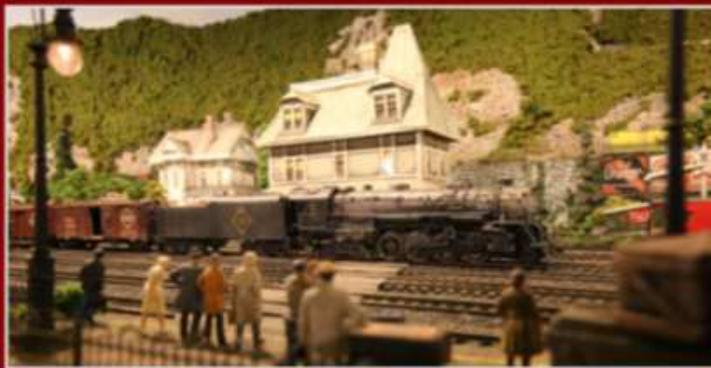
- **HO scale Illinois Central 50-foot boxcar decals.** Single-door boxcar (1957+), single-door boxcar with cushioned underframe (1963+), and double-door boxcar (1961+). Brown cars with "Mainline of Mid-America" slogan. Each set completes two cars and has extra reweighs and other data. Screen-printed waterslide decals. \$10 each. Illinois Central Gulf Decals, home.mindspring.com/~paducah

Weathering supplies

- **Weathering Mix.** New colors: Burnt sienna, burnt umber, raw sienna, raw umber, and yellow ochre. Alcohol-based washes. Eight-ounce bottle, \$9. Hunterline, 866-934-4174, www.hunterline.com 

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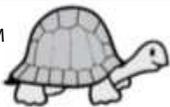
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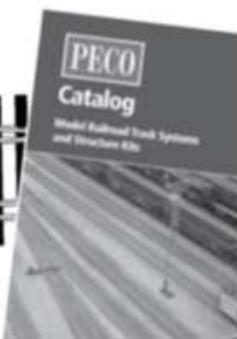
*Q. Hmmm, where
 am I going to get my
 track from?*



*A. The Modeler's
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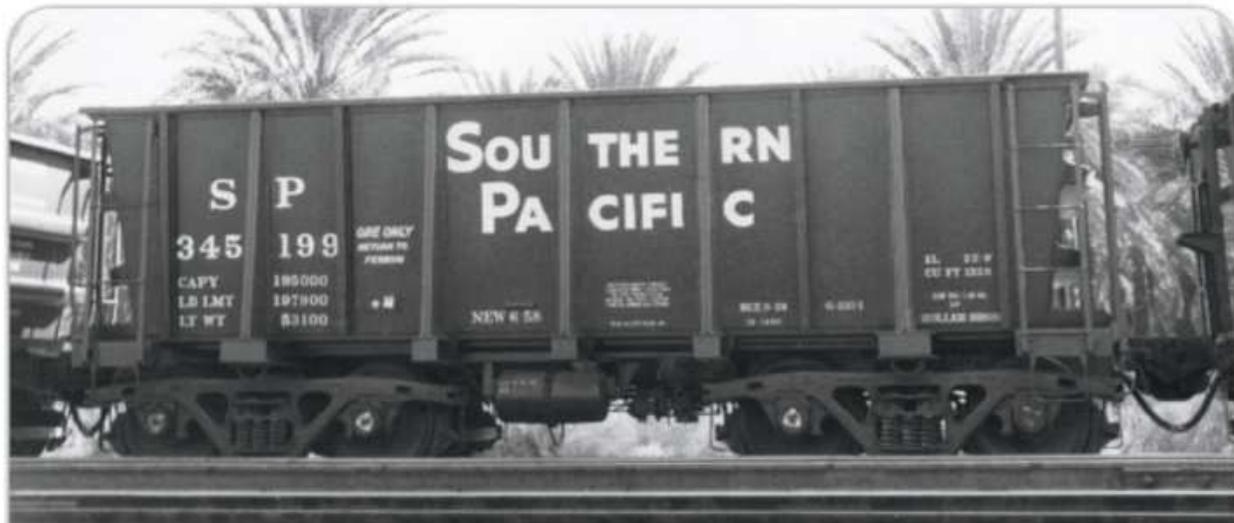
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The Southern Pacific added 600 of these 26-foot house-built ore gondolas to its roster in 1958. Later, Model Die Casting would add an HO scale version to its Roundhouse line. Ray Savage photo

What was this HO ore car's prototype?

Q I'm curious to know what prototype was used to model the old Model Die Casting 26-foot tight-bottom ore cars, and what the capacity of the original cars was. I plan to have a sizable fleet hauling copper ore, and I can't seem to find any information online in regards to these cars. Thank you in advance!

Matt Liverani, Ely, Nev.

A The Roundhouse/Model Die Casting (now Athearn) 26-foot tight-bottom ore cars were based on a Southern Pacific prototype. I found a picture of the prototype in the 1966 *Car & Locomotive Cyclopedia* (Simmons-Boardman) whose caption indicated that they were built in the railroad's own car shops. The cars had a reported capacity of 1,350 cubic feet and a load limit of 197,300 pounds (minus the car's light weight of 53,700 pounds, that gives a capacity of just over 70 tons).

The 1959 *Official Railway Equipment Register* shows the car as belonging to a series of 600 such ore gondolas, numbered 345000 to 345599 and built in 1958. The photo above was published in *Trains* magazine in April 1960. Model Die Casting also sold its cars decorated for the Pennsylvania RR and Union Pacific. But while those railroads did have similar-looking tight-bottom ore cars, they weren't exactly the same. The Pennsy's, built in the railroad's own shops, were just 22 feet long, while the UP's were 29 feet. The ladders on the B end differed on the Pennsy and UP cars, too.

Q I'm in the process of putting metal wheelsets on all my cars. My old Tyco and Mantua trucks bind with the new wheels. I thought I saw an article on this in MR, but can't find it. Do you have any suggestions?

Dennis Foose, Firestone, Colo.

A Not being able to examine the offending trucks, I can only make a few guesses as to the cause of the binding. It's possible that over the years, your trucks have warped slightly, either becoming too tight back-to-back and squeezing the axles, or too loose, letting the axles ride on the conical surface at the ends of the axles rather than on the points. A truck

frame that's become twisted can cause the axles to go out of alignment with each other, which can cause binding with the track.

Also, are the new wheels the same diameter as the old ones? If you're replacing 33" wheels with 36" ones, they could rub against the car floor or underframe.

Finally, older trucks might not have been built to the same level of quality you can get today. Look into a "truck tuner" (available from Micro-Mark, www.micromark.com) to make sure there's no molding flash or other roughness inside the sockets of the trucks' sideframes. Or replace the trucks entirely with newer, better engineered ones.

Q I'm looking for an old HO scale track plan called the Gum Stump & Snowshoe. I built it in N scale for my children one Thanksgiving, but our home was lost in a fire and the layout went with it. Now that I'm retired, I'd like to rebuild the model railroad for my son and grandson, but I can't find the track plan.

George Prinkey, Tarrs, Pa.

A Chuck Yungkurth's Gum Stump & Snowshoe was published in the April 1966 MR. Robert Smaus showed his expanded version in our October 1989 issue. If you don't have those back issues in your personal library, you can subscribe to our online archive at www.ModelRailroader.com/archive.

Q I'm planning to build a second level on my layout, which will be reached by way of a helix. Can you recommend a publication that deals with the construction of a helix?

Robert River, Ancaster, Ont.

A We've run a number of articles over the years on designing and constructing helixes. One of the more thorough treatments was published in our April 2008 issue, "Construct a simple and reliable helix" by Jeff Johnston. That article is available for registered users of our website. We also have two article collections available at KalmbachHobbyStore.com, *Guide to Helix and Staging Design*, parts 1 and 2.

Q I notice from your Product Reviews that you test Digital Command Control locomotives on both a DCC system and on a direct-current power pack. Do all DCC locomotives work on a DC layout without any modification?

Pete Smulovic, United Kingdom

A I wouldn't feel confident saying "all," but the vast majority of DCC decoders being made these days are "dual-mode," meaning they run on either DCC or direct-current layouts without modification. There were a few decoders that would run on DC to start with, but once they were used on a DCC layout, locked themselves into DCC mode and wouldn't run on DC without reprogramming, but even that's rare these days.

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

READER TIP

Preserving adhesives and other hobby chemicals

I enjoy reading **Ask MR** each month, but I think your answer in the July 2018 issue on extending the life of glues, paints, and solvents didn't go far enough. There are simple ways to protect those materials and extend their lives from months to years.

Cyanoacrylate adhesives (CA) need to be protected from even the smallest amount of moisture. I store my bottles of CA in a sealed glass jar packed with packets of silica gel or a similar drying agent.

If unopened, CA can be stored in a refrigerator or freezer, as can most resins and solvent-based paints, since they contain no water. Once opened, though, don't refrigerate them, or the moisture that's entered the bottle will condense and solidify the chemical.

Food and hobby chemicals should never mingle, so I keep a refrigerator in the workshop just for these chemicals.

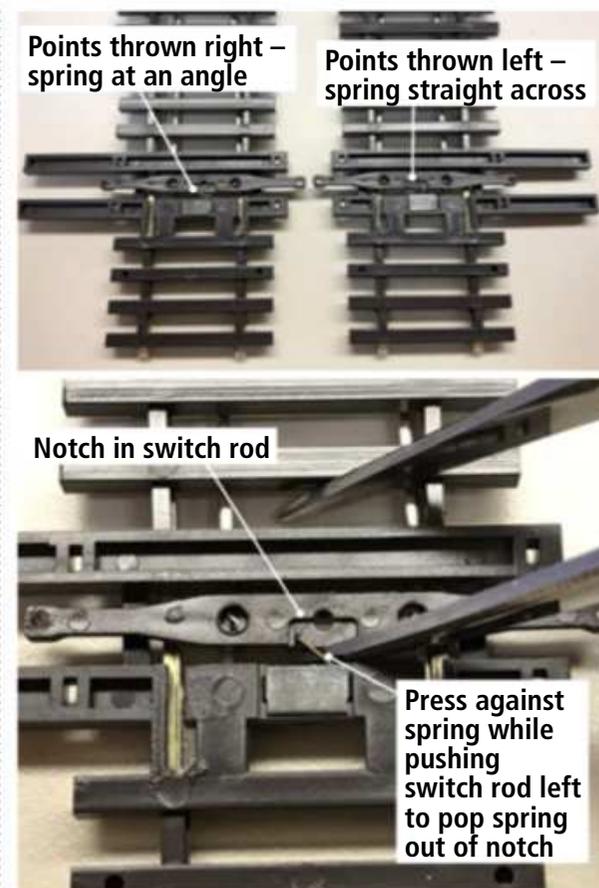
Water-based substances, such as acrylic paints, white glue, yellow glue, and the like, cure when the water evaporates. Don't freeze these. I keep mine in an old dishwasher with an open jug of water to keep the humidity high. (I put a splash of household bleach in the water to inhibit mold.) For smaller quantities of paint, you could use a plastic tub with a tight lid and a cup of water inside.

Finally, there are solvent-based materials like tube glues, adhesives, fillers, and paints. If you can smell a paint solvent (toluene) or vinegar-like aroma during the curing process, you can slow this by storing them in a closed container with a similar-smelling material. By not allowing the solvent to evaporate, you retard the curing process.

Be careful when smelling chemicals. Waft a little of the vapor toward your nose with your hand rather than taking a good whiff of the stuff.

Sorry if this is more of a lecture than a note, but old chemistry profs can't help but try to explain things. – *Wayne Wesolowski, Tucson, Ariz.*

[Wayne has contributed a number of articles and how-to videos to MR over the years. – *Ed.*]



Peco HO scale turnouts have a spring to hold the points against the stock rail. Removing the spring to make it easier for a switch machine to work is simple.

Steven Otte photo

A The spring assembly that holds the points against the stock rails on Peco turnouts is the same for both Electrofrogs and Insulfrogs. So it's unlikely that the problem was caused by your turnout being an Electrofrog. Let's look at an easier way to neutralize those springs.

The spring is a thin piece of wire bent at an angle that pivots from underneath one of the headblock ties to provide positive pressure on the switch rod when the points are lined in either direction. Look at the first photo above and you'll see that when the points are thrown in one direction, the spring is at an angle; in the other, it's straight. The end of the spring engages a notch in the switch rod.

To remove the spring, line the switch rod so the spring is at an angle (as on the left in the first photo). Put the point of a fine screwdriver, tweezer, or hobby knife in the angle between the spring and the switch rod, then push it and the switch rod toward the other side. The screwdriver's pressure against the spring should cause it to pop out of the notch. See the second photo. The switch rod should then move freely.

Having said all that, you shouldn't have to remove the springs. Circuitron, maker of the SMAIL, says it can handle a Peco turnout if you just use a stiffer, heavier-gauge actuator wire. **MR**

Look for "dual-mode" in the decoder's description and it will run on both DC and DCC layouts.

Q I'm wanting to build an HO scale steel-making blast furnace and have purchased *The Model Railroader's Guide to Steel Mills* by Bernard Kempinski (Kalmbach Books, 2010). A search through the MR Archives came up with "Steel Mill" by Bill Rau and Bruce Alter in the Nov. 1950 issue. While this is a good read, it is of its time, and I wondered if MR had any articles about scratchbuilding a more modern model steel mill.

Paul Lazenby, York, England

A "I am the very model of a modern model metal mill ..." Sorry, went to Broadway for a second there. Check out "Building Freytag's Foundry," a two-article series in the April and May 2009 issues. Dean Freytag also shares a lot of insights into steel mill modeling in

"Heavy industry in HO scale" in our Nov. 2003 issue. And although it's not a how-to story, you can probably glean a lot of ideas for modeling steel mills from Mike Rabbitt's HO scale H&R Steel Co. layout, featured in *Great Model Railroads 2018*.

Q I'm using Slow Motion Actuator with Integrated Logic (SMAIL) switch machines by Circuitron with Peco HO scale turnouts. I've been removing the springs that hold the turnouts' points against the stock rails so the switch machines don't have to work so hard. On Insulfrog turnouts this hasn't been a problem, but the Electrofrog turnout is another matter. I broke one of the headblock ties on one switch removing the metal spring cover. Please tell me the best way of removing these springs without damaging the turnout. Or should I just leave it connected and let the switch machine work harder?

Kem Widmer, Newburyport, Mass.

N scale by the numbers

Scale model railroading couldn't exist without numbers, some that are very important and some that are not important at all, but fun to play around with. This column is for those who model in N scale, so let's look at N scale numbers, starting with the two most critical, 9mm – the track gauge – and 1:160 – the scale proportion. How closely are these numbers related to one another, which is another way of asking, how accurate are our models?

The standard track gauge in North America is 4'-8½" (56½"), so let's divide that by 160, and we come up with .353". There are 25.4 millimeters in an inch, so we'll multiply that by .353 and we arrive at 8.97mm, meaning that for all practical purposes, our track gauge is dead on. If we divide 8.97 by 9, we find our models are 99.7 percent accurate. That's way more than good enough for me.

Just for kicks I ran the same numbers for HO and found it to be 99.9 percent accurate. Shucks, I figured we had them.

Developing the numbers. The first N scale trains aimed at the American scale model railroading market were developed in Germany by Arnold and Trix, following a strategy that had succeeded earlier in model train manufacturing, making trains half the size of

the most popular scale. In this case N was roughly half the size of HO, which was roughly half the size of O.

HO track gauge is 16.5mm, so at 9mm, N scale is .75mm larger than half. Also at a modeling scale of 1:160, N scale trains are a bit larger than half HO size, 54 percent actually.

One consequence of this is that if you build a model from an HO drawing and just divide the measurements by 2, your model would not be N scale. You need to use a scale rule and convert the measurements.

The third dimension. To say that N scale is roughly half the size of HO is to tell only half the story. Like all objects, our models exist in three dimensions, so they're half as long, half as tall, and most important, half as deep, meaning they occupy only one-eighth as much space. This is why when you look at HO and N models side by side, the N models look much smaller than half-size. It's simply because they are. That's what gives us an enormous advantage when it comes to building large scenic features such as mountainsides and broad rivers in the same given space.

Scale weight. It's of absolutely no importance when it comes to model train operation or anything else, but I find it fun to compare the weight of our models versus what they would weigh if blown up to prototype size.

To start with, the National Model Railroad Association (NMRA) recommends that N scale cars weigh an initial .5 ounce plus an additional .15 ounce for each inch of car length. This comes out to 1.1 ounces for an N scale 50-foot car. Fortunately, you'll find most enclosed cars you buy come very close to this standard.

Now for the tire pump exercise. We'll blow up the car by a factor of 160 cubed, which is 4,096,000. (That's right folks, over 4 million times.) Our prototype-size plastic car would weigh 4,505,600 ounces, which divided by 16 gives us a weight of 281,188 pounds, or about 140 tons. A prototype 50-foot boxcar weighs between 35 and 40 tons. If we imagine our car has a 100-ton capacity and is loaded, then our empty



WE'LL BLOW UP THE CAR BY A FACTOR OF 160 CUBED, WHICH IS 4,096,000. (THAT'S RIGHT FOLKS, OVER 4 MILLION TIMES.) - JIM

car weighs as much as the prototype car would weigh, if loaded.

This seems hard to believe, but the sides, roofs, and floors on models are typically about 1/16" thick, which is a scale 10". Solid plastic walls that thick would be pretty darn heavy, whereas prototype car walls are made of

steel structural shapes and sheets that combine to be about 10" thick, or about the same thickness as the plastic walls on our models.

As far as model railroading goes, prototype cars weights have nothing to do with anything, except being fun to think about. Real railroads do what they need to do to keep cars on the tracks, and we do what we need to do. It would be nearly impossible with scale-weighted, empty cars. They'd almost float away. **MR**

This Wheels of Time N scale 50-foot boxcar weighs 1.2 ounces, making it close enough to the National Model Railroad Association-recommended weight of 1.1 ounces. Bill Zuback photo

prototype
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tons (loaded)

1:160
proportion



99.7%
accurate
track gauge

1.2
ounces

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Milwaukee, Racine & Troy GP38 no. 842 poses for the company photographer in front of the railroad's enginehouse. Cody Grivno shares techniques for accurately capturing the look of a freshly painted locomotive. Bill Zuback photos

How to model a locomotive in fresh paint

Wait! What? Cody Grivno is modeling a *clean* locomotive? Yes, you read the headline correctly. This month, I'll show you how to model a locomotive that looks like it has just rolled out of the paint shop.

This project was more than a decade in the making. In 2004, we adopted Missouri Pacific's Jenks Blue as the paint scheme for the Milwaukee, Racine & Troy, our HO scale staff layout. Around that time, we purchased 10 Atlas Master Line Electro-Motive Division GP38 diesel locomotives painted for MP but unnumbered. Model Railroader Video Plus producer David Popp lettered three of the units using some old MR&T decal sets we had laying around. The rest of the engines sat in storage.

Fast forward to 2018. We commissioned Highball Graphics to produce MR&T decals in HO and N scales. Each set will complete two locomotives and one caboose. You can order your own sets online at the Kalmbach Hobby Store (www.KalmbachHobbyStore.com). The N scale set is no. 84060; the HO set is no. 84059. With a fresh stock of decals, it was time to get the remaining GP38s into service.

Starting with painted but unnumbered locomotives saved me from having

to paint the entire model, but there was still work to do. I had to remove the heralds, touch up the cab sides, and do some detail painting.

Having a few freshly painted locomotives in your fleet gives your model railroad a sense of history, whether it's to

suggest new engines or ones recently repainted. Now I'm going to head over to the enginehouse and get a few pictures of MR&T GP38 no. 842 myself. That shiny blue paint and bright white lettering won't stay clean for long once the unit starts moving freight.

STEP 1 PREPPING, PAINTING, AND GLOSS COAT



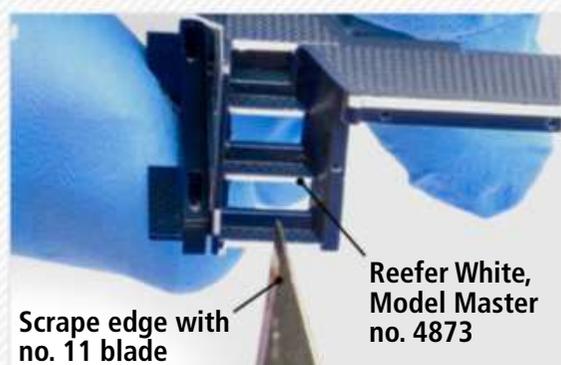
The Atlas HO scale Missouri Pacific GP38 diesel locomotive was unnumbered, but it still had the railroad's herald on the cab.

To remove the two-color herald, I applied Microscale Micro-Sol. The decal setting solution helped soften the printing. Then I used 600-grit sandpaper to gently remove the herald.



As careful as I tried to be, I sanded through the paint, revealing the gray plastic underneath. This was a quick fix, though.

First, I washed the cab in warm water with dish soap added to remove any residue from the sanding process. After letting the cab dry, I airbrushed the sides Polly Scale ATSF Blue (no. 414150). Post-it notes were

STEP 1 PREPPING, PAINTING, AND GLOSS COAT (CONT'D)

Scrape edge with no. 11 blade



Guards Red, Model Master no. 4632



Black Model Wash, Vallejo no. 76.518

handy masks to protect the window frames, which are painted silver.

Since I was in painting mode, I also brush-painted a few items. First, I painted the step faces Model Master Reefer White (no. 4873).

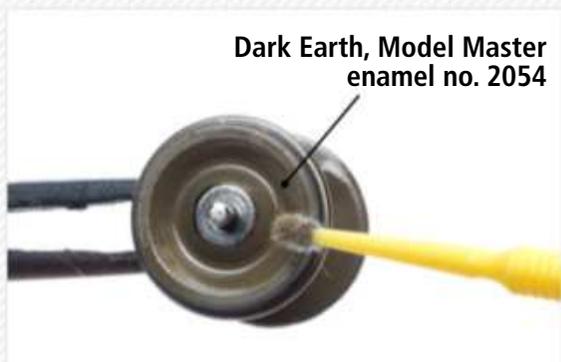
Once the paint dried, I gently scraped off any paint the top and bottom of the steps with a no. 11 blade.

Then I painted the m.u. receptacle covers. First, I used a paint marker to color the cover silver. Since red doesn't cover dark colors well, a silver or white base coat is a must. Then I brush-painted the cover Model Master Guards Red (no. 4632).

To give the inertial filter and radiator screens some added depth, I applied Vallejo Black Model Wash

(no. 76.518). I used a damp cotton swab to remove the wash from raised portions of each screen.

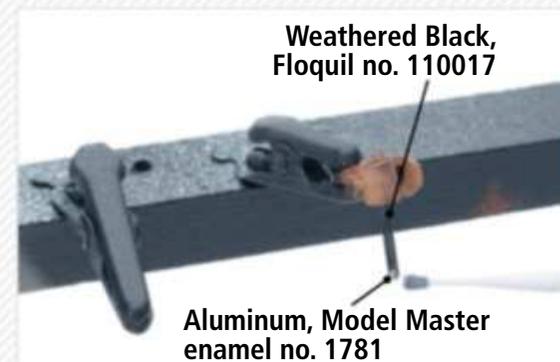
I applied Tamiya for Plastic Clear (no. TS-13) to the shell. To ensure even coverage on all surfaces, I separated the shell into its major components (cab, sill and step assembly, and long hood). I let the clear dry for 24 hours before proceeding.

STEP 2 WHILE THE GLOSS COAT WAS DRYING...

Dark Earth, Model Master enamel no. 2054



Rusty Brown, Monroe Models Scenery Solutions no. 975



Weathered Black, Floquil no. 110017



Engine Black, Model Master no. 4888



Sprint White, Pactra no. RC-51

I shifted gears and worked on other parts of the model while waiting for the gloss coat to dry. First, I wiped the wheels with a cotton swab dipped in 70 percent isopropyl alcohol. This removed oil and other impurities from the manufacturing process.

Then I used a Microbrush to paint the wheels Model Master enamel Dark Earth (no. 2054). Keep the paint off the tip of the axle, the tread, and the face that touches the brass wiper concealed behind the truck sideframe.

I replaced the plastic couplers with Kadee no. 148 standard whisker couplers. To give the couplers a gritty, rusty appearance, I first sprayed the metal couplers with Testor's Dullcote (no. 1260). Once the Dullcote had dried, I used a Microbrush to apply a wash of Monroe Models Scenery Solutions Rusty Brown (no. 975).

Though the couplers are often rusty on freshly painted locomotives, the air hoses are new. To capture that look, I painted the trip pin Floquil

Weathered Black (no. 110017), which has a slight grayish tone that even fresh rubber has. I painted the tip of the pin Model Master enamel aluminum (no. 1781).

The front and back number boards are cast in clear plastic with the headlights. I painted the boards Model Master Engine Black (no. 4888) using a Microbrush. After the paint dried, I used another Microbrush to apply a clear gloss finish.

The front and rear uncoupling levers are molded in acetal, a slippery engineering plastic. Since regular model paint won't stick to the plastic, I used Pactra Sprint White (no. RC-51) to paint the ends of the levers.

If you can't find Pactra paints at your hobby shop, Duratrax Bright White (no. PC51) or Parma International Faskolor Faswhite (no. 40000) would also work.

STEP 3 WORKING WITH THE DECALS



Liquid Decal Film, Microscale no. MI-12



Cut as close to artwork as possible



Position decal with toothpick or other soft object



Slit decals in door seams with no. 11 blade



Pop trapped air bubbles with tip of no. 11 blade



Touch up decals with 10/0 brush and white paint

The ink used on Highball Graphics decals can be easily scratched with scissors or tweezers. To protect the ink, I used a foam paintbrush to apply Microscale Liquid Decal Film (no. MI-12).

I trimmed as closely as possible to the artwork to reduce the amount of clear film around the decal. To make the cuts, I used a sharp no. 11 blade. Make the cuts in light passes so you don't damage the decals.

I first applied the decals to the number boards (I was working on two

units, which is why you see some photos with engine no. 830). I soaked the decals in distilled water, which is free of minerals that could dry as white spots. Once the decal slid freely from the paper, I positioned it with a toothpick. Then I blotted off the excess water with a cotton swab.

Next, I applied the decals to the long hood. I let the decals sit overnight, then applied Microscale Micro Sol, a setting solution that helps the decals conform to irregular surfaces. After a few hours, I used a

no. 11 blade to carefully slit the decals in the door seams. Then I applied another coat of Micro Sol.

After the second application of Micro Sol, there were still trapped air bubbles in a few spots, specifically around the door hinges. I used the tip of a no. 11 blade to pop the bubbles, and applied more Micro Sol.

After I'd finished popping all of the trapped air bubbles, I used a 10/0 paintbrush and white paint to touch up the decals in the door seams and around hinges.

STEP 4 SEAL THE DEAL



Apply clear in light coats



I gently wiped the model with a cotton swab dipped in distilled water. This removed residue from the decaling process. Then I applied two light coats of Tamiya clear. This helps give the model a uniform, gloss

appearance and helps hide the edges of the decals. After the clear had 24 hours to dry, I reassembled the locomotive.

With its glossy finish, bright lettering, and rusty couplers and

wheels, Milwaukee, Racine & Troy GP38 no. 842 captures the look of a freshly painted locomotive. Now it's time for this locomotive to earn its keep pulling freight trains through southeastern Wisconsin. 



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P34107

Brent D. Johnson modified a Life-Like Proto 2000 shell to fit on a Walther's Proto mechanism that features a SoundTraxx Tsunami sound decoder. He also detailed the shell to match the full-size Seaboard Coast Line no. 2009.



ADD A NEW MECHANISM TO AN OLD SHELL

This upgrade project adds Digital Command Control and sound to an HO scale Electro-Motive Division SD45

By Brent D. Johnson • Photos by the author

Like many of you, I have locomotives and freight cars that have been in my collection for a while. One example is an HO scale Electro-Motive Division SD45 diesel locomotive decorated for Seaboard Coast Line (SCL) that was produced by Life-Like in its

Proto 2000 series. The model had a lot of fine details, but it was direct current and lacked sound.

Fast-forward to 2005. Wm. K. Walther's Inc. acquired the Life-Like Proto 2000 line. The Milwaukee-based manufacturer has since

re-issued the six-axle road unit with an improved motor and a SoundTraxx Tsunami sound decoder.

With an improved (and sound-equipped) mechanism available, it now seemed like a great time to bring my SCL SD45 model to contemporary

standards. I took the opportunity to add prototype-specific details, apply some period-appropriate lettering, and weather the model. This project turned my already good-looking SCL SD45 into a real stunner with accurate sounds.

Make the modifications

I started by removing the Life-Like shell from the chassis. When I turned it over, there were two round tubes used for securing the shell to the chassis with screws. The tube on the fireman's (brakeman's) side needs to be removed ❶. This can be done with a pair of sprue cutters or a no. 11 blade in a hobby knife.

With the tube removed, I placed the Life-Like shell on the Walther's chassis. I noticed that the Walther's chassis was slightly lower in relation to the draft-gear box opening on the pilot of the Life-Like shell. Using a small file, I removed approximately $\frac{1}{32}$ " from the bottom of the opening ❷. This allowed the draft-gear box to slide through the opening and underneath the frame.

While I was working on the pilots, I removed the front and rear footboards using a chisel blade in a hobby knife ❸. After sanding the pilot beams smooth, I touched up the areas with Tru-Color Black (TCP-010).

Cosmetic upgrades

The Walther's SD45 I purchased for the mechanism had Flexicoil trucks with low-mounted brake cylinders. These trucks weren't correct for SCL no. 2021, which had high-mounted brake cylinders. However, an internet search revealed that SCL no. 2009 was equipped for a time with trucks that had low-mounted cylinders. I removed the factory-applied numbers by wet-sanding the cab sides with 320-grit sandpaper, being careful not to damage the yellow stripes ❹.

Changing the road number meant I had to change the number boards, too, which I did using the same technique. I repainted the number boards Model Master Flat White (no. 4769). I also removed approximately $\frac{1}{32}$ "

of the lower lens on the front headlight so I could add a red lens to simulate a warning light ❺ on the next page. After the paint dried, I placed the combined number board and headlight castings back in the shell.

The new road number also required some detail changes. I removed the factory horn, filled the hole with Squadron white putty, and sanded the area smooth. I replaced the stock horn with a Details West Leslie RS-5T-RF horn.

I turned to Details West again for the firecracker antenna. I also added an M.V. Products red lens in the bottom opening for the front headlight. Then I used putty to fill holes on the long hood (two behind the cab on the engineer's side and one on the brakeman's side). All of the cosmetic upgrades are shown in ❻.

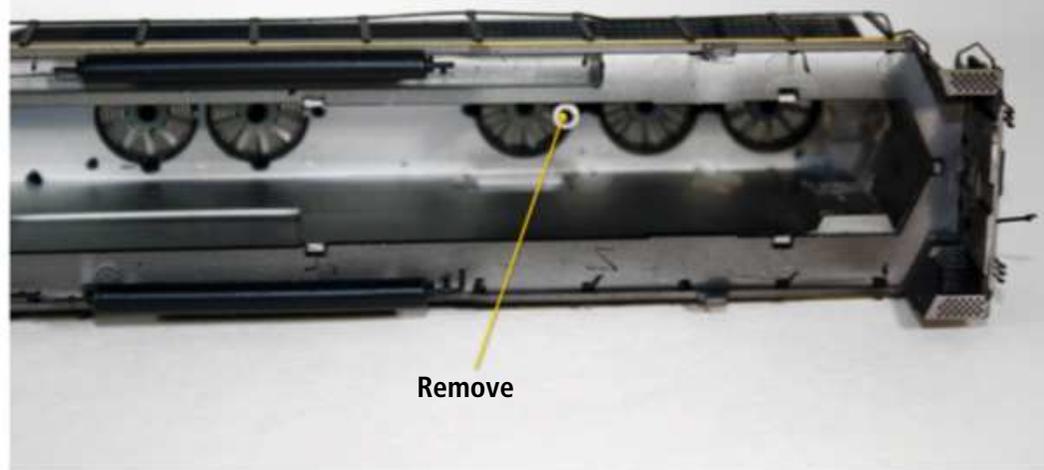
Paint and decals

I masked the yellow stripes on the cab and near the patched holes on the long hood. I also masked the cab windows and headlights ❼.

Next, I sprayed the side of the cab and the patched areas on the roof and hood with Tru-Color Black (TCP-010). Then I brush-painted the vertical portion of the handrails in the stepwells with Tru-Color Seaboard Coast Line Yellow (TCP-315).

After the paint had dried, I sprayed the model with Testor's Glosscote. This provided a smooth, glossy surface for the decals. I used Microscale's Seaboard Coast Line diesel decal set (no. 87-896) for the road number on the cab sides and number boards, as well as the "Pulling for You!" slogan on the battery box doors. The Automatic Car Identification plate is from the same company's set no. MC-4280 ❽.

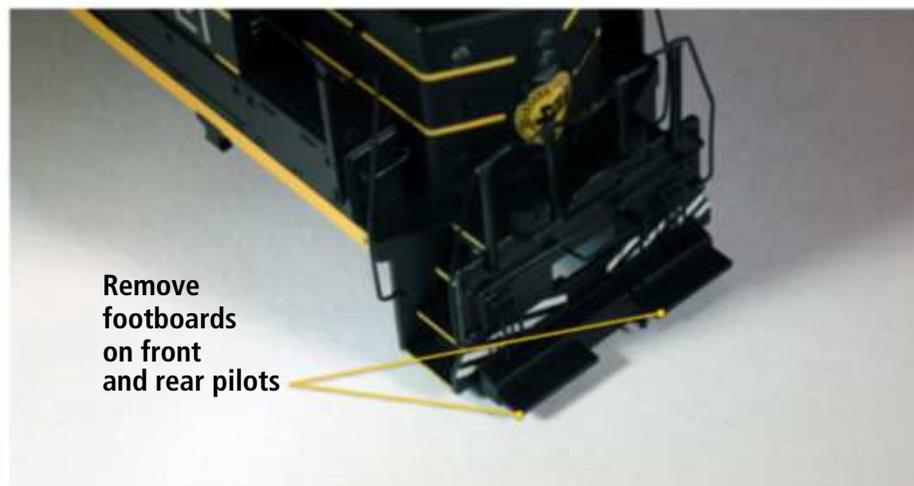
Once I was satisfied with the decal placement, I applied Walther's Solvaset to help the decals conform to any uneven



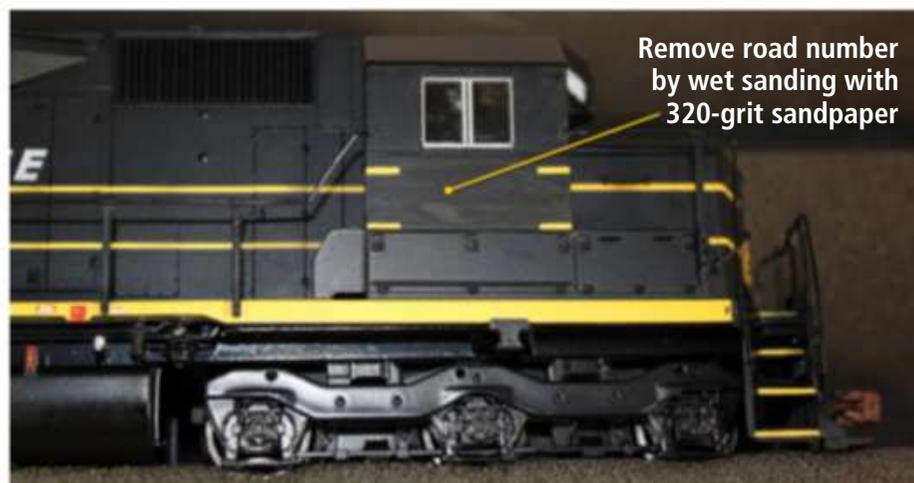
❶ **Off with the tube.** In order for the Life-Like shell to fit on the Walther's Proto mechanism, Brent had to remove the tube on the brakeman's side of the long hood. This can be done with sprue cutters or a no. 11 blade.



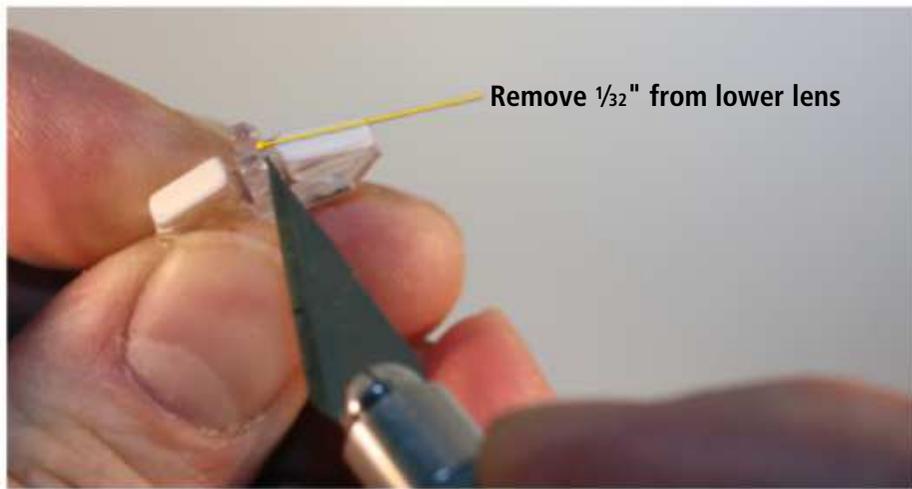
❷ **Filing plastic.** In order for the draft-gear boxes to fit, Brent had to enlarge the opening on the pilots. He used a file to remove $\frac{1}{32}$ " from the bottom of each opening.



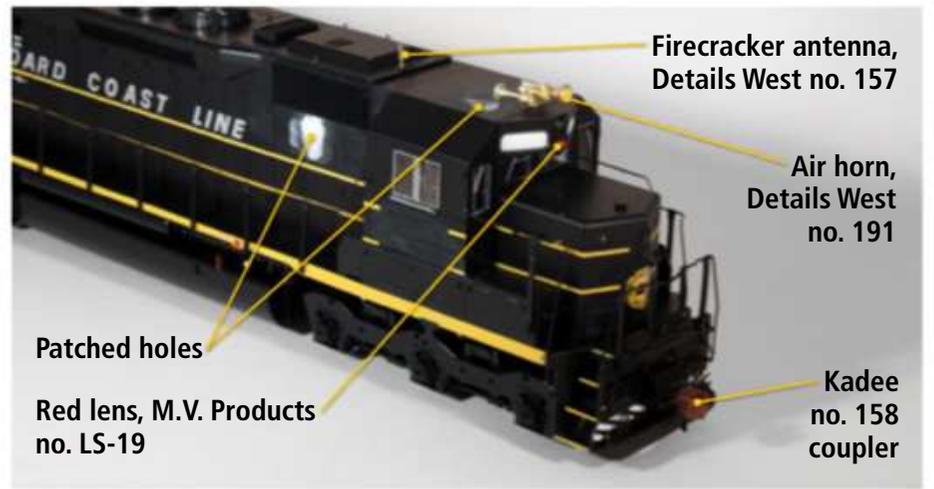
❸ **No more footboards.** Brent used a chisel blade to remove the front and rear footboards. He sanded the pilot beam smooth and touched up the area with Tru-Color Black paint.



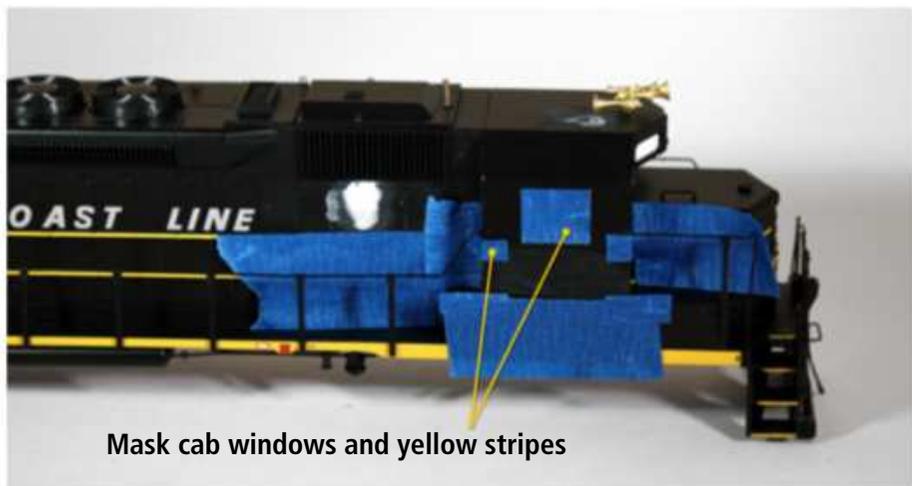
❹ **New digits.** The Walther's Proto model had low-mounted brake cylinders, but SCL no. 2021 had high-mounted cylinders. Brent found SCL no. 2009 had low-mounted cylinders, so he removed the factory-applied road number.



5 Take warning. The bottom front light on Seaboard Coast Line no. 2009 was red. To accommodate the M.V. Products lens, Brent removed $\frac{1}{32}$ " from the lower headlight lens.



6 Quick upgrades. This photo shows the detail parts Brent added to make the model match the real SCL no. 2009. He filled any holes with Squadron white putty.



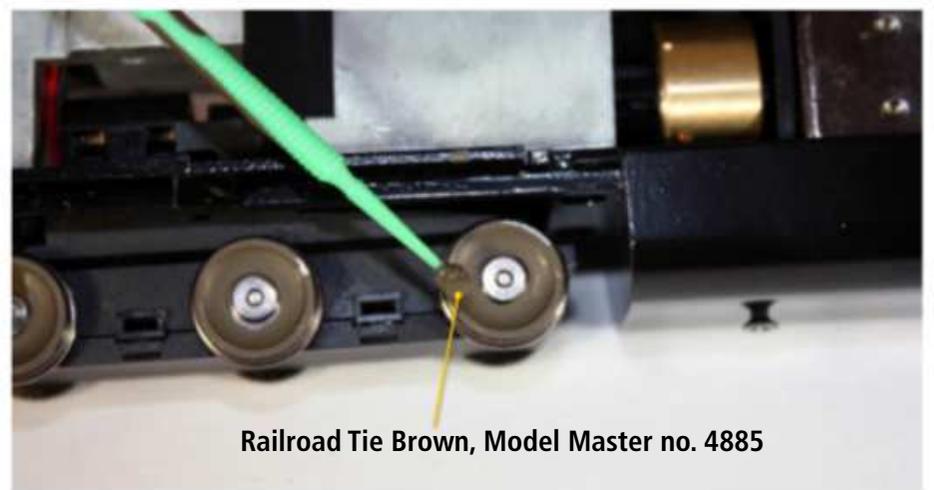
7 Keep it clean. Brent masked the window glazing and factory-applied stripes to prevent overspray from getting on those areas. He used an airbrush to spray the modified areas Tru-Color Paint Black.



8 Time for decals. After the black paint had dried, Brent shifted his attention to decaling. Two Microscale sets were all he needed to accurately letter the model as Seaboard Coast Line no. 2009.



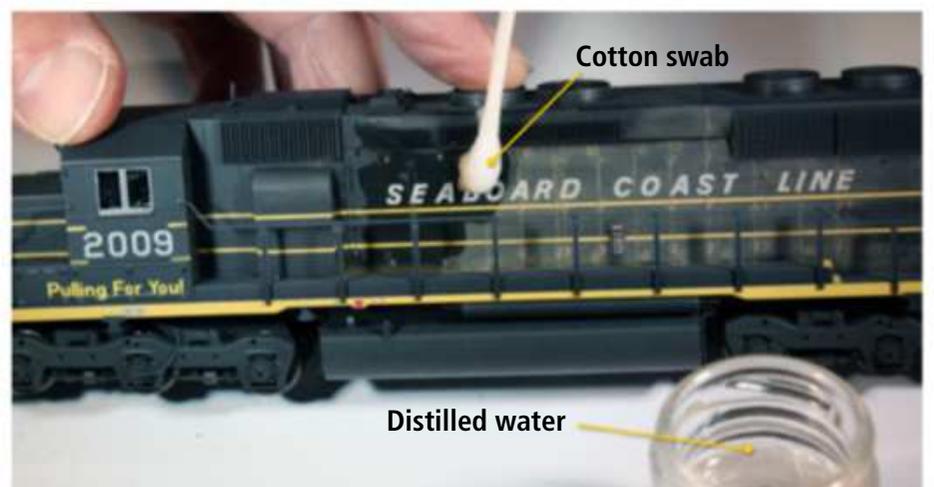
9 Pastel weathering. After painting the truck sideframes and fuel tank Tru-Color Paint Flat Grimy Black, Brent weathered the parts with Bragdon Enterprises powders.



10 Face time. Though the wheels are chemically blackened, they look better painted. Brent used a Microbrush to paint the wheels Model Master Railroad Tie Brown.



11 Fade and grime. Brent airbrushed the entire shell with thinned Model Master Light Ghost Gray. He then used a brush to apply Bragdon Enterprises weathering powders.



12 Washed out. Next, Brent used a cotton swab dipped in distilled water to wash the pastels down the side of the model. He kept the cotton swab parallel to the doors.

Materials list

Bragdon Enterprises

Weather System

FF-63 Dark Rust
FF-64 Soot Black
FF-66 Dust Bowl Brown
FF-69 Weathered Brown

Details West

157 firecracker antenna
191 Leslie RS-5T-RF air horn

Kadee

158 scale couplers

Life-Like Proto 2000

Seaboard Coast Line Electro-Motive Division SD45 (out of production)

Microscale

MC-4280 Automatic Car Identification plates
87-896 Seaboard Coast Line diesels

M.V. Products

LS-19 .078" red lenses

Squadron

9065 white putty

Testor Corp. paint

1160X Dullcote
1161X Glosscote
2002 Model Master Skin Tone Dark Tint
4762 Model Master Light Ghost Gray
4769 Model Master Flat White
4885 Model Master Railroad Tie Brown

Tru-Color paint

TCP-010 Black
TCP-315 Seaboard Coast Line Yellow
TCP-804 Flat Grimy Black
TCP-812 Flat Rust

Wm. K. Walther's Inc.

Electro-Motive Division SD45 diesel locomotive (any road name)

surfaces. After the first application, I checked for trapped air bubbles and popped any with a small pin. Then I applied more Solvaset.

I let the model sit overnight before spraying it with Testor's Dullcote. This protects the decals, hides the edges of the film, and give the model's surface some tooth for adding powdered pastels.

Grime time

I removed the truck sideframes and fuel tank and washed them in warm water with a drop of dish soap to remove skin oil and other impurities. I let the parts dry, then airbrushed them with

Tru-Color Flat Grimy Black (TCP-804).

After the paint dried, I brushed a mix of rust, brown, and black weathering powders from Bragdon Enterprises on the trucks and fuel tank. I sealed the powders with a light spray of Testor's Dullcote 9.

I followed up by spraying the trucks and fuel tank with Model Master Skin Tone Dark Tint (no. 2002) diluted 1:5 paint to thinner. Since I already had the sideframes removed, I painted the wheel faces Model Master Railroad Tie Brown (no. 4885) with a Microbrush 10.

I then airbrushed the entire locomotive with Model

Master Light Ghost Gray (no. 36375), diluted to approximately a 1:8 ratio of paint to thinner. I built up the effect in light layers until I achieved a faded look.

After letting the paint dry overnight, I applied Bragdon Dust Bowl Brown powder to the sides of the model 11. I followed that with a liberal wash of distilled water using a cotton swab, moving it in a vertical motion 12.

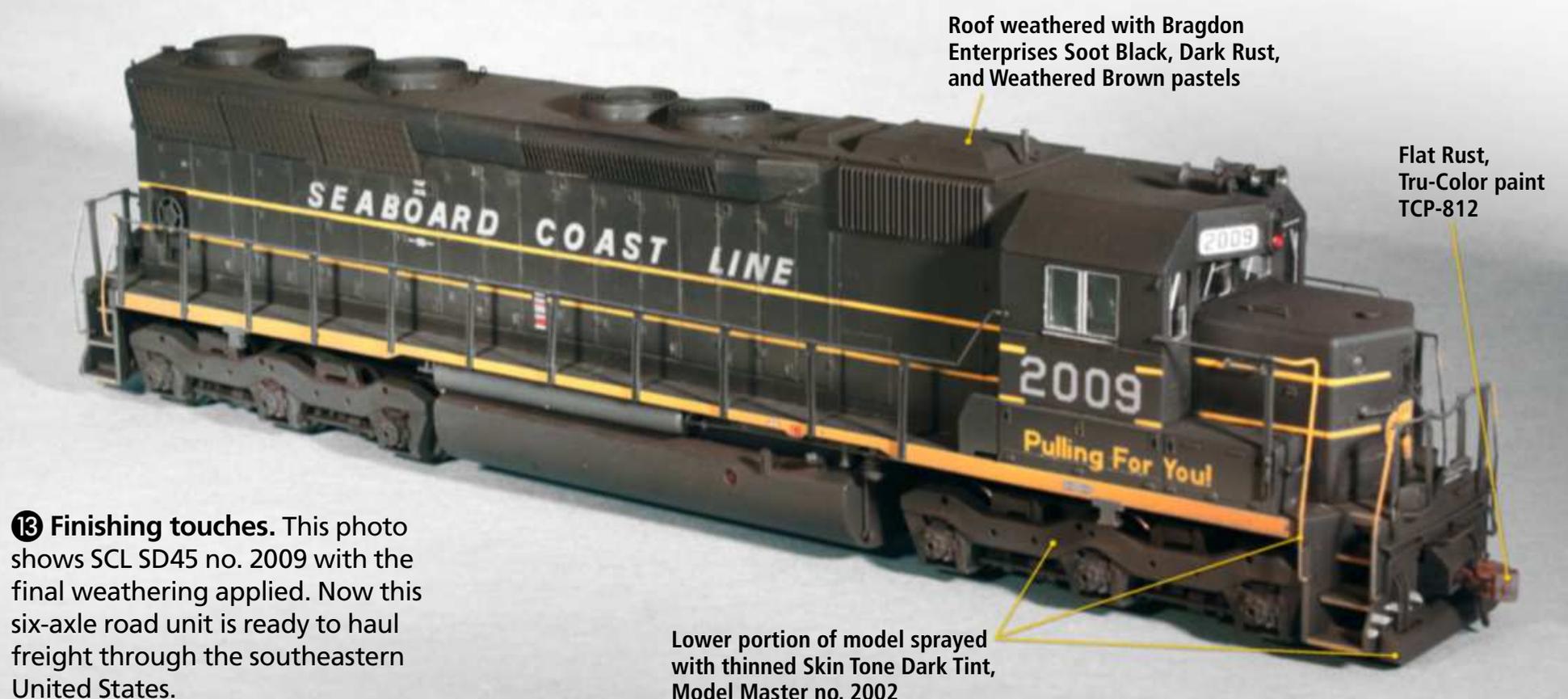
I weathered the roof using Bragdon Weathered Brown, Dark Rust, and Soot Black powders. As before, I sealed the powders with Dullcote.

Then I airbrushed the couplers with Tru-Color Flat Rust (TCP-812). The pilots,

steps, and side sills received an application of diluted Model Master Skin Tone Dark Tint to simulate road grime 13.

Adding the Walther's Proto mechanism to my old Life-Like Proto 2000 shell was a rewarding project. Now I have a sound-equipped six-axle road locomotive that has details and sounds to match the full-size Seaboard Coast Line Electro-Motive Division SD45 no. 2009. [MR](#)

Brent D. Johnson is a state trooper and lives in Troy, Ohio. His article "6 steps to a better covered hopper" appeared in the July 2014 Model Railroader.



Roof weathered with Bragdon Enterprises Soot Black, Dark Rust, and Weathered Brown pastels

Flat Rust, Tru-Color paint TCP-812

Lower portion of model sprayed with thinned Skin Tone Dark Tint, Model Master no. 2002

13 Finishing touches. This photo shows SCL SD45 no. 2009 with the final weathering applied. Now this six-axle road unit is ready to haul freight through the southeastern United States.

THE CLINCHFIELD UPSIDE DOWN



John Armstrong designed this Appalachian layout for an Australian client who flipped it over to better fit his space

By Eric White

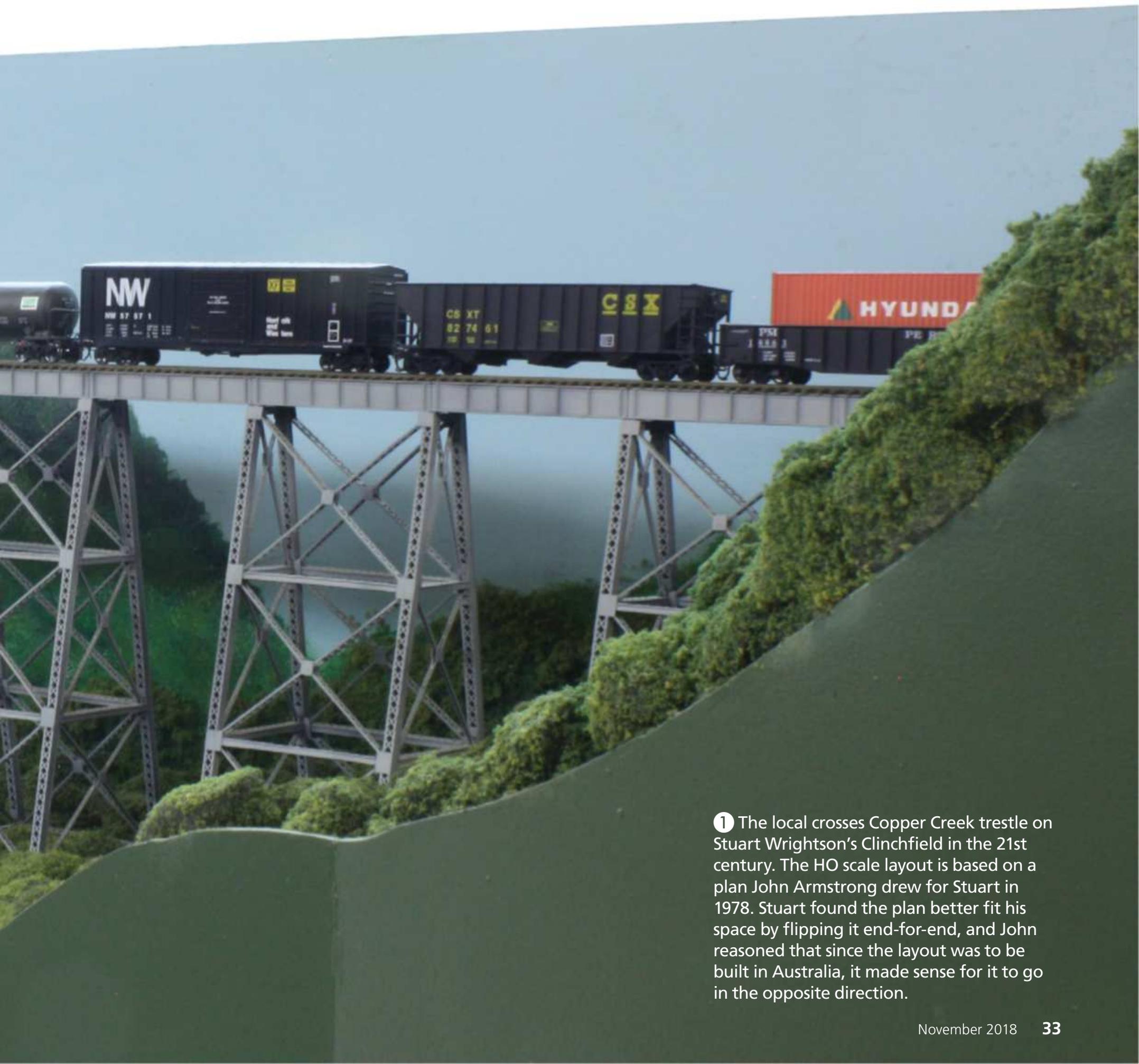
Photos by Stuart Wrightson

If you've been a model railroader for a while, you've probably heard of John Armstrong. He's often referred to as the dean of model railroad planning, and his book, *Track Planning for Realistic Operation* (Kalmbach Publishing Co., 1998), is the go-to source on the subject. John passed away in 2004.

He also was a track planner for hire, designing layouts for clients across the United States, and at least one in Australia. We've published "found" track plans from John before, and it was one of these, published in the January 2014 MR, that inspired Stuart Wrightson, of Toronto, New South Wales, to write us.

In the late 1970s *Model Railroader* associate editor Gordon Odegard built the magazine's N scale Clinchfield project layout, and John Armstrong advertised a layout design service – although Stuart doesn't recall where he saw the ad. He hired John in 1978 to create a plan for an HO scale Clinchfield layout.

John was quite pleased to have the chance to design a Clinchfield "down under," as that prototype was the inspiration for his own freelanced O scale Canandaigua Southern. After completing the plan, John sent Stuart a cassette tape to explain the final result and to offer suggestions on construction.



1 The local crosses Copper Creek trestle on Stuart Wrightson's Clinchfield in the 21st century. The HO scale layout is based on a plan John Armstrong drew for Stuart in 1978. Stuart found the plan better fit his space by flipping it end-for-end, and John reasoned that since the layout was to be built in Australia, it made sense for it to go in the opposite direction.



② A unit coal train passes through St. Paul as helper engines await their next assignment. Stuart prefers to operate alone, watching long freights wend their way through Appalachian scenery, so as he's rebuilt the layout, most of the industries and spurs have been removed.

John's introduction

John starts with his customary greeting – he must have preferred to make his recordings in the evening – and then begins describing how he accommodated Stuart's preferences into the plan for the new layout.

“Good evening, Stuart.

“Welcome to the down-under version of the Clinchfield RR. As you indicated in the questionnaire, a primary desire is the operation of long freight trains. And in addition, a capability for passenger trains.

“We have been able to adhere to the 30" minimum radius for all points on the main line, except that there are a few places where sidings have 28" radius. So if you have any equipment that is uncomfortable on less than 30", at least it can operate over the entire the main line.

“It is basically a dieselized Clinchfield, as suits your roster of motive power, but



③ A CSX freight emerges above St. Paul. After running along the McClure River, it will disappear again as it makes its way through two tunnels on its way up to Copper Creek trestle and then the yard at Erwin.

Stuart responded with a proposal to flip the track plan end-for-end, which, in another cassette, John discusses. John concluded Stuart's change was a great improvement. He also noted, tongue in cheek, that since the layout would be built in the southern hemisphere, it would make sense to flip the plan over since from that vantage point, you'd see the Clinchfield from below.

Stuart eventually built the revised plan, then revised it some more to improve access as he got older and the

layout began to experience “shrinking aisles syndrome.” John had a tendency in his track plans to maximize layout area at the expense of people space, and the narrow aisles that looked navigable in youth grew increasingly cramped as gravity took over.

Stuart digitized John's recordings, about 1 hour 20 minutes' worth, and sent those files to us. I quoted John's words for this article, but subscribers can hear the dean's sonorous voice on our website, www.ModelRailroader.com.

there are some provisions for steam. And, pretty much like the Clinchfield itself, it's practically all railroad with very little else in the way of structures or the signs of civilization."

As John says later, the Clinchfield is a personal favorite, and that came through as he described the ideal nature of the prototype.

"It's definitely a back-country railroad, which of course is one of the things that makes it ideal, since we don't like to waste space on things that aren't pretty closely related to the railroad itself.

"If you'll take a look at the schematic of sheet three, this shows that basically we have a loop-to-loop railroad, with at least one layover track on each loop."

John uses the more railroady term "layover track" instead of staging track. Staging was an accepted concept in 1978, but the phrase "staging yard" was not yet in wide use.

"But in addition, there is a major capability to operate in continuous fashion, because a large portion of the Clinchfield traffic is going to be coal in open-top hoppers, and we want to be able to operate the loads primarily southbound and the empties northbound in accordance with the prototype practice, without having to actually load and unload the cars. So it's assumed that most of the through coal traffic will operate in continuous fashion, making use of the so-called open-top bypass."

The "open-top bypass" is part of John's signature loads-in, empties-out mode of operating. As he describes later in the recording, loaded trains of coal will arrive at a power plant and disappear into the lower level staging area to be replaced by an identical train of empties, simulating a unit train delivering coal to the power plant.

A tour of the layout plan

Once John finished with his introduction, he began a tour of the layout from end to end. He started at the exit from the lower-level staging loop depicting the Chesapeake & Ohio connection at the north end of the Clinchfield, then entering Elkhorn City, the railroad's northern terminus. In 1978 this was a power-change point as trains were passed between the railroads.

John envisioned a small scene there with an enginehouse, coal loading tipple, and a residential area along the Big Sandy River before trains disappeared into Sandy Ridge tunnel, "which is not as high as it should be, not as long as it



4 Erwin Yard is to the right, with the staging loops stacked below it. In the distance, the Clinchfield makes its way across the Blue Ridge. The drain pipe to the right was one of the few obstacles John Armstrong had to deal with.

should be, and not as far away from Elkhorn City as it should be, but does serve the purpose of shifting the scene to Berta."

Berta was to be a junction town, with a branch leading to Nora. The branch tunneled through the backdrop, made a 180 degree turn, then hugged the wall opposite the layout proper on the other side of a narrow aisle.

There were four mines planned for the branch, and John included an empties-in, loads-out arrangement at one he called Haysi, pronounced HEY-sigh, on the main layout peninsula. He suggested a fiddle concept where loads and empties could be swapped by hand from the mines farther down the Nora Branch to another branch back under the main layout peninsula – more on that later.

A couple more tunnels brought the railroad into Dante, with a small yard. John pronounced Dante to rhyme with can't. Next was St. Paul and a branch representing an interchange with the Norfolk & Western. This branch dropped down a 1½-turn helix, emerged at the bottom of Copper Creek gorge below a spectacular steel trestle, and ended at the fiddle yard opposite the Nora Branch at a spot called Norton on the plan.

After St. Paul, the main line crossed a high steel trestle above Copper Creek and then disappeared into Clinch Tunnel, one of many tunnels copied from the prototype onto the model railroad. John points out that there's a lot of hidden trackage on the layout, but he doesn't think it detracts from realism, "since for once we don't have to apologize for having a lot of tunnels."

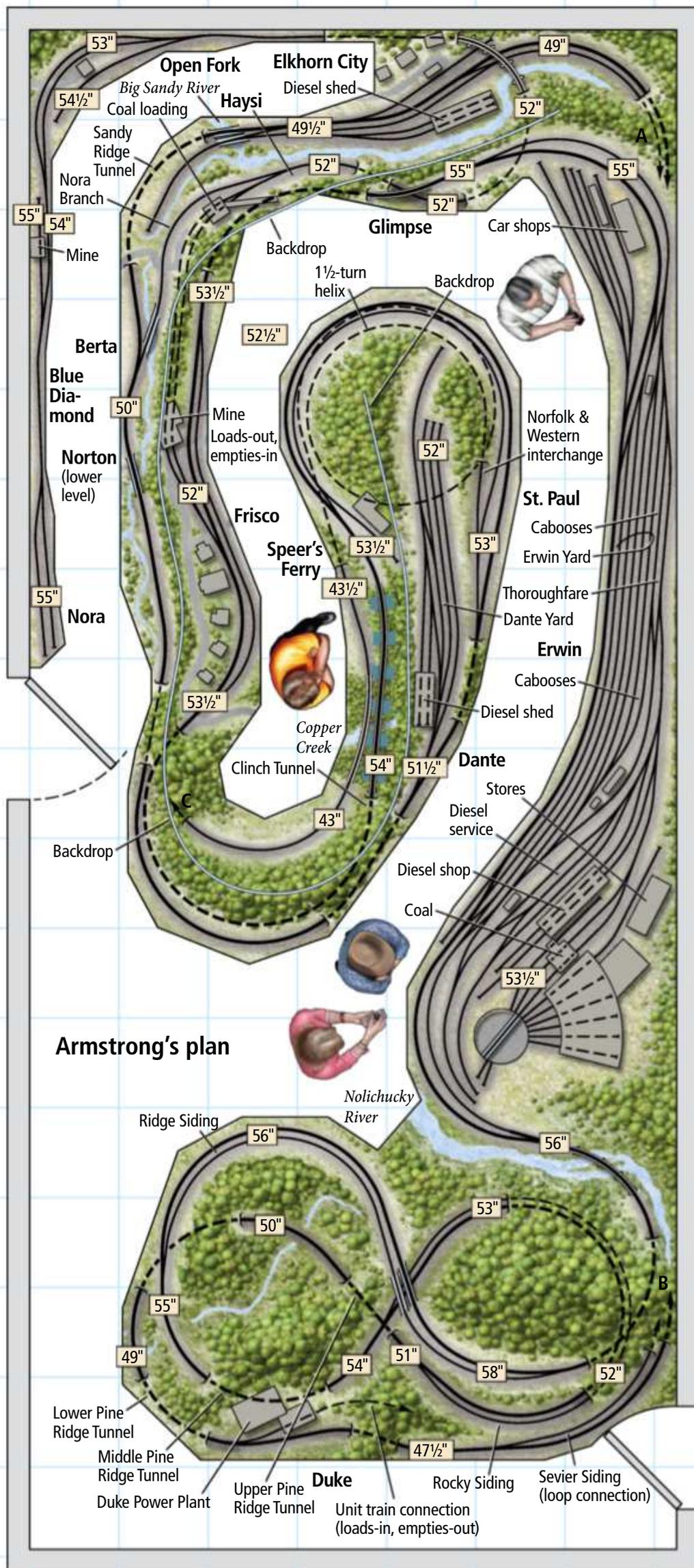
The line reappears at Frisco, which had a siding and a mine that provided



This drawing shows John's revised contour lines for the original plan. Wear and tear from the construction process is evident in the print.

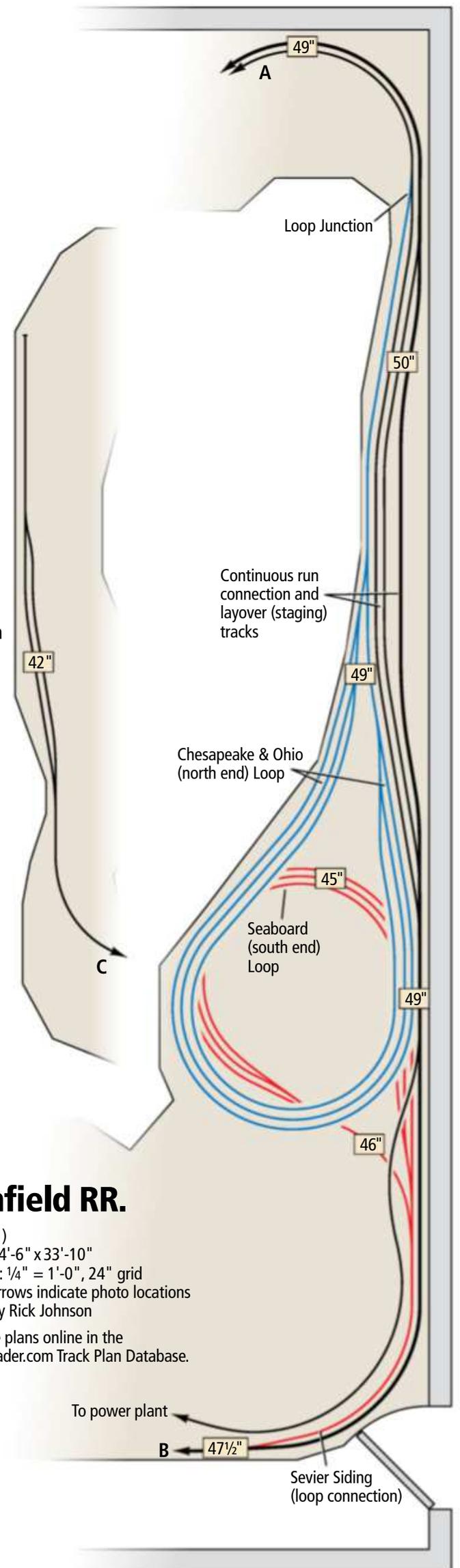
the other end of the empties-in, loads-out arrangement for the mine at Haysi.

After the main line makes a brief appearance at Glimpse, one of two spots with humorous "classic Armstrong" place names, as Stuart called them, the railroad enters Erwin and the layout's main yard.



“The Erwin Yard design is certainly not fancy. It concentrates on holding a lot of cars and having reasonably long tracks, since we want to run fairly long trains on this railroad,” John said. “It will still be necessary to double over to

pick up a complete train, and it doesn't do a great deal of classification.” Since Stuart's layout depicted a dieselized Clinchfield, John put the oil-burning locomotives on the front row, tucking a roundhouse and turntable against the



Clinchfield RR.

HO scale (1:1)
 Room size: 14'-6" x 33'-10"
 Scale of plan: 1/4" = 1'-0", 24" grid
 Numbered arrows indicate photo locations
 Illustration by Rick Johnson

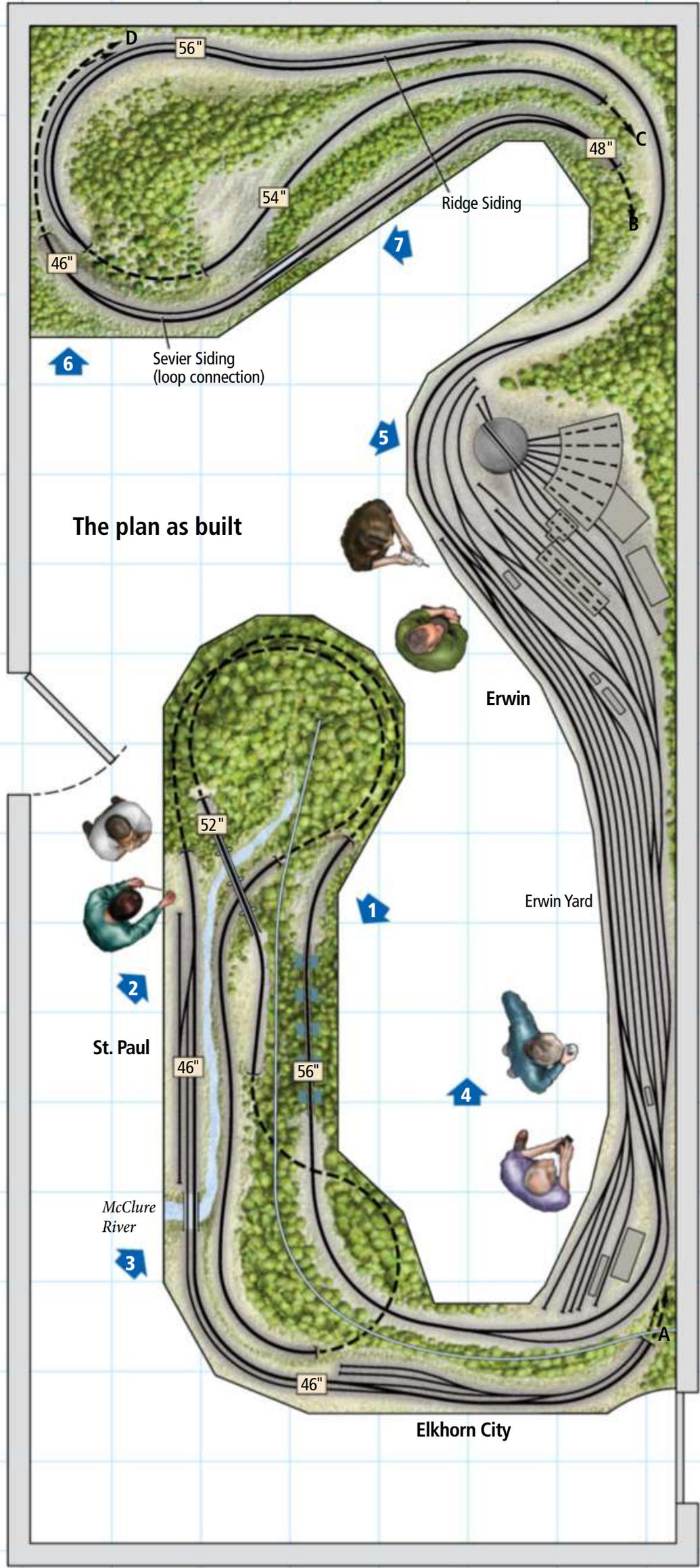
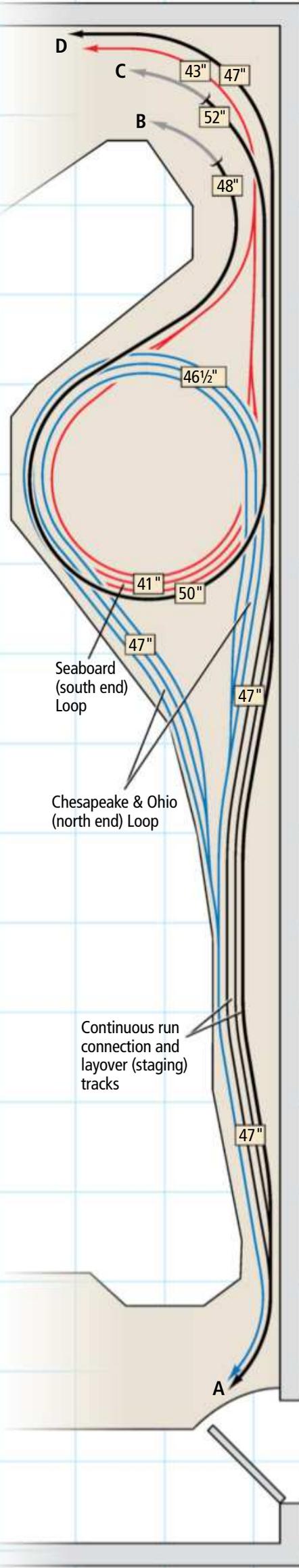
➦ Find more plans online in the ModelRailroader.com Track Plan Database.

wall to display Stuart's steam fleet, intended for use on excursions and during motive power shortages.

A drain pipe in the wide-open layout room was one of the few obstacles John had to accommodate.

The layout at a glance

Name: Clinchfield RR
Scale: HO (1:87.1)
Size: 14 x 32 feet
Prototype: Clinchfield RR, CSX
Locale: From Elkhorn City, Ky., to the Tennessee/North Carolina border
Era: Original plan, 1978; existing layout, present day
Style: walk-in
Mainline run: 223 feet (original)
Minimum radius: 30"
Minimum turnout: no. 6
Maximum grade: 2.3 percent
Benchwork: L-girder
Height: 42" to 58"
Roadbed: cork
Track: Shinohara code 70, visible; Peco code 100, hidden
Scenery: plaster cloth over cardboard web
Backdrop: brush-painted on tempered hardboard
Control: Lenz DCC



“In order to get a reasonable number of tracks in Erwin without taking away too much space from aisles and other sectors of the layout, I haven’t shown anything done in the way of hiding the drainpipe.

“The yard elevation is low enough so that tracks can sneak under it. But, if we were to disguise it ... it would mean considerable loss of important trackage. Perhaps all you can do is paint it blue to match the sky and put it out of mind.”

Leaving Erwin, the main line followed the Nolichucky River, then climbed through a curve to reach the summit of the layout at Ridge Siding. It then dropped down through a series of curves and tunnels, passing the Duke



5 Diesels now fill the ready tracks and roundhouse. Stuart asked John to provide for his small steam fleet in 1978, but over the years he has modernized his layout, keeping only a few Clinchfield SD45s and F units.

Power Plant with its loads-in, empties-out connection to staging, and finally into Sevier Siding (the other classic Armstrong place name) and the south end staging loop.

A connection between the staging loops allowed both for continuous running and a connection to serve the loads and empties of the power plant.

Plans for operation

“Operationally, one of the principal characteristics of the railroad is the use of a large number of switch crews, or

local freight crews, mine run crews, working in specific areas,” John said as he described the opportunities available while running the railroad. “And we’ve represented that, of course, by the engine terminals at Elkhorn City and at Dante.

“And this should make a pretty good situation from the standpoint of being able to operate through traffic when you have one or two operators, and then really having fun when you have more people available as they are assigned to work in intermediate areas, and keep clear of the through traffic, which will of course have its own fun meeting opposing trains at the various passing points.”

John also described adding passenger operations to the Clinchfield, one of Stuart’s requests and reflective of the railroad’s popular excursion program in the 1970s.

“Nowadays (in 1978, when Armstrong designed the track plan), the Clinchfield runs as many as 20 or 30 excursions a year, but so far as I know, the facilities for handling the passengers consist simply of bringing the train up on one of the main tracks and having people climb aboard carefully, but without the aid of any formal platforms or other nuances. So that’s the way it’s represented here.”

John also offered suggestions for more passenger traffic. “If you want to envision the Clinchfield as serving as part of a major north-south passenger route, the through trains, of course, could run from loop to loop, either non-stop, or with just a crew change at Erwin, and the question of servicing facilities could be neatly dodged, at least for the time being.”



If you build it, I may come

John concludes his tape with a few thoughts on construction, and a desire to see any progress on the layout.

“It’s really a pleasure, of course, to work on a Clinchfield layout at any time, since my own Canandaigua Southern is very largely patterned after the Clinchfield, with, as in your case, the addition of passenger traffic.

“As is standard on drawings of this scale, I have not attempted to show easements on the curves, because when the minimum radius is up in this region, the difference is almost indistinguishable, being about the width of the lines.

“However, I assume it would be built with suitable easements on the curves if necessary by reducing the actual radius

of these nominal 30” curves for example, by about a half inch or so.

“All in all, it should not be a difficult railroad to build, except for the fact that it is a pretty large railroad. Again, the wide-open space for construction and the nice high ceiling is certainly to be appreciated.

“Best of luck, and if we ever get by, we’ll be interested in seeing what its status is at the time. And likewise, if you ever get up in the general direction of the other Toronto, we hope you’ll stop by here so you can play with the trains.”

Looking at the flip side

About a year later, John had mailed off another cassette, this time with a review of the revised plan that was generally the same, but flipped end-for-end.

“Good evening, Stuart. It was very good to hear from you and to get the modifications to the Clinchfield. I certainly agree that you have made a real technological breakthrough with this flipped-over design.

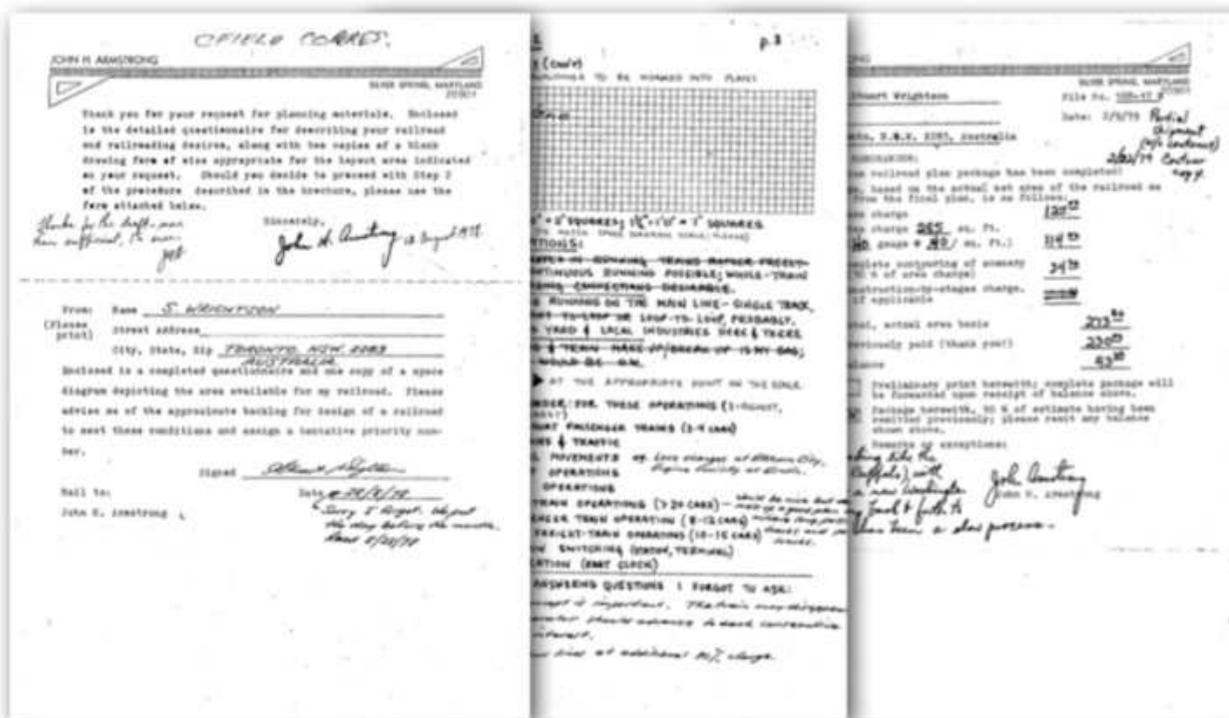
“And since it isn’t really clear which way the Clinchfield would look from down under, flipping it over certainly doesn’t change the reality of it at all.”

John goes on to mention a visit to the Southern Hemisphere in the 1960s, and his realization that the sun crosses the northern sky instead of the southern sky as it does in the United States.

“In any case, you can still follow the main line from one end to the other,” John says of the revised plan, “without ducking under or doubling back, and that was the objective, and no matter which way the sun was going, the rail-



6 Just as on the prototype, Stuart's Clinchfield twists and turns through the mountains with few stretches of tangent, or straight, track.



Some of the correspondence Stuart exchanged with John Armstrong to start the planning process. On the right are John's fees for layout design.

road still meets that requirement very nicely.”

John next touched on Stuart's rearrangement of the loops in the Blue Ridge section.

“I think that the major improvements you have made really illustrate the point that you can always do it best for yourself. The arrangement of the loops on the east side of the Blue Ridge, which you have, is certainly much superior in representing the prototype than the arrangement that we had originally, and the whole thing is very nice.

“Of course the way this came about is through a couple of things, which I believe are thoroughly practical, and which you will have no problem with. One is having the four layers stacked up there in the middle.”

Stuart's design, and the built layout, took some of the track from the Blue Ridge descent and stacked it over the

original north and south end loops under Erwin Yard.

“This is something I would hesitate to show on a drawing for someone else, but since you have inflicted it on yourself, I really don't think there is going to be any problem.

“Although it is, as you are undoubtedly finding out, very difficult to draw. And that is perhaps one of the subconscious things that keep me from putting more than about three layers, even though I have four layers on my own railroad. With it, of course, I didn't have to worry initially about whether or not it was easy to draw.”

The second tape was much shorter, the balance of it dealing with John's work on the contour drawings for the scenery. John also shared some news about Clinchfield general manager Tom Moore, then in charge of the railroad's excursion program, running into some

legal difficulties that resulted in Moore being fired from the company, and ultimately bringing a halt to the steam excursion program.

Further developments

Stuart began construction in 1980.

“The south end, the descent of the Blue Ridge, was built first with a temporary return loop where the roundhouse and turntable are now. This let trains go up and down to the SCL (Seaboard Coast Line) Loops,” Stuart said.

“Further construction was slow until I retired in 1991. The rest was finished in three years and gave many years of satisfaction 'til 2008, when rebuilding the north end was started.”

That's when Stuart decided the narrow aisles had become uncomfortable.

“The aisles in the north end of the layout shrank considerably with time, necessitating a complete rebuild north of Erwin. This section now bears no resemblance to John's design,” Stuart said.

“Copper Creek Trestle was kept and incorporated in the new section. Erwin and the south end are still as originally built.”

The new north end used a three-turn helix to transition between levels, but this had the trains out of view for too long, so it was substantially modified by disconnecting the middle loop.

Benchwork and track

Stuart built his benchwork with L-girder construction supporting sub-roadbed made from 3/4" particle board initially, and later 3/4" medium-density fiberboard. He laid Shinohara code 70 track on cork roadbed in the visible sections of the layout, with Peco code 100 on the hidden loops and the bypass, what John called the Continuous Running Connection.

Stuart had a stock of Shinohara turnouts he wanted to use for the layout, and gave John an inventory.

“I haven't made an accurate count to see if there are exactly 60 no. 6s to match those that you have on hand, but I think it's not far away from that number. I think we have at least 60 of them,” John said in the first tape.

Layout control

With the exception of some manually controlled turnouts in the engine servicing area, Tortoise by Circuitron switch motors are used throughout. Most



7 A pair of modern CSX Electro-Motive Division SD70MACs cross a short bridge on their way down the Blue Ridge on Stuart's layout. The rock faces are hand-carved plaster.

Tortoises at Erwin Yard have DCC Specialties Hare stationary decoders.

The layout has a Lenz Digital Command Control (DCC) system.

"Android mobile phones communicate via the house WiFi to a desktop computer programmed with, among other things, Java Model Railroad Interface (JMRI)," Stuart said. "This in turn interfaces with the Lenz bus. There are still three Lenz LH100 throttles around."

Stuart used the Hare decoders to set up 10 Smart Routes through Erwin Yard. The Smart Routes make it easy to set up and activate a route to a particular yard track.

The loops and bypass sections of the layout were built before the days of modern electronics, so Stuart's son built three large panels with relays and lots of other components to completely automate passage through them. Only the desired track has to be selected. "They are still working OK," Stuart said. The train and clearance infrared detectors are Heathcote Electronics IRdots.

Scenic highlights

Stuart started his scenery with a cardboard strip lattice covered with

plaster-soaked paper towels. Later, he changed to plaster cloth.

The forested hills are colored lichen on the south end, but this proved both expensive and subject to fading and mildew growth. The lichen is being gradually covered with Woodland Scenics ground foam to improve its appearance and blend it with the newer sections. The rest of the hills are covered with randomized poly fiber clumps covered with ground foam.

Most of the rocks were carved plaster, but recently Stuart has used Rubber Rocks from Cripplebush Valley Models to build cliff faces. The backdrops were painted by Stuart's youngest daughter, who also painted the stream beds before Stuart applied Woodland Scenics Realistic Water.

Modern Clinchfield

Although John Armstrong envisioned several operators running the layout, it's not operated in any formal way. Over the years, Stuart has learned that satisfaction for him comes from the construction, and making what he hopes will be improvements, then seeing those long trains snake through the hills.

"You will see that there are now no industries or sidings other than passing sidings. I do sometimes do a bit of switching at Erwin," Stuart said.

Stuart is interested in the modern era and has continually upgraded his

Meet Stuart Wrightson

Stuart was born and raised in

Toronto, New South Wales, Australia, about 100 yards from where he now lives. In 1954, he left to see the world and ended up in that other Toronto, in Canada.



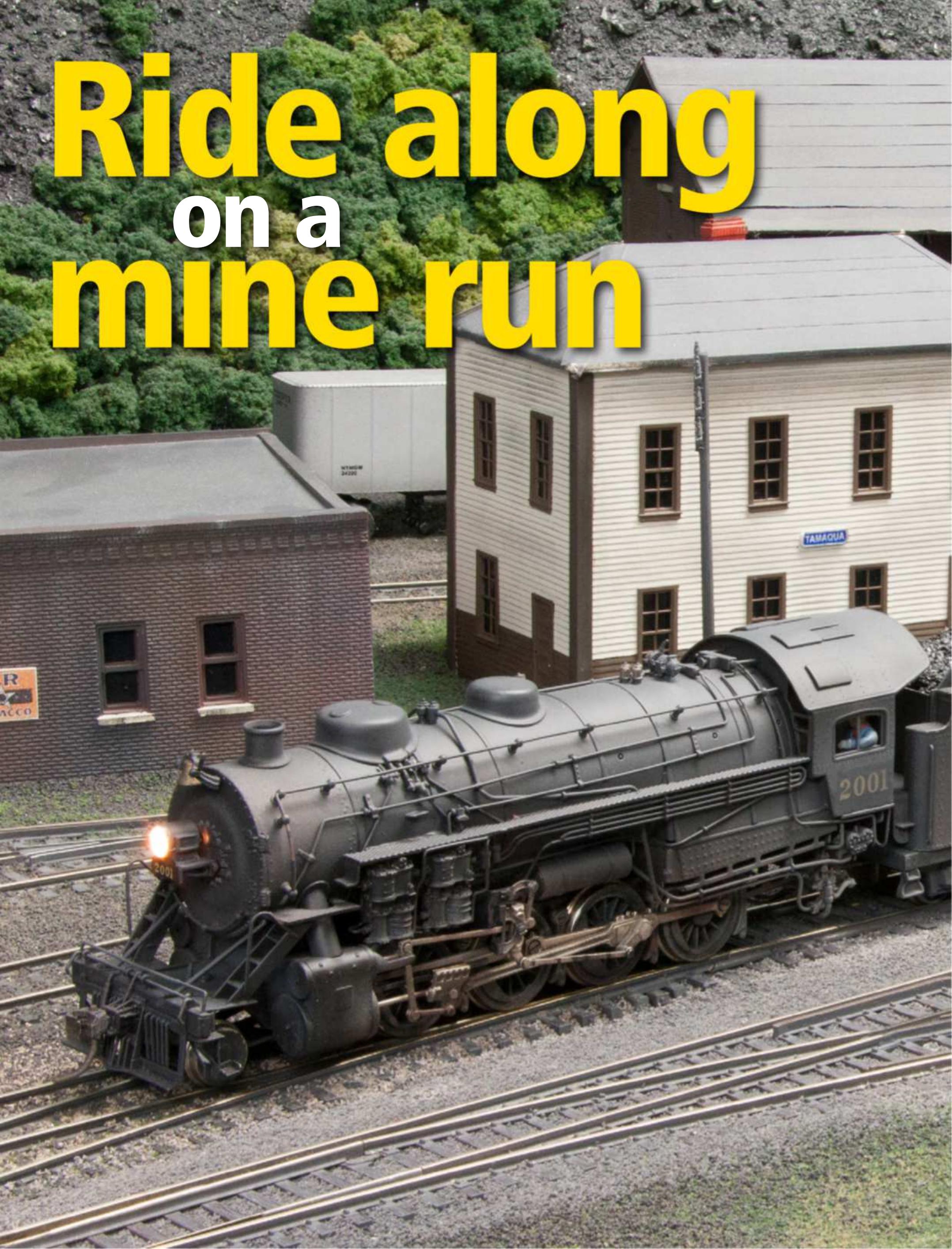
On many trips south across the Canadian border, he grew fond of Appalachia and of the Chesapeake & Ohio and Clinchfield railroads. He built three layouts over the years while in North America.

Stuart returned to Australia in 1974, by this time with a wife and four kids. As they say, the rest is history.

locomotives and rolling stock to reflect this. "But the Clinchfield SD45s have been kept," he said. The rest of his locomotive fleet is mostly modern CSX Electro-Motive Division (Diesel) and General Electric diesels.

John never did get down to see Stuart's layout, but the Clinchfield lives on, even if the trains do go around in the opposite direction. **MR**

Ride along on a mine run





① In front of the Tamaqua yardmaster's office, engine no. 2001 pumps up the air on its train, Extra 2001, as helper no. 2004 drifts to the rear of the train. Known as the Region Turnaround, Extra 2001 exemplifies prototypical mine turn operation on Jim Hertzog's HO scale Reading Co. Shamokin Division.

Helper operations highlight the Region Turnaround job on the HO scale Shamokin Division

By Jim Hertzog • Photos by Mike Rinkunas



② After climbing the 1.6 percent grade and exiting the west portal of Tamaqua Tunnel, the Region Turnaround rolls past loaded hoppers at Mintzers Siding. Once an active passing siding, by the 1950s the track had been downgraded to car storage.

Trains running over my 30'-6" x 40'-0" HO scale Reading Co. (RDG) Shamokin Division are faithfully patterned after those on the prototype between 1952 and 1956 during the Reading's steam-to-diesel transition era. The main business of the railroad is hauling anthracite coal up and down the steep grades of this busy main line in eastern Pennsylvania.

My original track plan for the Shamokin Division was featured in *Model Railroad Planning 1998*. The layout has been featured in the March 2006 *Model Railroader* and *Great Model Railroads 2011*. I most recently described some of the mine operations on the layout in *Model Railroad Planning 2014*. An updated track plan is found on page 47.

A typical operating session on my railroad requires 18 crew members and takes about four hours. Scheduled trains include six passenger trains, numerous symbol freights, and several coal extras, but it's the dozen mine turns that truly define my railroad's purpose.

Sixteen mines and loading points populate my modeled 40-mile section of railroad between the mining communities of Tamaqua and Shamokin, Pa. The

mine turns are quite popular with the operating crews. Emulating the prototype runs, they generally take longer and require a bit more planning of the switching moves. However, as lower class trains, they're also expected to stay clear of higher priority movements, and like the prototype, have to wait until the dispatcher can give them clearance.

Shamokin Division mine turns

In railroading parlance, a turn is a train that departs from a terminal or home base, runs to some distant point, and then returns back to its starting point, usually in the same day and hopefully within the maximum hours of service law. On my layout, some of the mine turns are short out-and-back runs, while others take longer, much to the enjoyment of the assigned train crew. Many of the turns require time-consuming switching moves at the mines.

Although mine runs were always called as extra movements, they usually ran at established times. Many were unofficially named after the area or mine they serviced. In the anthracite region

on the Reading Co., one could hear references made about the Shamokin Eastern, the Reliance Crew, the 1st Colliery Crew, the Alaska Crew, or the Natalie Crew, to name a few.

Many of the mine turns were specialized, as well. Some worked mines that loaded only processed coal (already cleaned and sized), while others picked up only raw coal consigned to another colliery for processing at its large breaker building. A few mine turns even served as shuttles between yards, one where the coal was initially weighed and then sent to another yard for storage and a later pick up. All are modeling features that can enhance coal road operations.

The Region Turnaround

One fascinating mine turn on the Shamokin Division was an extra known to railroaders as the Region Turnaround. As its name implied, it serviced the heart of the anthracite coal region and had a longer run than most, stopping at several locations along the way. Although called as an extra, it generally left Tamaqua in the morning, six days a week, and ran 30

miles west to the mammoth coal preparation plant and storage yard at Locust Summit. There the train would swap its empties for loaded anthracite-laden hoppers and return to Tamaqua. During the steam era the run required the services of two and occasionally three helper crews.

Critical to the Reading's upstate Pennsylvania train operations, Tamaqua was situated midway along the Reading's 202-mile main line from Philadelphia to Newberry Junction, located just west of Williamsport and the important connections with the Pennsylvania RR and the New York Central. At Tamaqua the Reading maintained a substantial yard, with division operations conducted from the third-floor offices in the downtown freight house. The neighboring Lehigh & New England RR (LNE) also interchanged cars (mostly loaded coal hoppers) with the RDG.

The Region Turnaround's sole purpose was to support coal production at the Locust Summit central coal breaker. During the 1940s the turns were exclusively steam powered and averaged 40 to 60 empty hoppers. Power was usually a single class I-10sa 2-8-0 Consolidation. Many of the turns, which consisted mostly of empty hoppers, would still receive a helper west out of Tamaqua. On occasion RDG 2-8-8-0 Mallets or the enormous K Class 2-10-2 Santa Fe types powered the trains.

As steam was retired during the early 1950s, Baldwin AS-16 diesels took over the run. On occasion a Reading home-built class T-1 4-8-4 Northern type, now bumped to the coal region service, would substitute. By the mid-1950s, coal loadings had seriously dropped and the run was eliminated. In 1960, the coal weighing scale at Tamaqua Yard was closed and the yard's years of importance in Reading's coal operation had ended.

Modeling mine turn operation

To get a better idea of how to model a mine turn, I'll describe a typical day in 1952 on the Region Turnaround, as modeled during operation on my HO scale railroad.

④ As the train crests the grade, Helper no. 2004 cuts off before entering Mahanoy Tunnel. The portal is hidden behind the massive ventilation equipment, which clears the bore of exhaust fumes after each train passes.



③ The train continues westbound past Mahanoy Junction and UG Tower. This tower controls traffic between the Catawissa Branch on the left and the main line.





⑤ The Region Turnaround creeps through the massive coal yard at St. Nicholas, where the crew will set out a block of empties for loading. A photo of the actual St. Nicholas coal breaker is visible on the backdrop.



⑥ After arriving at Gordon, the Region Turnaround receives helper no. 3006, a class K-1 2-10-2, for the climb up the 2.6 percent grade to Locust Summit. The Reading's 2-10-2s were the heaviest Santa Fe-type locomotives ever built.

At the compact Tamaqua engine servicing terminal, locomotive no. 2001 is being readied to lead train Extra 2001 West, known to veteran railroaders as the Region Turnaround ① on page 42. The engine slowly backs to the yard, just east of town. Engine 2001 is a class I-10sa, one of 20 powerful 2-8-0s on the roster. The shorter than normal train consists of only 46 empty hoppers, but it will still require the services of a rear helper engine, which today is sister engine no. 2004.

After the air test, the Region Turnaround slogs west through down-

town Tamaqua putting on quite a display, stopping all automobile traffic as it begins assaulting the 1.6 percent grade. A few minutes later, the train enters the short Tamaqua Tunnel. After exiting the west portal, it passes by Mintzers Siding ② on page 44, now a coal storage track.

Shortly thereafter, Extra 2001 passes the important connection with the Reading's Catawissa Branch at East Mahanoy Junction ③. The friendly operator at UG tower gives the crew a wave as the extra proceeds due west.

A few miles later, Mahanoy Tunnel looms into view. The rear helper will cut

The layout at a glance

Name: Reading Co. Shamokin Division

Scale: HO (1:87.1)

Size: 30'-6" x 40'-0"

Prototype: Reading Co.

Locale: eastern Pennsylvania

Era: 1952 to 1957

Style: walk-in

Mainline run: 310 feet

Minimum radius: 30"

Minimum turnout: no. 6

Maximum grade: 2.6 percent

Benchwork: open grid

Height: 45" to 60"

Roadbed: cork and Homasote on 1/2" plywood

Track: code 83 flextrack

Scenery: plaster gauze over cardboard lattice

Backdrop: painted tempered hardboard with some photos

Control: Lenz Digital Command Control

off "on the fly" prior to the bore in order to avoid the noxious exhaust gases ④. An elaborate ventilation system will be activated by the operator at nearby BF Office after the train passes through the 3,409-foot tunnel, the longest of eight tunnels on the Reading.

Cresting the grade, the train starts downgrade toward Mahanoy City and St. Nicholas Yard, a mile west of town,

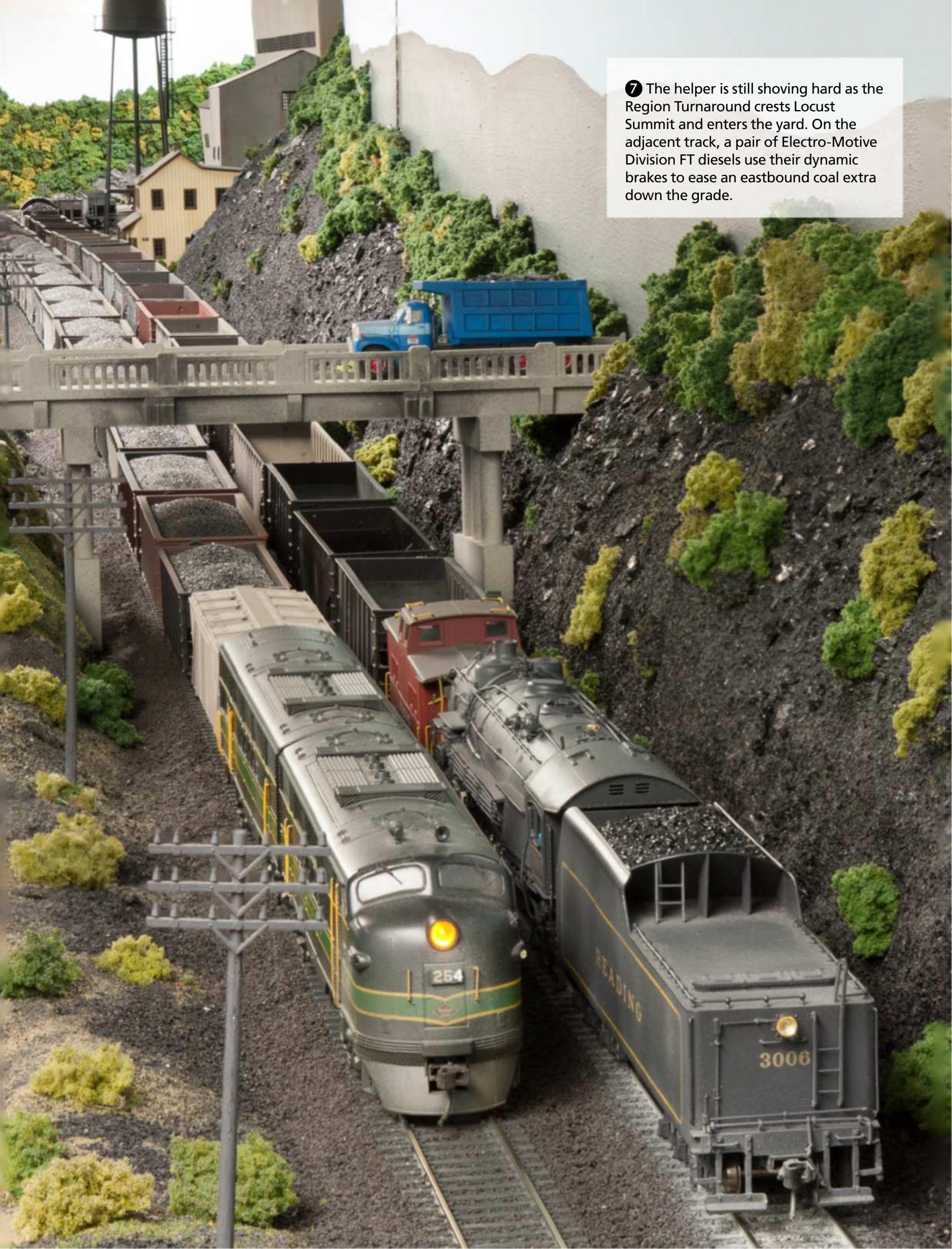


Reading Co. Shamokin Division

HO scale (1:87.1)
 Room size: 31 x 40 feet
 Scale of plan: 7/32" = 1'-0", 24" grid
 Numbered arrows indicate photo locations
 Illustration by Rick Johnson

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

7 The helper is still shoving hard as the Region Turnaround crests Locust Summit and enters the yard. On the adjacent track, a pair of Electro-Motive Division FT diesels use their dynamic brakes to ease an eastbound coal extra down the grade.



where a dozen hoppers will be set out for the large St. Nicholas colliery **5** on page 46.

The next stop will be the tiny village of Gordon. Here the Reading had a modest yard but supported an impressive engine servicing terminal for the local mine runs and helper engines. The Gordon Yard switcher quickly adds 16 empty hoppers for Locust Summit. More significant is the helper engine **6** that will assist the Region Turnaround on the steep climb up the 2.6 percent grade to Locust Summit and its massive coal preparation plant. Class K-1 3006 is an imposing 2-10-2 Santa Fe type locomotive (the largest of its kind) and will provide the much-needed rear-end muscle for the climb.

At the summit, a switch tender has the train already lined into Locust Summit Yard. As the mine turn crests the grade **7** and slows in the yard, the helper cuts off and returns to Gordon. Not wasting any time, the crew drops the empties and begins to assemble its return train of 22 loaded hoppers **8**. Before departing, retainers have been set to hold back the train's descent down the steep grade. Depending on its tonnage, the returning eastbound Region Turnaround might require the services of an eastbound helper out of Gordon, but today's power should handle the lighter-than-normal train up the 1 percent grade.

With hours of service approaching the limit, Extra 2001 East enters Tamaqua Yard limits **9** with another trainload of Reading anthracite and helps to solidify the Reading's slogan as "America's Largest Anthracite Carrier." After the coal is weighed, it will soon be sent east to the docks at Philadelphia.

Modeling prototype train movements is a fascinating aspect of our hobby. On my HO scale Shamokin Division, the glory days of coal hauling on the Reading have come back to life. 

The grandson of a Reading locomotive engineer, Jim Hertzog lives in Mertztown, Pa., with his wife, Gerri. Both his current layout and his previous HO scale Lehigh & New England have appeared in numerous hobby publications.

9 Exiting the east portal of Tamaqua tunnel, the Region Turnaround enters yard limits. The workday will soon be over for the crew of Extra 2001, but the loads will eventually continue eastward from Tamaqua Yard to the docks of Philadelphia.



8 The Region Turnaround slowly pulls through Locust Summit Yard, where its empty hoppers will be exchanged for a block of loads. For the return trip, no. 2001 will handle the 22-car train without the aid of a helper.



Open au



With its colorful load of finished automobiles, the open auto rack is an eye-catching piece of rolling stock and a signature railcar of the 1960s and 1970s. Before being replaced by fully enclosed auto racks in the 1980s, thousands of open auto racks could be found all across the North American rail network.

The multi-deck auto rack car **1** saved the automobile business for railroads. By the late 1950s, railroads' share of finished automobile traffic had dropped to 8 percent. Trucks had taken over almost all delivery of automobiles, and the railroads' method of carrying autos – in boxcars with internal racks – was inefficient, labor-intensive, and on its way to extinction.

The open auto rack, introduced in 1960, quickly became the most efficient way to carry finished vehicles. Rack cars soon entered service by the thousands, and open racks with their colorful loads became common sights on railroads across the country.

Credit for the resurgence in traffic and development of the rack car largely goes to the St. Louis-San Francisco Ry. (Frisco). Chrysler was building a new assembly plant on the Frisco in suburban St. Louis. The plant, set to open in 1959, would be a big source of auto parts traffic for the railroad, but the auto manufacturer planned to ship all finished vehicles by truck.

The Frisco knew the only way to recapture that business was better rates, which meant finding a way to haul more

vehicles per railcar and simplify the loading and unloading processes. The railroad's first solution in 1959 was carrying finished vehicles loaded on semi-trailers on flatcars as piggyback **2** on page 52.

Trailer-on-flatcar (TOFC) traffic had grown significantly by the late 1950s, and the then-new 85-foot piggyback flatcars allowed hauling 8 to 10 vehicles per flatcar on a pair of "haulaway" auto trailers. The Frisco negotiated agreements with three highway carriers to provide rail-highway service under the Interstate Commerce Commission's Plan V, which defined joint motor carrier/rail rates.

The first revenue piggyback movements, in June 1959, were successful. By the end of the year, traffic had increased and auto trailers were traveling in TOFC

to racks

Prototype info on the rail cars that hauled automobiles
in the 1960s and 1970s

By Jeff Wilson



service on several railroads, including Chicago & North Western, Erie, Great Northern, Louisville & Nashville, Milwaukee Road, Nickel Plate, Southern Pacific, Union Pacific, and Wabash.

Early auto racks

Although auto piggyback service was successful, a better solution was needed. One idea came from Germany, where Volkswagen and the German Federal Rys. had developed a two-deck articulated auto carrier in the early 1950s. Another promising idea was a 75-foot-long, two-level boxcar that allowed circus-loading of automobiles. Canadian National eventually acquired 75 of these cars (and an equal number of 57-foot versions) starting in 1957 ³.

The Frisco built an experimental two-level open rack on a 42-foot flatcar and began testing it in February 1959. The car's simple design allowed circus-style loading and unloading from either deck with use of end ramps. Unlike the Evans Products experimental two-level Auto Loader cars of the early 1950s, the new cars just held autos—they didn't include equipment for elevating cars to the upper level, instead relying on external ramps. Multiple railcars could be loaded and unloaded similar to piggyback cars.

Satisfied with the results, the Frisco went to Pullman-Standard, which built the first true long (83-foot) car, a tri-level rack (SLSF no. 3000) delivered in January 1960 ⁴. The car could carry 12 full-size or 15 compact automobiles. After successful testing, the railroad

¹ Owned by the Detroit, Toledo & Ironton and riding atop a Trailer Train flatcar, this Paragon-built 89-foot auto rack carries a load of 15 Ford Mustangs in June 1964. Learn all about the open auto rack, including modeling tips, from author Jeff Wilson. J. David Ingles collection

ordered 130 rack cars from P-S, nos. 3001-3130, delivered in fall 1960.

Other railroads and manufacturers developed similar rack designs. In April 1960 the Southern Pacific received the first production racks from the company that would become the dominant builder, Whitehead & Kales (W&K). The racks were mounted on General American G-85 flatcars ⁵.

Rarely has a new type of freight car been as widely and quickly accepted and adopted as the open auto rack. They were



② Carrying autos by piggyback was the railroads' first attempt to regain the business from the trucking industry. "Haulaway" trailers on flatcars, such as this one carrying Ford Thunderbirds, were common from 1960 to about 1963. J. David Ingles collection



③ Canadian National began using double-deck boxcars for carrying autos in 1957. The cars, which could be loaded and unloaded circus-style, foreshadowed the auto racks that were soon to come. J. David Ingles collection



④ Shown with a load of new Fords, Frisco no. 3000 was the prototype long (83-foot) tri-level auto rack, built by Pullman-Standard in January 1960. Later production cars didn't have the curved and angled gussets. Pullman-Standard

easy to load, with autos driven into place via external ramps and secured by hooks and chains attached to rails on the decks.

Rack cars were efficient – carrying up to 15 vehicles compared to four in a boxcar – and began winning finished auto traffic back from trucks. More than

1,200 auto racks were in service by early 1961, and more than 4,000 were on the rails by the end of that year. By 1962 railroads had increased their share of auto traffic to 25 percent, a number that would climb to 40 percent by 1965. Piggybacking of auto trailers continued

through 1963, but was rare after that as more auto racks entered service.

Racks – especially early versions – were built in many styles. Racks had either two or three decks (bi- or tri-level). Individual decks are identified by letter from the flatcar deck upward: A, B, and C.

Bi-level cars ⑥ are used primarily for pickup trucks, vans, and other vehicles requiring higher clearance than a standard auto. Because of clearance issues with tunnels and bridges, bi-level cars were also sometimes used to carry standard autos to the Northeast and East.

Tri-level cars were used for standard automobiles, including sedans and station wagons. Since autos outnumbered other vehicles through the 1970s (mini-vans and SUVs were still on the horizon), tri-level cars were much more common (by about 3:1) than bi-levels through the open-rack era.

For the most part, auto racks were mounted on the same flatcars used in piggyback service. Bi-levels were usually mounted on standard-height flatcars. Tri-level racks could be mounted on standard-deck cars, but many were mounted on low-deck flats with the ends of the middle decks hinged to provide clearance for loading and unloading. These were known as "Eastern" cars ⑦ and were usually assigned to routes in areas of the East and Northeast where clearance issues were most severe. Tri-levels on standard decks were known as "Western" cars.

Cars using Trailer Train flats received reporting marks indicating the car length, number of levels, and whether decks were hinged or elevating. See the chart on page 54 for a list.

The two dominant rack builders became W&K and Paragon Bridge & Steel Co. Dana Companies built some

early racks, and other minor builders included American Car & Foundry (ACF) and Darby. Some railroads, notably Atchison, Topeka & Santa Fe Ry., built racks in their own shops as well. See 8 on the next page.

Spotting features include the number, location, spacing, and style of side posts; style, location, and pattern of diagonal bracing and gussets; ladder style and location; and deck design. Flatcars are also a spotting feature: Racks were mounted on cars from several builders, namely Pullman-Standard, Bethlehem, and ACF.

Many early racks were mounted on non-cushioned cars, so the racks themselves often had some type of cushioning to protect autos from damage from slack action and hard coupling. Some racks were “sliders,” with mounting that enabled them to move longitudinally on the car deck. None of these methods worked well, and by late 1963, racks were being rigidly mounted on flatcars that were equipped with underframe or end-of-car cushioning.



5 Whitehead & Kales, which would become the dominant rack builder, delivered its first production racks to Southern Pacific in 1960. The 85-foot car carries a load of 15 new Corvairs on its first run. Southern Pacific

Evolution

In 1963, Trailer Train adopted 89 feet as the standard length for new piggyback and auto rack flatcars. Earlier auto racks were mainly 85 feet, with some 87-foot cars. As soon as 89-foot cars became

standard, the number of 85-footers in rack service dropped through the 1960s (many had their racks removed and were reassigned to piggyback service).

A solution to the problem of height clearance for tri-level cars was the “elevating” rack. These first appeared in late



6 This 89-foot Missouri Pacific Paragon bi-level rack was mounted on a Trailer Train Pullman-Standard flatcar in 1963. Bi-levels were outnumbered by tri-levels more than 3:1 through the mid-1960s. J. David Ingles collection



7 The KTTX reporting marks indicate a tri-level with hinged deck ends. The Paragon “ladder-style” rack rides on a low-level American Car & Foundry flatcar; note the deck level compared to the standard “Western” rack at right. J. David Ingles collection



8 The Atchison, Topeka & Santa Fe Ry. built many of its own auto racks and flatcars. This 87-foot class Ft-27 tri-level car with cushion underframe was built in 1963. J. David Ingles collection



9 The middle and upper decks of this loaded Pennsy elevating rack car (a Paragon Lo-Hi-Tri) have been lowered for transit (top photo). For loading and unloading, the decks are at the levels of the horizontal framework, as on the empty Detroit, Toledo & Ironton Lo-Hi-Tri (bottom photo). Pennsylvania RR; J. David Ingles Collection

Trailer Train reporting marks

Reporting mark and description

- BTTX 85- to 89-foot bi-level
- ETTX 89-foot tri-level with elevating middle and top decks
- KTTX 89-foot hinged-end tri-level
- RTTX 85- to 89-foot fixed-end tri-level
- TTBX 89'-4" bi-level
- TTKX 89'-4" or longer hinged-end tri-level
- TTRX 89'-4" fixed-end tri-level

1961 and were made by Paragon and W&K. On these cars, the B and C decks could be lowered after loading 9. Their Trailer Train reporting marks were ETTX. The cars were mechanically complex and tended to be unstable. About 600 were in use by the mid-1960s, but most were out of service by 1970.

The many early designs settled to a common appearance for rack builders. W&K racks had I-section or “hat-shaped” cross-section vertical posts with diagonal bracing in various patterns 10. These racks had smooth decks, and some early W&K racks had solid vertical panels inset from each end.

Many of Paragon’s early cars had what became known as “ladder-style” side posts (pairs of verticals with multiple short horizontal cross pieces joining them) 7 with corrugated decks. These evolved to heavy tubular posts with triangular gussets. Paragon’s vertical posts



Athearn made a bi-level auto rack in HO (top), and Micro-Trains made a tri-level car in N (bottom). Bill Zuback



Modeling auto racks

There was a tremendous variety in designs of open auto racks, particularly early cars. Available models capture just a small portion of prototype cars, but several companies offer or have offered models of open auto racks.

In HO, Athearn Genesis has made models of W&K bi- and tri-level racks on 89-foot Bethlehem flatcars. Accurail has kit and assembled versions of Paragon staggered-post (1968 and later) bi- and tri-level racks on flush-deck flatcars. The firm also made versions with protective side panels. Bachmann has a ready-to-run model of an open rack that follows the design of a Santa Fe-built rack from the early to mid-1960s.

Another older model was made by Gloor Craft (later Quality Craft), a wood and metal kit for an elevating-style auto rack of the early to late 1960s. These often turn up at swap meets, as well as on eBay and other sites.

In N scale, Micro-Trains offers ready-to-run bi- and tri-level cars. These are Paragon's staggered-post designs on a

flush-deck flat, with X-bracing added by many modelers to better simulate other prototypes.

Adding the vehicles themselves offers great modeling potential but can be pricey. The good news is that the wide choice of scale autos available allows placing your layout in a specific time frame.

Many HO and N vehicles can be found on eBay and other online sources, including Busch, Classic Metal Works, Herpa, Motor-Max (Fresh Cherries), Praline, Trident, Wiking, and others. Also look for more inexpensive toys that can pass as scale models when serving as loads. Less expensive models can be dressed up with paint, Bare Metal foil trim, and other details.

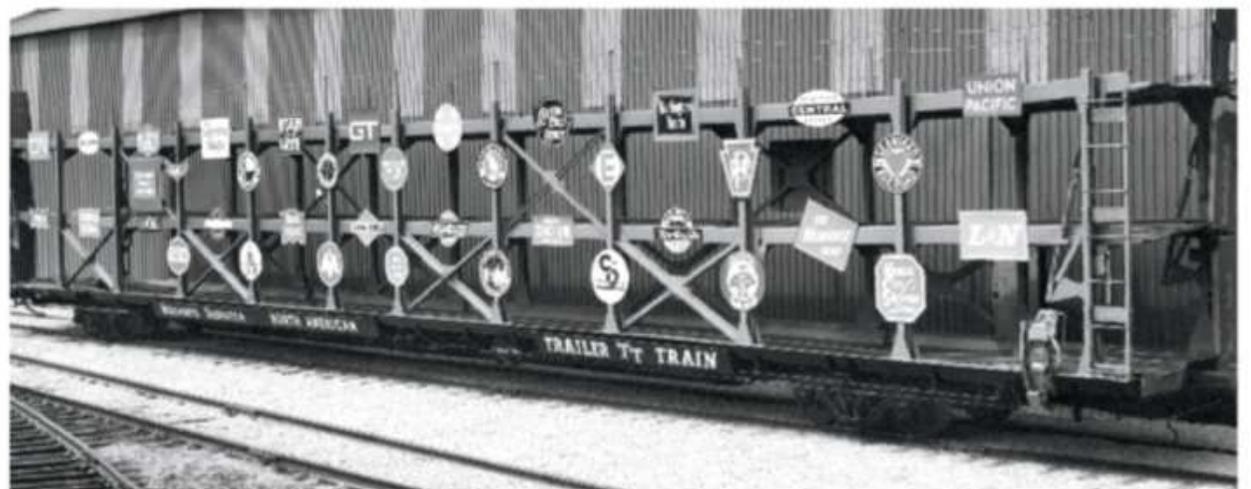
For realism, remember each rack car should carry vehicles of a single manufacturer and – usually – the same model, although a single rack could carry variations (two- and four-door and different colors), and sometimes different models made by the same assembly plant. – *Jeff Wilson*

were evenly spaced until 1969, when the posts became staggered. See 11 on the next page. This ensured that a loaded auto would have a clear area on one side or the other for opening a door.

Trailer Train changed to 89'-4" flatcars in 1967 (with a change in reporting marks as well). Spurred by piggyback hitch designs, flush-deck flatcars were adopted as standard in 1968.

Car-mounted bridge plates were standard through the late 1960s, but clearance issues and auto damage led to their being removed from racks (and not added on new railcars) by 1968. Instead, portable bridge plates were used, supplied by loading and unloading facilities.

Another change at that time was the move to wide decks, with the upper decks extending outward to the outside of the vertical posts instead of the inside. Paragon began staggering the side posts on its cars in 1969. This made it easier for



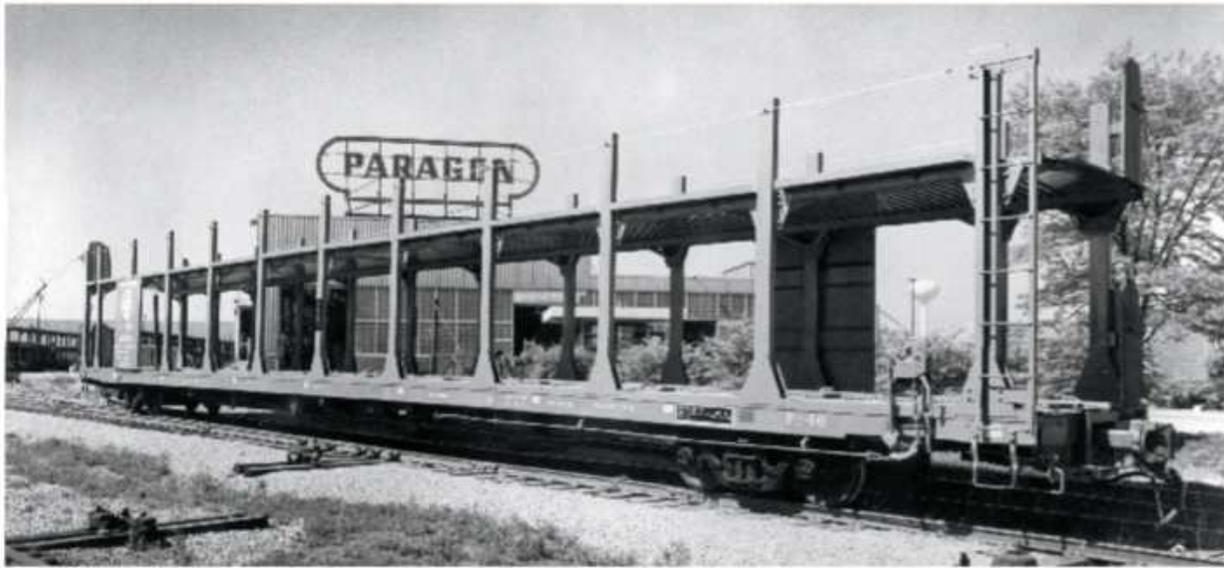
10 To commemorate the building of its 10,000th rack car, Whitehead & Kales in 1968 decorated this hinged-deck tri-level with heralds of all of its customers. The deck hinge mechanism is at right (note the springs). Whitehead & Kales

workers to enter and exit auto doors without having a rack post in the way.

Ownership and paint schemes

Look at photos of open auto racks and you'll notice that most racks were owned

by railroads, while the flatcars themselves were usually owned by Trailer Train. Other companies also owned flatcars, namely North American and Merchants Despatch (both for New York Central racks). Some railroads owned both the racks and flatcars. In the



11 This Paragon bi-level, built on a Santa Fe flatcar in 1972, has rectangular tube-style posts with angled gussets and staggered post spacing from side to side. The upper deck extends to the outside of the posts. Paragon photo; James Kinkaid collection



12 This hinged-end, 89'-4" tri-level was fitted with corrugated side panels by the early 1970s. The Burlington Northern herald on a smooth panel takes the place of a corrugated panel. *Trains* magazine collection

open-rack era, these roads included Santa Fe, Southern Pacific, Cotton Belt, Missouri Pacific, Frisco, and others.

Note that Trailer Train is *not* a leasing company. It's a company that provides cars in a pool to its member (owning) railroads, which by the early 1960s included most major Class 1 lines. By 1960, Trailer Train was already investing heavily in new 85-foot piggyback cars – the same cars that would be used for auto racks.

At that time the cost of a new 85-foot flat was about \$16,000, with a new tri-level rack another \$7,000. Trailer Train's governing board (comprising representatives from owning railroads) decided that splitting the costs between Trailer Train and individual railroads would help spread the financial risk, and at any time if the racks were removed (or if rack service didn't survive), the cars themselves could easily be converted to piggyback or other duty.

From the early 1960s into the 1970s, rack cars were assigned to specific

assembly plants (each automaker used a different style of tie-down hooks and anchors). You'll see stenciling on most open racks indicating "Return to ..." with a specific railroad and city. Railroads owned racks in pools for each assembly plant, providing cars in proportion to their share of the traffic. No effort was made to operate rack cars on the railroads that owned the specific racks – the system was in place to share equipment costs equitably.

Trailer Train's standard flatcar paint scheme was mineral red until 1970, when the scheme switched to yellow. Auto racks were generally painted in the owning railroad's colors, and through the 1960s it wasn't uncommon for Trailer Train flats to be painted to match the rack color. That practice had largely disappeared by the time the yellow scheme arrived.

Railroad heralds were usually applied to signboards attached to (or between) vertical posts or on diagonal bracing on each side of the rack. The size and

specific placement varied by rack manufacturer and railroad.

Panels and enclosed racks

By 1968, more than 15,000 rack cars were in service, with auto traffic still growing: The following year railroads would carry 52 percent of finished autos. However, damage claims were accumulating rapidly. Vehicles aboard open racks were targets of vandalism (mainly rock throwing), and theft of components was also becoming a problem.

The first solution was equipping racks with side panels to protect vehicles. These began appearing in 1970, and they were soon being applied to new cars and being retrofitted to earlier cars. Early options included smooth and later corrugated fiberglass panels as well as wire-mesh screens, but corrugated metal panels soon became the norm **12**. Many styles were used, as several companies offered "kits" for fitting panels on cars.

Panels cut down on vandalism but not theft, so the ultimate solution was to build fully enclosed auto racks, including end doors and roof. These began appearing in 1974, hastening the end of the era of the open rack. Open cars could be found in declining numbers through the 1970s, but most were fitted with side panels by 1980.

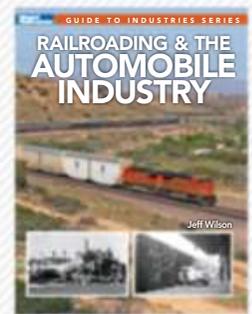
The open auto rack, with its load of vehicles on display, was a distinctive freight car of the 1960s and 1970s, and worthy of capturing for modelers with layouts set in those decades. **MR**

I would like to thank Jim Panza, James Kinkaid, Dave Ingles, Keith Kohlmann, and Stuart Thomson for their help with information and photos.

Get Jeff's new book

For even more detailed information about open and enclosed auto racks, auto parts boxcars, assembly plants, and automobile train switching

and other operations, see Jeff Wilson's new book, *Railroading & the Automobile Industry*, published by Kalmbach Books. To purchase a copy online, visit the website www.KalmbachHobbyStore.com.



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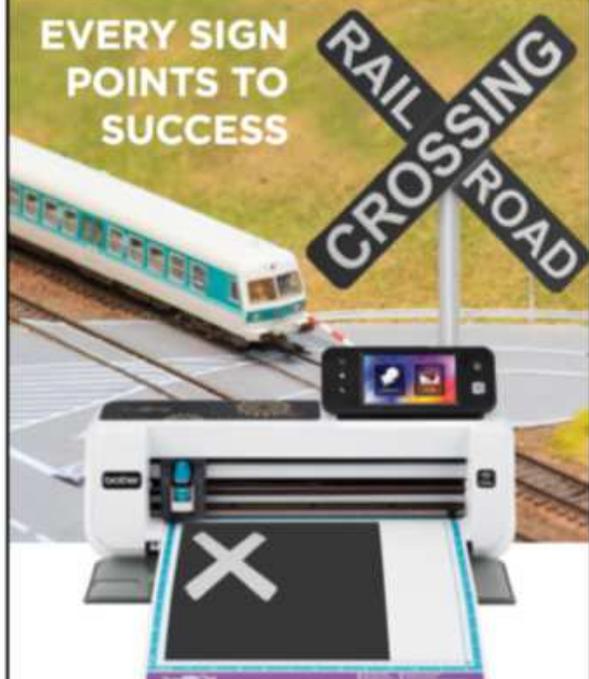


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Southern F7A no. 6718 leads a consist on Larry Puckett's Piedmont Southern layout. Larry describes back-electromotive-force control and installs a decoder in the Walthers locomotive.

When discussing decoders

I often refer to back-EMF, or back-electromotive-force control. But just what is back-EMF, how does it work, and what is it used for? First, let's look at the basics behind back-EMF.

You might think the decoders in our locomotives work like little direct-current (DC) power packs, sending a current of a specific voltage to determine how fast the motor spins and therefore how fast the locomotive moves.

But that isn't how Digital Command Control (DCC) decoders work. Instead, they use a method called pulse width modulation (PWM). With PWM, a full voltage pulse is sent to the motor that makes it turn a little with each pulse. The longer the pulses are on (the width), the faster the motor will spin. Send out a series of short (narrow) pulses and the locomotive will move slowly. Increase the duration (width) of the pulses and the locomotive will speed up proportionally.

But what does PWM have to do with back-EMF? Direct-current motors turn when an

electrical current is applied to their windings. If you spin a DC motor by hand it will generate a small current.

With PWM, the motor is constantly spinning, but there are periods between the pulses where no current is being applied **1**. During each of those gaps between the pulses, the motor generates a brief pulse of current that travels back to the decoder. That's the back-electromotive force, or back-EMF.

So how does a decoder use that back-EMF? The current generated will be proportional to the speed at which the motor is turning **1**. Using that relationship, the decoder senses not only how fast the motor is turning, but by comparing a series of back-EMF pulses it can also determine whether it's speeding up, slowing down, or maintaining a set speed. By monitoring back-EMF, the decoder can adjust the pulse widths it's sending to the motor and control the motor's speed. One nickname for back-EMF is cruise control for model locomotives. With

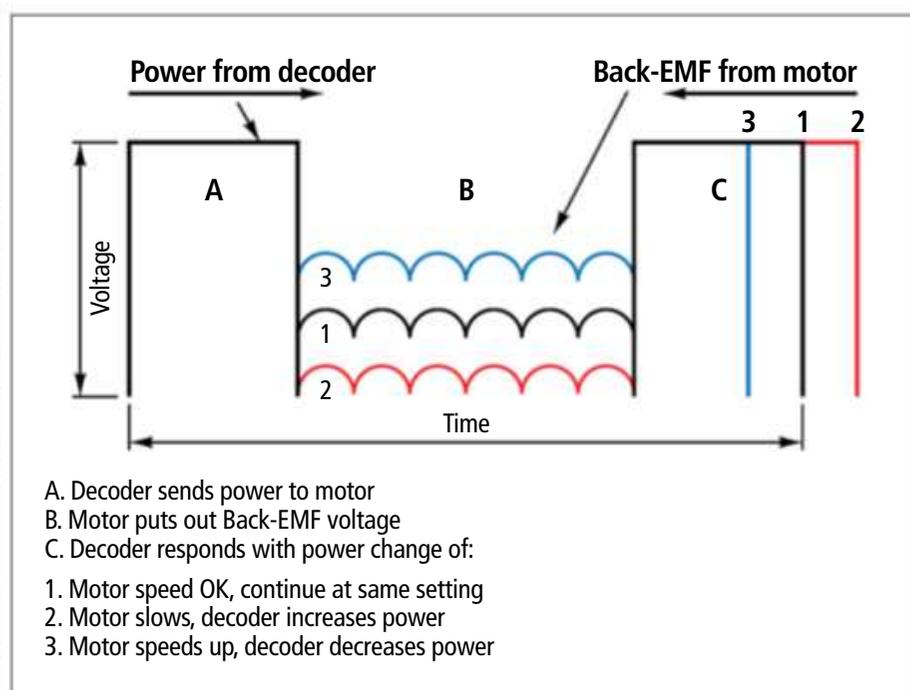
back-EMF working, you can throttle up to a desired speed and the decoder will use back-EMF to maintain that same speed even going up or down grades.

To achieve this level of control requires some pretty complex mathematics. One commonly used approach is called a PID controller. This approach uses three factors:

Proportional, Integral, and Derivative, to make the constant speed adjustments **2**. Each factor monitors a different aspect of motor response, and their combined adjustments keep the motor turning to provide a constant speed even under varying loads.

Not all decoders use the PID three-factor approach. Some may use fewer factors, while others may use a completely different method. For example, SoundTraxx only uses the P and I factors. However, if there are three adjustment variables described in your decoder manual, then it's likely they're using the full PID method.

Adjusting these variables can get quite complicated. Both Train Control Systems and Electronic Solutions Ulm (ESU) LokSound decoders have automatic calibration procedures to help simplify this process. However, I've never felt the need to make adjustments to the factory programmed values in the currently available decoders I've used.



1 Using the force. Back-electromotive-force control uses the current generated by the motor between the DCC power pulses to monitor how fast the motor is turning. Depending on how much current is generated, the decoder can detect the speed of the locomotive, and make speed adjustments accordingly. Diagram used with permission of American Hobby Distributors

Because the decoder is constantly monitoring the back-EMF and adjusting the pulses to maintain a constant speed, it can create very smooth operation, especially at slow speeds. Once the locomotive starts to pick up speed, the usefulness of back-EMF decreases. Therefore, some decoders cut out back-EMF above a certain speed step.

Back-electromotive-force control works great as long as you're using a locomotive by itself, but complications may arise with consist operation. If the locomotives in the consist aren't speed matched (see DCC Corner, September 2016), then they'll fight one another. You end up with a push-me pull-you situation.

So the first step with consist building is to speed match all the locomotives involved. Also, do the automatic calibration procedure if you're using the TCS and LokSound decoders. If things still aren't smooth, then do an internet search – there are numerous websites that offer help with adjusting the control variables in different decoders. In the end you may actually find it's easier to consist locomotives of the same type and to use the same decoder type in all locomotives in a consist.

The utility of back-EMF isn't limited to providing cruise



A FULL VOLTAGE PULSE IS SENT TO THE MOTOR THAT MAKES IT TURN A LITTLE WITH EACH PULSE. THE LONGER THE PULSES ARE ON (THE WIDTH), THE FASTER THE MOTOR WILL SPIN.

– LARRY

control and smooth operation, it's also used in sound decoders. By monitoring the back-EMF pulses, the decoder can sense how hard the locomotive is working and adjust related sounds in response. For example, most sound decoders now use back-EMF to increase the volume and cadence of the chuff of a steam locomotive when the decoder senses the locomotive is working harder.

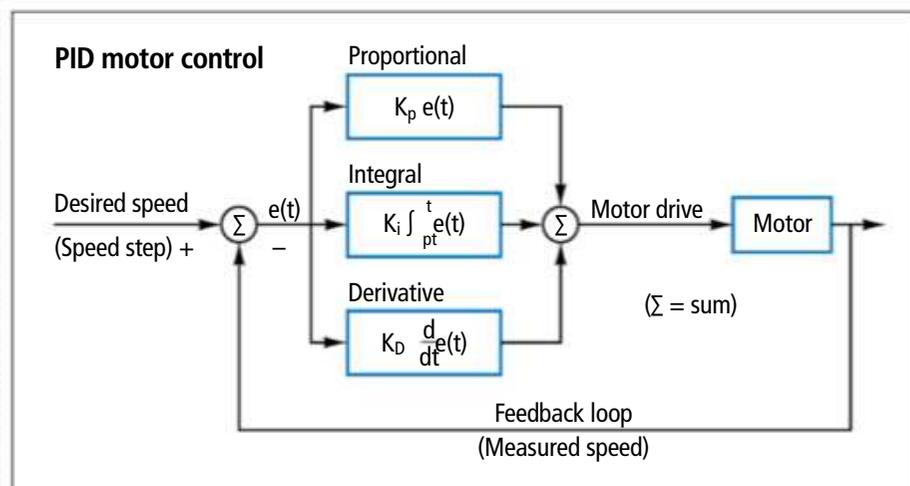
Diesel decoders respond similarly, increasing the volume of the prime mover and changing the rpm level. Back-electromotive-force control is so integrated into TCS WOWSound decoders that the company doesn't offer the option of turning it off.

Walthers Mainline F7A

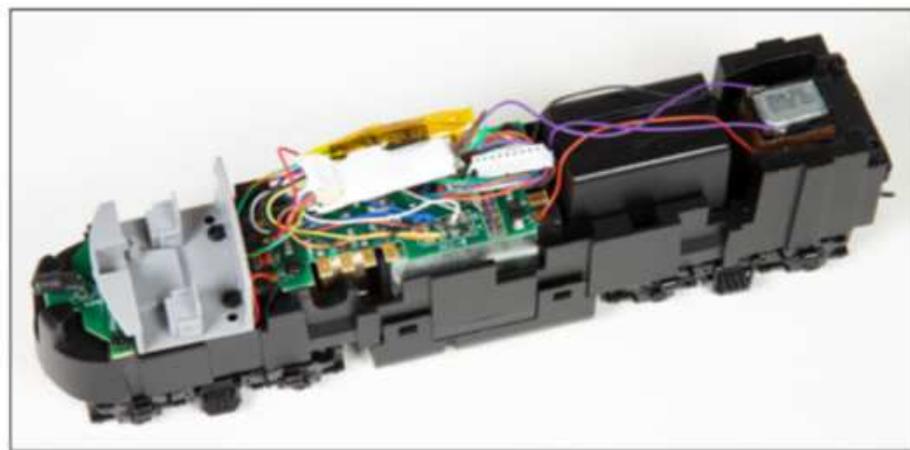
I recently acquired a trio of Walthers Mainline HO scale Electro-Motive Division F7A locomotives that included one without a DCC decoder, so let's take a quick look at adding DCC. The DCC version of this model comes with a SoundTraxx Tsunami-based decoder, and the DCC-ready version comes with a printed-circuit (PC) board designed by SoundTraxx.

This PC board offers two approaches for adding a decoder. At the rear of the model there's a small circuit board attached with a 9-pin JST connector to wires running to the main PC board. It's a simple procedure to disconnect this board from the wires and attach a decoder in its place.

Since I wanted to use a SoundTraxx sound decoder to see how well that would operate with the factory-installed SoundTraxx decoders, I used an Econami ECO-100 I had on hand. Because these decoders don't have a 9-pin JST connector, this gave me the opportunity to test the other conversion method



2 Gotta have algorithms. Many decoders use the Proportional, Integral, and Derivative (PID) control method to maintain a constant speed. By monitoring the back-EMF current generated by the DC motor between DCC pulses, the decoder uses advanced algorithms to maintain a constant speed. Diagram used with permission of Mark Gurries



3 Simple installation. The circuit board in the Walthers DCC-ready Mainline F7A units, designed by SoundTraxx, makes converting these models to DCC an easy process. You have the option of either installing a decoder with a 9-pin JST connector or soldering the wires into eight holes on the main board, as shown here.

– soldering the wires into the eight holes on the PC board. (Alternatives to the ECO-100 include the Tsunami2 TSU-1100 with wires or TSU-2200 with a JST connector).

The PC board is relatively uncluttered, so I soldered the wires in the holes without removing the PC board. Although the Walthers instructions didn't say anything about removing the small board with its JST connection in the rear, I pulled it just to be safe, in case it acts as a shorting plug for DC operation. I then added a sugar cube speaker in the space over the rear truck where the JST connector board had been **3**.

The reassembled model ran smoothly with the new sound decoder. And because I used a

SoundTraxx decoder, it was perfectly matched with the factory-installed SoundTraxx Tsunami decoders.

When consisted, there was no lurching or push-me pull-you fighting due to the back-EMF-based Hyperdrive2 control algorithm in the decoders. Even though the Econami and older Tsunami decoders are a generation apart, the control approach and variable settings are so well matched I didn't need to make any adjustments to the back-EMF settings or speed curve.

Back-electromotive-force control is a useful component of DCC decoder design. And conflicts can be avoided, including by installing matching decoders in consisted locomotives. **MR**



Atlas Trainman HO scale GP39-2 with ESU LokSound

New road names and factory-installed sound highlight the latest version of the Atlas Trainman Electro-Motive Division (EMD) GP39-2. We first reviewed a direct-current (DC) version of the GP39-2 in the January 2010 issue. This latest release has a dual-mode ESU LokSound Select decoder that provides realistic sound on Digital Command Control (DCC) and DC layouts.

The prototype. Beginning in 1974, EMD began offering the GP39-2 as a more fuel-efficient alternative to the firm's popular GP38-2. While the GP38-2 used a normally aspirated 16-cylinder 645 diesel engine, the GP39-2 used a turbocharged 12-cylinder 645 prime mover. The latter produced 2,300 hp and fewer emissions vs. the 2,000 hp GP38-2.

Electro-Motive Division built 239 GP39-2s between 1974 and 1984. Original customers included Atchison, Topeka & Santa Fe Ry.; Burlington Northern; Delaware & Hudson; and Reading Co. Many of these Geeps have soldiered on in shortline service.

The model. Originally built as Delaware & Hudson no. 7615 in 1976, the prototype for our review sample would serve Guilford Transportation and Union Pacific before being sold to the Wisconsin & Southern RR (WSOR) in the early 2000s and numbered 3928. Shortline conglomerate Watco Transportation Services purchased WSOR in 2012.

Our review sample is decorated for no. 3928 after it was repainted in a special livery to commemorate the WSOR's 35th anniversary in 2015. All lettering is straight and correctly placed. There's sharp separation between the red and gray paint.

Appropriate for its prototype, the model's dimensions, including short hood length and long hood details, match a scale drawing of a "phase 1" GP39-2 in the December 1988 issue of *Mainline Modeler*. Early-production units had an 81" short hood, while late-production "phase II" units had an 88" short hood. Later units also had the position of the engine moved rearward by three feet, which shifted the position

PERFORMANCE TESTS	
DRAWBAR PULL	2.25 ounces 32 HO scale freight cars
SCALE SPEED (DC)	
VOLTS	SCALE MPH
7.5 (start)	1
9	15
10	21
11	48
12	63
SCALE SPEED (DCC)	
SPEED STEP	SCALE MPH
1	1
7	15
14	37
21	63
28	66

of the blower ducts, radiator fans, and other details.

The plastic model features well-defined grills, engine-access doors, and other molded detail. The handrails and stanchions are made of flexible plastic to resist breaking. These parts are securely glued to the body shell and straight. The three-chime air horn is also a separate plastic part.

Like other Trainman Series models, the GP39-2 includes drill starter points for the grab irons. Modelers need to supply the grab irons themselves, as well as any other roadname-specific details that they wish to add. For example, the prototype no. 3928 has a cab air conditioner and ditch lights. Tricking out the Geep

to look like a specific prototype would be a fun project. A variety of HO diesel detailing parts are available from Details West, KV Models, and others.

Mechanism. After removing the coupler draft-gear boxes, I lifted off the plastic body shell. The model features the same mechanism as a top-of-the-line Atlas Master Line model.

A can motor equipped with two brass flywheels rests in the center of the die-cast metal chassis. Driveshafts transfer power from the motor to the truck-mounted gear boxes. Additional metal weights are screwed to the chassis above the front and rear trucks.

The weights also support the main printed-circuit (PC) board, which is mounted above the mechanism. On our DCC equipped sample, the ESU LokSound Select decoder is plugged into a 21-pin socket on the PC board. A downward-facing rectangular speaker in a plastic enclosure is screwed to the weight above the rear truck.

Two light-emitting diodes (LEDs), one at the front of the PC board and the other to the rear of the speaker, illuminate the front and rear headlights and number boxes.

Performance. As shown in the charts at left, the model accelerated smoothly in both DC and DCC speed tests. The locomotive crept along at 1 scale mph without any hesitation or jerkiness. Its top speed of 65 scale mph is close to that of the prototype.

According to our force meter, the GP39-2 has a drawbar pull equivalent to 32 free-rolling HO freight cars on straight and level track. During a hill climb test on our staff layout, the locomotive hauled an 11-car freight up the 3 percent grade.

Full Throttle features. After placing the locomotive on the rails of our DCC equipped layout, I pressed function button 8 and heard the EMD 645 diesel start up. The sound was crisp and clear with no rattles or buzzes.

The ESU LokSound Select decoder in our review sample included the Full Throttle sound and effects package. A button-controlled brake allows for realistic stops without having to use the DCC cab throttle. The DRIVE/HOLD function makes for easy manual notching by keeping the locomotive speed constant while I use the throttle knob to notch the engine rpm up or down.

The horn and bell sounded prototypical. I also enjoyed the realistic dynamic brake sound sequence when I pressed F4 as the locomotive headed downgrade. Other user-triggered effects include the coupler, sanding valve, compressor, and a separate headlight dimmer.

Out of the box, the headlights and number boxes operate according to direction. There is no independent control of the number boxes. However, I programmed the lights on each end to operate manually with separate function buttons for more realistic control.

In addition to changing the locomotive address, I also advance consisted no. 3928 with another DCC-equipped four-axle locomotive. I could also set up function control to work with the consist address.

In addition to re-mapping functions, the decoder has configuration variables (CVs) that control every sound, lighting, and performance feature. I could adjust the volume level of each sound effect, fine-tune the speed curve, and much more. An extensive downloadable user manual is available at www.esu.eu/en/

I find that programming LokSound decoders is an easier and quicker task

Facts & features

Price: \$239.95, (DCC sound), \$149.95, (DC, no sound)

Manufacturer

Atlas Model Railroad Co.

378 Florence Ave.

Hillside, NJ 07205

www.atlasrr.com

Era: 1974 to present

Road names: Wisconsin & Southern (Watco Transportation), CSX, Delaware & Hudson, and Union Pacific

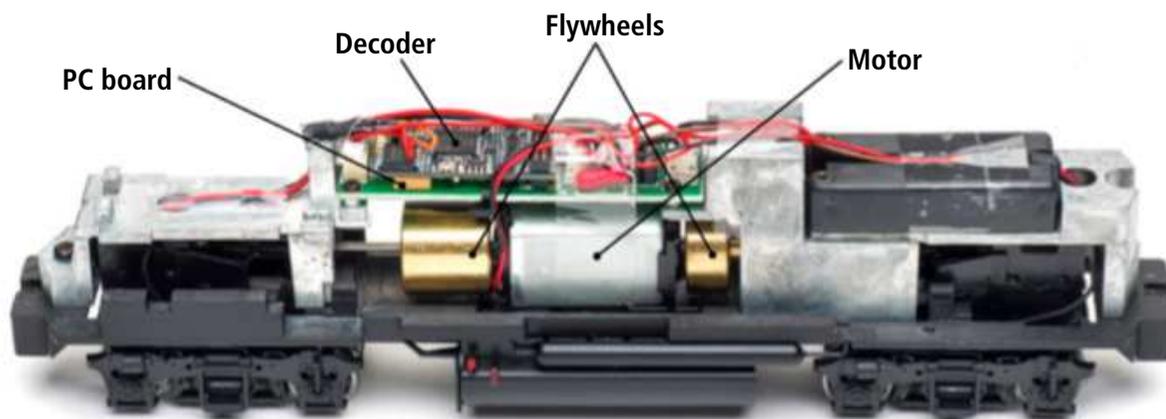
Features

- Accumate plastic knuckle couplers at correct height
- All-wheel drive and electrical pickup
- Blackened metal RP-25 contour metal wheels in gauge
- Die-cast metal chassis
- Eight-pin DCC socket
- ESU LokSound Select dual-mode decoder (DCC version)
- Five-pole skew-wound motor with dual brass flywheels
- Light-emitting diode (LED) headlights and number boxes
- Minimum radius: 18"
- Weight: 13.3 ounces

with the firm's LokProgrammer computer interface (sold separately for a manufacturer's suggested retail price of \$179.99). For those who don't wish to purchase the interface, the free ESU LokProgrammer software can also be used without the device to easily find CV values, as outlined in the instructional videos on the ESU website.

DC sound. Like other sound-equipped locomotives, the GP39-2 requires a lot of voltage to get moving. When I advanced the DC power pack to 6V, the lights came on and the engine sounds started. As I advanced the throttle to 7.5V, the engine sounds realistically ramped up before the locomotive started moving. Aside from the engine sounds and directional lighting, there are no other user-controlled effects when the locomotive is operated with a DC power pack.

Back in 2010 the Atlas Trainman GP39-2 was already a smooth performing, solid model of its second-generation diesel prototype. The addition of a fully featured LokSound decoder makes it even better. – Dana Kawala, senior editor



The mechanism is mounted in the center of the die-cast metal chassis. Additional die-cast metal weights over the trucks add to the locomotive's tractive effort.



Athearn N scale class Z-8 Challenger 4-6-6-4

Even in N scale the class Z-8 4-6-6-4 is an imposing steam locomotive. Like the Athearn Genesis HO Z-8 that I reviewed in the August 2017 *Model Railroader*, the accurately detailed N scale model is available with a factory installed SoundTraxx Tsunami dual-mode decoder. The model delivered smooth performance and realistic sounds on both Digital Command Control (DCC) and direct-current (DC) layout tests.

The prototype. Built by the American Locomotive Co. in 1943 and 1944, the 20 class Z-8 Challengers were the last steam locomotives purchased by the Northern Pacific Ry. These locomotives were nearly identical to the class Z-7 Challengers delivered to the NP in 1941. Both the Z-7 and Z-8 class locomotives were heavier and more powerful than the NP's first Alco-built Challengers, the Z-6 class, delivered in 1936 and 1937.

Two additional class Z-8 locomotives were added to the NP's 1944 order. While most of the NP Challengers burned coal, these locomotives were

built to burn oil for service on the Spokane, Portland & Seattle Ry.

Unlike compound articulated Mallets, the Challengers were simple-expansion locomotives with two sets of high pressure cylinders. The class Z-8 Challengers had a starting tractive effort of 107,000 pounds and were the most powerful 4-6-6-4s ever built.

During their careers, the class Z-8 Challengers sped freight as well as a passenger and troop trains along the NP main. All were retired by 1957.

The model. Most of the N scale model's dimensions, including the correct 70" driver diameter, match prototype drawings of a class Z-8 Challenger published in the May 1974 *Model Railroader*. The space between the locomotive cab and tender deck is about a scale foot wider than the prototype. This helps the N scale locomotive handle tight model railroad curves.

The plastic boiler and tender have well-defined molded detail, including piping and throttle linkage on the boiler.

Separately applied plastic detail parts include air piping, handrails, and the dual air compressors mounted on the smokebox front.

There's clear window glazing in the all-weather cab. The cab interior features a detailed boiler backhead.

The locomotive and tender are smoothly painted with a black satin finish. The smokebox and smokestack are correctly painted graphite. Some valve handles on the boiler and the ash pan dump wheel under the firebox are painted red. Lettering fonts match prototype photos.

The mechanism. Both the front and rear engines of the N scale articulated locomotive pivot, allowing the model to negotiate tight model railroad curves. On the prototype, the rear engine is fixed and only the front engine pivots.

The dual-flywheel equipped motor is mounted to a die-cast metal weight that's enclosed by the two halves of the plastic boiler. Worm shafts connect the motor to the first axle of the front engine and the third axle of the rear engine. The drivers on those axles are also equipped with traction tires. The metal siderods transfer power from the geared axles to the non-geared axles.

An eight-wire harness connects the electronics in the locomotive and tender. The SoundTraxx Tsunami



The N scale model's plastic boiler features well-defined molded detail. The many separate parts include the handrails, piping, ash pan dump wheel, and bell.

PERFORMANCE TESTS	
DRAWBAR PULL	1.6 ounces 38 N scale freight cars
SCALE SPEED (DC)	
VOLTS	SCALE MPH
7.25 (start)	4
8	12
9	30
12	56
SCALE SPEED (DCC)	
SPEED STEP	SCALE MPH
1	4
7	15
14	30
28	56

is housed inside the tender along with a well-enclosed round speaker. The tender backup light and the locomotive headlight are illuminated by light-emitting diodes (LEDs).

DCC operation. For DCC testing, I ran the N scale Z-8 with a Digitrax Zephyr Extra system that delivered 14.7V to the track. The Challenger easily negotiated no. 6 turnouts and crossovers, including slow backing moves through a yard. Although it can handle an 11" radius curve, the model looks much more realistic rounding 15" or wider radius curves.

Out of the box, the model accelerated smoothly set to 28 steps in DCC, as shown in the chart above. The model's top speed of 56 mph is close to that of the prototype, which was designed to haul tonnage on the NP's undulating main line at speeds of up to 60 mph.

The model's performance can be further fine-tuned using configuration variables (CVs), including programming custom speed tables or choosing one of the 16 preset speed curves. By programming CVs 3 and 4, I added acceleration and deceleration momentum to better simulate the gradual stops and starts of a massive locomotive. A list of all the supported decoder CVs is included in a printed quick start guide, and a more extensive user manual is available at www.soundtraxx.com.

I also easily programmed the locomotive address to match its cab number and changed the directional head- and backup light to manual control. By programming CV61 I set up the Tsunami train brake feature, which let me use a function button (F9) to stop or start the train regardless of the throttle setting.

Other user-triggered functions include a coupler crash, bell, and long and short whistle blasts. When I turned

Facts & features

Price: \$479.98 (DCC sound), \$379.98 (DC)

Manufacturer

Athearn Trains
1600 Forbes Way, Suite 120
Long Beach, CA 90810
www.athearn.com

Era: 1943 to 1957

Road name: Northern Pacific; Spokane, Portland & Seattle

Features

- Electrical pickup on eight drivers (12 with traction tires removed) and all tender wheels
- Five-pole skew-wound motor with dual brass flywheels
- McHenry operating knuckle coupler on rear of tender (at correct height)
- Metal wheels in gauge
- Minimum radius: 11" (15" recommended)
- SoundTraxx Tsunami decoder (DCC version)
- Weight: 6.3 ounces (Engine alone weighs 4.3 ounces)

on the headlight, I also heard the whine of the dynamo. The effect was a bit loud for my taste, but the volume levels of all the sounds can be adjusted with CVs.

When underway, the exhaust was synchronized to the correct four chuffs per wheel revolution with the sound of one engine occasionally going out of synch with the other just like on a real simple articulated.

DC operation. On our DC test track, the model's sounds and lights came on at 6V, and the model crept along at 4 scale mph when I set the throttle to 7.25V. As I advanced the throttle, the Challenger accelerated smoothly to 56 scale mph at 12V.

When operated with a DC power pack, the sounds are limited to the exhaust chuffs, squealing brakes when the throttle is decreased, and a grade-crossing whistle signal when the direction switch is quickly flipped. Operating the model with a Model Rectifier Corp. Tech 6 analog sound controller allows access to other user-triggered functions as well as some programming capability.

With its realistic sound system and a detail level that rivals its larger HO scale cousin, the N scale Z-8 is a worthy model of its Northern Pacific "super-steam" prototype. — Dana Kawala

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Model Railroader November 2018



Facts & features

Price: \$89.98

Manufacturer

Wm. K. Walther's Inc.

5601 W. Florist Ave.

Milwaukee, WI 53218

www.walthers.com

Era: 1949 to present

Road names: BNSF Ry., Canadian Pacific, Pennsylvania RR, Southern Pacific, Union Pacific, maintenance of way (gray), and painted yellow but unlettered. Also available undecorated.

Walther's Proto HO scale Jordan Spreader

Walther's has added a Jordan Spreader to its HO scale Proto series. But this isn't an assembled version of the kit from the 1990s. No, this is a newly tooled model that has several features not found on the kit, including positionable wings and slopers, wire grab irons, and railroad-specific details.

The Walther's Proto model is based on a Model 2-200 prototype. The full-size Jordan Spreader could be used as a spreader, ditcher, and snow plow, making it a valuable, year-round asset for railroads to have in their maintenance-of-way fleets.

I compared the model to dimensions for a base Model 2-200 Jordan Spreader that I found online. The dimensions closely follow the published data. The truck wheelbase is a scale 5'-9", not 5'-6" as on the plan. However, the plan depicts solid-bearing trucks. The model correctly has roller-bearing trucks.

Our sample is decorated as BNSF Ry. no. 939004. The prototype was built in June 1949 as Chicago, Burlington & Quincy no. 203845. After the 1970 merger that created Burlington Northern, the Jordan Spreader was renumbered 972618.

In the 2000s the Jordan Spreader was rebuilt and renumbered BNSF no. 939004. Though it's still pneumatically operated (modern rebuilds are often converted to hydraulic operation), the prototype has a new, taller cab; three-pane all-weather windows on the sides; and a side-facing light above the all-weather window.

What really makes the Walther's model stand out are the positionable wings and slopers. Yokes are attached to the frame

and back of the wings and slopers. A wire pin holds the universal block in the yoke. A brace on one end and a rack on the other connect to the blocks, allowing the wings and slopers to move in and out. The slopers can also be raised and lowered. The small plow end wings are sprung and move when the main wings are extended.

Though some of the details on the Walther's model don't match the full-size no. 939004, the lettering placement and striping make it a reasonable stand-in. The paint is smooth and evenly applied, and the white and yellow printing is opaque.

The cab on the Walther's model has clear window glazing on the sides and ends, but the interior isn't detailed. Attached to the main vertical wing post crosstie is a non-functioning horizontal twin-beam headlight and single-chime air horn. It's hard to tell in prototype photos, but the real 939004 has at least a two-, and perhaps a three-, chime air horn.

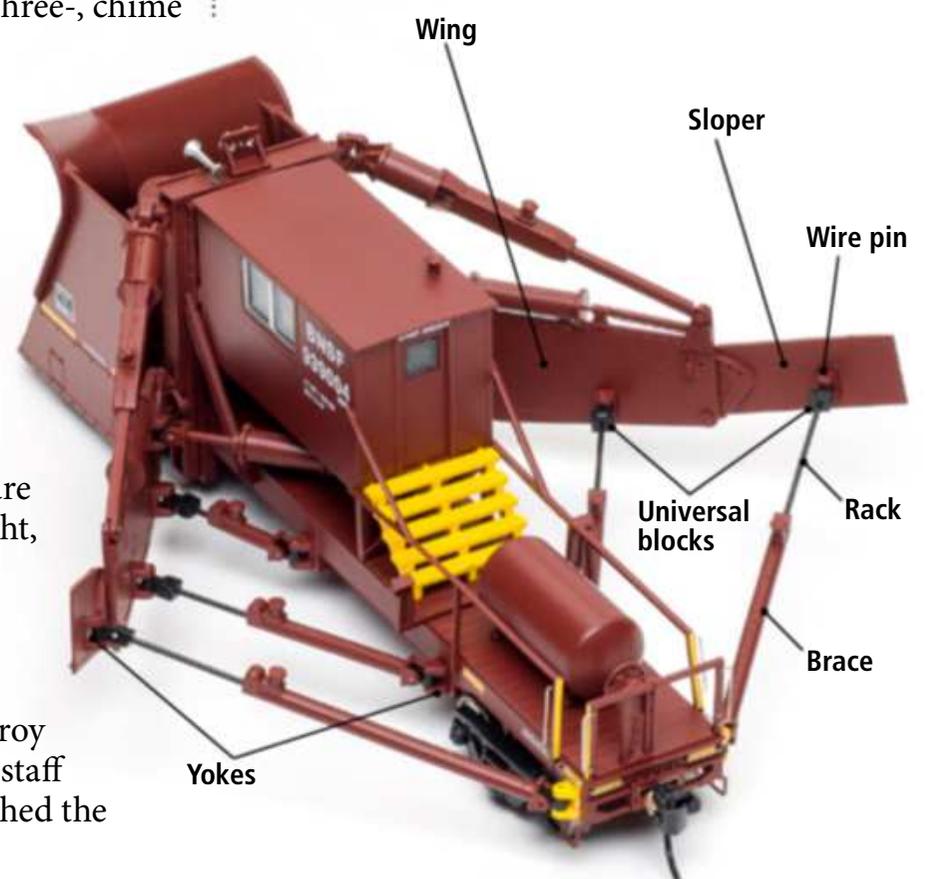
In the field. The model weighs 2.8 ounces, which is 1.4 ounces too light based on National Model Railroad Association Recommended Practice 20.1. However, there is space under the body to conceal extra weight. The Proto-Max metal couplers are mounted at the correct height, and the 33" metal wheelsets are correctly gauged.

I tested the Walther's Proto Jordan Spreader on our Milwaukee, Racine & Troy and Wisconsin & Southern staff model railroads. First, I pushed the

Jordan Spreader around both model railroads with four- and six-axle road units. Even though the model is underweight, it navigated no. 5 through no. 8 turnouts without incident.

Then I towed the Jordan Spreader at the end of a train, as this is how it would typically be transported between terminals. Again, the model operated flawlessly.

I'm glad Walther's brought the Jordan Spreader back to its HO scale lineup. The Proto-series model is vastly improved from the 1990s-era kit. I'm a fan of maintenance-of-way (MOW) equipment, and the positionable parts ratchet up the cool factor on this model. Visitors will be drawn into a scene featuring the Jordan Spreader, whether it's parked on a siding, being handled in a train, or earning its keep at a MOW site. – *Cody Grivno, associate editor*



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QUICKLOOK

Athearn Ready-To-Roll 40-foot boxcar

Price: \$27.98

Manufacturer

Athearn
1600 Forbes Way, Suite 120
Long Beach, CA 90810
www.athearn.com

Era: 1970-1980, as decorated

Road names: Chicago, Burlington & Quincy; Chicago & Illinois Midland; Chicago & North Western; Delaware, Lackawanna & Western; Elgin, Joliet & Eastern; Maine Central; Monon; Reading Co.; Southern Pacific; St. Louis Southwestern (Cotton Belt); Toledo, Peoria & Western; and Western Maryland (multiple road numbers)

Comments: Although standard-height 40-foot boxcars were on their way out by the 1970s, many railroads kept them in service, even if it meant adding Automatic Car Identification (ACI) labels and updating data panels.



Athearn has updated its line of legacy Model Die Casting/Roundhouse 40-foot boxcars for the modern era as well, adding plastic knuckle couplers and metal wheelsets, along with finer molded detail on the sides.

These Athearn Ready-To-Roll models come with scale-sized knuckle couplers mounted at the correct height. At 3.8 ounces, the models are right in line with National Model Railroad Association Recommended Practice 20.1 specs for 40-foot car weight. One wheelset was slightly tight and resisted efforts to adjust it by hand.

The paint on our sample, Chicago, Burlington & Quincy no. 1652 with Colorado & Southern subsidiary reporting marks, exactly matched the photo in *CB&Q Color Guide to Freight and Passenger Equipment* by Michael J. Spoor (Morning Sun Books, 1995), right down to the glossy patch of paint

under the capacity data stencils. The only differences I noted were the Superior door (the model has six reinforcing ribs and the prototype photo shows four), and the roof appears to be unpainted galvanized steel. A little silver paint would take care of the roof, but changing the door would be more work, as it's molded onto the body.

The brake wheel and running board are the only separate parts on the body shell, but the grab irons, stirrup steps, and ladders on the car sides are much finer than on earlier models. Trucks and coupler covers are secured with screws.

The boxcar tracked well on the Wisconsin & Southern project layout, having no trouble with the layout's no. 5 turnouts.

Modelers looking to add to their fleets of 40-foot boxcars have another option with these Athearn Ready-To-Roll cars. – *Eric White, associate editor*

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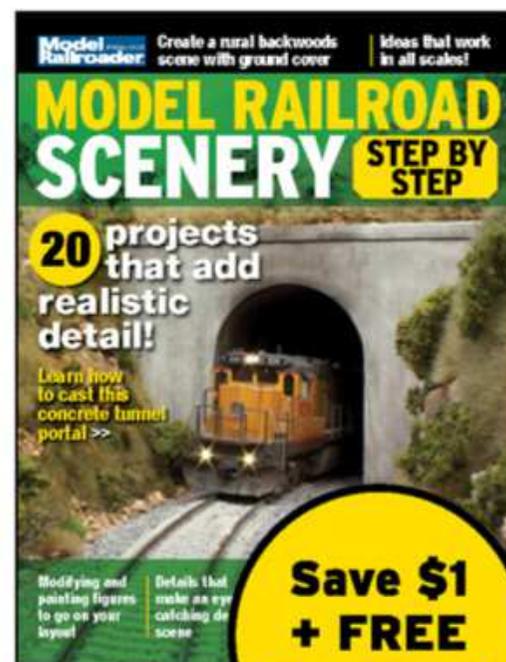
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QUICKLOOK



Bachmann N scale tight-bottom ore gondola

Price: \$33

Manufacturer

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

Era: 1960s to 1990s

Road names: Union Pacific;
Pennsylvania (black or Tuscan Red)
Canadian Pacific; Duluth, Missabe &
Iron Range; Norfolk & Western

Comments: An ore car that's been offered in HO scale for decades is now available in N scale from Bachmann. The 26-foot tight-bottom ore gon, based on a 1958 Southern Pacific prototype, is offered in five paint schemes.

The model is a close representation of the Southern Pacific tight-bottom ore gondola, nos. 345000 to 345599. The car matches prototype photos of SP cars as well as the dimensions listed for

them in the 1959 *Official Railway Equipment Register (ORER)*. Bachmann doesn't currently sell an SP version.

Both our sample cars were painted smoothly with opaque lettering. They were decorated for Pennsylvania RR and Union Pacific. While both railroads had similar cars, neither is an exact match for the Bachmann model.

The prototype Southern Pacific ore cars have a 26-foot interior length and nine exterior posts, four of which are shallower than the rest. Bachmann's Pennsy car models no. 14517, part of a 1,000-car series of class G39 ore jennies that had an inside length of just 22 feet and seven shallow posts per side.

According to the 1960 ORER, Union Pacific no. 64190 was a 41-foot gondola. The UP did own 55 ore gondolas with the right arrangement of side posts, but they were 31 feet long and numbered 27500 to 27554.

The wheelsets on both our sample cars were slightly tight back-to-back. After carefully loosening the wheels with a pair of pliers, I was able to twist them into gauge with my fingers.

The cars weighed .5 ounce, which is .3 ounce underweight according to National Model Railroad Association Recommended Practice 20.1. Installing a load would be an easy way for a modeler to add more weight to the model.

Both cars rolled smoothly around the 11" curves and Peco medium-radius turnouts of our Canadian Canyons project layout. The car's body-mounted plastic E-Z Mate Mark II couplers were mounted at the proper height per NMRA standards.

A long string of these ore cars, properly weathered, would look right at home waiting to be loaded at an N scale copper or iron mine. — Steven Otte, associate editor

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- Today's location of each locomotive.

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Adding interchange traffic

Enchanting, warm spring evenings, with windows thrown open to hear peepers singing choruses, make a special treat after long northern winters. Those same nights might carry the sounds of an approaching train, whistling for crossings, working upgrade. Boys like me might lie in bed quietly, falling asleep to the soft lullaby of a per diem freight moving a late-night delivery to an important interchange.

Interchange, the exchange of freight cars between carriers, helps make North American rail transportation remarkably efficient. A cargo rolls freely from one railroad to another without transloading, thanks to standardization of rail car equipment such as couplers, air brakes, and safety appliances. The American Railway Association and its successor, the American Association of Railroads, have maintained specifications and procedures that govern the entire process, making every railroad's cars completely interchangeable with any other railroad.

We enjoy similar benefits as modelers. Conformance to National Model Railroad Association standards has us coupling models produced by different manufacturers without a second thought.

Interchange takes many forms. Two peddler freights might swap cars at a lightly used siding three times a week. A busy yard where two or more railroads meet end-to-end could see moves three times a day. Where more than



A fall morning sees Grand Trunk GP9 no. 4905 inching along Commercial Street in Portland, Maine, in 1976, after delivering interchange to Maine Central's Rigby Yard. Jerry Dziezic photo

one railroad served a city, transfer runs often handled interchange cars. Steam- and transition-era labor agreements sometimes demanded that each road makes its own delivery, as when I photographed this Grand Trunk engine in Portland, Maine, returning from an interchange move to Maine Central's Rigby Yard. A Portland Terminal job with a delivery to GT's India Street Yard followed behind. Each road's crew returned to its yard as a light engine move.

As agreements evolved, a transfer crew both delivered and picked up interchange traffic. The agreements might have one road provide a crew for a specified time, six months or a year, after which the other road's crew would take over.

Today, run-through trains move from one road to another with little more than a crew change and a 1,000-mile inspection. This makes

interchange almost transparent, but there remains a physical point at which the roads transfer legal responsibility for the shipment and divide its freight revenue.

An interchange has great modeling appeal. It's a "universal" industry at which any car type can appear. It's also an opportunity to add foreign power. My layout sees transfers headed by Lehigh Valley Baldwin VO-1000 switchers and Pennsylvania H-9 Consolidations.

An interchange track is an easy weekend project. Find a place to fit a simple stub-end track twice the length needed to hide an engine and a few cars, screening them with some trees or a building. During an operating session, a road crew stops at the interchange. The same crew now handles the foreign road's engine, shoving its cars into the open, uncoupling and backing out of sight. In charge of the road freight again, the crew picks up the cars and continues the run.

Cars need not move to or from an industry physically located on a layout. Interchange can represent overhead

traffic moving over two lines, one the stub-end track just described and the other a yard or staging track representing the destination.

I mentioned the nightly per diem freight of my boyhood. "Per diem" is car rental that railroads charge one another. A Santa Fe boxcar seen on the Burlington earned its owner a daily fee, whether loaded or empty. Railroads expedited movements at important junctions because the per diem clock started at midnight. Delivering the car to a Santa Fe interchange before then saved the Burlington an extra day's charge. Per diem evolved to car hire, calculated by the hour since 1979.

Adding a per diem freight to the lineup is another modeling opportunity. Moving cars offline in time reduces per diem cost for foreign road cars and starts earning per diem for home road cars.

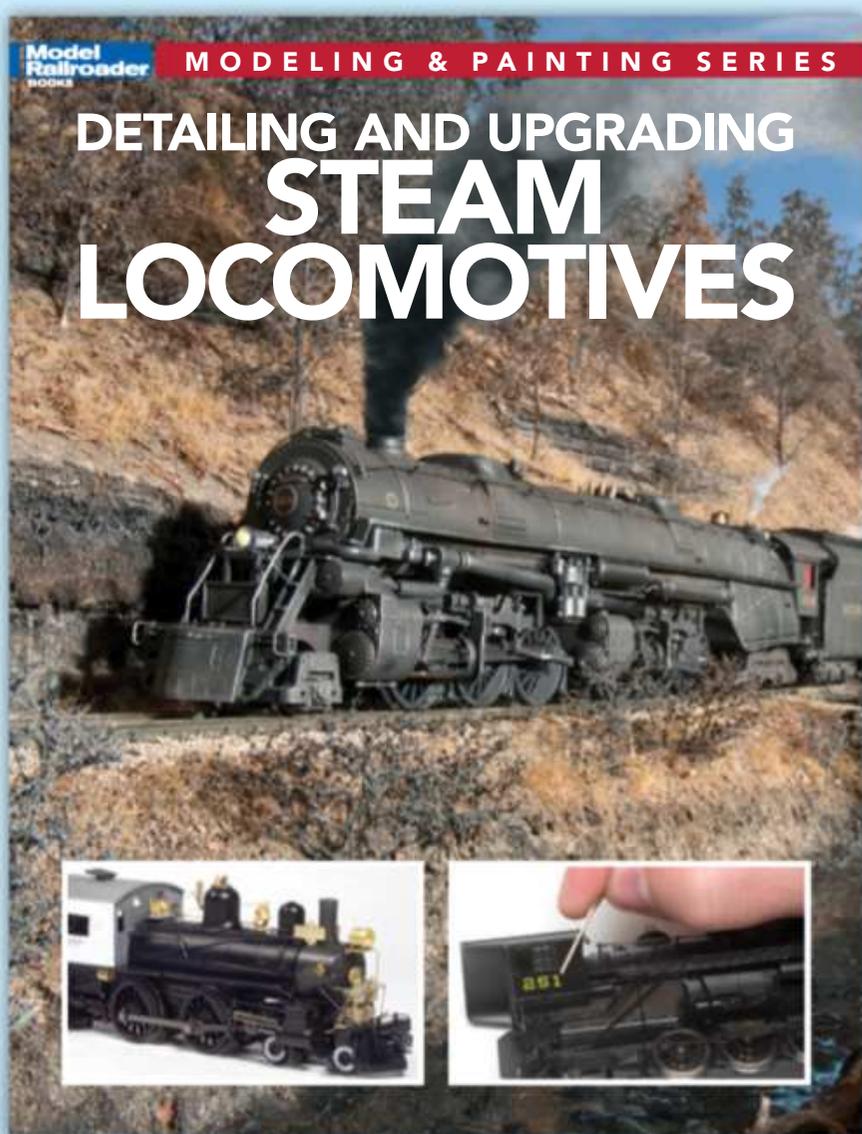
The waybills, car accounting, and legions of clerks that interchange once demanded make a story all its own. Putting it to work on a layout needs only a couple lengths of flextrack, a turnout, and some carefully placed trees. 



AN INTERCHANGE HAS GREAT MODELING APPEAL. IT'S A "UNIVERSAL" INDUSTRY AT WHICH ANY CAR TYPE CAN APPEAR.
— JERRY

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Anyone who models the steam era through the 1950s will love the new book, *Detailing and Upgrading Steam Locomotives*. This invaluable guide from *Model Railroader* presents a wide variety of reference materials in one place!

With expert contributors like Andy Sperandio, Tony Koester, and Cody Grivno, this handy reference book provides the best information available for upgrading, detailing, modifying, and maintaining your steam locomotive models. Although HO models are the main focus of the book, modelers of N and other scales will benefit as well.

Covered topics include:

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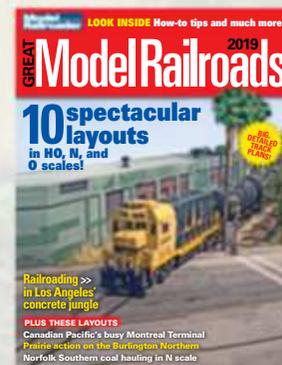
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Trackside Photos

Northbound Soo Line train 241 blasts through Lewis on John Emley's Soo Line Latta Subdivision. The HO scale layout models a former Milwaukee Road branch bought by the Soo Line to serve coal mines in southwestern Indiana. John shot the photo.





Great Model Railroads 2019 is packed with articles, photos, tips, tricks, and track plans from 10 incredible layouts. This month, Trackside Photos features

images from four of those model railroads. *Great Model Railroads 2019* goes on sale Oct. 16 at your local hobby store. You can also order directly from our Customer Service hotline at 800-533-6644 or from our website at www.KalmbachHobbyStore.com.



The Norfolk Southern Executive Train races east over Cooper Trestle as a loaded coal train rolls beside it in the same direction. The scene takes place on Scott Teague's N scale NS Pocahontas Division. Lou Sassi photo

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



MORE ON THE WEB

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A loaded log train chugs past a steam pile driver that's building a new trestle on the On30 Gold Creek Timber Co. layout built by Jim Lemmond and Lorne Neufeld. The layout was built in less than a year for display at the 2015 National Narrow Gauge Convention in Houston. Bob Werre photo



Rio Grande Southern no. 455 pulls a manifest freight over one of the many wooden trestles in the high country on Gregg Condon's HOn3 Denver & Rio Grande Western layout. Gregg has been fascinated with narrow gauge railroading since he was a child.

Dave Rickaby photo





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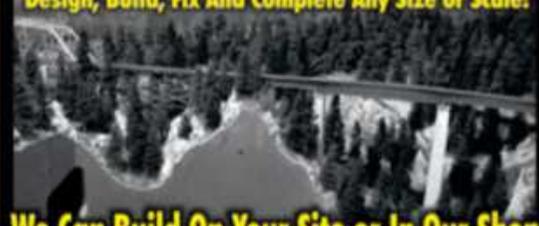
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Schedule of Events

AZ, GLENDALE: ARHS Model Train Swap Meet. Glendale Christian Church, 9661 North 59th Ave. Saturday, October 13, 2018 9:00am-1:00pm. Admission \$5.00. Tables \$25.00. To sign up, send stamped envelope, check or money order to ARHS, PO Box 5643, Glendale, AZ 85312-5643. Contact: Craig Faris 623-340-3529.

AZ, TUCSON: Tucson Toy Train Show & Swap Meet. Tucson Expo Center, 3750 E. Irvington. November 9-10, 2018 Friday, 1:00pm-6:00pm and Saturday 9:00am-2:00pm. Admission \$6.00, kids under 12 are free-proceeds support the Gadsden Pacific Toy Train Operating Museum. www.gpdtoytrainmuseum.com or call Jeff, 520-310-1392.

CO, COLORADO SPRINGS: Train Expo Colorado (TECO) hosts its next model train show at Chapel Hills Mall Events Center, October 13-14, 2018. Saturday 10:00am-5:00pm and Sunday 10:00am-4:00pm. Admission: \$6.00/person or \$10.00/family. Senior and military discounts. Contact Mike, 719-640-2076 or <http://www.tecoshow.org>.

CO, DENVER: Rocky Mountain Hobby-Expo, Denver Mart, 451 East 58th Avenue. October 27-28, 2018, Saturday 9:00am-5:00pm; Sunday 10:00am-5:00pm. Admission \$12.00, under 12 free. Trains, RC, Drones, slot cars, diecast and kits- 120,000sf of manufacturers, vendors, demos, workshops and hands-on activities. Free Parking. Information: Jim Marski 303-345-5031 or www.RockyMountainHobby-Expo.com

FL, CRYSTAL RIVER: Regal Railways, Toy Train Collectible & Hobby Show, US Army National Guard Armory, 8551 West Venable Street, Crystal River, FL 34429. Saturday, November 10, 2018, 9:00am-2:00pm. Admission: \$5.00 adults. Vendors, operating layout lunch items for sale. Contact Joe: 727-244-1341 or visit: www.regalrailways.com.

FL, DOVER: Regal Railways Presents Toy Train Collectible & Hobby Show. Hillsborough County Fairgrounds, 215 Sydney Washer Road, Zip: 33527. Saturday, November 17, 2018, 9:00am-2:00pm. Admission: \$5.00 adults. Vendors, operating layout, videos playing. Lunch items for sale. Contact Joe: 727-244-1341 or visit: www.regalrailways.com for more information.

FL, OCALA: Lions Semi-Annual Train Show. First Christian Church, 1908 SE Fort King St. Saturday, November 3, 2018, 9:00am-3:00pm. Adults \$5.00, children 12 and under free w/ adult. Bring two canned goods and receive \$1.00 off admission. Information: Bob 352-694-6381 or cell 352-208-5284

IA, HAMPTON: NCIMRRC Train Show, Franklin County Convention Center. 1008 Central West, Sunday, October 28, 2018. 9:00am-3:00pm. Admission \$5.00. Trains (all scales), memorabilia and collectibles to buy, sell and trade. Individual tables welcome. For information or table reservations contact. Eastside Trains, 641-456-1998, e-mail eastsidetrains@gmail.com

IL, ORLAND PARK: Fall S Fest 2018, Georgios Quality Inn & Suites, 8800 W. 159th St. Orland Park, IL 60462. November 2-4, 2018. CASG, Inc. Be part of the greatest S, 1/64 event! Registration \$30.00. 170 tables! Clinics! S-Fest Cars! www.trainweb.org/CASG or call Joel 847-212-3541

IL, ST. CHARLES: 27th Annual Chicago Railroadiana and Model Train Show. Kane County Fairgrounds, 525 South Randall Rd. Sunday, October 21, 2018, 10:00am-3:00pm. Admission: \$6.00 (includes tax). Tables \$60.00. For information: 847-358-1185, RussFierce@aol.com or www.RRShows.com

IN, AUBURN: RxR Mania Train Show. Kruse WWII Museum, (National Military History Center), 5634 County Road 11-A; from Interstate 69, Exit 326; Saturday, October 20, 2018, 9:00am-3:00pm. Adults \$5.00, under 12 free. \$20.00 per table, 5+ tables \$15.00 each. Info: www.RxRMania.com or 260-715-2519

IN, DANVILLE: Central Indiana Division-NMRA annual Train Show at Hendricks County 4H Fair Grounds, Saturday November 17, 2018. 10:00am-3:00pm. Admission \$3.00 adults, \$5.00 family. Operating Layouts, Vendors, Clinics, Food. Dealer Tables 8' at \$16.00. Info: gtwfan@bluemarble.net or 812-876-6799. CID website <http://cidnmra.org>

IN, EVANSVILLE: Evansville All Gauge Model Train and Railroadiana Show. Saturday, November 10, 2018. Gates open 10am-3pm CST. St. Paul's UCC, 2227 West Michigan Street, Zip: 47712. Admission \$3.00, under 12 free. Vendors, test track, operating trains, Lego layout, Thomas dealer, food available. Contact John 812-306-5050.

IN, INDIANAPOLIS: The Indianapolis Model Railroad Show and Open House. Manual High School Gymnasium, Saturday, December 8, 2018, 10:00am-3:00pm. Admission \$5.00, children 12 & under free. Boy Scouts in uniform free. Free parking. Naptown & White River Model Railroad Club. Contact: Michael Roderick 317-833-3556, E-mail: naptownmrr@gmail.com

IN, MICHIGAN CITY: Duneland Model RR Club Train Show and Swap Meet. IBEW Building, 301 East 8th St. Sunday, November 18, 2018, 9:30am-2:00pm (Chicago time). Adults \$4.00, youths 6-13 \$1.00, 5 and under free. Contact: Dave Novak at trains86@frontier.com or 219-778-1186.

IN, TIPTON: Antique Toy & Train Show. Tipton 4-H Fairgrounds, 1200 S. Main St., Zip: 46072. Saturday, November 10, 2018, 11:00am-3:00pm. Adults \$5.00, 13-18 \$1.00, 12/under free. 100+ tables, all gauges, kits, free-parking, working-models, food/drink. Contact: David Moree, 4402 East 100 South, Kokomo, IN 46902, 765-457-1044.

MA, MARLBOROUGH: Hub Division NER/NMRA. Royal Plaza Trade Center, 181 Boston Post Road (Rte. 20 West). Saturday December 1, 2018, 10:00am-5:00pm and Sunday December 2, 2018, 10:00am-4:00pm. Admission \$10.00; Children under 12 and Scouts in Uniform FREE. Admission good both days. Information: Mark 508-528-8587; E-mail TE.info@hubdiv.org; www.hubdiv.org

MA, RAYNHAM: OLD COLONY MODEL RAILROAD CLUB 1st ANNUAL MODEL RAILROAD OPEN HOUSE, Raynham Depot, Suite 16, 770 Broadway, Raynham, MA. Exit 8 from Route 495. October 20, 2018, 10:00am-3:30pm. Admission Free - Donations Appreciated. Contact Dennis Ingalls, 508-285-3963, email: dingalls@comcast.net

ME, BREWER: Eastern Maine Model Railroad Club Show. Jeff's Catering in Brewer, 15 Littlefield Way. Saturday, November 17, 2018, 10:00am-3:00pm. Admission \$4.00 for adults, under 12 free. Dealers, silent auction and operating layouts. Geoff Anthony, PO Box 187, Blue Hill, ME 04614, 207-374-2786, dahak@roadrunner.com

MI, ANN ARBOR: Rails On Wheels' Southeast Michigan Model Railroad Show & Sale, Washtenaw Farm Council Grounds, 5055 Ann Arbor Saline Rd., 48103. Sunday, November 25, 2018, 10:00am-3:00pm. Admission: \$4.00; under 12 free w/adult. Early bird- \$10.00 (8:00am-10:00am). Tables available. rails-on-wheels.com Contact: Walt Trancygier 734-552-4581 Email: trancywj@gmail.com

MI, EAST LANSING: Lansing Model Railroad Club Show and Sale. Michigan State University Pavilion. Sunday, November 11, 2018, 10:00am-4:00pm. Admission \$6.00, under 12 free. Michigan's largest train show: layouts, demonstrations and 500+ tables. Free parking. Flyer, table forms and map, www.lmrc.org or call Ron St. Laurent 517-256-3588

MI, KALAMZOO: Southwest Michigan Train Show & Sale. Kalamazoo County Expo Center, 2900 Lake Street. Sunday, October 28, 2018, 10:00am-3:00pm. Admission \$6.00; Children 10 and under free. Presented by Kalamazoo Model Railroad Historical Society. Contact David Hayes-Moats 269-344-0906, www.kmrhs.org

MI, MT. CLEMENS: Gratiot Valley Railroad Club Train Show & Sale. Mt. Clemens High School, 155 Cass Ave. Zip 48043. November 3-4, 2018, 10:30am-4:00pm. Adults \$6.00, Kids under 12 free. Operating layouts, dealers and door prizes. For more information: www.gvrr.org or 586-468-4877.

MN, ST. CLOUD: Granite City Train Show and Sale. River's Edge Convention Center, 10 4th Avenue South. Saturday, November 10, 2018, 9:00am-3:00pm. \$6.00, 10/under free. Buy/sell model/toy trains, books, videos, railroad collectibles. Operating displays. Win a LIONEL train set or FSM structure kit. 320-255-0033; edwardolson@cloudnet.com or www.GraniteCityTrainShow.com

MN, WOODBURY: Newport Model RR Club Flea Market & Train Show. Woodbury High School, 2665 Woodlane Drive, Zip: 55125. October 20, 2018, 9:00am-2:00pm. Admission \$5.00. Future shows to be announced. Club Address: Newport Train Club, PO Box 0061, St. Paul Park, MN 55071. Contact: Ed, 651-233-3310

MO, CARTHAGE: 35th Annual Southwest Missouri Railroad Association Show - Swap Meet. Fairview Christian Church, 2320 S. Grand Ave. October 20, 2018, 9:00am-4:00pm. Adults \$3.00, under 12 free. Tables 8'-\$12.00 or 6'-\$10.00 round tables. Crafters Welcome! Contact Pam Parcell, 417-540-0692, swmra@hotmail.com or 901 East 9th, Joplin MO 64801

MO, ST. LOUIS: 28th Anniversary Greater St. Louis Metro Train Show by Mississippi Valley N Scalers. Kirkwood Community Center, 111 South Geyer Road, Kirkwood, MO 63122. October 13-14, 2018, Saturday 10:00am-4:00pm; Sunday 11:00am-3:00pm. Adults \$7.00, kids/students w/ID free. All scales, free parking. David Johnson, 636-225-2405, visitseetrains.com

NC, THOMASVILLE: Thompson's Train Show & Thomasville Rail Days. 12 West Main Street, Thomasville, NC 27360. November 3, 2018, 10:00am-3:00pm. Adults, \$5.00, 6-14 \$2.00, under 6 FREE. Operating layouts. Free parking. Food available. For information contact: David Thompson, 517-304-0638 or email: thompson1j@yahoo.com

NH, DOVER: The Great Northern New England Train Show. Dover Lodge of Elks #184, 282 Durham Road, Zip: 03820. Saturday, November 3, 2018, 10:00am-3:00pm. Admission: \$5.00 per family. Exhibitor tables \$25.00. (includes entrance fee). All Scales, operating layout, food. Contact Ed Martin, Efmenter@aol.com or 603-362-4300

NJ, EAST RUTHERFORD: METCA/NYSME Train Show, St. Joseph's School, 120 Hoboken Road, Zip: 07073. Saturday, November 3, 2018 METCA/NYSME members 8:00am, Public 9:00am-2:00pm. Admission: \$5.00 Adults 16+, FREE for METCA families. NYSME Club layouts open FREE to attendees. Info: www.METCA.org; Bob Amling, Secretary@METCA.org - 718-541-8619 or contact@modelengineers.org

NM, ALBUQUERQUE: Rails Along the Rio Grande 2018 Model Train Show. Sid Cutter Pilot's Pavilion-Balloon Fiesta Park, 9401 Balloon Museum Drive NE. November 17-18, 2018, Saturday 9:00am-5:00pm, Sunday 9:00am-4:00pm. Operating train layouts, new & used model trains for sale. Admission: \$5.00/person, Children under 12-FREE. www.railsalongtheriogrande.org.

NY, ALBANY "Great Train Extravaganza" TM. Empire State Convention Center. December 2, 2018, 10:00am-4:00pm. \$7.00 adults, Children free. Operating layouts, most scales including LEGO's for kids/grand-kids, 300+ tables, train sets, parts, accessories, scenery items, books/video/, DVD's, print, memorabilia. Refreshments available www.gtealbany.com 518-668-9892, trains@gtealbany.com

NY, ALBANY: Albany Train Show, Polish Community Center, 225 Washington Avenue Extension, Albany NY. Saturday November 17, 2018, 9:00am-3:00pm. Admission \$5.00 adults, Kids under 12 FREE. O, HO and N gauge working layouts. Over 100 vendor tables of trains-train related items. www.albanytrainshow.com or Jeff Stedje 518-852-7725.

NY, ELMIRA HEIGHTS: Upstate NY Chapter TCA Train Show. American Legion Post 154, 236 Scottwood Ave. Zip Code: 14903. Sunday, November 18, 2018, 9:00am TCA members, 9:30am-2:30pm General Public. Adults \$5.00, under 17 free with paid adult. Contact: Chuck 716-390-8216, E-mail: usnyc2015@gmail.com Web Site: www.upstate-ny-tca.com

NY, PORT JERVIS: Tri-States Railway Preservation Society Train Show, Port Jervis High School (Gymnasium), 20 Route 209 (N), Zip 12771. Saturday October 27, 2018, 10:00am-3:00pm. Admission \$5.00, children under 12 free. \$25.00 tables. Free-parking. Contact Jack Youchah, PO Box 161, Florida, NY 10921, 845-651-7872. Website: www.minisink.org/tsrps.htm

OH, DAYTON: 43rd Annual Dayton Train Show, NEW MONTGOMERY COUNTY FAIRGROUNDS, 645 Infirmary Rd. 45417. Sponsored by: Division 3 Mid Central Region NMRA, November 3-4, 2018. Saturday 11:00am-5:00pm and Sunday 11:00am-4:00pm. Admission: \$7.00, active-military \$6.00, under 12 free. Information: Rick Lach, PO Box 341233, Beavercreek, 45434, 937-301-0746.

OH, MASSILLON: CJ Trains Winter Massillon Train and Toy Show. Knights of Columbus Hall, 988 Cherry Road NW, 44647. Sunday, December 9, 2018, 10:00am-3:00pm. \$5.00 admission, 12 and under free. \$25.00/dealer table, 152 - 8' dealer tables. Jon Ulbright, PO Box 446, Wooster, OH 44691, 330-262-7488, cathijon@ssnnet.com www.cjtrains.com

OH, MILAN: Norwalk & Western RR Model Train Show. EHOVE Career Center, 316 West Mason Road. Sunday, November 11, 2018, 10:00am-3:00pm. Admission: 10 and over \$5.00. Trains all scales, toys, operating layouts and displays, books, Thomas items, lunch available, free parking. Contact: Tony, 419-706-8038, www.norwalkandwesternrr.com

OH, MT. HOPE: CJ Trains Fall Train and Toy Show. Mt. Hope Event Center, 8076 St. Rt. 241, Zip 44660. Saturday, November 3, 2018, 10:00am-4:00pm. Admission: \$5.00, Free under 12. \$25.00/dealer table. 600+ tables. Contact, Jon Ulbright, 330-262-7488, cathijon@ssnnet.com. www.cjtrains.com (GPS directions: Millersburg, OH 44654)

PA, HORSHAM: 13th Annual Main Street Hatboro Train Show. Keith Valley Middle School, 227 Meetinghouse Rd. Saturday, December 1, 2018, 9:00am-3:00pm. \$5.00 adults, under 12 free. 145+ vendor tables in cafeteria and gym. Contact Al Zollers, azollers06@verizon.net or Joe Lutz J040440@verizon.net or www.hatborotrainshow.org

SC, CHARLESTON: Charleston Area Model Railroad Club Train Show. Danny Jones Armory Park, 5000 Lackawanna Blvd., North Charleston, SC. November 17-18, 2018. Saturday 9:00am-5:00pm and Sunday 10:00am-4:00pm. Adults \$5.00, Children 12 & under FREE. For table information contact the club at trainshow@chamrc.com or www.chamrc.com

SC, GREENVILLE: Greenville Shrine Club, 119 Beverly Rd. Saturday, December 8, 2018, 9:00am-3:00pm. Admission \$5.00, under 10 FREE. Over 150 vendor tables, Large variety of G, O, HO, S/AF, N gauge. Contact Todd at 843-307-8674. sctradeshows.com

SC, MURRELLS INLET: 9th Annual Myrtle Beach Model Train Show, Inlet Square Mall, 12125 Hwy. 17 Bypass, November 10-11, 2018. Saturday 10:00am-5:00pm and Sunday 10:00am-4:00pm. Adults \$5.00 under 12 FREE. Operating Layouts, All-Scales, Clinics and door prizes. www.gsmrrc.org or Call Joe 843-297-7162 or 443-520-2600.

TN, UNION CITY: Gulf, Mobile and Ohio Historical Society's fall convention meets. November 9-11, 2018. Modeltrain and railroading train show/sale is Saturday 9:00am-2:00pm. Admission \$5.00. Quality Inn Hotel, 2201 W Reelfoot Ave. Hotel Phone: 731-885-8850, Press 2. http://www.gmohs.org/Events.htm

TX, NEW BRAUNFELS: Fall Model Train Show. New Braunfels Civic Center, 390 S. Seguin Ave. October 27-28, 2018. Saturday 10:00am-5:00pm, Sunday 10:00am-4:00pm. Adults (over 14) \$8.00, children (5-13) \$2.00. 300+ vendor tables, layouts including Legos, silent auction, refreshments, museum open house. Info: www.nbrfm.org Jim Edmondson 830-629-2071

VA, GRAFTON: Fall Open House, Chesapeake Bay and Western (CB&W) Model Railroad Club. 110 Dare Rd, Grafton, VA. Saturday November 17, 2018 10:00am-4:00pm. and Sunday November 18, 2018 12:00pm-4:00pm. Free admission, White Elephant table. Call 757-898-0717, http://cbw-mrc.com

VT, BARRE: Vermont Rails Show. Barre Auditorium, 20 Auditorium Hill, Interstate 89, Exit 7. Saturday, November 17, 2018, 10:00am-4:00pm. Adults \$6.00, children 6-12 \$2.00, children under 6 free. Sponsor: NWV Model Railroad Association. Contact Ron Piro, 802-598-0905, www.nwvrrailroad.org

WA, KENT: Boeing Employees Model Railroad Club Annual Swap Meet. 525 4th Avenue North, Kent Commons. November 10, 2018, 9:30am-4:00pm. \$8.00 admission, under 16 free. Ed Sherry, 550 SW Colewood Lane, Normandy Park, WA 98166; 206-244-3884; swapmeet@bemrrc.com

WA, SPOKANE: River City Modelers Fall Train Show, Spokane Fairgrounds, 404 North Havana. Sunday, October 14, 2018, from 9:30am-3:30pm. Adults \$6.00, Free under 12. 200+tables of Railroad items for sale, operating layouts, Free-MO, Operation Lifesaver & more. Free parking. For information: Shirley Sample, 509-991-2317 or email shirley@busnws.com

WI, GREEN BAY: 9th Annual First Freeze Fall Train Show & Swap Meet. Riverside Ballroom, 1560 Main Street. Sunday, November 25, 2018. 9:00am-2:00pm. Adults \$3.00, 12 and under free. Over 100 tables, operating layouts, train races, door prizes, food/beverages. Information: Bob 920-465-7913 or www.newogaugers.org

WI, MILWAUKEE: Trainfest, 9am to 5pm Nov. 10-11, 2018 at Wisconsin State Fair Park. Exhibitors include operating layouts, major manufacturers, modeling clinics, and hobby vendors. Admission information, discount tickets and PRIME ACCESS tickets available at www.trainfest.com Staged by NMRA WISE Division. Contact us at info@trainfest.com

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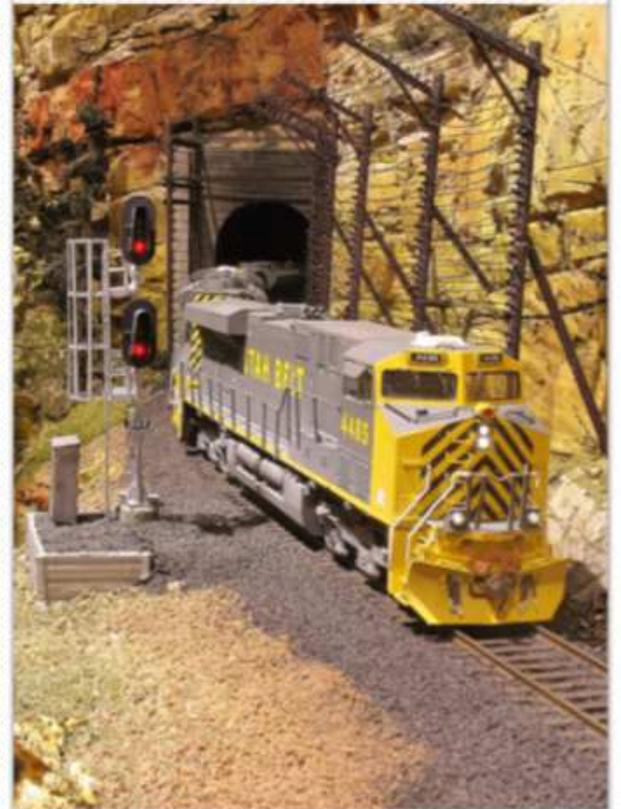
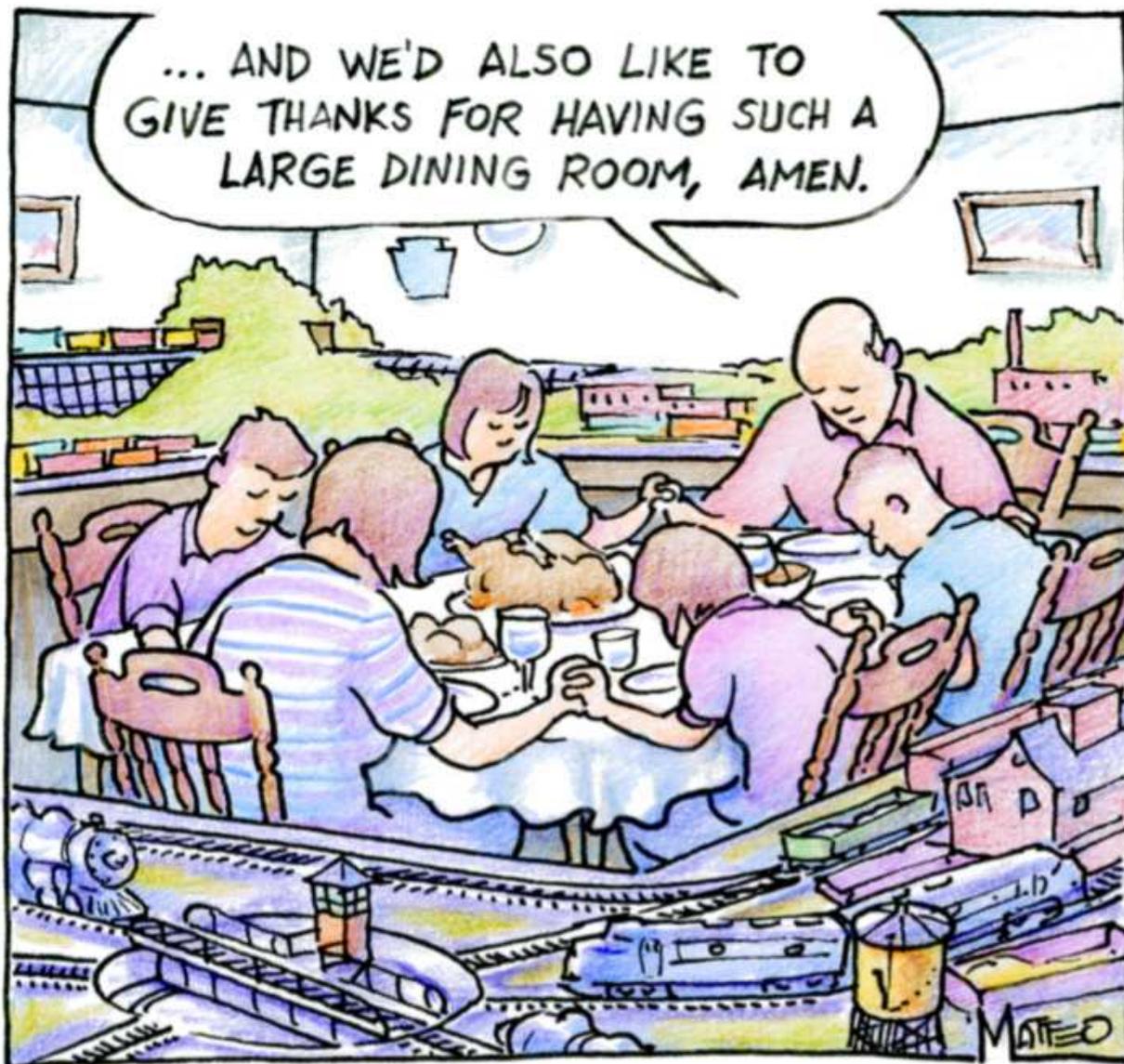
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Paying it forward to the next generation

Most of us have witnessed or heard about someone paying the tab for the person behind him or her at a fast-food restaurant or coffee shop. It's called "paying it forward." Someone does a good turn for you, and you do one for another stranger when the opportunity arises.

In my May 2018 column, "Keeping the torch burning," I discussed friends of a deceased modeler banding together to keep the railroad alive and growing for as long as the spouse was interested. That's another form of doing a good turn for someone while also lifting your own spirits.

In my closing, I mentioned that another form of passing the torch was evident at the La Mesa Model Railroad Club in San Diego, one of several model railroads in one structure near the San Diego Zoo.

Not long after that column appeared, Jim Singer forwarded a photo by Craig Willett showing exactly what I described in the closing remarks with one enhancement: It's clear who's running the show at the La Mesa Club: 19-year-old Travis Clark, seated before a huge Union Switch & Signal Centralized Traffic Control (CTC) panel with a lengthy train sheet spread out on the desk before him. But it also shows mentor Bill Darnaby, long an avid student of timetable-and-train-order (TTTO) operations and formerly a mechanical engineer for the Electro-Motive Division of General Motors.

While Bill was never a professional railroader, he rubbed elbows with a lot of them and didn't miss much. Bill's vast knowledge of prototype railroading has been shared over the decades with countless model railroaders,



With Bill Darnaby as his coach, 19-year-old Travis Clark uses a sprawling train sheet to help him orchestrate train movements on the La Mesa Club's superbly executed HO tribute to the Southern Pacific's main line via Tehachapi Pass, Calif. Craig Willett photo

including me, through his many feature articles in *Model Railroader* and *Model Railroad Planning*. I'm fortunate to be able to call Bill a close friend since our Purdue University days, and we've traveled to the far corners of the planet together, usually with wives Mary Ann and Judy along to keep the conversations from being trains 24/7. At least they try.

I'm also privileged to operate on his highly regarded Cleveland, Indianapolis, Cincinnati & St. Louis, better known as the Maumee Route, once or twice a year. Like the La Mesa club railroad's TTTO sessions, the Maumee is a sterling example of railroading as it was in the transition era when single-track TTTO operations challenged railroaders to be both safe and efficient. That's just often enough for me to be familiar with how things are supposed to work, but just far enough apart to forget something and screw up. Live and learn.

I do my best to pass along what I've learned from Bill and other experienced

modelers and professional railroaders to my own crews. Several of them are also good friends of Bill who share his dedication to the resurrection of a skill – indeed, an art – that has faded from full-size railroading.

But let's get back to the photo. Here's a student and a tutor working hard as a team to do something that challenged the professionals half a century ago. No one's getting paid to do this; it's the sheer love of an arcane form of railroading that drives them, that creates beads of sweat when things are not going as well as planned and wide smiles when they do.

Travis and quite a few other young people will one day switch roles and become the mentors of yet another generation of modelers who want to learn how things were

done in what many regard as the golden age of railroading. But make no mistake: The La Mesa Club also hosts more modern-era sessions when second-generation diesel power is battling the same grades and curves that tripped up its steam-powered predecessors. In those times, the CTC machine assumes the major role as handwritten "flimsies" are again relegated to the past. Bill knows about CTC rules too, as they were in force during his career and many cab rides while at EMD. So he also serves as a mentor when the era shifts ahead.

Paying it forward is a custom we all need to embrace if the hobby is to be sustained. It's happened to me. Now, like Bill, it's my turn – and maybe yours – to pay it forward. 



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