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October 2019
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Model Railroader®

A high-tech history lesson

Innovations have helped build
this realistic Civil War layout

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Bernard Kempinski's
layout depicts Union
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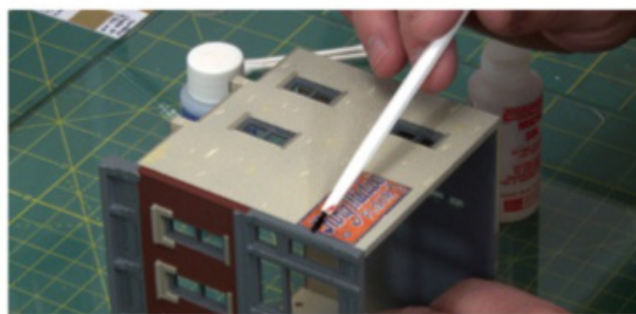
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On the cover: A United States Military RR 4-4-0 locomotive crosses a trestle on Bernard Kempinski's O scale Aquia Line. Bernard Kempinski photo



Next issue

In November, we visit a large scale Rio Grande Southern layout in a basement. Plus, an HO scale NYC track plan, how to extend scenery into the aisle, and more!

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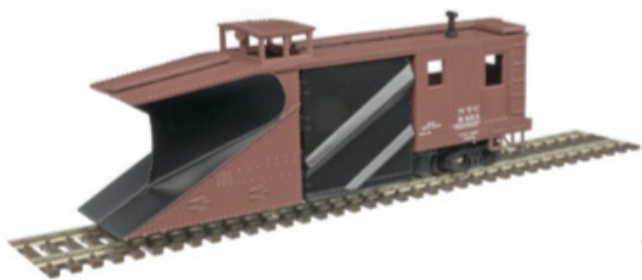
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The leaves may be starting to change color soon, but Model Railroader Video Plus is celebrating one last blast of summer with a special series for MRVP subscribers. Producer David Popp hosts the MRVP 2019 Summer Camp, featuring all-new how-to videos about painting, weathering, scenery, and more!

You'll also want to check out all the videos in the MRVP Log Blog series. From layout planning to model building to electronics, a wide variety of projects are featured as David builds an addition to the On30 Olympia Logging Co. layout.

At MRVP, there's always something new to learn and something fun to watch! Visit www.MRVideoPlus.com to see what you've been missing!



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BE SURE TO FOLLOW DAVID'S LATEST PROJECTS IN THE LOG BLOG SERIES!



My Game is a Bit Rusty

David plans and details a log pond scene, and provides some tips for modeling rusty backwoods machinery.

MRVideoPlus.com/LogBlog14



Give Me an A ... Frame

This series is full of prototype and modeling information. In this episode, you'll learn about A-frame log unloaders.

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Loading Logs

Get tips for building craftsman wood structures as David completes a log loader model for the Olympia.

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Ben Lake,
3D trackplan
designer



TOUR A LAYOUT SET DURING THE CIVIL WAR

Bernard Kempinski's O scale

Aquia Line is inspired by the operations of the United States Military RR (USMRR) during the U.S. Civil War. On page 36 of this issue, Bernard describes the high-tech methods he uses to build and operate his stunning model railroad.

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exclusive tour of the layout, as Bernard guides his battery-powered locomotive over

the 130-foot mainline run. He'll also demonstrate his working O scale link-and-pin couplers and handbrakes.

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Among diamonds, the coal shines brightest



While out West in Salt Lake City for the National Model Railroad Convention and National Train Show in July, a number of things occurred to me about railroads, both modeled and full-size:

I didn't make it to Promontory Summit to celebrate 150 years since the completion of the First Transcontinental Railroad, but I did get out

and about. It was enough to get a real feel for what an arduous task it must have been to build that line across desolate terrain in a climate that says, "Nature doesn't really want you here."

I think if the hobby is experiencing growth anywhere, it's in N scale. Younger people coming into the hobby are embracing the smaller scale



Some of the all-time greats are on display at Ogden Union Station. None were as useful as the 40-foot boxcar.

for its economy and footprint. That's the way I see it.

An hour train ride north of Salt Lake City is Ogden Union Station and the Utah State Railroad Museum. Among its rolling-stock highlights: Union Pacific gas turbine 26, UP Centennial DDA40X no. 6916, UP 4-8-4 no. 833, and Denver & Rio Grande Western tunnel



motor SD40-2T no. 5371. Also, an ordinary UP 40-foot Association of American Railroads-standard boxcar.

Guess which one got the most attention?

The grand behemoths are great, but the details on the lowly old boxcar are far more useful for modeling.

Take time to see – and embrace – the mundane on your travels.

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Siemens SC-44 Charger diesel-electric locomotive. A pre-production sample of this recently announced model was unveiled by Bachmann. The Siemens SC-44 Charger will be decorated for Amtrak (Midwest in two road numbers and Pacific Surfliner and Cascades [WSDOT] in one number each).

The HO scale model (\$459) will have a die-cast metal frame, a dual-mode TCS WOWSound decoder with Audio Assist, a KeepAlive capacitor, and interior corridor work lights. The model is scheduled for release in 2020. Bachmann Trains, 215-533-1600, www.bachmanntrains.com

Contemporary the theme at 2019 national

Fans of the modern era had a lot to look at during the 2019 National Train Show at the Mountain America Exposition Center in Sandy, Utah, a suburb of Salt Lake City, in early July.

Bachmann's HO scale Siemens SC-44 Charger (above), Kato's N scale Amtrak

Viewliner II baggage car (opposite), and Atlas' HO scale Gunderson Multi-Max auto rack (opposite) were among the contemporary models featured.

Lionel Trains marked its return to HO scale with several new items, including the MagneLock track system. The

track, opposite, features molded roadbed with magnets to hold sections together.

To see the more than 150 product announcements (almost all of which have photos) and our video report on the show, visit the magazine's website, www.ModelRailroader.com.



Peco's Bob Phelps received the National Model Railroad Association's Distinguished Service award. From left are NMRA Honors Committee chair Allen Pollock, Phelps, and NMRA president Pete Magoun. Hal Miller photo

Peco's Phelps honored by NMRA

Bob Phelps, former principal product design engineer at Peco, received the National Model Railroad Association's (NMRA) Distinguished Service Award during the National Train Show in Sandy, Utah. Phelps started his career with Peco in 1963 and retired in 2016.

The award was presented to Phelps during a ceremony at the Peco booth. He received the award from NMRA Honors Committee chair Allen Pollock and NMRA president Pete Magoun.

HO scale locomotives

- **Electro-Motive Division F7A-B-A diesel locomotive set.** Coca-Cola. Permanent drawbar-connected units. Modeler-installed snow plows, detailed cab interior in A units, mfx+ digital sound decoder, two powered axles per unit, traction tires, directional warm white light-emitting-diode headlights (conventional and digital modes), illuminated number boxes on A units, and wire grab irons. \$659.99. Märklin Inc., 573-365-9522, www.marklin.com

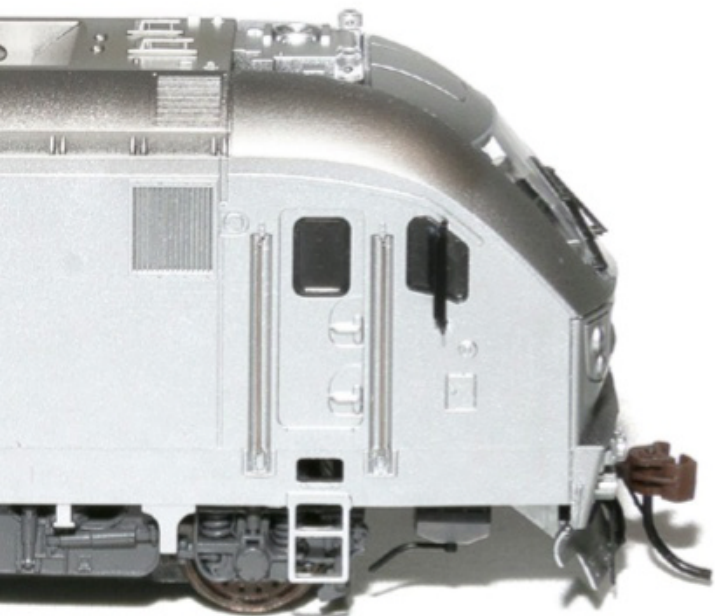
HO scale freight cars



- **Evans 5,277-cubic-foot-capacity boxcar.** Wisconsin Central (Sault Ste. Marie Bridge reporting marks),

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Canadian National, Ferdinand RR, Laurinburg & Southern, Mississippian Ry., and Ontario Northland. Undecorated kit also available. Drop-style grab irons, 33" or 36" metal wheels, 70- or 100-ton trucks, and Kadee no. 58 couplers. Price to be announced. Late summer 2019. ExactRail, 866-945-1701, www.exactrail.com



- **50-foot boxcars.** Pre-production sample shown. Plug-door boxcar: Denver & Rio Grande Western. Sliding-door boxcar: Milwaukee Road, Pennsylvania RR, and Southern Pacific. Four road numbers per scheme. Metal wheelsets and plastic couplers. \$21.99. Fall 2019. Hornby America Inc., 877-358-6405, www.hornby.com
- **National Steel Car 4,300-cubic-foot-capacity three-bay covered hopper.** K+S Potash Canada. Forty-eight road numbers (eight six-packs). Prototype-specific details, metal wheelsets, and Kadee no. 58 couplers. Six-pack, \$264. Graphics by North American Railcar Corp., available exclusively from Pacific Western Rail Systems, 866-840-7777, www.pwrs.ca

HO scale structures

- **Rockfish Cafe.** Laser-cut basswood walls with laser-cut door and window openings, plastic windows and doors, interior, and detail castings. Measures 7 1/4" x 3 1/4". \$42.95. JL Innovative Design, www.jlinnovative.com

Conducted by Cody Grivno

N scale



Amtrak Viewliner II baggage cars. These models are now available from Kato USA Inc. The Amtrak Viewliner II baggage cars (\$35 each) are decorated in the passenger carrier's phase 3 heritage scheme in two road numbers. The N scale injection-molded plastic models have metal wheels, Kato knuckle couplers, modeler-installed trip pins, and window glazing. Kato USA Inc., 847-781-9500, www.katousa.com

HO scale



Gunderson Multi-Max auto rack. Atlas Model Railroad Co. displayed a pre-production sample of this modern car. The Multi-Max will be decorated for Canadian Pacific/Soo Line, BNSF Ry., Canadian National/Grand Trunk Western, and Kansas City Southern in four road numbers each; it will also be available undecorated. The HO scale model will have new flatcar, truck, and superstructure tooling; four body style variations; and metal couplers. The Master Line model, due out in late 2019, will be priced at \$99.95 (undecorated, \$89.95). Atlas Model Railroad Co., 908-687-0880, www.atlasrr.com

HO scale



MagneLock track system. Lionel announced its return to HO scale in Salt Lake City. Among the products displayed was the MagneLock track system, featuring 4 1/2" and 5" straight sections and 20" radius half-curve four-packs, \$19.99 each; 9" straight and 20" radius curve four-packs, \$22.99 each; and code 83/100 rail joiners (24-pack, \$2.99; 400-pack, \$34.99). The track features nickel silver code 83 rail, molded roadbed with magnets, and electrical connections under the roadbed. The track can be joined to other brands of HO track with rail joiners. Lionel LLC, 800-454-6635, www.lionel.com

HO scale



53-foot Railgon gondola. This HO scale gondola was one of several new items announced by Wm. K. Walther's Inc. The 53-foot Railgon gondola (pre-production model shown) will be decorated for Baltimore & Ohio; Chicago & North Western; Delaware & Hudson; Denver & Rio Grande Western; Elgin, Joliet & Eastern; Railgon; and Soo Line. The HO scale Walther's Mainline model (\$27.98) is due out in June 2020 and will feature new tooling based on Railgon 310000-series cars and have Proto-Max metal couplers, 100-ton roller-bearing trucks, and 36" turned metal wheelsets. Wm. K. Walther's Inc., 414-527-0770, www.walther's.com

HO scale details and accessories

- **Assorted white-metal details.** Railroad telephone crossarm four-pack, \$2.10. Band saw, \$5.35. Light pole transformer, \$2.10. Mailbox three-pack, \$1.85. Pack mule and pack, \$10.50. Passenger car vent four-pack, \$2. Potbelly stove

with stove pipe, coffee pot, and coal bucket, \$5. Surface grinder, \$5.35. Alexander Scale Models, 269-944-5129, www.alexanderscalemodels.com

- **Industrial shell and tube heat exchanger flatcar load.** Scale 6 foot diameter; scale 45 feet long. 3-D printed in ABS plastic. Kit, \$28; assembled and

primed, \$40. Measures 6½" x 1¼" x 2". Dimensional Modeling Concepts, www.dmcrrproducts.com

N scale locomotives



- **United States Railroad Administration heavy and light 2-8-2 Mikado steam locomotives.** Heavy: Milwaukee Road; Great Northern; Atchison, Topeka & Santa Fe; Chicago, Burlington & Quincy; Erie; and New York Central/Pittsburgh & Lake Erie. Light: Baltimore & Ohio, Canadian National, New York Central/Indiana Harbor Belt, Pennsylvania RR, Southern Ry. (one road number), and Union Pacific. Two numbers per scheme unless noted; both versions available painted black but unlettered. Die-cast metal body and chassis, golden-white light-emitting-diode headlights, and

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N scale freight cars



- **American Car & Foundry two-bay Center Flow covered hopper.** Rock Island, American Car & Foundry Co. (gray with ACFX reporting marks), Blue Circle Cement (gray), and eight other road names. Injection-molded plastic model with metal wheelsets. \$27.95. InterMountain Railway Co., 800-472-2530, www.intermountain-railway.com
- **Department of Defense flatcar with Humvee load.** Buckeye six-wheel trucks, plastic wheelsets, tie-down chains, and Magne-Matic couplers. Three-pack,

HO scale



Humble Home. This injection-molded plastic structure is part of the DPM Building Kit line from Woodland Scenics. The Humble Home (\$18.99) features injection-molded plastic construction and includes metal detail parts. Figures, street light, details, and landscaping are not included. Woodland Scenics, 573-346-5555, www.woodlandscenics.com



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HO scale



Electro-Motive Division SD70ACe diesel locomotive. A pre-production sample of this six-axle road unit was shown by Athearn Trains. The HO scale Union Pacific SD70ACe is decorated in the George Bush 41 Presidential Library and Museum scheme. The HO scale Genesis-series model is slated for release in December 2019 and will feature a removable cab roof secured with magnets and light-emitting-diode headlights and ditch lights. Direct-current models with 21-pin NEM plug for a Digital Command Control decoder will sell 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

Z scale



Alco RS-3 diesel locomotive. A test shot of this classic road switcher was shown by American Z Line. Proposed road names for the Z scale RS-3 include Burlington Northern; Canadian National; Delaware & Hudson; Denver & Rio Grande Western; Great Northern; Milwaukee Road; New York Central; New York, New Haven & Hartford; Northern Pacific; Pennsylvania RR; Seaboard Air Line; St. Louis Southwestern (Cotton Belt); Southern Ry.; and Union Pacific. The model will feature Association of American Railroads Type B two-axle trucks, prototype-specific details, and AutoLatch couplers. American Z Line, 614-764-1703, www.americanzline.com

Multiple scales

Zephyr Express. This Digitrax Digital Command Control starter set (**\$235**) includes a DCS52 all-in-one throttle/command station/booster, a PS314 power supply, one LT1 LocoNet cable and decoder test kit, a Zephyr Express quick start guide and manual, and a Digitrax decoder manual. The throttle features 2.4" liquid crystal display screen and large backlit keypad, a speed control knob and direction switch with brake, an integrated USB computer interface, and two- and four-digit addressing. Digitrax, 850-872 9890, www.digitrax.com



\$124.99. Micro-Trains Line Co., 541-535-1755, www.micro-trains.com

N scale passenger cars



• **American Car & Foundry light-weight coach.** Great Northern (*Empire Builder*, no. 1209). Injection-molded plastic with side grab irons painted silver, metal wheels, interior detail, and window trim. \$42. RailSmith Models, www.lowellsmith.net/railsmith

N scale structures



• **Bain & Mitchell Wagon Co. kit.** Includes two farm wagons and spare wheels. Measures 3 5/8" x 7 1/4". Based on prototype structure in Salt Lake City. \$69.99. RSLaserkits, 503-371-4290, www.rslaserkits.com

N scale details and accessories

• **20-foot standard height intermodal container.** BNSF Ry. (Chicago Division). Injection-molded plastic container with prototype-specific details, inter-box connecting pins, and JTC magnetic connecting system (magnet on bottom and metal plate on top). Single container, \$14.95. Jacksonville Terminal Co., 904-253-3430, www.jtcmodeltrains.com

O scale structures

• **ABC Brewery.** Kit features cast urethane walls, laser-cut wood and plastic parts, and custom signs. Distillery measures 8" x 15", bottling and warehouse measures 8" x 12", office and administration measures 8" x 14", and trackside freight dock measures 1.80" x 35". Complete kit, \$1,150. Individual buildings: distillery, \$325; bottling and warehouse, \$265; office and administration, \$385; and square smoke stack, \$75.

Altoona Model Works, 814-793-7016,
www.altoonamodelworks.net

Large scale locomotives



- **2-6-0 Mogul steam locomotive.** Union Pacific and Atchison, Topeka & Santa Fe. Directional light-emitting-diode lights, smoke unit, sound decoder, and PIKO SmartDecoder. Full featured in direct current and Digital Command Control. \$649.99. PIKO America, 619-280-2800, www.piko-america.com
- **Electro-Motive Diesel SD70ACe diesel locomotive.** 1:32 proportion. BNSF Ry. (Heritage III), Electro-Motive Diesel demonstrator (yellow), Norfolk Southern (as-delivered and Reading Co. heritage schemes), Union Pacific (as-delivered, Denver & Rio Grande Western heritage, George Bush 41 Presidential Library and Museum, and Spirit of the Union Pacific

HO scale



Thrall-Trinity 42-foot coil steel car. ScaleTrains.com unveiled a sample of its next Rivet Counter line freight car. The Thrall-Trinity 42-foot coil steel car will be decorated for CSX, Canadian Pacific, Chicago Heights Terminal & Transfer, Conrail, Indiana Harbor Belt, and Norfolk Southern. The HO scale model (\$46.99) will be offered in three body types with six removable hood styles; photo-etched metal walkways; a simulated wood interior; separate, positionable load dividers; a coil steel weight load; and American Steel Foundries 100-ton trucks. The model is scheduled for release in late 2019/early 2020. ScaleTrains.com Inc., 844-987-2467, www.scaletrains.com

schemes). One road number each. Polycarbonate body, light-emitting-diode lighting, remote-controlled Proto-Couplers, and Proto-Sound 3.0. \$749.95. MTH Electric Trains, 410-381-2580, www.mthtrains.com

Electronics/controls

- **TS3 trackside signal control circuit.** Detects trains using infrared light and controls track signals at a junction or passing siding. Circuit works on

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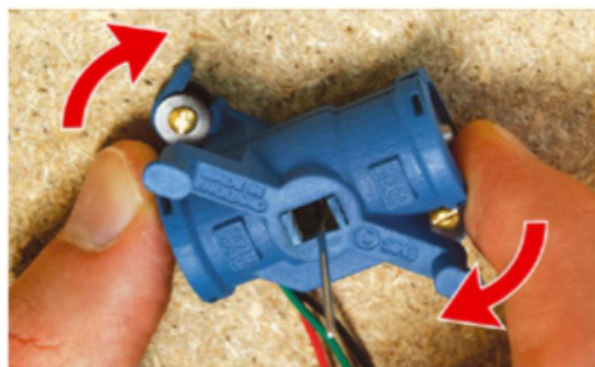
HOn3 scale



Denver & Rio Grande Western 30-foot refrigerator cars. Blackstone Models is offering new road numbers on its popular narrow gauge refrigerator car. The Denver & Rio Grande Western HOn3 car will be offered with the Moffat Tunnel herald in two numbers and Flying Grande lettering in four numbers. The model (\$64.95) will have Kadee no. 714 couplers, prototype-specific details, and a built-in speaker housing and openings in underbody for installation of a SoundTraxx Tsunami SoundCar Digital Command Control decoder (sold separately). Blackstone Models, 970-259-0690, www.blackstonemodels.com

alternating current, battery-powered layouts, direct current, and Digital Command Control. Can be linked to other TS3 circuits and TS2 and TS2-D signal circuits. Computer-free system can be expanded and reconfigured. Automatically adapts to common anode (positive) or common cathode (negative) light-emitting-diode signals. Features onboard current-limiting resistors. User can select three-aspect (clear/approach/stop) or four-aspect (clear/advance approach/approach/stop) operation. TS3 with two infrared sensors, \$49; two-pack (two circuits and four sensors), \$89. Azatrax, 303-775-2214, www.azatrax.com

- **Lamplighter 2.** Provides power for more than 45 Dwarvin fiber-optic lamps. Works with all scales. \$129. Dwarvin Enterprises Ltd., www.dwarvin.com



- **TwistLock turnout motor.** 16VAC, 3A solenoid turnout motor. Compatible with all Peco (and other manufacturers) turnouts up to O scale. Can be removed and refitted repeatedly. Drive pin long enough to reach through baseboards up to 15mm (.59") thick. Twin microswitch attachment twist-locks to motor for changing polarity. Surface mounting option available. Options include TwistLock turnout motor, turnout motor and microswitch, turnout microswitch,

and surface-mount turnout motor. Prices to be announced. Pritchard Patent Product Co. Ltd. (Peco), +44 0 1297 21542, www.peco-uk.com

Scenery



- **Flexible dry stack rock walls.** Dry stack blasted rock (HO and N scales) and dry stack fieldstone (all scales). Flexible, interconnecting vinyl sheets designed for hillsides. Sheets measure 3½" x 11½" \$14.99 each. Chooch Enterprises, 425-273-4794, www.choochenterprises.com



- **Assorted tunnel portals.** HO scale Hoosac west portal, \$48.50. N scale auto portals (concrete and stone), \$8.95 each. S scale Lehigh Valley double-track portal, \$34.50. Pre-Size Model Specialties, 970-527-4586, www.pre-size.com

Weathering supplies

- **Weathering Mix.** New colors: Burnt orange, emerald green, fern green, marigold yellow, moss green, olive green, and pumpkin orange. Alcohol-based washes. Eight-ounce bottle, \$10. Hunterline, 866-934-4174, www.hunterline.com 

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Industries line the Fox River in Appleton, Wis., site of the first hydroelectric power station, on Gordon Lind's N scale model railroad. Dave Rickaby photo

Museum gem

I'm delighted that Gordon Lind's N scale layout depicting Appleton, Wis., is now in a local museum ["Rolling on the river," August]. Model railroads are great Americana and folk art, and as such should be preserved when they are a good fit within the scope of a museum or historical society.

Sam Powell's freelance Penn Creek Valley, featured in *Great Model Railroads 2015*, now resides in the Tri-Town Area Historical Society Museum in Dawson, Pa. Sam designed his layout to come apart in sections for easy moving, and he was consciously modeling southwestern Pennsylvania, which appealed to the historical society. Much credit is due to Sam's family and friends for making this happen. It should happen more often.

*Richard Lind
Rio Rancho, N.M.*

InterMountain trucks

In the August Ask MR, Jason Layne writes that after taking the trucks off an InterMountain Ry. freight car, "the trucks and wheels come apart" and that he's "tried cyanoacrylate cement (CA) to no avail." Your reply perhaps misses the point when you say "the sideframes and bolsters are one piece." This is the case now, but I believe the first runs of the cylindrical hoppers, and all of the many kits I've built, have three-piece, non-rigid trucks (plus brake beams).

The sideframes have short pins that click into the bolsters and allow the sideframes to move slightly (and come apart sometimes as trucks are removed). If that is Jason's problem, I don't recommend gluing the sideframes to the bolster, because of problems getting perfect

alignment of the sideframes and bolster. I've found that the non-rigid trucks don't roll as well as one-piece trucks, and, as you point out, the best solution is to replace the trucks.

Replacement one-piece rigid trucks without wheelsets are available from InterMountain if he wants to use his existing wheelsets. New wheelsets are also available. Trucks come with separate brake beams, but they're invisible when the car is on a layout and a nuisance to install.

*Roger Walker
Calgary*

DCC buyer's guide

I was stunned to see no mention at all of the Lenz system in "A buyer's guide to DCC systems" by Dana Kawala [July].

This is a robust and well-developed (and recently updated) system that's been around for many years, and Lenz was one of the pioneers in both developing and popularizing DCC control.

*Jim Brown
via email*

As stated at the beginning of the roundup, we focused only on systems actively marketed in North America. This statement no longer applies to Lenz. I reached out to the firm that was a major distributor of Lenz products in the U.S. and was told that Lenz is no longer actively participating in the North American market. The Lenz USA website also hasn't been updated in several years.
– Dana Kawala, senior editor

DCC coverage

In a recent blog post (dccguy.com), DCC Corner writer Larry Puckett discusses ideas for upcoming columns.

Ever since MR started covering electronics in model railroading, these articles have been my first go-tos. When the CTC-16 was introduced in your pages [December 1979], I was too young and poor to build it, but I followed it carefully and knew that this was the future.

So please keep the articles coming on this aspect of the hobby.

*Greg Williams
Canterbury, N.B.*

Like the real thing

There's a lot of truth in the July cartoon [by Matt Matteo] depicting Canadian National railroaders going to an operating session to see the layout.

Once, at a model railroad show, I spotted two men who looked like real railroaders. I tagged along at a discreet distance to hear what they had to say. They stopped to examine a model locomotive painted, lettered and weathered to replicate a locally assigned locomotive.

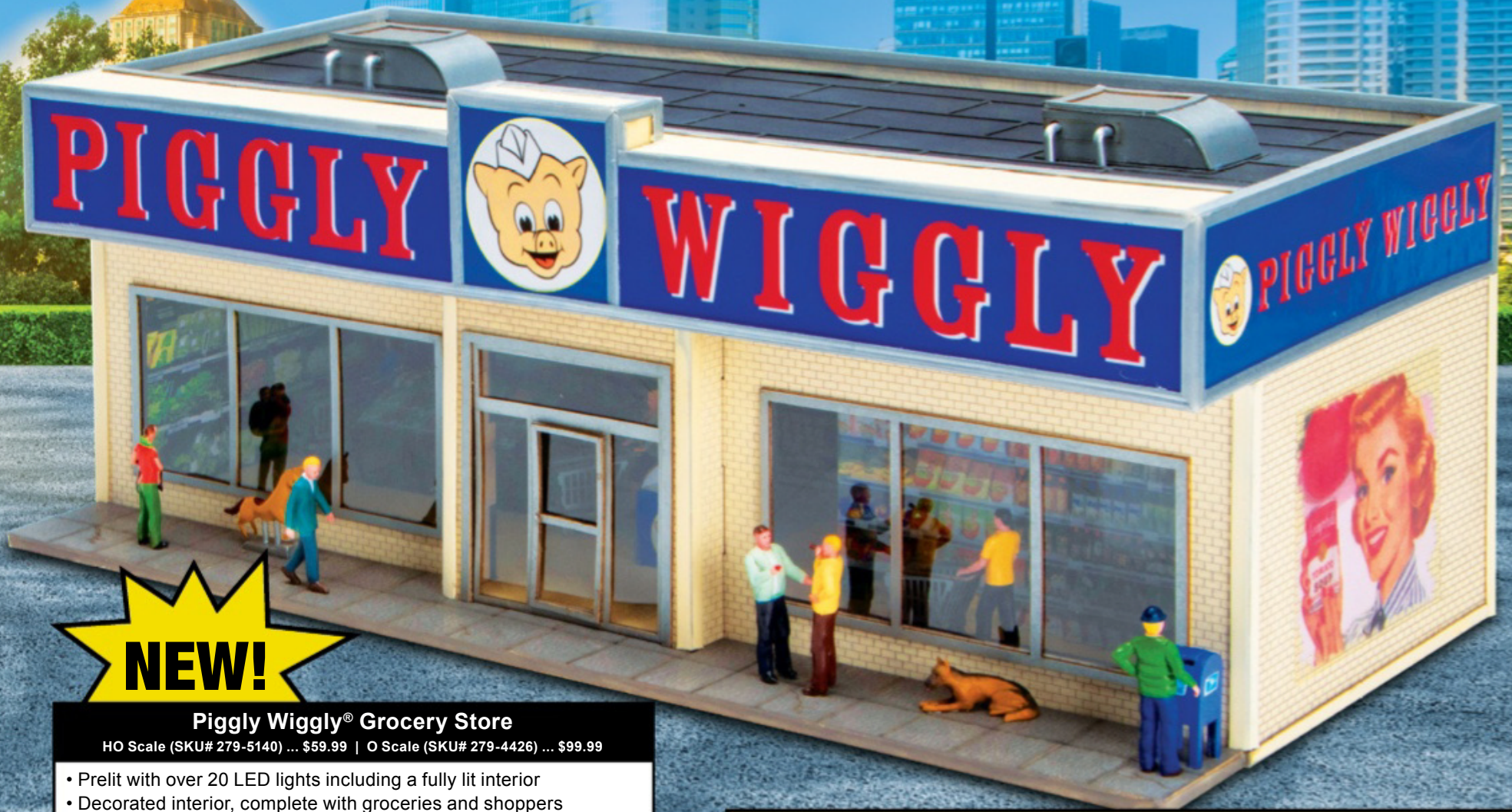
One of the men said to his pal, "Look, he's got the fire extinguisher decal on crooked just like it is on the real one."

Yeah, some of the real guys do pay attention to what we do.

*Gordon D. Jomini
Fredericton, N.B.*

Comments, suggestions, and additional information on *Model Railroader* articles and departments are welcome in this column. Every comment will be read, but not all can be printed or answered. Make your statement in 300 words or less, and send it to **Railway Post Office, Model Railroader magazine, P.O. Box 1612, Waukesha, WI 53187**, or e-mail rpo@mrmag.com. Please include your name, city, and state.

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Model Railroader Video Plus contributor Charlie Conway visited the Copper Basin Ry. for the MRVP video series "Taking Care of Business." David Popp later designed an HO scale model railroad of the prototype. Charlie Conway photo

Where do I get Copper Basin Ry. maps?

Q Just recently, I watched parts 1 and 2 of "Taking Care of Business: Copper Basin Ry." on Model Railroader Video Plus. I wanted to design a track plan for the Copper Basin, but I can't seem to find detailed maps of the railroad. Do you know of any good maps I could use? Thanks.

Braden Gryskiewicz, Wadsworth, Ohio

A Hello, Braden! Thanks for dropping us a note. I designed an HO track plan for the Copper Basin Ry. (CBR), which you can find on pages 26 and 27 of *Model Railroading: The Ultimate Guide 2019*. It might serve as a good starting point for your own layout design.

To plan that layout, I spent a lot of time with Google Maps satellite images, following the entire line from the Union Pacific connection to its conclusion. I made a number of screen captures of key line details and features to help pull together the finished plan. Google's satellite images are far better than any maps you may come up with, as they give you not only track and structure locations, but also scenic details.

Even on a limited railroad like the CBR, which serves just one industry, I couldn't hope to have included all of the trackage on the prototype. Following the operating details from Charlie Conway's two videos, I selected tracks that would make sense for a model railroad that could be run with a few friends.

I particularly had fun tracing the maze of tracks for the ASARCO industrial railroad inside the Hayden smelter. I could only guess at half of their functions, but some of the tracks had good clues – particularly where various types of cars were spotted. The ASARCO railroad could easily make a layout all on its own.

Best wishes on your endeavor! – David Popp, Model Railroader Video Plus producer

As for your interchangeable module idea, well, that's what modular means. It's easy to switch out modules on a stand-alone layout to change up industries or scenery; we ran an article like that back in February 2008. Check out "Seven paired industries, one versatile scheme" by Robert P. Foster.

Q After a many-year hiatus in the hobby, I'm going through my boxes of HO scale trains for a project to do with my grandson. I found the December 1974 MR with Jack Work's article "Track Planning for Small Spaces." I had always hoped to build it as a standard gauge HO layout with 18" minimum radius. Now the time is right. Any ideas on how to convert that track plan would be appreciated.

Michael Barber, Reston, Va.

A It looks like the minimum radius on Mr. Work's track plan is 10". Enlarging the plan 180 percent (1 track square = 21.6") would give you a minimum radius of the desired 18". Mathematically and geometrically, it would probably be easier on you to simply double the size of the plan (1 square = 24", minimum curve radius 20"). The only adjustment to be made after that would be to change the spacing of parallel tracks to conform to the standard for HO scale (2 1/8" on center). This may allow you to add more tracks in yards, as well as more and larger trackside structures. Let us know how your project comes out.

Q I'm building an N scale model railroad and having a problem with my turnouts. When one of my locomotives goes into the turnout, it loses power. It seems as though the plastic frog and/or guard rail will raise one side of the engine off of the rails. I can press down on the engine and it will run again. What can I do to rectify this situation?

Wayne Lilly, Glenarm, Ill.

A Figuring out what's consistent about the problem will help you narrow down what the problem is. Does it happen on all your turnouts? Are they all the same type, brand, and size? Then it might be the locomotive. Check whether the locomotive's wheel flanges meet National Model Railroad Association (NMRA)

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

Q I notice there are different types of tempered hardboard. Which hardboard type did the MR staff use for its T-Trak module challenge (June 2016), and how thick was it?

I'm thinking of doing a similar concept for my 2'-6" x 8'-6" switching layout so I can lift off modular sections from an L-girder platform and replace them with a new block of scenery. In this way I could continually refresh and

modify the railway over time. Do you know of anybody who's done something similar? Is this a crazy idea?

Mark Rees, Toronto

A Whenever we use tempered hardboard for a project, it's almost always 1/8" thick, single-side surfaced. That's what we used for our T-Trak module challenge and for the fascia and backdrop of many other projects.

wheel contour standards, or whether they're too big. If the flanges are oversized (what modelers call "pizza cutters"), look into replacing the wheels with ones that conform to the NMRA Recommended Practice RP-25 contour.

Or does it happen on only one turnout? Then it's probably something about that particular turnout. Perhaps you've installed it at a point where the track grade begins or ends, and the turnout's elevation is uneven, causing a "hump" at the frog. Remove the turnout and check for a hump in the middle of the roadbed. Rasp it flat and reinstall the turnout. Good luck tracking down your problem.

Q I have several Mantua "Big Six" 0-6-0 locomotives that I built in the 1970s. I put can motors in them 20 years later. They don't run very well now, and I tracked down the problem to the driver wheels. I tried to clean the axles along with the brass bushings and the cavity in the frame, but they still have poor electrical contact. Is there any trick to cleaning the axles, bushings, and frame to get a good electrical connection?

Joe O'Neill, via e-mail

A As old as those locomotives are, their zinc-alloy frames might be suffering from corrosion that interferes with electrical conduction. There's no way to reverse that short of replacing the frame. Instead, I would bypass the frame. Insulate the motor from the frame with tape, solder wire leads onto its pads, and install phosphor-bronze wipers to pick up current directly from the wheels and carry it to the motor.

Q I've seen "paint stands" for steam engines that make the wheels spin while the locomotive is being painted so the side rods don't block the paint from the drivers. I'd like to put one of these in my paint booth, but my locomotives are all Digital Command Control. Do I need to have an expensive DCC power source, or can I temporarily run the locomotive using an old direct current power pack?

Ray Mlecko, Phoenix

A Most DCC decoders made in the past decade are "dual mode," meaning they will run under direct current as well as DCC. Unless your decoders are old, they should work on DC. Check the manual that came with the engine or decoder.

READER TIP



Steve Ascolese uses a pocket jig to drill screw pockets into his benchwork joists, making them easier to remove in case a joist has to be moved to clear a switch motor or other under-benchwork item. *Steve Ascolese photo*

Sometimes you have to move a benchwork joist after it's been installed. For example, it might interfere with the installation of a switch motor or a signal mast. If the joist is installed using screws from above, tracks or scenery may cover the screw head. Adding a flange on top of each joist before installation allows attachment from underneath, but that's a lot of work and takes up vertical space you may need if there's staging underneath that deck.

My solution is to use a pocket screw jig to make pockets for attaching the joists to the tabletop from under the layout. If a joist needs to be moved, simply undo the screws in the pockets and move the joist. All of this is done under the benchwork, so nothing above is affected. – *Steve Ascolese*

Q What's the secret to getting a good masking job when painting models? I've used tan masking tape, blue painter's tape, green frog tape, and yellow frog tape, and I always get bleed through. I've been using spray paint from the hobby shop; would an airbrush be better?

Doug Coates, Brooks, Calif.

A I learned this trick from Group Technical Editor Cody Grivno. First, paint the entire object the color you're going to mask off (the stripe on a locomotive shell, for instance). Secondly, mask off your stripe, and then – here's the trick – spray the object with the same color again. This second coat will seal the edges of the masking tape, but any paint that seeps under the edge will be the right color. Finally, paint the body color one or two coats, and after it's dry, carefully remove the masking tape. Since the second coat of paint sealed the masking tape, you should get a crisp edge.

Q I'm thinking of superelevating the track on my N scale layout. My internet search reveals plenty of discussion on

the subject. What's most often recommended is lifting the track, typically by layers of masking tape, plastic strips, or gentle wedging. Wouldn't it be prototypically more correct to superelevate the entire cork roadbed? I'm thinking of lifting the outer edge of the cork, using 1/16" strips of basswood. Wood wedges would fill the inside space between the support surface and the cork bedding. All would be sanded down to create a smooth surface and also to adjust the superelevation at the spiral section.

Eberhard Jaeckh, Portland, Ore.

A Your method of shimming under the cork roadbed would work as well as shimming the track on top of the roadbed. It would be wrong to call either method "prototypically more correct," though, since the prototype doesn't use anything like cork roadbed, just ballast on top of dirt. Go ahead and use whatever method of superelevation works better for you. I personally prefer masking tape on top of the cork, since masking tape can be flexed around curves and built up gradually in thin layers. **MR**

Minton Cronkhite, Q gauge, and the Santa Fe

Minton Cronkhite, 1888-1971, one of model railroading's pioneers, forged the way in 1920s scale modeling with Ed Alexander and Fred Icken. His 1927-1928 Pennsylvania RR class IIs 2-10-0 Decapod was one of several locomotives featured in a June 1966 *Model Railroader* story about his engine-building skills.

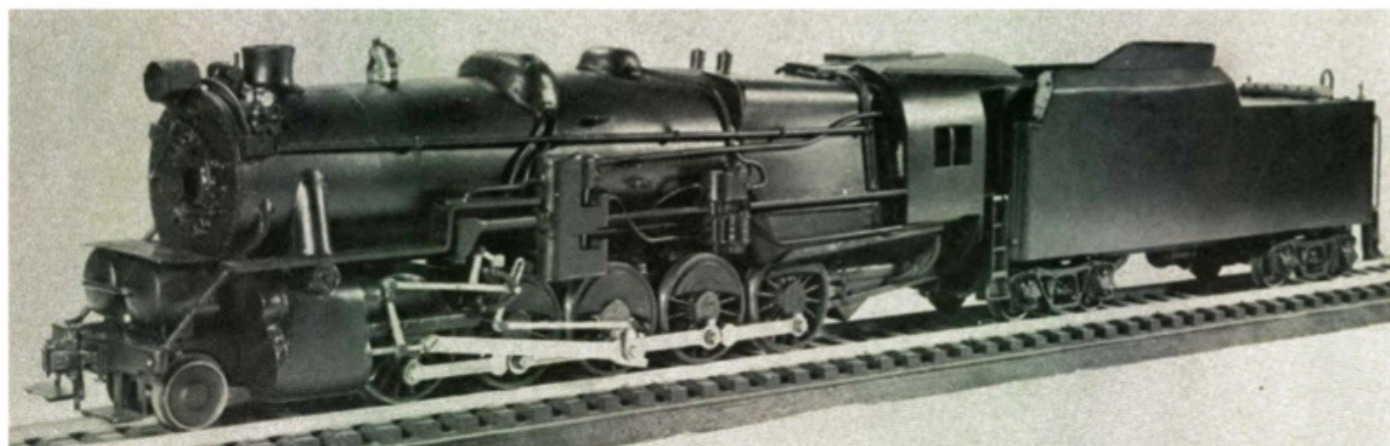
He moved from New York to California in about 1930, where his large San Marino & Santa Fe two-rail O scale home layout received publicity. He was contacted by the Atchison, Topeka & Santa Fe to build an O scale demonstration layout for the 1933-1934 Chicago Century of Progress Exposition.

Cronkhite espoused Q gauge, which corrected 1:48 O scale models to a more accurate 1³/₁₆" gauge track. With none commercially available, handlaid track was a necessity. Few truck suppliers meant re-gauging was also required.

His pièce de résistance was the 1941 Chicago Museum of Science and Industry layout with Q gauge steam and diesel locomotives made directly from Santa Fe blueprints. The layout was placed in a large hall with an upper balcony around all four sides.

Viewers could look down from about 12 feet to see it below, while at floor level, visitors could walk around the 45 x 60-foot layout and its low-lying rolling desert scenery.

While preparing the 1939-1940 San Francisco Golden Gate Expo layout, Cronkhite was busily



This Pennsylvania RR class IIs 2-10-0 Decapod was one of five built by Minton Cronkhite in 1927 and '28. It was among the first models built by this model railroading pioneer.

designing the Chicago layout to open in January 1941. The event was covered in the March 1941 issue of *Model Railroader* and the November 1941 issue of *Model Builder* magazine. The layout was modernized in 1953 with 1¹/₄" O gauge track. It saved having to re-gauge commercial models to the slightly narrower 1³/₁₆" Q gauge. Cronkhite's steamers were returned to the Santa Fe as diesels assumed greater importance.

Santa Fe relinquished ownership of the layout in the late 1960s, and it was dismantled and auctioned off on eBay in 2002. The iconic, historic layout no longer reflected current railroad operation, and was replaced by an HO scale layout built partially with donations from ATSF successor BNSF.

[See the June 2003 MR for more on the museum's current layout. – Ed.] Cronkhite continued building 1:48 scale steam locomotives for 1¹/₄" track until near the end, when Parkinson's disease encumbered him.

When creating expo locomotives, Cronkhite relied on Walthers and Lobaugh to



Atchison, Topeka & Santa Fe 2-10-2 Texas type no. 3872 was built after Cronkhite moved to California from the Northeast. Both it and the PRR Decapod at top were featured in a June 1966 MR story about Cronkhite's locomotives.

flesh out needed freight and passenger rolling stock; Lobaugh's 1940 catalog carried Cronkhite's Electro-Motive Division E1 and stainless steel streamlined passenger cars.

O scale was the "rich man's" hobby, too costly for a Depression-era wage-earner. Ed Alexander cataloged an O scale steam locomotive in 1930 equal in price to a \$495 Chevrolet roadster. Rather, a growing Hi-rail O gauge market was best exemplified by Lee Ridgman's expansive Centinella Valley RR club's mix of scale-tinplate and commercial O scale inside-third-rail kit locomotives and cars.

Q gauge, discussed at times in letters to editors in the postwar hobby press but never fully adopted, remained an obscure sideline as most O scale manufacturing held to National Model Railroad Association (NMRA) 1:48 O scale standards.

Cronkhite's Santa Fe layouts were: 1933 Chicago demonstrator, 1935 San



The cover of the March 1941 *Model Railroader* featured a scene from Cronkhite's Museum & Santa Fe layout built for the Chicago Museum of Science and Industry.

Diego California-Pacific International Exposition, 1936 Dallas, Texas, Centennial Exposition, 1939 San Francisco Treasure Island, and 1941 Chicago Museum of Science and Industry.

For more complete information, see "Locomotives by Minton Cronkhite" in the June 1966 MR by James A. Slocum, pp. 44-49, with many photos of his locomotives. He was a man of great talent, prolific energy, and vision, who, like Alexander and Icken, led us on the path to where we are today. **MR**



Q GAUGE WAS DISCUSSED AT TIMES IN LETTERS TO EDITORS IN THE POSTWAR HOBBY PRESS BUT WAS NEVER FULLY ADOPTED.
– KEITH

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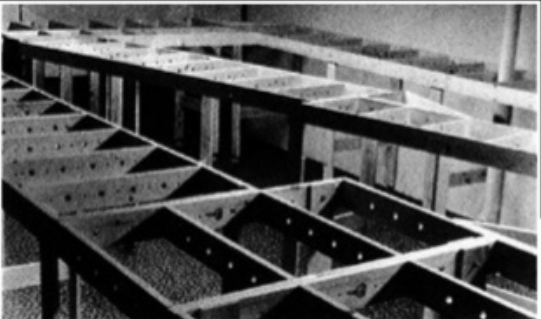
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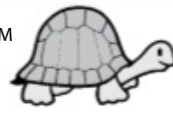
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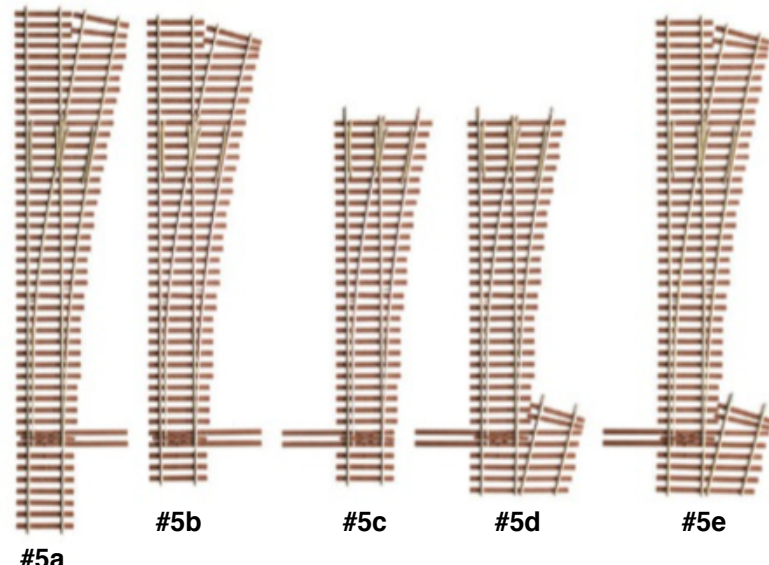
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Build, paint, and weather a structure kit

Design Preservation Models (DPM, part of Woodland Scenics) structures have been a part of model railroading for decades. In the August 2019 issue, I wrote about how to add and illuminate an interior for the company's HO scale Robert's Dry Goods kit (no. 10200). This month, we'll take a look at how to assemble, paint, and weather the building.

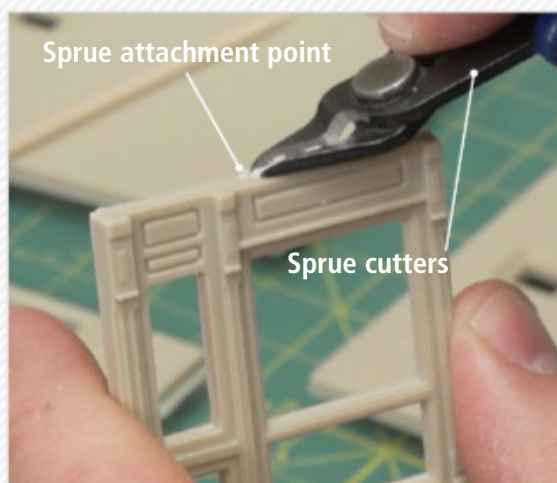
Now you might be thinking, "Really! This is a plastic kit. How tough can it be?" Well, to an extent you're right. But with DPM kits, it's the little steps you take, especially on the front end of the build, that make the finished structure look great. Cleaning sprue attachment points, removing flash, and squaring the edges to get tight corner joints are just a few things you can do.

But a well-built model is only part of the process. A prototypical paint job, some signs, and realistic weathering will make an ordinary building a standout.

So if you're working on a DPM kit, give these techniques a try. You can also watch me build and detail this structure from start to finish on "Cody's Workshop." The series is available exclusively on Model Railroader Video Plus (www.MRVideoPlus.com).



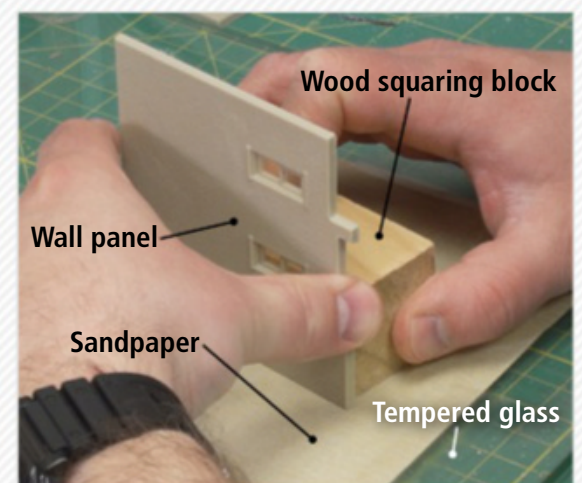
STEP 1 PREPPING THE PARTS



The wall panels were attached to a sprue, which was removed at the factory. However, there were still ragged chunks of plastic at the sprue attachment points along the edges of the wall. I removed them with a pair of sprue cutters.



Other parts had flash, excess plastic that oozed out of the mold. I removed the flash with a variety of tools, including jeweler's files, a no. 11 blade in a hobby knife, and, as demonstrated in the middle image, a sanding stick.



The wall edges are slightly beveled from the manufacturing process. To get the edges square, I held each panel against a wood squaring block and slid it back and forth on a piece of 320-grit sandpaper attached to a piece of tempered glass.

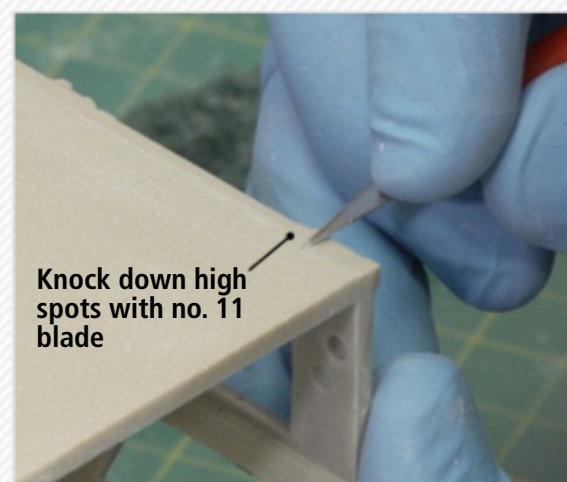
STEP 2 TIME FOR GLUE



I assembled the wall panels with Plastruct Bondene, a plastic solvent cement. To help keep the corners at right angles, I used Bachmann's magnetic snap and glue set, available from the Kalmbach Hobby Store (no. 84013). I applied the glue with assorted Microbrushes, also available at our store, and a paintbrush.

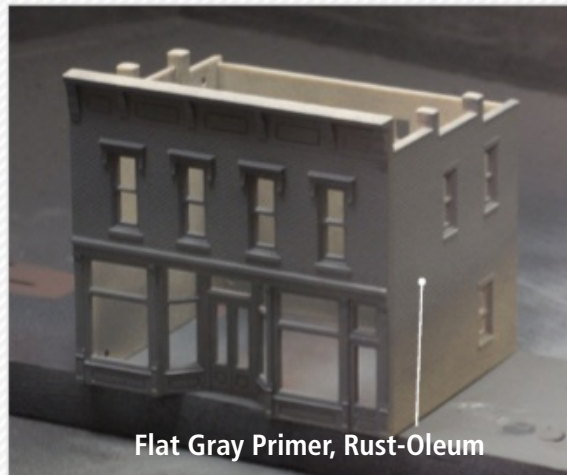


Next, I carefully applied plastic solvent cement to the joint from the outside with a paintbrush, as shown in the middle image. The solvent cement will melt the plastic, filling in any small gaps between the side wall panels and the front and back panels. The result will be a nice, tight joint that's nearly invisible.



Gluing a joint from the outside may cause some of the plastic to bubble up. To remedy this, I carefully ran a no. 11 blade in a hobby knife along the joint, knocking down any high spots. I followed that by passing a 3M final stripping pad (no. 10113NA) over the seam to remove any shiny spots from the glue.

STEP 3 PRIMING AND PAINTING



I washed the model in warm water with dish soap added to remove dust, skin oils, and other impurities that might affect paint adhesion. Then I spray-painted the model with Rust-Oleum Painter's Touch 2X Flat Gray Primer (no. 249088). The plastic-compatible paint, available at most big-box stores, doesn't craze plastic.

Before proceeding, I made sure the primer was completely dry. Then I airbrushed the building with Model Master no. 4720 Sand. Let some primer show through to give the bricks a weathered appearance.

I let the Sand paint dry overnight, then masked the side and back walls with blue painter's tape. To ensure

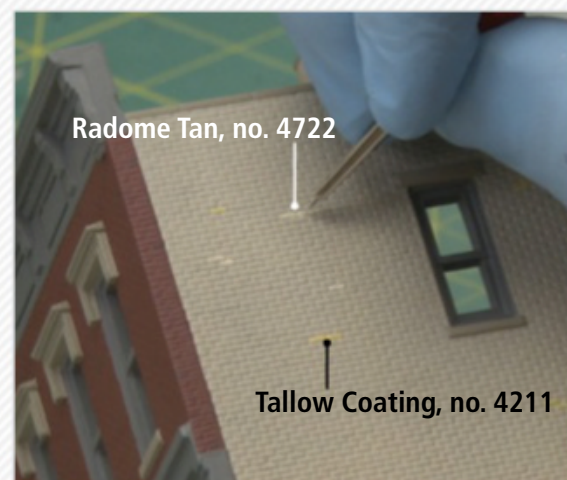
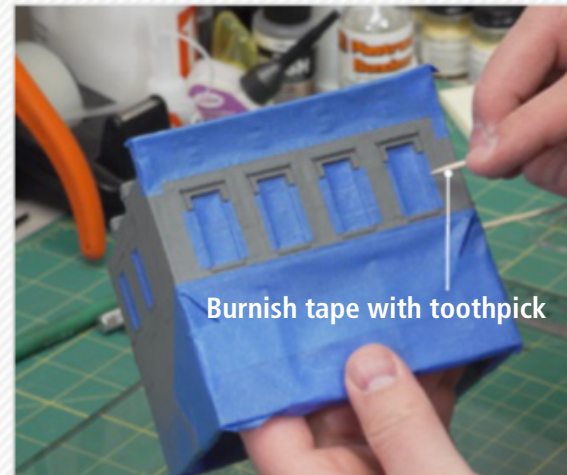


crisp separation lines, I trimmed off the factory edges with a sharp no. 11 blade. I burnished the tape with a toothpick after applying it.

I airbrushed the front of the building Oxide Red (no. 4882) and let it dry. Then I masked everything except for the windows, sills, headers, cornice, storefront, chimney caps, and ridge caps. I used an airbrush to paint these areas Reefer Gray (no. 4886).

Then I masked the windows, storefront, and cornice. I sprayed the headers, sills, ridge caps, and chimney caps Concrete (no. 4876).

Finally, I added spot color to individual bricks. I used Roof Brown (no. 4884) and Boxcar Red (no. 4881)



on the front wall. On the sides, I used Tallow Coating (no. 4211), Radome Tan (no. 4722), and discontinued Polly Scale SCL Hopper Beige (no. 414388) on the side and back walls.

STEP 4 DECALING AND WEATHERING



Decals adhere best to a glossy surface, so I airbrushed the building Model Master Clear Gloss Acryl (no. 4638). Once it was dry, I was ready to apply the King Midas Flour sign from T2 Decals Ghost Sign Decals set no. 5. While the decal was soaking in distilled water, I prepped the area by applying Microscale Micro Set (available from the Kalmbach Hobby Store, no. 84085). The solution softens the decal and helps improve adhesion. Then I set the decal into place and removed excess water with a cotton swab.

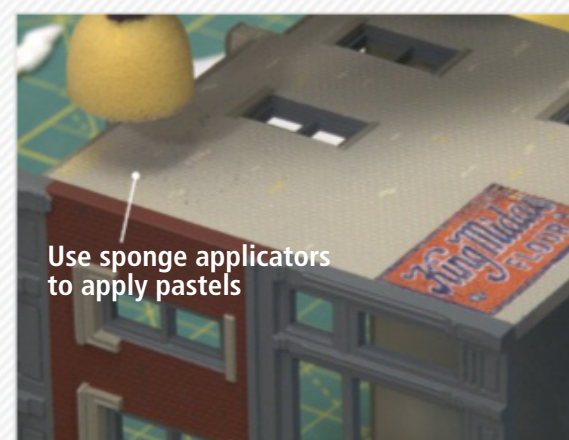
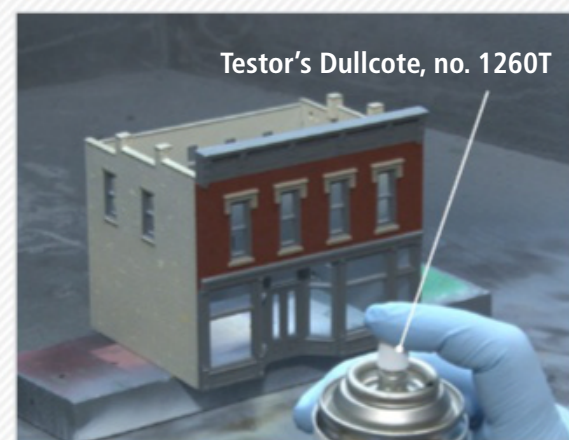
I let the decal set overnight and applied Micro Sol with a paintbrush.



The setting solution helps the decal conform to irregular surfaces, such as brick. You may wind up with trapped air bubbles during this process. If you do, pop them with the tip of a sharp no. 11 blade and apply more Micro Sol. Repeat as necessary.

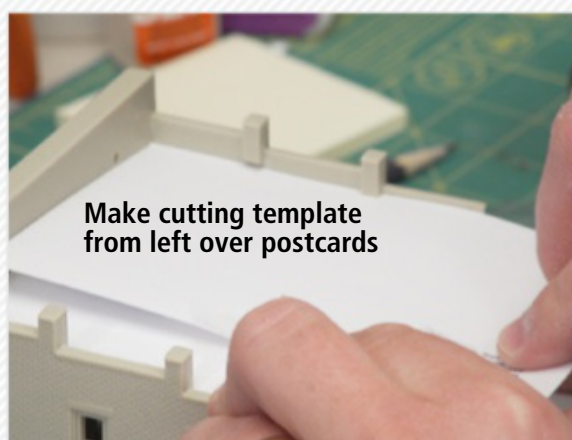
Satisfied with how the decal looked, I sprayed the model with Testor's Dullcote (no. 1260T). This not only gives the building a realistic, flat finish, but it gives the model some tooth for applying powdered pastels.

I used various shades of PanPastel to weather the sides and back of the building. Assorted sponge-type applicators work well for applying



PanPastel, as it keeps the material on the brick face and out of the mortar lines. If you don't like how the weathering looks, wipe it off with a damp towel or cotton swab and try again.

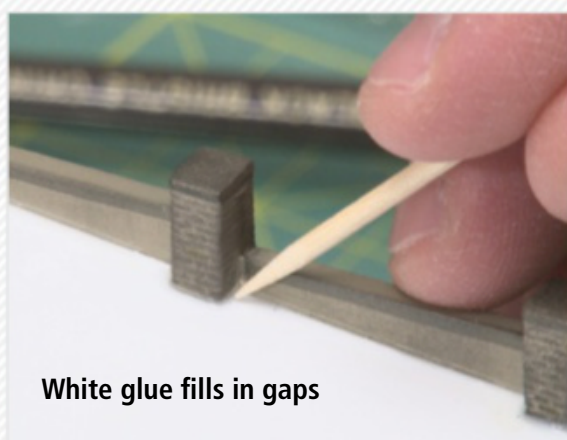
STEP 5 THE ROOF



The DPM kit includes one sheet of .020" styrene sheet for the roofing material. To make sure I cut the styrene right on the first try, I made a cutting template.

I attached the styrene roof to the building with Plastruct Bondene. Then I sealed the edges from the top with white glue to fill in gaps and seal the roof.

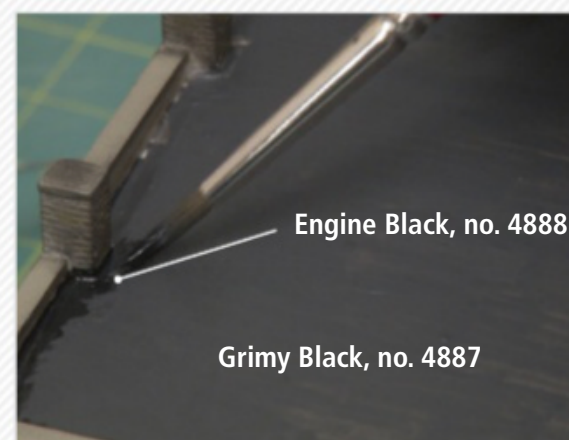
I brush-painted the roof Grimy Black (no. 4887). Then I used Engine



Black (no. 4888) to simulate sealant where the roof meets the walls.

Once the paint dried, I applied diluted white glue to the roof. With the glue still wet, I used a spoon to apply Smith & Sons no. 50 ballast.

Immediately after I had the ballast in place, I wet it with 70 percent isopropyl alcohol applied with a pipette. Hold the pipette close to the ballast. If you hold the pipette too high, it may cause craters in the ballast. **MR**





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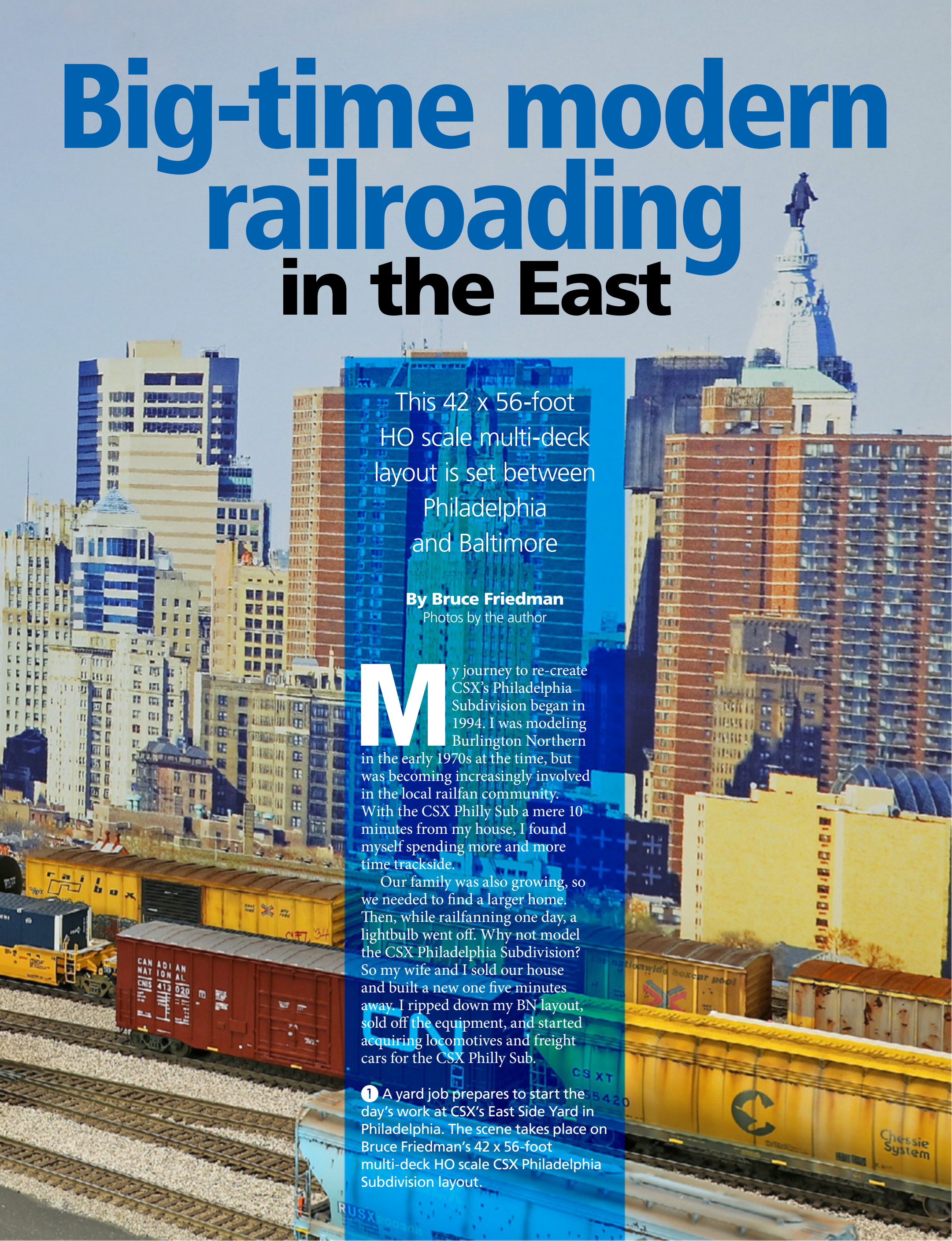
By Bruce Friedman

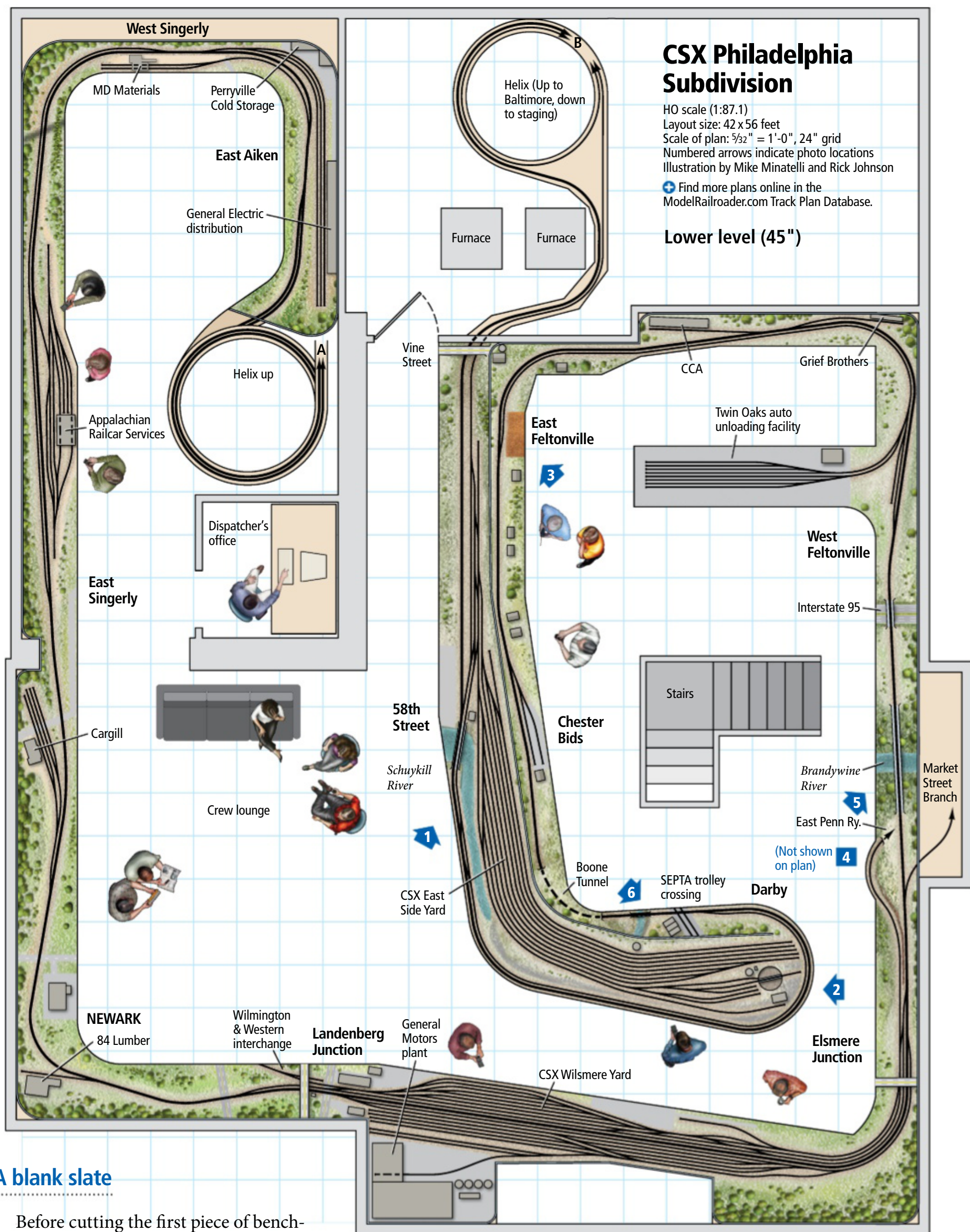
Photos by the author

My journey to re-create CSX's Philadelphia Subdivision began in 1994. I was modeling Burlington Northern in the early 1970s at the time, but was becoming increasingly involved in the local railfan community. With the CSX Philly Sub a mere 10 minutes from my house, I found myself spending more and more time trackside.

Our family was also growing, so we needed to find a larger home. Then, while railfanning one day, a lightbulb went off. Why not model the CSX Philadelphia Subdivision? So my wife and I sold our house and built a new one five minutes away. I ripped down my BN layout, sold off the equipment, and started acquiring locomotives and freight cars for the CSX Philly Sub.

1 A yard job prepares to start the day's work at CSX's East Side Yard in Philadelphia. The scene takes place on Bruce Friedman's 42 x 56-foot multi-deck HO scale CSX Philadelphia Subdivision layout.





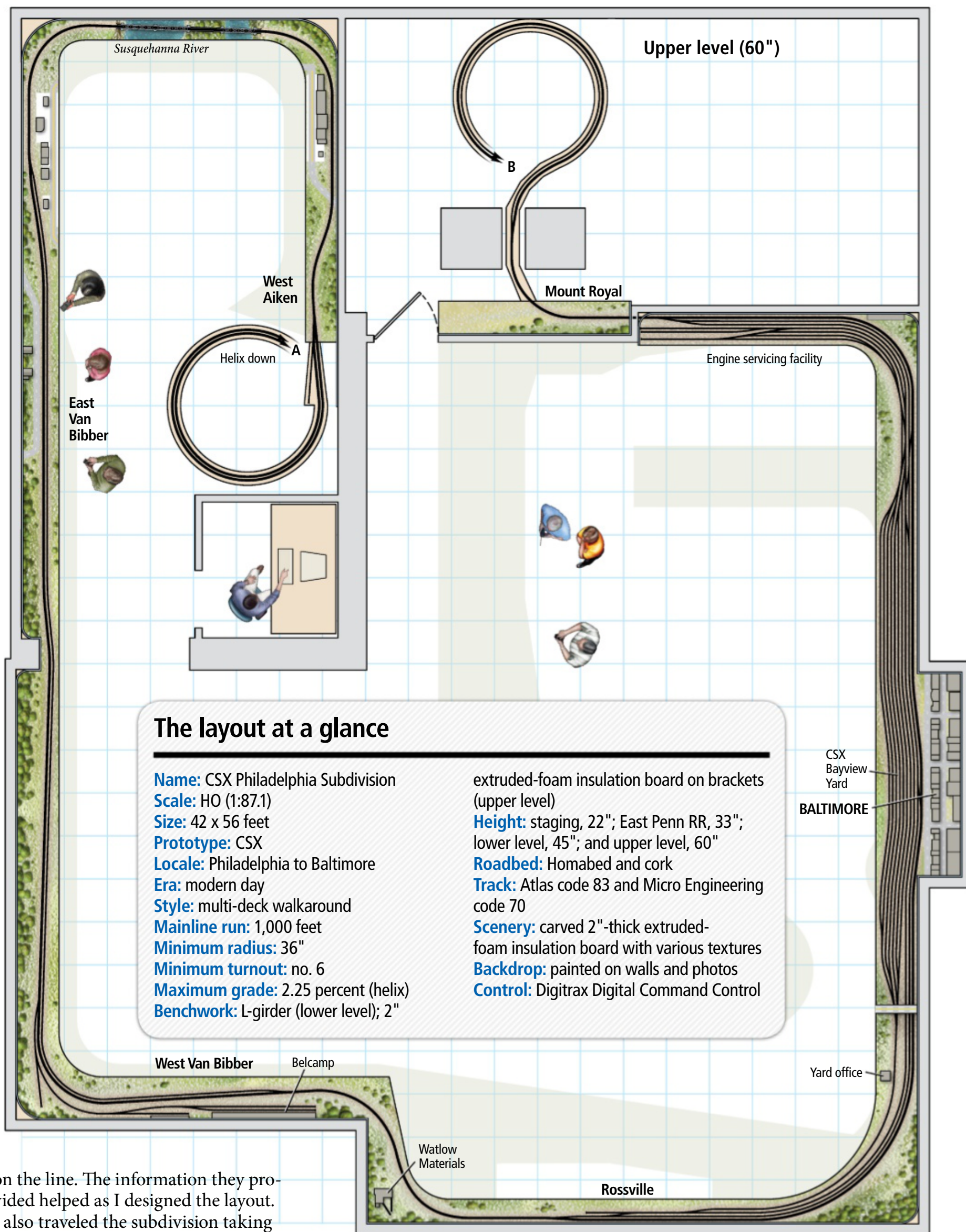
A blank slate

Before cutting the first piece of benchwork, I had the basement finished with carpeting and a drop ceiling. While that work was being completed, I drew the track plan on paper and had my friend Mike Minatelli convert it to CAD. This proved helpful, as I could see how things

looked before I started building. Having operated on several model railroads, I knew what I liked and didn't like. My goal was to have an operations-oriented

model railroad that re-created the Philly Sub as closely as possible.

Through railfanning, I became friends with CSX employees who worked



on the line. The information they provided helped as I designed the layout. I also traveled the subdivision taking pictures and notes.

Applying lessons learned

When I started work on the layout in 1994, it was point-to-point with no

staging. About five years later, I started hosting operating sessions, which opened my eyes to many things. I made changes as needed, but the lack of

staging was becoming an issue. It also became apparent that I needed to have a continuous-run option when the layout was on display during open houses.



2 This overall view shows how Bruce's layout fits in his basement. In the foreground is the CSX East Side Yard, which handles diesel servicing and freight car classification.

My solution was to model the three large classification yards that anchor the Philly Sub: East Side Yard in Philadelphia; Wilmere Yard in Wilmington, Del.; and Bayview Yard in Baltimore. Though these yards could hold between 150 and 300 cars, they filled up fast, acting more like staging yards. Clearly, this wasn't a long-term solution.

In 2001, I was considering how to solve both my continuous running problem and the need for staging. I had two levels on the layout at the time, connected by a helix with a 2.25 percent grade and 42" radius curves.

Then, as I was staring at the East Side Yard, it dawned on me I could add staging below, accessed via another helix. But the helix wouldn't be easy to build, as it had to serve three levels and allow for continuous running.

The new helix leaves the main level near East Side Yard, heads down to the new staging level below, runs around the yard, and climbs back up, emerging near Bayview Yard on the upper level.

My friend Dave Sommers, a technical guy with a good mind for these things, designed the helix in CAD. My good friend John Lassahn, a retired Conrail employee, helped design the staging yard. The 16-track yard can hold 400 cars. The seven-track engine terminal



3 Though Bruce's layout is set between Philadelphia and Baltimore, it's not all big-city scenery. CSX local D757, lead by GP40 road slug no. 2374, passes a farm as it pulls loaded auto racks from the ramp at Twin Oaks, Pa.

can support 30 locomotives. The layout now spanned four levels (upper, lower, staging, and the East Penn RR).

Fast forward to 2004. My wife and I had been talking about adding a sun-room to the back of the house. We originally wanted to put the addition on footers, but I inquired about putting a basement under the room. This 16 x 30-foot addition lengthened the

mainline run and provided space for new industries. I also built a room specifically for the dispatcher's office just off the crew lounge.

Building benchwork

I built the lower level with traditional L-girder benchwork. Once the lower level was finished, I built the helix next.

However, I wasn't sure how I was going to build the upper level.

I read about modelers having good results using 2" thick extruded-foam insulation board as a scenery base. For my layout I used 2 x 8-foot tongue-and-groove sheets of this material purchased at my local home improvement store.

Then I built a test section on the wall using heavy-duty shelving brackets. I screwed a 1 x 2 to each bracket to provide a gluing surface, then attached the foam with Liquid Nails for Projects, a latex-based adhesive that won't dissolve foam. I set a few bricks on the foam to hold it in place while the adhesive dried.

After a few days of drying, I put some track down and tested it. It was great. Satisfied with the results, I marked the outline of the track with a marker and installed Homabed on the main line and cork roadbed on the sidings, both of which I also attached with Liquid Nails for Projects. I used track nails to secure the track to the roadbed.

Keeping up with the times

My layout was doing well, but the real CSX was changing. I came to the conclusion that I wanted to stay current and thus started a cycle that continues today. As full-size locomotives and freight cars are repainted or retired, I make those changes on my layout. The same goes for operations and industries. As prototype trains are added or deleted and rail-served businesses open or close, I modify the layout accordingly. Rarely are two operating sessions the same.

The CSX Philadelphia Subdivision is a single-track line with five sidings. I modeled all of the sidings, the majority of which can hold at least 40-car trains.

CSX has been aggressively adding more online customers along the Philly Sub. I've tried to keep up, but due to space constraints only have 14 industries. However, this is more than enough to keep my operating crew busy.

My favorite industry is the Twin Oaks auto ramp. The full-size auto ramp has 10 tracks. My version has eight and can hold 40 auto racks.

Twin Oaks receives one loaded train per day and ships one empty train. The local spots the loads and pulls the empties to build a westbound unit train.

I use a card system copied from Ted Wilk's Chesapeake & Ohio HO scale layout to route cars. Every car has a waybill that dictates its route and destination. Dave Sommers wrote a program that searches a database of all the cars on my



Contemporary freight cars

When I started work on the CSX Philadelphia Subdivision, I did minimal weathering to my freight cars. But when I stood trackside, it became apparent that my shiny ready-to-run cars didn't match what I was seeing.

At first I weathered the trucks. Then I started painting wheelsets and adding graffiti to a few cars. Once friend Lenny Harlos finished a few custom-weathered freight cars with graffiti, I was convinced.

Since then, I've weathered hundreds of freight cars, many of which have graffiti. Other talented friends have contributed weathered and tagged rolling stock.

In 2004, the Federal Railroad Administration (FRA) mandated that freight cars and locomotives have reflective striping applied. The policy went into effect on Jan. 1, 2005, with a 10-year period to bring equipment into compliance.

I made an effort to buy new cars with factory-applied FRA striping. As the deadline was fast approaching, I took an inventory of my freight cars and found approximately 200 of the 800-plus cars were in compliance.

I accumulated the supplies necessary to bring the remaining 600 cars into compliance – Microscale decals, gloss coat, and Dullcote – and began work in September 2014. I worked on the cars 20 at a time in assembly line fashion. In April 2015, I finished the last car.

If I buy a car today that needs striping, I add it right away. And if decals aren't your thing, you can use peel-and-stick striping from Smokebox Graphics that's actually reflective. What a hobby! – *Bruce Friedman*

layout. I enter the car data, select a route based on full-size car movements, and print the cards on 3 x 5 cardstock.

Once a crew is assigned to a train, they receive the waybills. In yards, the waybills are given to the yardmaster; at industries, there are hooks on the fascia so the waybills can be left with the cars.

Signaling the layout, twice

When I started the layout, I knew I wanted to include B&O's distinct Color Position Light (CPL) signals. Once the

track plan was complete, I visited each real signal location and photographed the type of signal used.

I contacted Integrated Signal Systems (www.integratedsignalsystems.com). The company produces stock B&O signals and custom signals. Based on my photos, I determined that about 80 percent of the signals were stock ISS B&O CPL and dwarf signals. There were a few locations that required custom signals.

I had no plans to light the signals. Then I visited Fran Giacomini's B&O layout. As I was walking down the stairs,

4 The East Penn RR interchanges with CSX at Wilsmere Yard. Three of the line's road switchers are parked at the railroad's office in Kennett Square, Pa.



I saw the same signals I had from ISS, but Fran's were lighted and operational. I spent over an hour at his layout watching trains knock down the signals and display different aspects. I was hooked. I returned home that day and vowed that I would light my signals and make them operational.

Since I was already using Digitrax Digital Command Control (DCC) on the layout, I selected that firm's detection and signaling equipment. After a few weeks of studying the instructions and reading the Digitrax Yahoo forum, I finally began to understand how to set up the signals.

But I needed to tie the signals with dispatching software. Bob Garner came to the rescue and installed my Railroad & Co. TrainController software.

In 2013 CSX began replacing the old B&O signals with modern hooded signals. Over the next two years, the CSX worked west to east replacing signals. To keep up to date, I replaced the B&O signals with modern signals made by BLMA (now Atlas Model Railroad Co.)

Running like the real thing

With a functioning signal system, I began designing operating sessions that followed the real CSX Philly Sub

schedule. This was a huge undertaking. I learned quite a bit by railfanning and talking with CSX employees that work the line.

I operate all trains that run on the CSX's Philly Sub. I also run a CSX business train at most sessions. My initial plans were to operate every month. That wasn't realistic, as raising a family and working at a busy career didn't allow for this. I now host operating sessions about four times a year.

Since I want my operating sessions to be prototypical, it takes about a month to stage the layout. The first thing I look for is any changes to the prototype road trains. Do any trains need to be added or deleted from my operating scheme?

Then I look at the cars in the trains to make sure they reflect the types of cars currently running. I also block the cars following prototype practices. The road trains work the same yards on my layout as they do in real life. I follow the same procedures for locals.

Not all road trains do work on the Philly Sub. On my layout, these are just overhead trains that traverse the layout.

With the layout staged, I next assemble locomotive consists for the road trains and locals. My typical road trains are 40 to 50 cars long, so the locomotives assigned to the train must be able to

handle the train plus any pickups or set-outs en route.

It takes about 70 engines to run the schedule in an operating session. Just like the real railroad, we have failures during sessions, and these engines must be replaced. About 70 percent of my engines have sound, and I make sure that every lead engine is sound equipped. Most consists have at least two sound-equipped engines.

Smart-sized crews

Approximately 12 operators are needed to run the layout. In the early days, I would invite upwards of 20 people, but that proved to be too many and operators were looking for more work. I prefer to have just the right amount of operators so everyone remains busy.

I have a full-time dispatcher who works in a separate office. Train crews communicate with the dispatcher via Family Radio Service radios. On the full-size CSX, crews are required to call signals over the radio, and my crews do likewise. Since the layout has full block detection and signaling, crews run on signal indication.

Most of my crew members are active or retired railroaders, adding realism to the sessions. It's not uncommon for

members of my crew to operate on a full-size CSX road freight or local during the day and run the same train on my layout that evening.

Making the connections

CSX interchanges with the East Penn RR (ESPN) at Wilsmere Yard in Wilmington, Del. The short line is based in Kennett Square, Pa. The railroad typically runs down and interchanges into CSX's yard two days a week. It has rights to enter the yard (with dispatcher permission and signal indication) to set out and pick up cars.

On my layout, the ESPN goes west to Avondale, Pa., and north to Chadds Ford, Pa. Don Richard designed the ESPN for me and helped build it. Possible expansion of the modeled portion of the line to Coatesville, Pa., may happen in the future.

I have four of the ESPN's Electro-Motive Division GP38-3 diesels. During operating sessions, we run the job to Wilsmere Yard and back. The ESPN also serves several industries on my layout. Fans of shortline railroading like this job.

I also model a CSX local that goes down to the former Reading Co./B&O West Yard via Amtrak's busy Northeast Corridor. This is a joint yard where CSX and Norfolk Southern interchange cars once or twice per week.

Staging solutions

My first staging yard worked well, but after a few years it also started to fill up. This proved problematic, as I wanted to add more trains to the Philly Sub.

Staging yard 1 has 17 tracks and holds 588 cars. Staging yard 2, a stub-ended yard, has six tracks and can hold 198 cars. Then I installed a running track through Staging 2 and built Staging 3. The new stub-ended yard has eight tracks and a 277-car capacity.

Am I done with staging? I can't say for sure. But with the ability to stage more than 1,000 cars, I'm able to run long trains, which is what I love to do.

Friends and family

The HO scale CSX Philadelphia Subdivision has been a big part of my life. I couldn't have built a 42 x 56-foot multi-deck model railroad without the help of many friends, including Mark Sakely, Joe Sakely, Tom Gears, Wil Jamison, Jon Lassahn, Bob Garner, Don



5 CSX General Electric ET44AH no. 3367 leads westbound train Q301 over the Brandywine River viaduct in Wilmington, Del. The viaduct, which still stands, was originally built by the Baltimore & Ohio.



6 A Southeastern Pennsylvania Transportation Authority Kawasaki light rail vehicle waits for CSX train Q371 to pass. This at-grade crossing is based on a prototype location in Darby, Pa.

Richard, Jesse Cloud, Mike Minatelli, and Dave Sommers.

Family has also played a big part in my enjoyment of the hobby. My dad, Stuart, introduced me to model railroading as a teenager. My wife, Marla, and children, Ellie and Elana, have provided support and encouragement as I've built the CSX Philadelphia Subdivision.

My CSX Subdivision is constantly evolving to keep up with changes on the prototype. I've become comfortable with the constant change, as it keeps the layout fresh. You can keep up with my ever-changing model railroad on YouTube (brfriedm) and Facebook. 



Meet Bruce Friedman

Bruce Friedman has worked for Cisco for the past 20 years. He and his wife, Marla, both University of Delaware graduates, have two children, Elana and Ellie. Bruce's other interests include railfanning, photography, and Israel.



How do you build a model railroad when your chosen subject has few commercial products to ease the task? That was the question I asked myself when planning my Aquia Line O scale railroad based on an unusual, but fascinating subject – the United States Military RR (USMRR) during the U.S. Civil War. The answer came from

some of the latest technology that's now available to model railroaders, including laser cutting, photo-etching, 3-D printing, battery-powered Digital Command Control (DCC), and microcontrollers.

Even if you're not planning an early steam-era railroad, read on. The high-tech tools and techniques that I describe are sure to be helpful to your projects regardless of the time period modeled.

Why model the Civil War?

The first question you might ask is, why build a model railroad with a Civil War theme? As a child growing up in New York City in the 1950s, the Civil War was ancient history, overshadowed by my parent's experiences in the Great Depression and World War II. Their stories of those events sparked my interest



Highball to

HIGH TECH

Battery power, laser-cutting, 3-D printing,
and more help bring the Civil War-era
Aquia Line to life

By Bernard Kempinski • Photos by the author

Locomotive *Whiton* blasts out of Clozet Tunnel on Bernard Kempinski's O scale United States Military RR Aquia Line layout. The locomotive is equipped with a Stanton on-board battery radio Digital Command Control system, while the freight cars and tunnel portal are examples of models made with laser-cut parts.

in military history and modeling, especially armor and dioramas.

In the 1980s, I moved to northern Virginia after serving in the U.S. Army. The proximity to so many local battlefields, national archives, and other historical sites kindled my interest, and I became involved in Civil War-focused historical research, war gaming, and figure modeling.

In the early 1990s I began model railroading due to my young son's influence. Together we built several railroad projects, but he lost interest eventually. At that time my focus changed to modeling the railroads during the Civil War.

I found these railroads offered a compelling combination of military and railroad modeling subjects. The Civil War was the first "railroad war," as railroads

began to dominate military planning and operations. Nearly every major battle in the Civil War occurred within 20 miles of a rail line or navigable river. Furthermore, in true Victorian style, locomotives in the era sported colorful and ornate paint schemes and were usually named instead of numbered.

Though railroads of the era employed many track gauges, most were standard



1 Stanton Battery System. The battery and its power supply sit atop the motor on the tender of the locomotive *Whiton*. The wood pile conceals the battery, and the man sitting on the box hides the off switch. The system automatically turns on when it senses track power, but it must be manually turned off.

gauge (4'-8½") or wider. However, the equipment was relatively small. For example, a typical boxcar was 28 feet long compared to the 36-foot and 40-foot boxcars of the 20th century steam era. For a model railroad, the small equipment allows for sharper curves and a more compact design. I was able to get a satisfying track plan in O scale in a medium-size space.

Civil War-era railroads were busy, running frequent but shorter trains. The railroads employed early versions of timetable-and-train-order operation to control the trains. Both those factors provided interesting operations on a model railroad.

To learn more about modeling Civil War railroads, including my own Aquia Line and military railroading past and present, read my book *Model Railroads Go To War* (Kalmbach Media, 2015). My layout was also featured in *Model Railroad Planning 2012*. Both are available at www.KalmbachHobbyStore.com.

The USMRR Aquia Line

I model the Aquia Line during late winter-early spring 1863. In January 1863, Gen. Joseph Hooker took command of the Union Army of the Potomac, which he rebuilt after the disastrous Union defeat at the Battle of Fredericksburg. He relied on the USMRR, run by Col. Herman Haupt, to provide logistics support.

The line started at the Aquia Landing wharves, where ships and railroad car

ferries brought in supplies. The USMRR car ferry was the first ever deployed. The railroad distributed supplies and provided transportation over 13 miles of track to the 120,000 men and 60,000 animals of the Union Army of the Potomac dispersed around four stations near Fredericksburg, Va. The railroad employed five locomotives and 60 to 80 cars and provided regular scheduled service until the spring campaigns began.

My 31 x 32-foot O scale layout is a point-to-point design that includes the four stations that were south of Aquia Landing: Brooke, Potomac Creek, Stoneman's Station, and Falmouth. All of these stations are modeled to varying degrees of historical accuracy.

This layout is designed for realistic operation, following historical sources. The National Archives has records of the trains that ran on the railroad during the modeled time period, including train orders, conductor logs, equipment rosters, timetables, letters, and maps.

During operating sessions train length is relatively short – about six to eight cars – but the large scale of the models lend themselves to additional operating possibilities. The link-and-pin coupler system uses track nails and magnets, and some cars have working hand brakes. This makes a two-man crew ideal as two hands are needed to couple and uncouple. Because the link and pin isn't as simple to operate as a knuckle coupler, the layout design ensures that tracks where switching takes place are close to the front fascia for easier access.



2 Stay-alive circuits. A SoundTraxx Tsunami decoder equipped with the firm's CurrentKeeper capacitive power supply mounted on the tender of locomotive *Haupt*. The speaker, which in this photo is hanging on the black wires alongside the tender, also fits in this space, all covered by the wood pile.

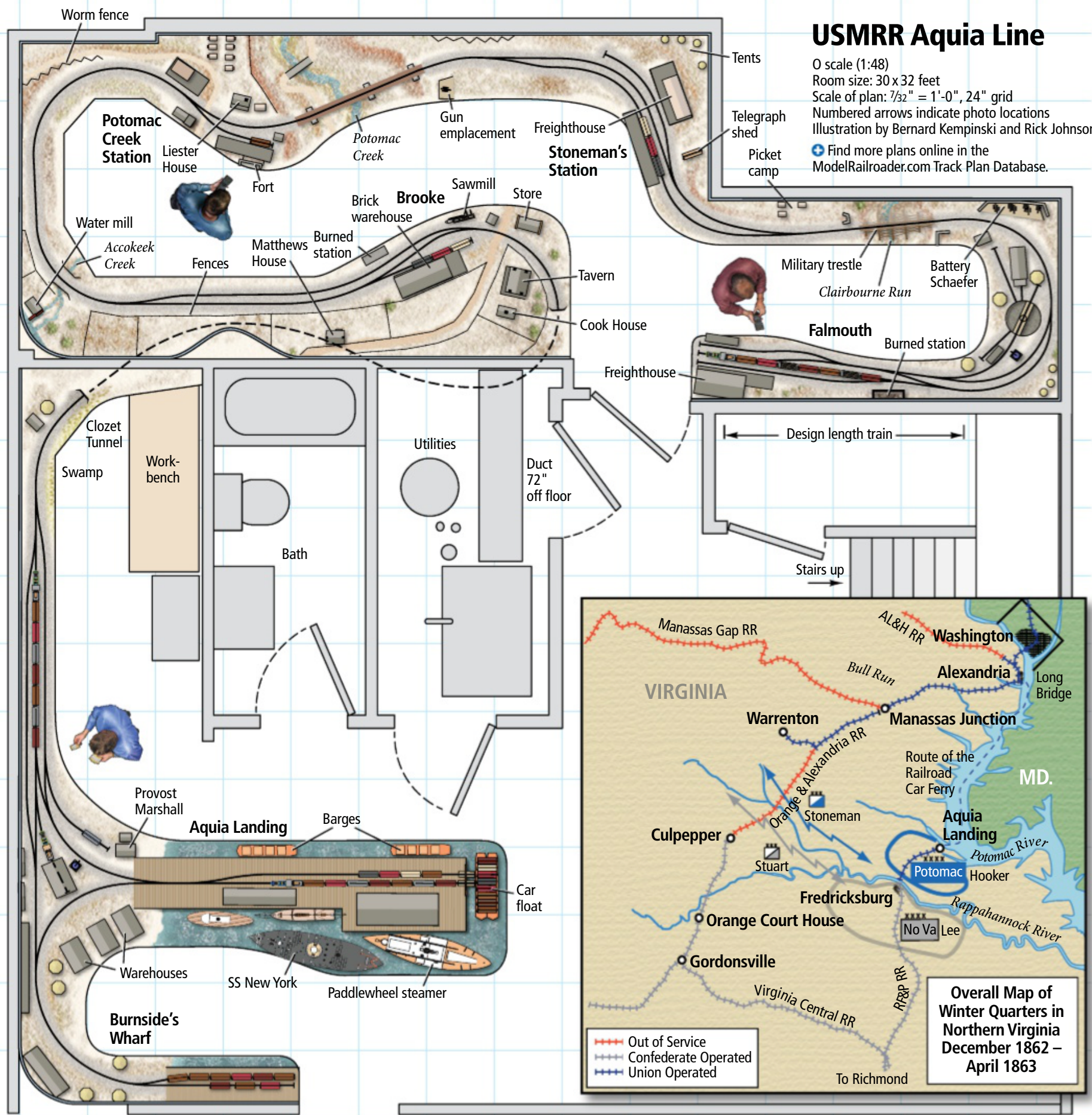
The challenges

By the start of the Civil War in 1861, steam-powered railroads had existed for about 35 years, but railroading was still a young and evolving industry. A modern observer would recognize a Civil War-era railroad as such, although every other feature would be different. These differences include: steam versus diesel-electric motive power, iron versus steel rails, stub versus bladed turnouts, hand versus air brakes, and link-and-pin versus knuckle couplers. There was also no standard track gauge and almost no interchange between railroads.

Therein lies the challenge – most products available today wouldn't be era-appropriate. I had to scratchbuild much of the rolling stock and infrastructure.

USMRR Aquia Line

O scale (1:48)
Room size: 30 x 32 feet
Scale of plan: $\frac{7}{32}$ " = 1'-0", 24" grid
Numbered arrows indicate photo locations
Illustration by Bernard Kempinski and Rick Johnson
Find more plans online in the ModelRailroader.com Track Plan Database.



Battery power and stay alive

The vast majority of locomotives in this period were 4-4-0 American-type steam engines. In fact, all but one of the engines on the Aquia Line were 4-4-0s. For my model railroad, Schneider Model Trains (SMR) simplified the task of acquiring motive power by importing O scale brass steam locomotive models appropriate for the Civil War.

Like many brass models, the SMR locomotives needed some improvements to run reliably. I disassembled the engines to add all-wheel electrical pickup and DCC

The layout at a glance

Name: Aquia Line
Scale: O (1:48)
Size: 31 x 32 feet
Prototype: United States Military RR
Locale: Virginia
Era: late winter 1863
Style: walk-in
Mainline run: 115 feet
Minimum radius: 28"
Minimum turnout: no. 5
Maximum grade: 1 percent

Benchwork: open grid
Height: 48"
Roadbed: $\frac{1}{8}$ " plywood
Track: code 100, handlaid
Scenery: extruded-foam insulation board and plaster hardshell
Backdrop: painted styrene and tempered hardboard
Control: CVP Digital Command Control and Stanton battery-powered radio DCC



3 Laser cutter. Bernard's laser-cutting work station resides in his garage and is also used for his business, Alkem Scale Models. The Epilog Zing laser cutter has a 12 x 24-inch cutting bed and 40W of power. The laser sits on a Bofa air filter, which cleans the exhaust of smoke and toxins, a must for cutting indoors.

with sound (my layout is wired for DCC with Tam Valley Frog Juicers to power turnout frogs and wireless radio throttles to control the trains.)

Unfortunately, brass steam locomotive models, like their real-life counterparts, require constant maintenance, care, and the occasional angry word. My engines ran fairly well, but not without an occasional stall or electrical short. Inevitably, dirty wheels or track caused stalls despite regular cleaning. The shorts usually occurred while traversing the layout's tight curves as the pilot trucks would sometimes touch the cylinder. For near flawless operation, I adopted an onboard battery power system on some of my locomotives.

For two of my locomotives, I use the Stanton Battery System, which consists of five main components. The first is a SoundTraxx Tsunami decoder that's been modified to include a radio receiver. [Since Stanton distributor NorthWest Short Line has gone out of business, Stanton system components are now available at www.s-cab.com – Ed.] There's also a lithium polymer (LiPo) battery and an additional circuit board for the battery power supply (BPS). The BPS charges the battery safely and provides clean power to the decoder. The final component is a speaker.

The latest Stanton BPS can take current from the rails to both power the train and charge the battery. Thus, there's no need to remove the batteries from the engines to recharge.

My two battery-powered engines have proven to be the mainstays in my operating sessions. They rarely run out of charge. The battery allows them to chug right through the occasional short without interruption.

The drawback to the system is packaging – i.e., trying to fit all the components into the small locomotives. The only place in my locomotives to house the battery and the BPS is on the top of tender, as shown in **1** on page 38. The decoders and speakers are in the boiler

and firebox. With the advent of capacitive power supply or “stay alive” circuits for DCC decoders, which are smaller than the Stanton Battery System, I retrofitted some of my non-battery powered locomotives with those circuits. Stay-alive circuits provide about 10 to 20 seconds of power to the decoder in the event of an interruption to power pick-up from the wheels.

The stay-alive circuits have packaging challenges of their own, but generally it's easier to fit them in the locomotives **2**. Two of my engines now have all-wheel pick up and stay-alive circuits. I have one more engine to convert, and I'll probably add a stay-alive circuit rather than a battery because the packaging will be easier.

Laser cutting

Rolling stock also presented a challenge. There are a few brass freight cars available from SMR and others, but they were expensive and heavy. Overweight cars tax the pulling power of small engines. I needed 40 to 50 freight cars to support my operating scheme, so I scratchbuilt my cars from laser-cut parts.

I own a commercial-grade laser cutter **3** for my cottage industry, Alkem Scale Models (www.alkemscalemodels.com). Such a laser cutter has more capacity than a typical hobbyist needs. Less powerful hobby-grade laser cutters have decreased significantly in cost, and many now cost less than the price of a brass locomotive model.

Some companies offer laser cutting services for a fee. All the customer has to provide is the drawings. I started off using such an outside service, but found the process, especially revisions, went faster once I bought my own cutter.

I'd sold HO scale Civil War-era freight cars through Alkem Scale Models, so it was a relatively simple task to enlarge my drawings to O scale. A typical car, such as the unfinished model shown in **4**, includes laser-cut parts from several thicknesses of birch plywood, basswood, Bristol board, or resin-impregnated cardboard. My laser-cut cars include flatcars, boxcars, a conductor's car, express cars, and even a passenger car. Examples of my laser-cut rolling stock are shown in **5** and **6**.

The laser cutter has been invaluable for making structures, cannon chassis, and detail parts (See **7** on page 42, as well as the bridge at Potomac Creek featured on this issue's cover.) I've also developed these projects into kits for sale via Alkem Scale Models.



▶ MR Video Plus subscribers can take an exclusive tour of the O scale USMRR Aquia Line at MRVideoPlus.com.

The freight car trucks were an interesting challenge. Commercial brass trucks were available, but they tended to be expensive. I laser cut parts to make my own trucks using commercial wheel sets. Some of these trucks also have a working hand-brake mechanism.

Photo etching

To simplify working hand-brake construction, I used photo-etched metal parts **8** on page 43. The photo-etching, or photo-chemical-machining, process produces precision metal parts by selectively dissolving metal into solution. My photo-etching projects aren't done in-house. Instead, I use a professional etching firm in Massachusetts. I provide the artwork, which the etching firm converts to a photo tool to make the parts that they then send to me.

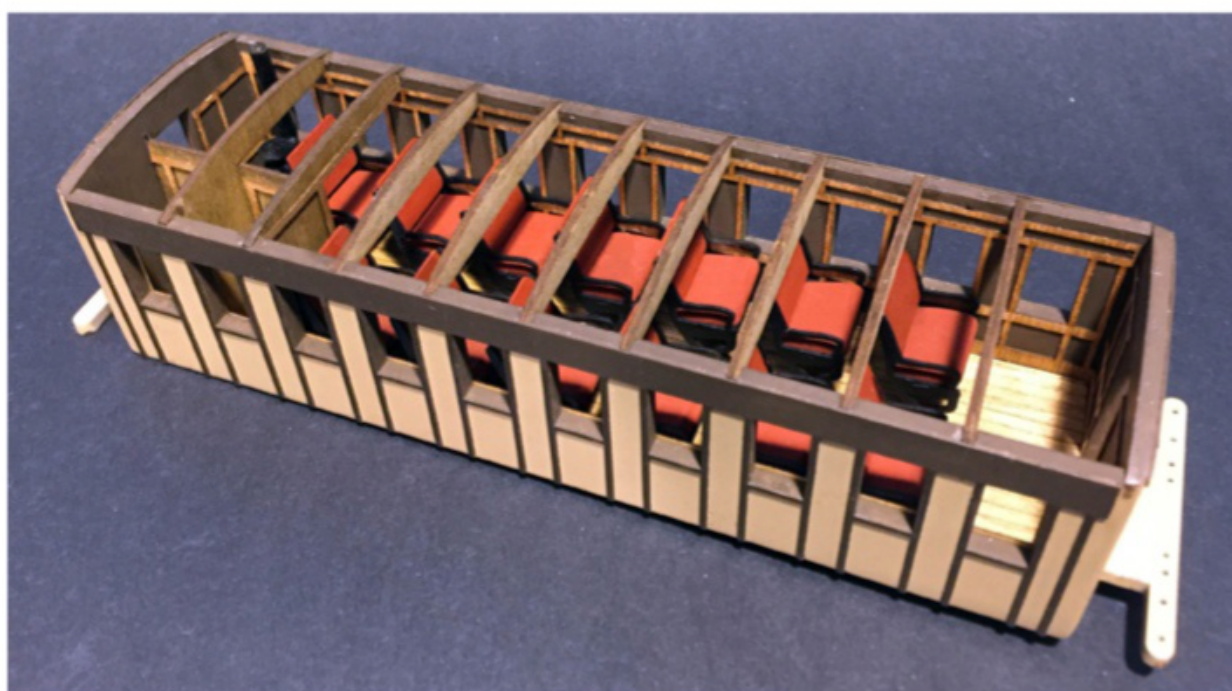
I had a learning curve to understand designing etched-metal parts, especially those that fold to create 3-D objects. There's also a limit on how fine parts can be made, generally 1.5 times the etch material thickness.

I used photo-etched parts, brass chain, and phosphor bronze wire to make the brakes operational on some cars. The operator turns the brake wheel on the roof and the car's brakes are applied. This task was simplified by the fact that instead of airbrakes, cars in this era had only a hand brake on one truck.

I've also used the photo-etching process to make other parts, including my switch stands and freight car and



4 Freight car construction. This unfinished freight car model shows the typical method of construction Bernard uses for his laser-cut freight cars. He cuts the frame members from a single wood sheet with interlocking tabs and slots to help simplify the construction process.



5 Passenger car construction. Bernard used his laser cutter to make the basic core of this O scale passenger car out of 1/8" acrylic. The coach's interior details, such as the seats and trim, also employ laser-cut parts.



6 Finished model. Here's the finished passenger car in service on the Aquia Line. Bernard scratchbuilt the handrails from phosphor-bronze wire. The trucks are from SMR Trains.



Meet Bernard Kempinski

Born in Brooklyn,

N.Y., Bernard Kempinski currently resides in Alexandria, Va., with his wife, Alicia. After serving in the U.S. Army, Bernard retired from a 35-year career as an engineer in defense analysis. He now runs Alkem Scale Models, and works on his model railroad when he isn't accompanying his wife on the golf course.



cannon detail parts. One drawback to photo-etching is that the process is somewhat expensive, and each revision requires a new tool with its associated fee. For small part runs, the process isn't that cost effective.

3-D printing and spin casting

The laser-cut trucks with working brakes proved time consuming to build. Eric Cox of Panamint Models helped me develop a 3-D printed truck ⁹. With products available through Shapeways (www.shapeways.com), Panamint offers an extensive line of 3-D printed N and HO scale parts for early steam-era modelers. I provided Eric with an O scale wheelset, and he modified his drawings to accommodate them.

I used the plastic 3-D printed parts to make molds for my spin caster. This device uses rubber molds in a centrifuge to cast molten metal parts. I purchased an entry-level spin caster ¹⁰ from Conley Casting Inc. that I use to produce white metal parts for the kits I sell.

The 3-D printed trucks could be used without going through the effort of spin casting. However, I find that the heavier metal trucks ¹¹ track better.

Three-dimensional printing is becoming an important tool for short-

run prototype modeling. There's a steep learning curve when getting started, but the potential is enormous. Although I used a commercial service to print my truck masters, home 3-D printers are becoming more affordable. Several of my friends that model the Civil War in HO scale make nearly complete locomotive models using parts printed from consumer-grade machines.

Arduino telegraphy

I wanted a working telegraph system on the Aquia Line for operators to report departures at every station, as outlined in the USMRR rule book. Even though the military at the time used the dot code, a simplified version of Morse Code that new recruits could quickly learn, I didn't expect my operating crew to have to become proficient telegraphers. Instead I designed a specification for an Arduino microcontroller-based telegraph system that would automatically generate the proper code.



7 Structures and details. Locomotive *McCallum* hauls a train through the town of Brooke. Bernard made all of the freight cars and structures visible in the image and many of the details, including the fences and saw mill, at least in part with laser-cut parts.

I worked with Seth Neumann and Steve Williams of Model Railroad Control Systems to convert my specification to a functional system. Seth developed the hardware, and Steve provided the programming.

This telegraph system is still under construction. An early prototype of the electronics is shown in **12**.

When it's fully installed, there will be control panels at each station. Train crews will use a rotary switch to select their train number and then push a button for either regular or extra to report their "OS" to the dispatcher. Arduino microcontrollers will generate the correct coded message that will play in the dispatcher's office on an authentic telegraph sounder. I received the sounder as



8 Working hand brakes. The truck sideframes and other main components are made of laser-cut parts. Photo-etched parts simplified constructing the working brake mechanism.



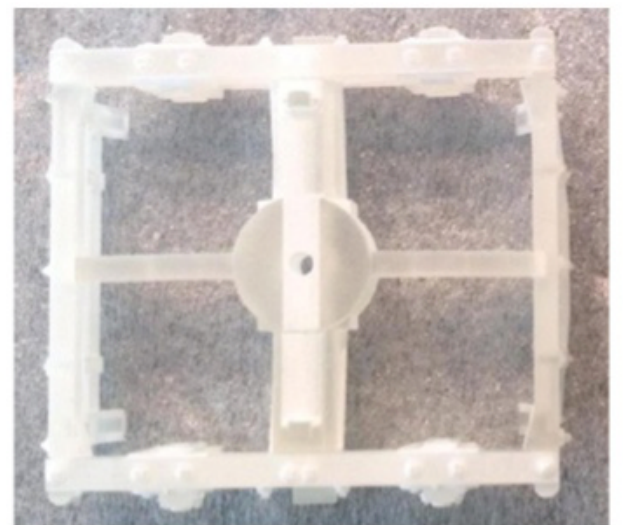
10 An entry-level spin-casting system. The steel circular disk in the foreground is the mold vulcanizer. The spin-casting machine is in the rear. In the middle is the small electric metal melting pot.

a gift from Ron Schmidt who visited my layout. This one-way system will add audio "scenery." During my current sessions, I act as the dispatcher, since that job isn't very busy. Perhaps once the telegraph system is in place, the dispatcher will become a more sought-after assignment during operating sessions.

Lessons learned

Battery power and capacitor-based stay-alive systems make smooth running DCC and sound-equipped locomotives possible. Laser cutting, 3-D printing, photo-etching, and spin casting open up many options for scratchbuilding prototypes that don't have widespread manufacturer support. Microcontrollers provide a means for adding animation to a model railroad. These high-tech tools are taking our hobby to a new level.

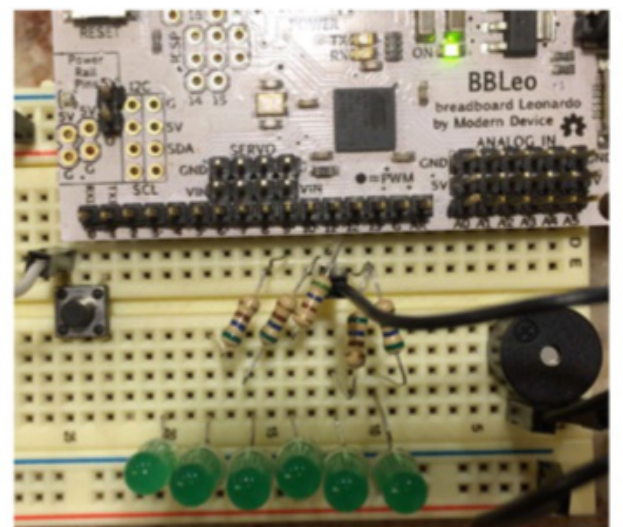
Those who don't have the time or expertise to exploit these technologies shouldn't be afraid to get help. This great hobby is chock-full of enthusiastic people



9 3-D printed trucks. Working with Panamint Models, Bernard had some freight car trucks produced using the firm's 3-D printer. The trucks are made of a plastic material.



11 Spin-cast metal trucks. These metal trucks were spin cast using molds made from 3-D printed masters. The metal trucks are heavier and track better than the lighter plastic trucks.



12 Microprocessor telegraphy. The telegraph system is still in development. This is an early breadboard prototype of the microprocessor, LED display, and a sounder used to evaluate the software.

who are willing to help a fellow modeler meet his or her goals. To this end I'm indebted to David Schneider, Eric Cox, Seth Neumann, Steve Williams, and Ron Schmidt. I also want to thank my many friends who continue to help me build and operate the O scale Aquia Line. **MR**

Build a late-1960s E unit

Learn how to remove porthole windows and add lighting effects to an HO scale Proto 2000 E8 **By Louis Millan** • Photos by the author



As cab units such as this Electro-Motive Division E8A entered their final decades, railroads made modifications either to address wear or to meet new safety regulations. Penn Central no. 4300 had its porthole windows removed and now sports grab irons up its nose. Louis Millan shows how he modified his HO scale Life-Like Proto 2000 model to represent a locomotive of the late-1960s.

In the career of a locomotive, modifications may be made that alter its exterior appearance.

Starting in the mid-1960s, several railroads operating Electro-Motive Division (EMD) E units began to replace the body side panels of the locomotives due to deterioration. Panels that included porthole window openings presented a particular challenge in having to cut a new replacement panel to fit and install the window assembly, which was largely an aesthetic treatment.

Seeking the economical approach, some railroads elected to simply replace the porthole panels with solid sheets, eliminating some or all of the portholes on the sides of the locomotive. This, in combination with other alterations such as mandated grab irons climbing the nose of the cab units, created a distinctive 1960s look that many E units would carry for the remainder of their careers.

Though it resulted in a more Spartan appearance, the solid side panels actually provided more surface area for the new

“billboard”-sized lettering and heralds that were coming into fashion at the time. Late-’60s to early-’70s views of E units on such railroads as Louisville & Nashville and Penn Central (PC) reveal large heralds or lettering placed where portholes had once been.

I had been wanting to reproduce this look on a Penn Central model for some time, and happened to have what is now an older Life-Like (now Walthers) Proto 2000 E8 from the 1990s. Its age helped me summon the courage for this alteration project, removing the portholes to create a more authentic-looking 1960s model.

Preparations

The model was decorated in Missouri Pacific’s blue and cream *Eagle* scheme. With headlights and window glazing removed, I dipped the body shell into a pan filled with paint stripper.

Then, a happy event occurred: The paint stripper loosened most of the etched metal grills, which helped solve

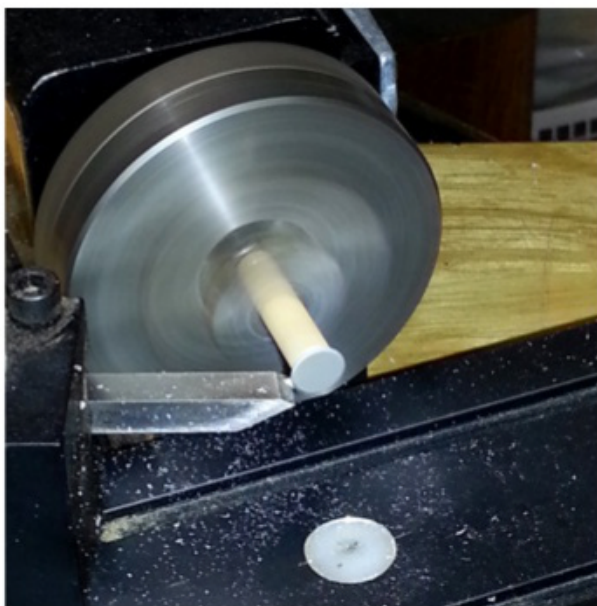
the mystery of how I was going to remove them. Sliding a no. 11 hobby knife blade between the loosened grill and the body shell made for quick and easy removal.

Porthole removal

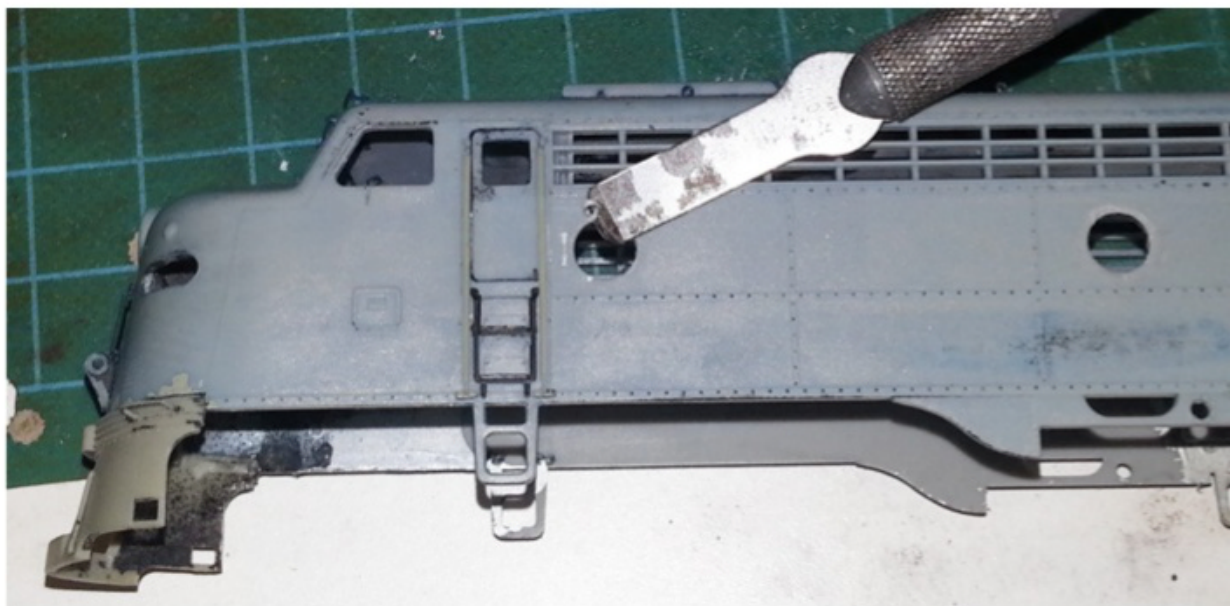
The project’s biggest challenge was removing the side portholes to simulate solid body panels. I considered retaining the existing porthole window glazing, filling the gaps with putty and sanding everything flat, but I rejected this option being concerned the glazing, a different type of plastic, wouldn’t sand down uniformly with the styrene body shell.

Over the years, I’ve accumulated a modest collection of hobby tools, and finally found a use for an old mini-lathe I picked up a few years ago. My goal was to use the lathe to turn small porthole plugs from sheet styrene. It turned out to be easier than I expected.

For each porthole plug, I cut a small octagon from styrene sheet. Each octagon was cut slightly larger than the



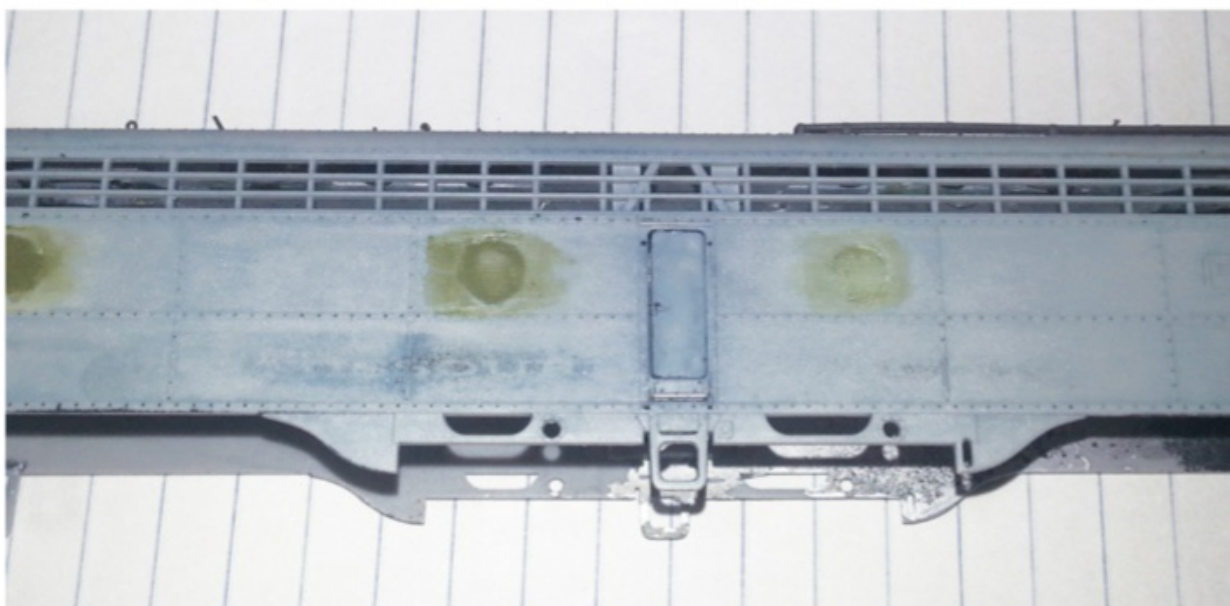
① A quick turn. Louis finally found a use for his mini-lathe – turning the plugs to fill the E8's porthole windows.



② Careful shaving. Louis rounded the edges of a no. 17 chisel blade so he wouldn't nick the plastic around the porthole window frames as he shaved them off in preparation for filling the openings.



③ A little putty. Acetone makes Squadron putty easier to spread, done with a piece of plastic in a knife handle.



④ Smooth finish. Careful sanding helps blend the porthole patches into the sides of the model. Take your time to avoid sanding the batten strips and their rivets.

porthole opening so the lathe could reduce it to the correct diameter. The octagon was attached to a small wooden dowel using a drop of cyanoacrylate adhesive (CA), being careful to attach it squarely perpendicular to the dowel.

Each octagon/dowel assembly was chucked into the main spindle of the lathe. The cutting tool was set at an angle to cut a beveled edge on the porthole plug, enabling the plug to nest into the body shell.

I used a caliper to measure the widest part of the porthole opening, which is closest to the outer surface of the body shell. Then, I turned the plug in the lathe **①**, cutting slowly and measuring frequently, until the outer diameter matched the caliper. Each plug took only a few minutes to make. With the turning complete, I carefully removed the plug from the dowel using a sharp hobby knife.

If you don't have a lathe, the dowel could be chucked into a drill and at low speed, the disk could be spun against a fine sanding block, at an angle to create

the beveled edge. The disk would be spun until it was reduced to the correct diameter. Safety is always the rule, and I would be sure to follow instructions and safety precautions when using any power tool.

On the body shell, the porthole frame and hinge must be removed. I used a sharp no. 17 chisel blade in a hobby knife. I modified the blade by removing the sharp corners with a grinding wheel to prevent unwanted nicks in the body shell.

I used this modified tool to slowly shave away the raised edge **②**, being careful not to damage the surrounding raised rivet strips. The area will be smoothed over later when sanding.

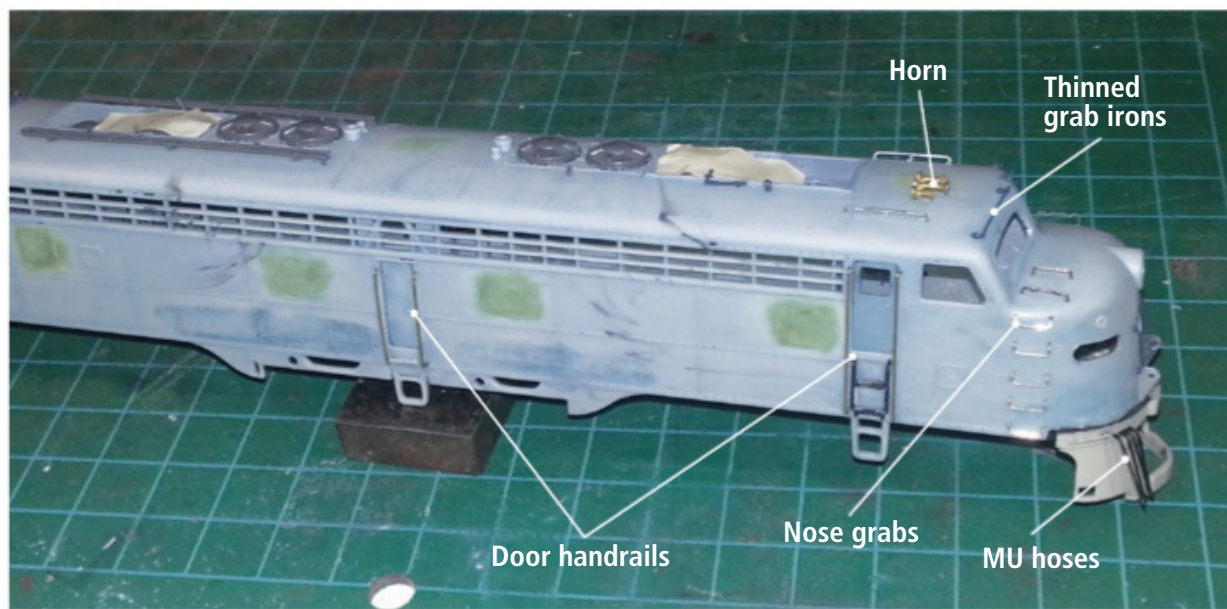
At this point the styrene plugs can be inserted into the porthole openings. Apply a styrene cement to the entire circumference when installing, as the strength of the cement will be needed when sanding later. Try to keep the cement on the beveled edge and not let it leak out onto the exterior of the body shell. Let this completely dry before proceeding to the next step.

There will be gaps and some unevenness between the plugs and the body shell surface. These areas were filled with Squadron Green putty that was thinned with acetone to make it more workable. To apply the putty, I used a thin piece of styrene, not more than a ¼" wide, in a no. 2 knife handle.

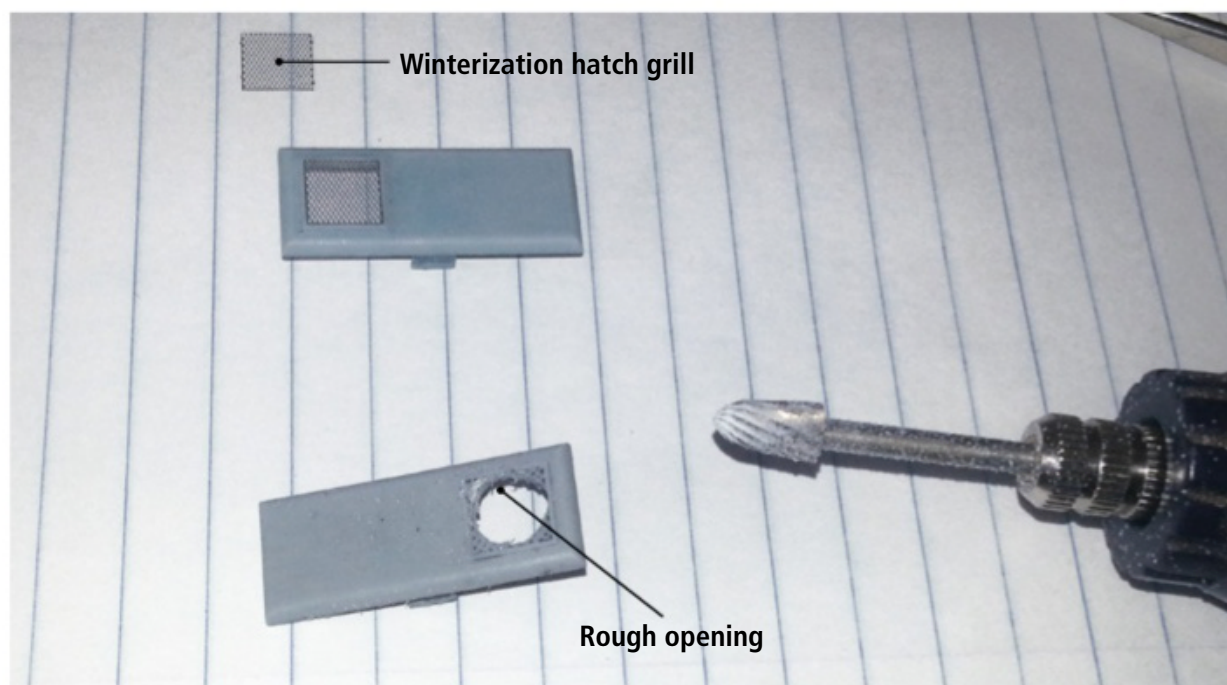
I used this to apply the thinned putty slowly and in little bits, frequently making small batches by mixing the putty and acetone in a small snack pie tin **③**. The thinned putty is very workable, but only for a short window of time. It dries relatively quickly to what seems to be a hard, almost crystallized surface.

To sand the narrow surface between the rivet strips without damaging the raised details, I cut small squares of 320 grit fine and 600 grit extra fine sanding film and cemented each square to the flat end of a similarly sized wooden stick with CA.

Proceeding from fine to extra fine, I used these sanding sticks to slowly sand the surface of the putty until the area



5 Extra details. In addition to plugging the portholes, Louis added m.u. hoses, handrails at the doors, grab irons up the nose, and a new horn.



6 Bonus parts. Louis used the winterization hatch grills that came with his Plano intake grills so he could see the fan detail below. He used a grinding bit in a motor tool to remove most of the plastic before squaring the hole with files.



7 Headlight tricks. Louis drilled two no. 54 holes in a square piece of styrene to simulate the twin sealed-beam headlight mounted in the door.

appeared to be smooth and flat, **4** on the previous page. The sanding film is so fine that the rivet strips act as a barrier that helps prevent the sander from overriding the strips and removing the detail.

At this point, the hardest work is behind you, and the remainder of the project proceeds more like a typical painting/superdetailing/decoder project.



8 Marker lights. Louis mounted small, red light-emitting diodes (LEDs) into slots cut in styrene tubing for marker lights. The slots hold the LEDs' leads.

Detailing and painting

On Life-Like's E8 and E9 models, most of the detail parts are plastic and appear to be affixed by melting the plastic tabs on the interior of the body shell. This presents a bit of a challenge in removing the detail parts. I found that chiseling away at the melted plastic on the interior

side goes far to help remove the handrails, which are particularly thick.

I wanted to replace them with thinner wire handrails. I made handrails from .016" brass wire sized to match the mounting holes in the body shell.

The nose and roof-mounted handrails were another story. I had considerable difficulty attempting to remove these detail parts, and realized that I risked damaging the model in the process. I actually like the look of these parts and the nut-bolt-washer castings. They just appeared to be a little too thick. This is where the wisdom of age kicked in.

I elected to retain these plastic detail parts. To me, the most apparent, overly thick parts were the roof-mounted handrails directly over the windshields. I used a fine file to gently remove the somewhat visible mold marks and ever so slightly reduce the thickness of the main span of the handrail. At this stage, I added several other detail parts, including a new horn, lift rings, and m.u. hoses **5**.

The body shell was ready for paint, and I took the typical preparations of removing dust and debris, washing the shell in warm soapy water to remove oils and other contaminants, and letting it dry adequately before airbrushing.

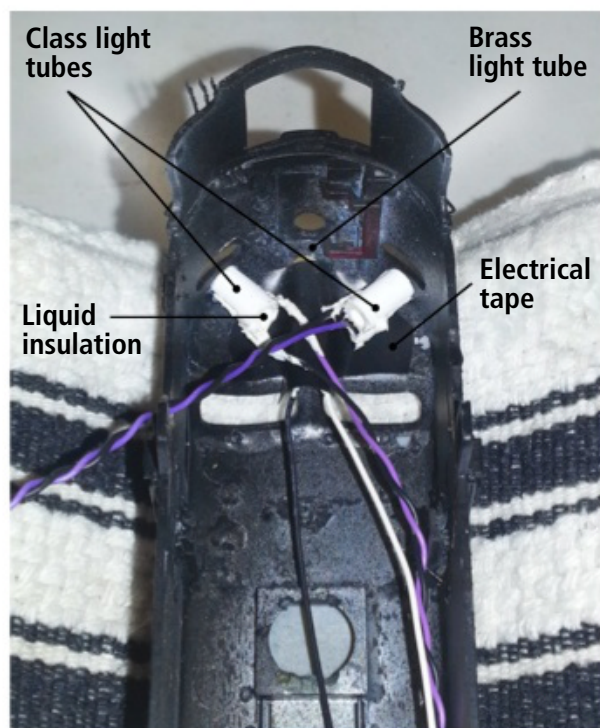
Modeling the Penn Central has its advantages, as black paint is universally available from a variety of manufacturers. I've become a big fan of the MicroLux line of model paints from Micro-Mark, and put a coat of its no. 29008 Engine Black on the E8. It's a very forgiving paint that sprays and cleans up easily. I then prepared the shell for decals by applying a gloss finish. I applied and sealed the decals with a satin finish before installing the windshield glazing.

I replaced the manufacturer's grills with photo-etched metal E8A intake grills made by Plano (part no. 14830), attached to the body shell with CA. Plano's kit also includes grills for the winterization hatches.

To "see through" to the fan below requires drilling out the plastic molded-on grill on the winterization hatches and filing the opening to a square edge **6**. Plano's small grill fits this opening well and attaches with a tiny bit of CA.

Lighting

I prefer to add lighting effects where possible, and Penn Central no. 4300 provides several opportunities. The locomotive was one of two former PRR E8s equipped with a nose headlight and a signal light above it, and as far as I can



9 Fitting it all in. The upper light was mounted in a $\frac{7}{32}$ " diameter brass tube, which was glued to the inside of the shell along with the class light tubes.

tell, no. 4300 was the only one to retain this headlight configuration through the PC and early Amtrak eras.

The door casing contained a twin sealed-beam headlight, which was simulated by drilling two no. 54 holes into a small styrene square, affixed to a styrene tube containing the light-emitting diode (LED) headlight **7**. The tube was cut at an 11 degree angle, approximating the slope of the nose of the locomotive and serving to keep the headlight beam parallel to the ground.

The upper (nose) fixture, which on the prototype might have been an oscillating signal light, utilized a short section of $\frac{7}{32}$ " diameter brass tube, cut slightly longer than the LED it would contain. I attached the brass tube/LED assembly to the inner body shell with CA, being careful to align the axis of the tube with the headlight opening. With the LED installed, the rear of the fixture was sealed for light leaks with black electrical tape.

I like the look of working classification and marker lights. I installed Detail Associates JW1708 $4\frac{1}{2}$ " clear classification lights according to the instructions. I fashioned LED housings for the lights from short lengths of $\frac{3}{16}$ " styrene tube. The LEDs, purchased from RadioShack a few years ago, fit into slots cut about half way down the styrene tubes. The slots provide for the LED leads, which were then bent back, attached to wires **8**, and insulated with brush-on liquid insulation.

Be sure the slots are cut deep enough to fully recess the LED from the protruding class light lens. A drop of CA will affix the LED in the tube, and



10 Mounting plate. Louis cut a styrene plate to match the curve of the inside of the locomotive shell so he could mount the next layer of lights.

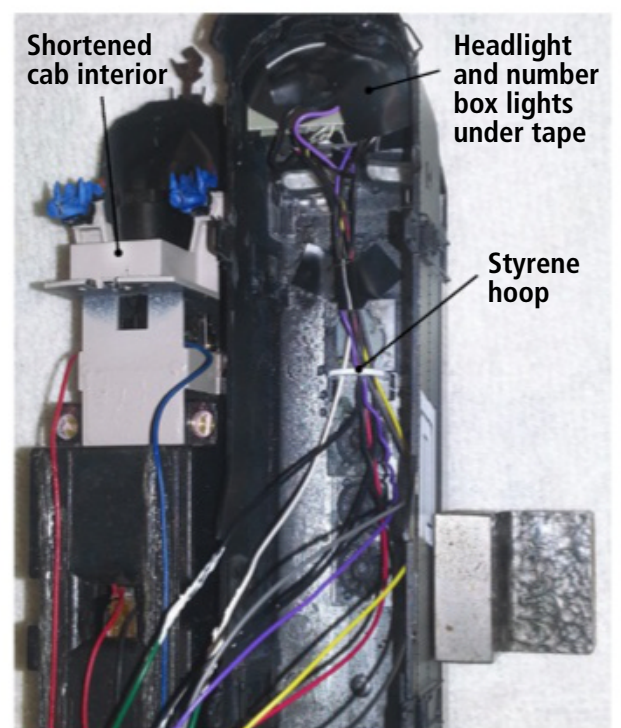
another will attach the tube/LED assembly to the body shell interior, placed directly over the protruding marker light **9**. I wired the class lights in series, opting to connect them to the reverse light (yellow) DCC decoder circuit, since they would act as marker lights when the locomotive was pushing or running light.

After installing the signal light and marker/classification lights, I examined the interior for potential light leaks, and used black paint and small pieces of electrical tape to seal everything up.

With the body shell placed upside down for interior access, I cut a piece of styrene sheet roughly to the shape of the rounded nose area and placed it directly on the upper headlight/class light LED array **10**. With the styrene plate affixed and sealed for light leaks, the door headlight LED assembly was cemented to the inside of the nose door, aligned carefully to center the headlight. This will function as the locomotive's main headlight and was wired to the white decoder lead.

Once the headlight was sealed for light leaks, two additional LEDs placed behind the number box openings were cemented directly to the styrene plate. Like the classification lights, they were wired in series. Both the signal light and number box lights were wired to the decoder's accessory leads.

The eight wires for the lights were bundled using black thread, forming a single "cable" that I passed through the center of the cab. I painted the bundle black to help hide it. I made a U-shaped fastener from sheet styrene and cemented it to the interior roof just behind the cab to hold the wires in place **11**.



11 Last bits. The door headlight and number box lights were mounted to the body shell and styrene plate. A styrene hoop helps manage the wiring.

I removed the front portion of the cab interior, cutting at a point directly in front of the base for the engineer and fireman figures, to allow space for the lighting. A square notch was cut into the top center of the rear cab wall to provide space for the LED wiring to pass.

I sprayed the cab interior a tan color, so it would be visible through the windows, and hand-painted the engineer and fireman figures. The unpainted cab assembly is shown in **11**.

The front cab interior mount on the die-cast metal frame interferes with the LED wiring, so I removed the mount with a motor tool cut-off wheel. Be careful not to let the metal shavings get into the gearing of the drive assembly.

There's sufficient space behind the cab for a small circuit board holding the resistors needed for the LEDs. Each of the four anode leads was connected to a resistor, then to the blue common wire. The remaining four cathode leads plus the blue resistor "common" wire were directed back to the rear of the locomotive, where I installed the DCC decoder.

With the wiring complete and grills installed, I carefully reattached the body shell. All that was left was to add a few more detail parts (like windshield wipers) and apply some weathering powder. The result is a fairly authentic-looking late-1960s E unit. **MIR**

Louis Millan has been a model railroader for more than 40 years. He lives in central New Jersey. He's married and has two children, and also enjoys music and gardening. This is his first article in Model Railroader.



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PLANS FOR THE EAST LOS ANGELES STATION

This mission-revival passenger station was the Union Pacific's gateway to Southern California for more than 40 years • **By Bruce Briggs**



An Astra Dome observation lounge car brings up the rear of the westbound Union Pacific RR *City of Los Angeles* as it makes a stop at the East Los Angeles Station in 1955. The station served some of the railroad's premier passenger trains until the Amtrak era. *Model Railroader* collection

The Union Pacific (UP) East Los Angeles Station remains a beloved memory from my childhood. On summer evenings in the 1950s, my parents would take my brother and me to East L.A. to watch UP's streamlined passenger trains. Once when I was 6 or 7 years old, a kindly engineer invited me up to the cab of an Electro-Motive Division E unit. The streamliners were still running in 1967 when I spent a happy summer between college semesters as a switchman in East Yard, just west of the station.

I'm also an avid model railroader, and I just knew that the station would have to be part of the layout that I plan to build. This article reflects years spent researching and making plans for this someday project.

Southern California traffic jam

By the 1920s, rail passenger service in Southern California was chaotic. In downtown L.A., the Atchison, Topeka & Santa Fe Ry. operated La Grande station. Just a few blocks away, Southern Pacific RR trains terminated at Central Station, where the Union Pacific subsidiary Los Angeles & Salt Lake RR (LA&SL) was also a tenant.

Tracks serving Central Station ran down the middle of Alameda Street. In Long Beach, LA&SL trains ran down the middle of Ocean Boulevard. The depot was located downtown and caused traffic jams daily. Southern Pacific and LA&SL tracks also ran down city streets in Glendale, just north of L.A.



In this late 1950s photo, UP no. 952, an Electro-Motive Division E9A, leads the eastbound *City of Las Vegas* past the station billboard advertising the train. The other side of the billboard is visible in the photo on page 49. Donald Sims photo



In the late 1970s, when this photo was taken, UP used the station as an employee credit union. The extended baggage room is visible on the right side of the photo. Bruce Briggs photo

The L.A. city government, the railroads, and other factions had been wrangling over a union station, which would consolidate several railroads in a single location, since 1915. Although voters had approved a union station in 1926, the battle to build it led to the U.S. Supreme Court. The issue wouldn't be resolved until 1939, when the Los Angeles Union Passenger Terminal was built.

In the meantime, the UP needed a solution, which turned out to be building its East Los Angeles Station in 1929.

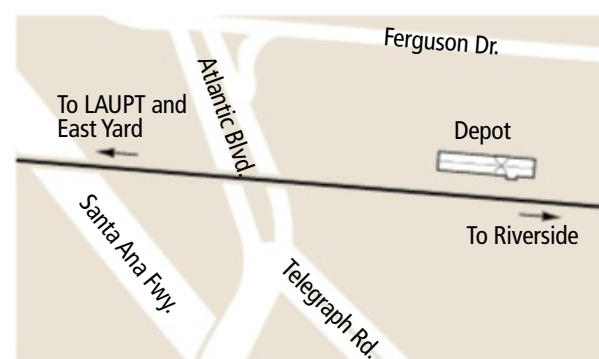
Gateway to Los Angeles

Located 6 miles east of Central Station (7 miles from the future site of the

LAUPT), the East Los Angeles Station's primary function was to serve as a hub for motor coach connections. For many UP passengers, the station was their gateway to the greater Los Angeles area, as it was close to major streets leading north to Glendale, south to Long Beach, and southeast to Anaheim.

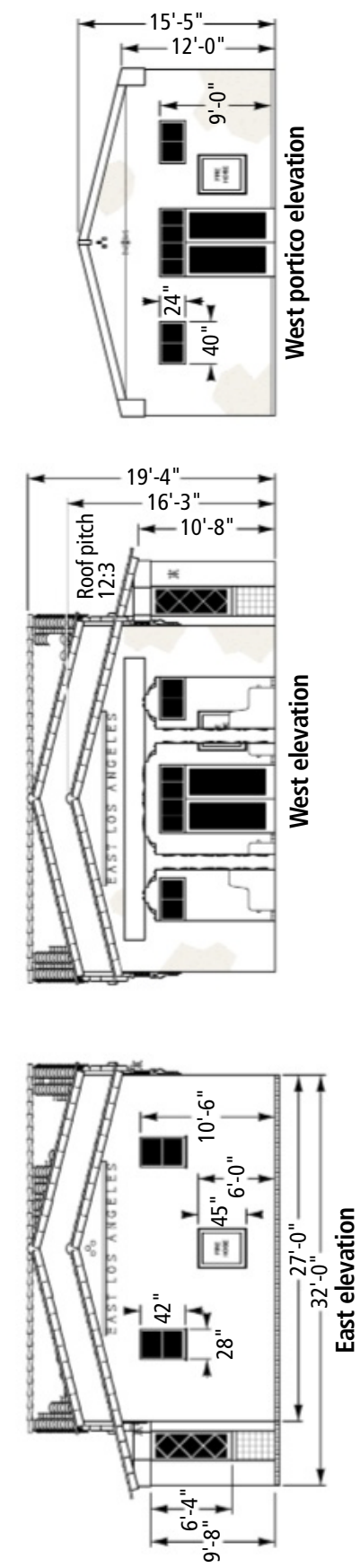
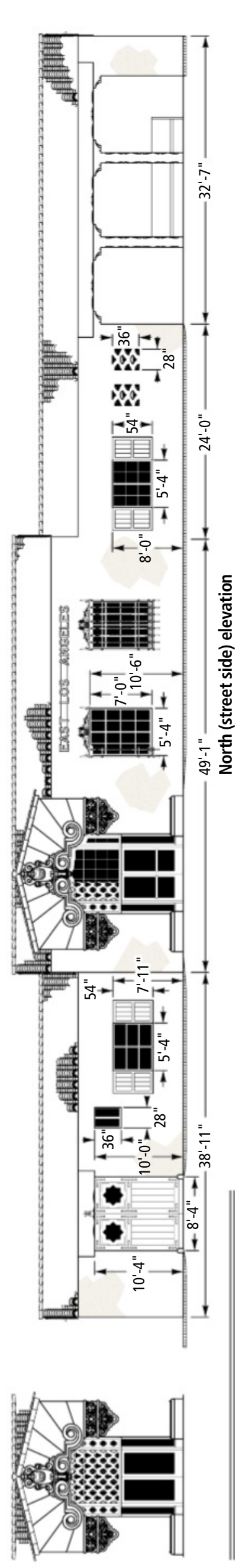
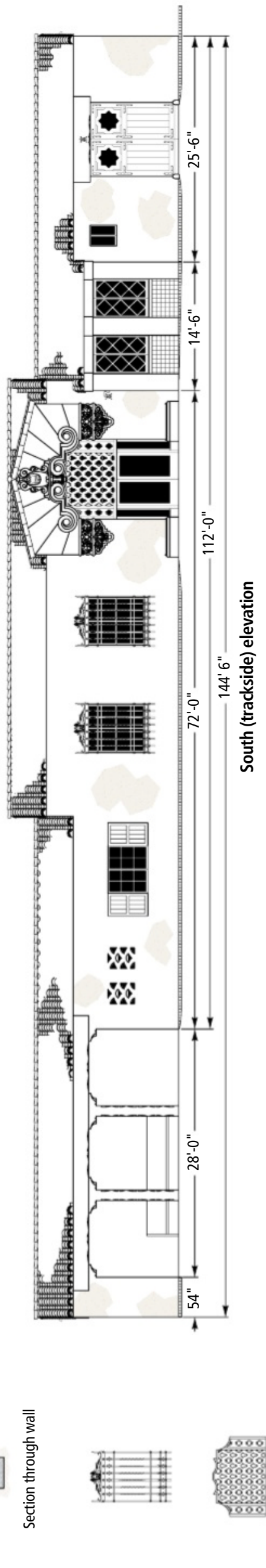
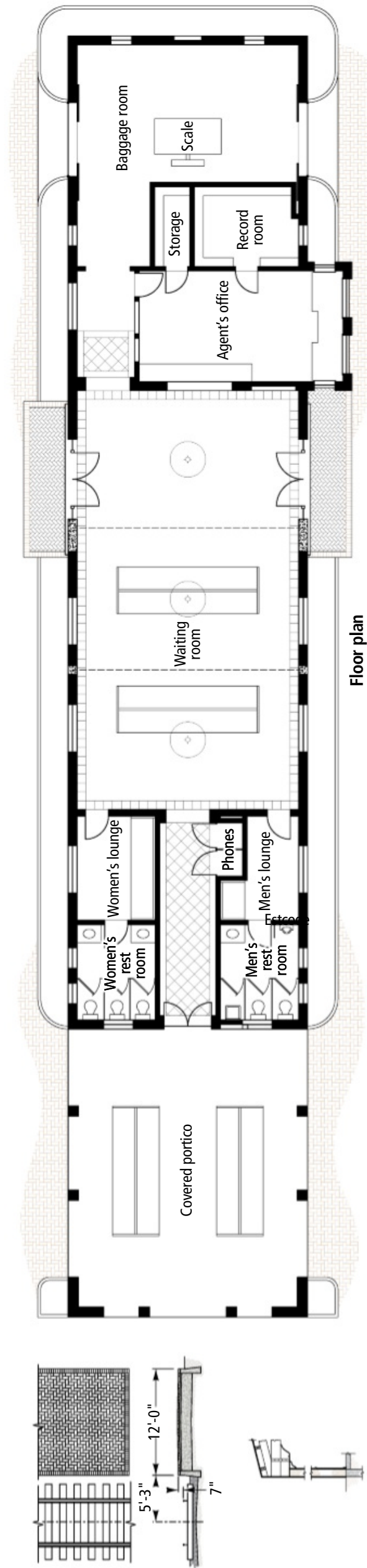
For the UP the station didn't need to be large, but it did have to be elegant. The UP commissioned renowned architect Gilbert Stanley Underwood, who designed many well-known buildings, as shown in the list on page 52.

Underwood designed the East L.A. Station in the mission-revival style. Opened in May 1929, the station featured wrought-iron window grills,



Moorish screens above the waiting room doors, and an irregularly laid tile roof. For most of its service life, the station's stucco walls had a thick ivy covering.

The station exemplified the same luxury and style as one would find in the grandest railroad stations of the era, but on a smaller scale. This included an



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Another view from the 1970s shows the covered outdoor waiting area on the east side of the station. When the station was still in use, there would have been long benches under the portico. Bruce Briggs photo

elaborate exposed beam-and-truss ceiling and wrought-iron chandeliers complete with winged dragons.

The East L.A. Station and its motor coach connections remained in continuous service on the UP's Salt Lake Route for 42 years. During that time, many prestigious UP passenger trains stopped at the station, including the *Los Angeles Limited*, the *Challenger*, and the *Gold Coast Limited*. The station also served famous streamliners, including the *City of Los Angeles*, *City of St. Louis*, and *City of Las Vegas*.

Film buffs may recognize the station as a featured location in the 1946 movie *The Postman Always Rings Twice*.

The beginning of Amtrak operations in 1971 marked the end of scheduled passenger service on the UP and the end of East Los Angeles as a working passenger station. The UP maintained the building and grounds for other purposes in the 1970s and 1980s.

Following its merger with the SP in 1996, UP moved its East L.A. offices to Colton and sold the station and neighboring office building. As of this writing the station still stands, but it's boarded

up and derelict. The wrought iron window grills have been removed.

The station suffered damage from the 1994 Northridge earthquake and is now fenced off. Too small for commercial use, the East L.A. Station's future is uncertain.

Making the plans

In 1984, when the UP still owned the station, I contacted the railroad's public relations department and obtained permission to photograph the station interior as well as the original blueprints. I used this research to produce the drawings on page 51.

In 1941, the railroad extended the baggage room by 40 feet. My drawings reflect the structure as it was built in 1929, including the original, smaller baggage room.

Modeling challenges

I think one of the biggest challenges in modeling the structure will be creating the symmetrical relief details, such as that above the doors and windows.

Other buildings by Gilbert Stanley Underwood

In addition to 19 other depots built for the Union Pacific RR between 1924 and 1930, architect Gilbert Stanley Sullivan designed several other famous structures listed below. Each structure name is followed by its location and year built. – Bruce Briggs

Old Faithful Lodge, Yellowstone National Park – 1923
 Bryce Canyon Lodge, Bryce Canyon National Park – 1925
 The Ahwahnee Lodge, Yellowstone National Park – 1926
 Union Station, Omaha, Neb. – 1931
 U.S. Post Office, Terminal Annex, Los Angeles – 1940
 U.S. State Department (renamed the Harry S. Truman Building in 2000), Washington, D.C. – 1940
 U.S. Federal Courthouse, Los Angeles – 1940
 U.S. Mint, San Francisco – 1947



One solution could be to carve the volutes and scrollwork in wood or plaster to make molds for resin castings. Another approach would be to create these and other details using 3-D printing technology. Most of the windows and doors would also probably be best modeled with 3-D-printed parts.

The wrought-iron window grates, light fixtures, and Moorish screens would likely have to be photo-etched. The screens above the doors are several inches thick, so they could possibly be made using a 3-D printer.

For the scalloped columns in the portico, one could carve a master from basswood, use that to create a mold, and then cast all six columns from resin or plaster.

The irregularly laid tile roof presents another challenge. Although textured styrene sheets could be used, they would be uniform in appearance. One technique I found in an architectural modeling book involves using a sharp hobby knife to split drinking straws lengthwise. The halves are then cut to length to model individual tiles. Handlaying individual tiles would be tedious, but it would better capture the irregular look of the prototype's roof.

The stucco walls could be built from textured sheet styrene, but note that the

Research sources

The following books were invaluable in my research about the East Los Angeles Station. – *Bruce Briggs*

The Los Angeles & Salt Lake Railroad Company by John R. Signor (Golden West Books, 1988)

Union Pacific in the Los Angeles Basin by Jeff S. Asay (Signature Press, 2010)

faux Moorish screens over the restroom windows are integral to the walls and not separate parts.

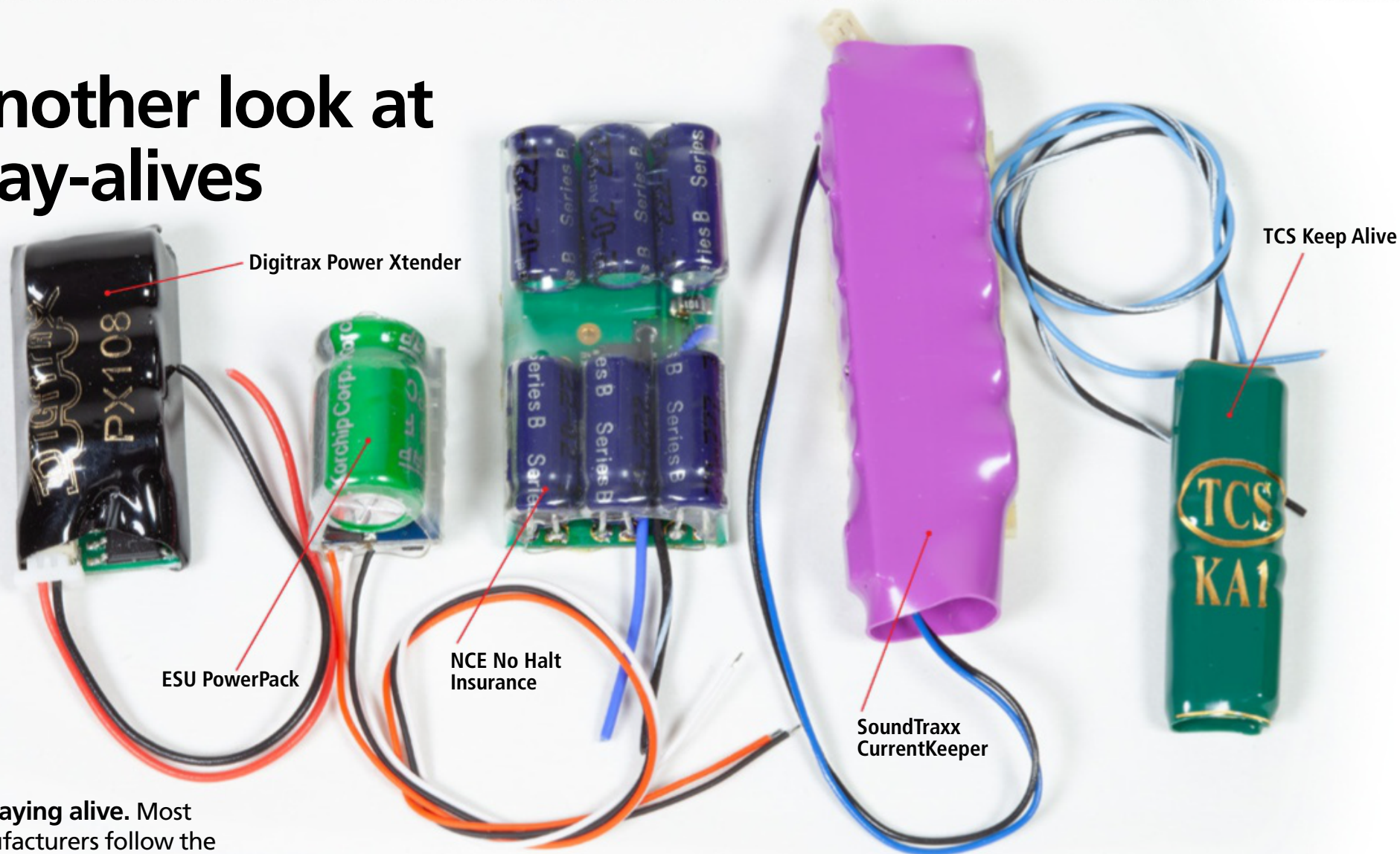
I don't know if I'll ever build this structure. However, for me the most important part of this project was drawing the plans and producing this article. I wanted to do my part to help preserve this classic architectural design. Perhaps my article will inspire another skilled modeler to take up the challenge and build the East Los Angeles Station. **MR**

Bruce Briggs lives in the Phoenix area. This is his first article for Model Railroader.

This street side view of the East L.A. station shows off many of its architectural details, including carved stone scrollwork, Moorish screens above the doors, and ornate wrought-iron grates over the windows. Ivy has covered the station's stucco walls for most of its life. Bruce Briggs photo



Another look at stay-alives



1 Staying alive. Most manufacturers follow the National Model Railroad Association (NMRA) guideline for a blue positive wire, but when it comes to the negative wire, some do their own thing. Larry Puckett helps sort out the options for stay-alive circuits to keep decoders working when electrical pickup is a problem.

I wrote about stay-alive devices back in the July 2018 DCC Corner column, and since then I've had numerous questions from readers. I want to revisit the topic to address those questions and add new information. As a reminder, stay-alives are small electronic circuits that can provide power for your decoder to get your locomotive over dirty spots and dead track.

Probably the biggest concern folks still have is whether one manufacturer's stay-alives will work with another's decoders. The answer is yes, with a couple exceptions. First, let me point out that in order to promote compatibility, the National

Model Railroad Association (NMRA) Standards and Recommended Practices specifies that for stay-alives, the common or positive wire should be blue and the negative ground wire should be black with a white stripe.

However, some manufacturers don't abide by that. For example, SoundTraxx uses a green wire with a yellow stripe for the ground on its CurrentKeeper stay-alive. Digitrax uses red and black wires with the conventional polarity of positive and negative, respectively. Both NCE and TCS use the blue and black/white wire colors **1**.

Another complication is some manufacturers use polarized plugs on their stay-alives that only mate with a socket on their decoders **2**. Of course, you can clip these off and solder on the correct plug, if you have one. Just make sure to always match the positive and negative wires. As long as you observe proper polarity, it's usually relatively easy to make the connection.

There are at least two exceptions to the compatibility question I know of – Electronic Solutions Ulm (ESU, maker of LokSound) and Lenz. The difference is their devices use three wires instead of the usual two **3**. This three-wire design allows the decoder to shut off the stay-alive when in analog mode and for programming. This is important, since not only can a stay-alive interfere with service mode programming commands, it can also create problems when trying to operate a decoder-equipped locomotive on a DC-powered layout.

You need to be aware of another factor. There is at least one video on YouTube that shows how to connect a non-ESU stay-alive to a LokSound decoder. The locomotive operates properly and the stay-alive does its

job, as well; however, installing a two-wire stay-alive can lead to disastrous results.

The folks at LokSound have had to replace so many blown decoders for modelers who used a non-LokSound stay-alive that they've told me they'll more closely scrutinize damage due to use of such third-party items. So if you watch the YouTube video instructions on how to do this and blow a LokSound decoder, remember, you were warned!

One question I continue to get is, why do these devices

have to be so large? After all, you only need the locomotive to stay alive a couple seconds, not 10 to 20. It comes down to a matter of voltage. While it's true that the capacitors in the circuit only have to be large enough to supply sufficient current to get over the dirty



ONE QUESTION I CONTINUE TO GET IS, WHY DO THESE DEVICES HAVE TO BE SO LARGE?
— LARRY

and rough spots, they also need to supply a certain voltage to meet the requirements of both the mobile decoder and the sound circuits.

The mobile part of the circuit requires about 3 to 5 volts (V), but the sound circuit requires about 6 to 8V. Given that the super capacitors used in most stay-alives are rated at 2.5 to 3V, if you do the math you quickly realize at least three are required, and four give a margin of security that makes electrical engineers comfortable.

That's why most stay-alives have four or more capacitors – manufacturers have to design for the lowest common denominator and build in a safety margin. It's the capacitors that determine the final size of the stay-alive.

Yes, I did say most stay-alives have four or more capacitors. The ESU stay-alives have only one or two capacitors **3**. Although I've never been able to get ESU to confirm or deny this, the general consensus is they use a booster circuit that kicks the voltage up to the minimum required. The trade-off is a smaller device at a higher cost, about twice some others, but a shorter run-time.

One recent development as a result of the continuing trend of miniaturizing components are the new KA1 and KA2 Keep Alives from TCS. These new Keep Alives use much smaller capacitors and are almost half the size of the company's previously smallest ones **4**.

I've used these in tight installations and found they do an excellent job of keeping the locomotive running and the sound on. I expect given this trend in miniaturization, we'll see decoders with built-in stay-alives in a few years.

There are some downsides to using stay-alives. First, since they supply a DC power

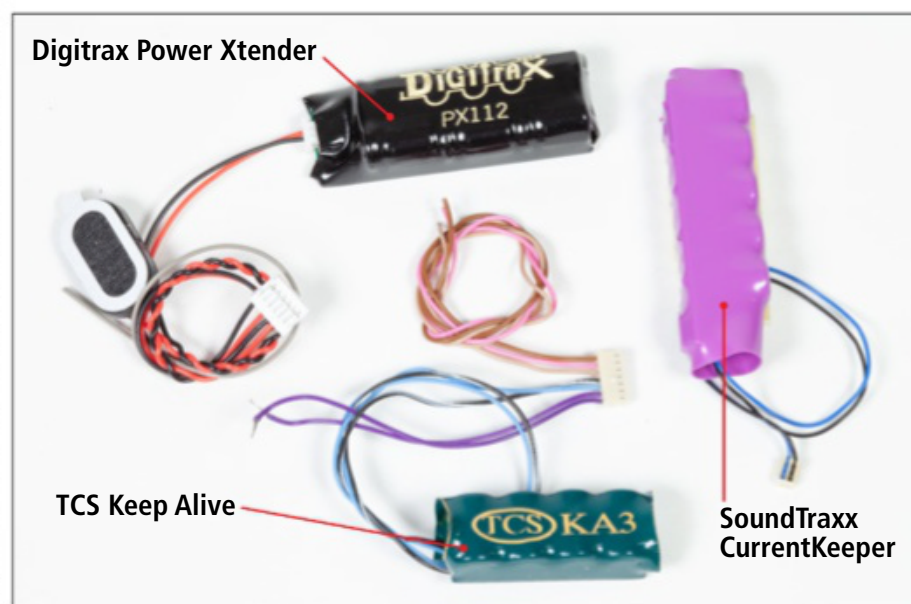
source, dual-mode decoders can interpret this as the locomotive running in a DC environment, so the dual-mode option should be turned off in CV29. SoundTraxx specifically points this out in its instructions. Stay-alives also can interfere with programming, especially on the service mode track. Again, SoundTraxx has specific instructions on how to deal with this in its instructions.

Some readers have told me they've installed a latching, magnet-activated reed switch to turn the stay-alive off during programming. I've also heard from one reader who has had locomotives take off uncontrollably after programming on the service mode track and asked me to warn readers of the potential for this. I've never had any of these issues, but I do about 90 percent of my programming on the main.

For some folks, using a stay-alive in all their locomotives may be an expensive option, so which locomotives benefit the most from them and under what conditions?

First, short-wheelbase locomotives like small diesel switchers and especially small steam locomotives are most likely to stall on dirty or uneven track. Unfortunately, these also are the ones that are most difficult to add a stay-alive to. However, the new TCS Keep Alives may make many of those installations possible. If you have lots of turnouts with unpowered frogs, then you might benefit from stay-alives to prevent stalling. Finally, even long wheelbase steam locomotives can be prone to stalling, especially if they only pick up power from the drivers.

In all cases, if a locomotive has a tendency to stall often or is exhibiting symptoms of rough running and flickering lights, then I would give a stay-alive a try. **MR**



2 Wires or plugs. Some stay-alives and decoders come with bare wires, but others use polarized connectors that aren't directly interchangeable. If you decide to mix and match, you'll also have to do some cutting and soldering.



3 Three wires. ESU PowerPack stay-alives have three wires and only one or two capacitors, yet can power a LokSound decoder for several seconds. These are the only stay-alives recommended for use with LokSound decoders.



4 Small packages. The redesigned KA1 and KA2 Keep Alives from TCS are about half the size of their bigger KA3 and KA4 brothers, so they will fit in many tight installations.



Broadway Limited Imports HO scale P5a

The boxcabs are back! Broadway Limited allowed us to get a sneak preview of its new HO scale Pennsylvania RR P5a electrics, and now we have production models in the office to test.

Previously available only in brass, these boxcab electric models are of primarily die-cast metal construction, giving them 1 pound, 6 ounces of heft for potentially pulling long freight or passenger trains.

While known as freight haulers for most of their lives, the P5a was the first successful mainline electric motive power under PRR catenary. Assigned to pull passenger varnish from New York's Penn Station to

Philadelphia's 30th Street Station, the locomotives lost their starring roles when the GG1 electric came on the scene.

Construction began in 1931 at Juniata Shops in Altoona, Pa., with a pair of prototypes. After rigorous testing, regular production commenced in 1932. Starting on May 1, 1934, the design shifted to a streamlined centercab design similar to the GG1 after a collision with a truck killed the crew in the vulnerable cab of the flat-faced units.

Once the "modifieds" came into service, they were mated with boxcabs as multiple units so that in at least one direction crews would have more protection. By this point, most P5as were

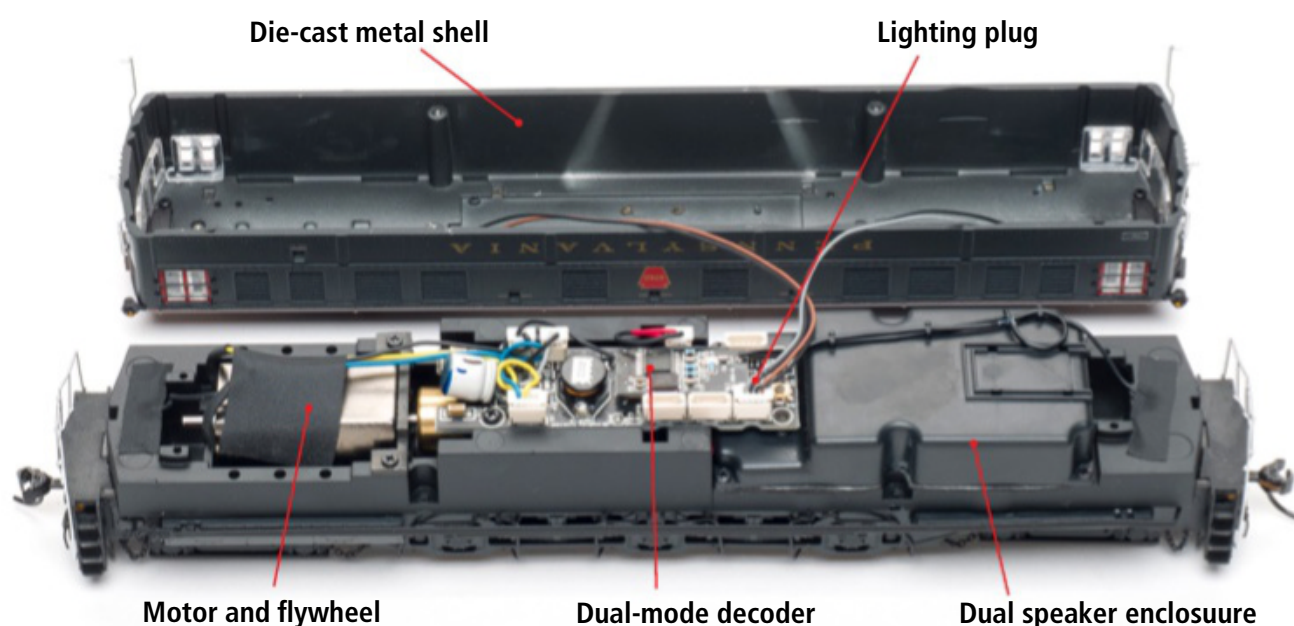
working as freight engines, where they were used in multiples of two or three.

When production ended in 1935, 92 P5s had been built in Eddystone, Erie, and Altoona, Pa. Electrical equipment orders were shared evenly between Westinghouse and General Electric. Generally, GE-equipped P5as were built at GE's plant in Erie and Westinghouse-equipped units were built by Baldwin at Eddystone, but the final 10 locomotives, all modifieds, were built in Altoona of both GE and Westinghouse parts.

The P5a locomotives were replaced by General Electric 4,400hp E44s between 1960 and 1963. Only one P5 has been preserved, prototype no. 4700 at the National Museum of Transportation in St. Louis. The rest were scrapped by the mid-1960s.

Broadway Limited's model matches dimensions from prototype equipment diagrams posted on Rob's Pennsy Page at www.prr.railfan.net. Our sample was decorated in as-delivered dark green locomotive enamel with a brown roof and gold lettering. Even the smallest sand box and fuel oil door lettering was legible. A builder's plate indicates the locomotive was built with General Electric equipment in April 1933.

Pop-off valves for the steam generator, the bell, and the early trolley whistle are brass castings. The window frames are



Broadway Limited Imports' P5a has a die-cast metal body shell and frame. The can motor powers all six wheels through a gear tower under the decoder.

PERFORMANCE CHARTS

DRAWBAR PULL	2.56 ounces 36 HO scale freight cars
SCALE SPEED (DC)	
VOLTS	SCALE MPH
8.75 (start)	1.1
10	20
11	50
12	100
14 (powerpack max)	109
SCALE SPEED (DCC)	
SPEED STEP	SCALE MPH
1	1.1
7	13
14	26
21	70
28	136

trimmed in red, and the end railings – made from flexible engineering plastic – are painted silver to simulate the aluminum used on the full-size locomotives.

The scale-sized 72" diameter drivers have alternating spring cup detail indicative of the quill drive favored by the PRR on its older electrics. However, the center drivers were blind (flangeless) on the prototype, unlike the model, which relies on a significant amount of lateral movement to allow negotiation of tight-radius model railroad curves and turn-out angles.

The four-wheel pilot trucks include restraining chain details at their ends. Wipers on their axles help improve power pickup.

The pilots have a combination of molded in detail and separately applied plastic and metal parts, including non-operating classification lights with colored jewels. On this early prototype, there are also a pair of classification lights on the upper corners of the cab and each end. Metal knuckle couplers are mounted at the correct height.

To access the inside of the locomotive, remove the four screws between the drivers and pilot trucks, then slip the end handrails that link the cab ends with the steps from the holes at the bottom of the steps. The body can then be slowly lifted off the frame.

Inside the die-cast metal shell is a can motor with flywheel at one end of the die-cast metal frame. The motor powers the drivers through a center-mounted gear tower. At the opposite end of the frame are a pair of round speakers facing down in a rectangular plastic enclosure. Between the motor and speakers is the dual-mode sound decoder.

The light-emitting diode headlights in the body shell are connected to the decoder with a four-pin plug. There is no provision to collect power from the pantographs.

The model is equipped with BLI's Paragon3 sound and operation system and supports the firm's Rolling Thunder system (see the review in the March 2018 MR). Sold separately, the Rolling Thunder subwoofer and receiver are placed under the layout. This system adds low-frequency bass sounds to the already loud sound from the engine-mounted dual speakers.

I tested the model first using an NCE PowerCab Digital Command Control (DCC) throttle. This gave me full control of all the sound effects packed into the model. These sounds include pantograph up and down sounds and an electric arc sound. Users can choose between the originally equipped trolley whistle used during the first days of passenger service, or the loud, single-tone air horn added when the P5as were used primarily in freight service.

Broadway Limited also allows users to record a set of instructions, called a macro, that the locomotive will then carry out. For a locomotive such as this, it could be programmed to run a set pattern to simulate a commuter train operating between several stations.

The model had excellent slow speed performance, smoothly crawling along at just above 1 scale mph in speed step 1. Speed step 28 saw 136 scale mph – significantly higher than the locomotive's design speed of 90 mph.

The locomotive's pulling power was disappointing, though. For its weight, it seemed to be leaving something behind. A common problem on steam locomotives with pilot and trailing trucks is that the springs on the trucks can lift the locomotive from the rails enough to let the drivers spin.

That appears to be happening with this model. With the pilot springs in place, the P5a generated 2.56 ounces of drawbar pull, equivalent to 36 freight cars on straight and level track. With the pilot springs removed, drawbar pull jumped to 3.84 ounces, equivalent to 54 freight cars.

But this isn't a perfect fix. When I removed the springs, the pilot trucks had a tendency to drop a wheel while

Facts & features

Price: \$399.99

Manufacturer

Broadway Limited Imports

9 East Tower Circle

Ormond Beach, FL 32174

www.broadway-limited.com

Era: 1935 to 1965, depending on paint scheme

Road names: Pennsylvania RR, passenger and freight type (multiple road numbers)

Features

- All drivers powered
- Blackened metal pilot and driver wheels, in gauge
- Die-cast metal body and chassis
- Die-cast metal knuckle couplers, mounted at correct height
- Minimum operating radius: 18" or greater
- Paragon3 sound and operation system with Rolling Thunder, operates on DC and DCC layouts
- Weight: 1 pound, 6 ounces

going around a curve. This wasn't an issue with the springs installed. Tracking through turnouts was fine with or without the springs. The ultimate solution would take a bit of tinkering.

As a dual-mode locomotive, the engine also operates on DC power. As the charts show, the model again has excellent slow-speed operation. As is typical of dual-mode-decoder-equipped models, it takes much of the throttle range to get moving.

Sounds commenced at 8.25 volts, and the locomotive started moving at just over 1 scale mph at 8.75 volts. Using a Bachmann power pack, I recorded a top speed of 109 scale mph at the pack's maximum voltage of 14V. On DC, all sound effects are automatic, with the sound of the locomotive's blower motors and drive motor whine predominating as they rose in pitch as the model moved faster.

This well-detailed model looks and sounds great, and with a bit of tinkering, it could be a strong-pulling locomotive as well. If you've been itching to expand your fleet of Pennsy electrics beyond the GG1, BLI's P5a is just the ticket. – *Eric White, associate editor*



Atlas Master Series N scale EMD SD35 diesel

The Electro-Motive Division SD35 is one of the latest Atlas Master Series N scale locomotives to be upgraded with factory-installed Digital Command Control (DCC) and sound. We reviewed the first release of the model in the October 2000 issue. This latest version is factory-equipped with a dual-mode ESU LokSound decoder that operates on both DCC and direct-current (DC) layouts.

Note that some of the road names listed are sold out at the manufacturer, but as of this writing many are available from Atlas dealers and hobby shops.

The prototype. Between 1964 and 1966, General Motors Electro-Motive Division produced 360 SD35 diesel-electric locomotives for several U.S. railroads. Like

the four-axle GP35 released a year earlier, the six-axle SD35 came equipped with a 2,500 hp EMD 567D3A diesel engine. Although not as big a seller as the GP35, the SD35 filled a niche with some roads, especially those that worked eastern coalfields.

After its formation in 1976, Conrail received its 52-unit SD35 fleet from predecessor railroads Penn Central and the Central RR of New Jersey. They served on various parts of the CR system for nearly a decade before being retired in the mid-1980s.

The model. The main dimensions of the Atlas model match a prototype diagram in the 1966 *Car and Locomotive Cyclopedia of American Practice*

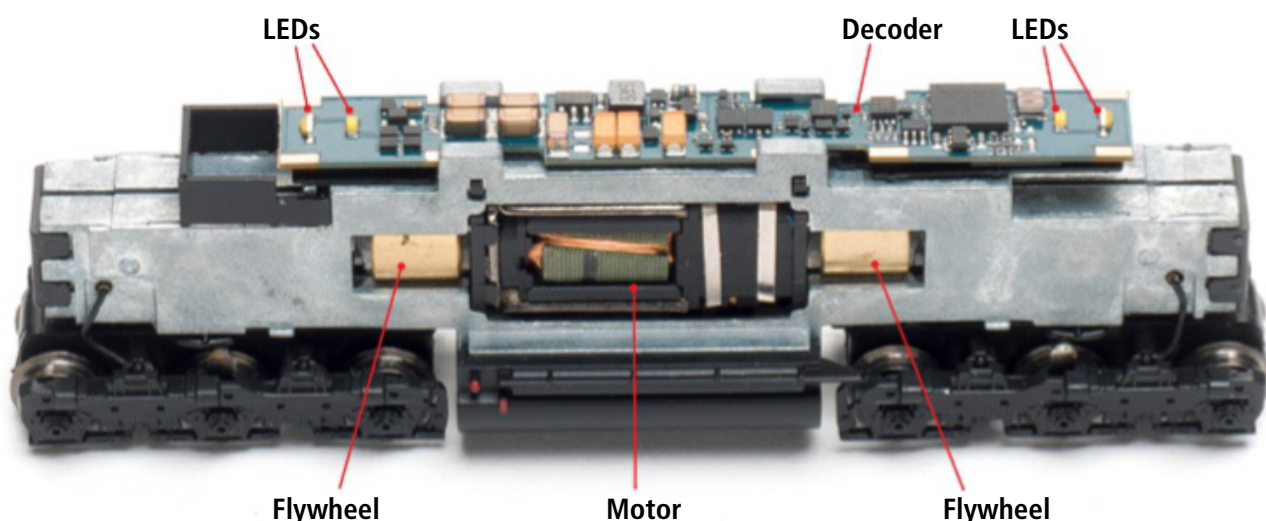
(Simmons-Boardman). The positions of the engine-access doors, grills, and other molded in detail matches prototype photos. Grab irons are also molded on each end.

Separately applied parts include handrail and stanchion assemblies made from flexible engineering plastic to resist breaking. The three-chime air horn is also separately applied and correctly positioned on the center-front of the cab roof. All the cab windows have clear plastic glazing with silver painted window trim on the side cab windows.

Our review sample is decorated for Conrail no. 6012. The model's prototype was built in 1965 as Pennsylvania RR no. 6012, then became PC no. 6012 after the PRR's merger with New York Central in 1968. Photos show that no. 6012 remained in PC livery for a few years after the 1976 formation of Conrail. The locomotive was finally painted in Conrail Blue in 1979.

The model's paint scheme matches the prototype's CR livery. The white stripes are straight and opaque with no voids. The end handrails are also correctly painted white.

All lettering is accurately positioned, including EMD builder's plates on the side sills under the cab and the SD35 classification under the cab number. Maintenance stencils, including FIRE EXTINGUISHER INSIDE and



A split die-cast metal frame surrounds the mechanism and provides electrical contact between the power pickups on the trucks and the decoder.

PERFORMANCE CHARTS

DRAWBAR PULL	1.25 ounces 30 N scale freight cars
---------------------	--

SCALE SPEED (DC)

VOLTS	SCALE MPH
7.5 (start)	3
8	19
9	49
10	67
12	100

SCALE SPEED (DCC)

SPEED STEP	SCALE MPH
1	1.5
7	26
14	71
21	117
28	121

EMERGENCY FUEL CUT OFF, are legible under magnification.

The mechanism. Removing the press-fit plastic body shell reveals the locomotive's mechanism. A split die-cast metal frame surrounds the dual-flywheel-equipped motor. All 12 wheels pick up track power. Wires connect the trucks to the frame to transmit track power to the decoder mounted atop the chassis.

Surface-mount light-emitting diodes on each end of the decoder board illuminate the headlights. The speaker for the sound system is mounted in an enclosure under the plastic fuel tank.

The frame and the motor give the model a relatively hefty 2.7 ounce weight. This, along with all-wheel drive gearbox, gives the SD35 a 1.25 ounce drawbar pull, equivalent to 30 N scale freight cars on straight and level track.

Performance and sound. On our DCC test track, the SD35 rolled smoothly at 1.5 scale mph in speed step 1 and accelerated smoothly to 121 scale mph. This is quite a bit faster than the prototype's top speed, which was 71, 77, or 83 mph, depending on the gear ratio.

The top speed and every other performance, sound, and lighting aspect of the decoder is easy to adjust via configuration variables (CVs). Programming LokSound decoders is made even easier with the firm's LokProgrammer software (free download) and LokProgrammer computer interface (sold separately). In addition to lowering the top speed, I programmed the locomotive address to the cab number and added deceleration and acceleration momentum.

User-triggered effects include the headlight, horn, bell, and coupler crash

Facts & features

Price: \$234.95 (DCC sound), \$124.95 (DC, no sound)

Manufacturer

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

Era: 1979 to mid 1980s (as decorated)

Road names: Low short hood: Conrail, Chessie System (Western Maryland reporting marks), Central of New Jersey, Penn Central, and Southern Pacific. High short hood: Central of Georgia and Norfolk & Western. Undecorated versions also produced.

Features

- All-wheel drive and electrical pickup
- Accumate couplers, at correct height
- Atlas Scale Speed motor with dual brass flywheels
- Blackened metal wheels, in gauge
- Dual-mode ESU LokSound decoder (DCC sound version)
- Golden-white light-emitting-diode headlights
- Weight: 2.7 ounces

sounds. I could easily "play" the horn for both long or short blasts using the HORN button on my NCE throttle.

The button-controlled brake and DRIVE/HOLD feature make operating the locomotive more realistic. The latter feature maintains the locomotive's speed setting, allowing the throttle knob to be used to manually notch the engine rpm sounds up or down. Pressing function 4 on a downgrade triggered a dynamic brake sequence.

On our DC test track, the sound started at just under 7 volts. At 7.5V the locomotive started moving at 3 scale mph and accelerated to 100 scale mph at 12V. Sounds are limited to the diesel engine and brakes. The engine rpm increases or decreases with the throttle setting. A quick decrease in speed also triggers squealing brake sounds. In DC mode, the headlights operate according to the locomotive's direction of travel.

The Atlas Master Series SD35 should fill a niche for those who model railroads that used this second-generation workhorse. – Dana Kawala, senior editor

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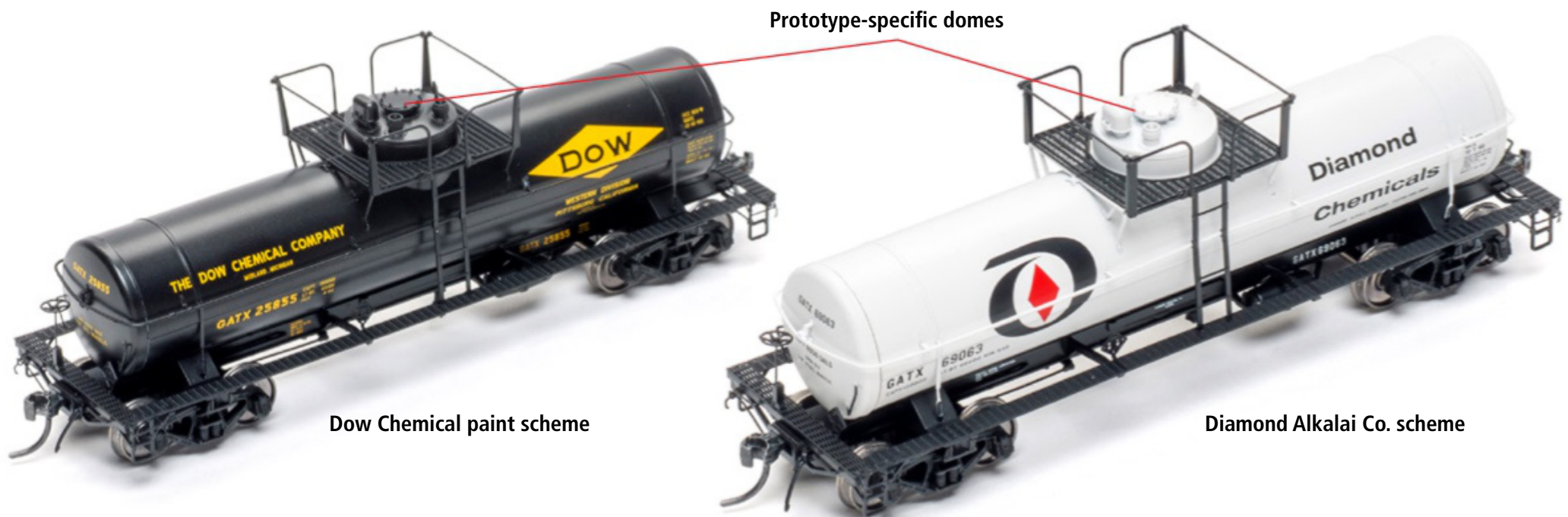


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Tangent HO scale GATX 1952 tank car

Tangent Scale Models has released an HO scale model of an 8,000-gallon General American Tank Lines (GATX) 1952 general-service tank car. The finely detailed, ready-to-run model represents a plentiful prototype seen on practically every railroad in the country.

According to the *Official Railway Equipment Register* (ORER) (Railway Equipment & Publication Co.), GATX, one of the nation's big three tank car leasing companies, had 45,632 tank cars on the rails in 1953. In addition to oil and gasoline, these cars carried corn syrup, fertilizer, liquefied petroleum gas, bleach, acids, and wine, among others.

Tangent's model represents an 8,000-gallon, uninsulated, unpressurized carbon steel tank car, designated by the Department of Transportation as DOT class 103W. The "W" indicated a welded tank. These cars typically carried ladings such as fuels, oils, solvents, caustic soda,

and alcohol. The model's major dimensions matched those listed in a General American Transportation Corp. data sheet in the 1957 *Car Builders Cyclopedia* (Simmons-Boardman).

One of our samples was painted in a Dow Chemical Co. billboard scheme, replicating one worn by cars that served the Dow plant in Pittsburg, Calif. These cars carried caustic soda (sodium hydroxide) to paper, textile, soap, and petroleum processing plants nationwide. The paint is a smooth satin black. The yellow printing is opaque, crisp, and legible on the tank, the center sill, and even on the side of the air reservoir.

Our second sample is painted for Cleveland, Ohio-based Diamond Alkali Co. The white paint is smooth and even, and the printing is crisp and legible. The seam between the tank body and the end caps was more visible on the white car. Like the Dow car, these could be found on any railroad across the continent.

The models bristle with fine details, including wire grab irons, see-through running boards and dome platforms, etched metal tank straps, and accurate hazardous material placard mounts. The two cars have different fittings to match their prototypes.

The blackened metal wheels are in gauge and ride on American Steel Foundries (ASF) double-truss trucks. I was pleased to be able to read the embossed lettering on the sideframes. The metal Kadee scale knuckle couplers are mounted at the correct height.

The cars rolled freely on our HO scale Virginian project layout and had no

Facts & features

Price: \$44.95

Manufacturer

Tangent Scale Models
P.O. Box 6514
Asheville, NC 28816
www.tangentscalemodels.com

Era: 1952 to 1990s

Road names: General American Transportation Corp. (GATX reporting marks, 1959 Diamond Chemicals and 1964 Dow Chemical Co. schemes, four road numbers each) and Vulcan Materials (UCLX reporting marks, two numbers).

Features

- Blackened CNC-machined 33" metal wheels, in gauge
- Flexible engineering plastic underbody details and platform railings
- Kadee scale knuckle couplers, at the correct height
- Prototype-specific valve arrangements
- See-through running board and dome platform
- Weight: 3.6 ounces (matches National Model Railroad Association Recommended Practice 20.1)
- Wire grab irons and details



The cars are equipped with metal grab irons, see-through running boards, and Kadee scale magnetic knuckle couplers.

problems negotiating its 18" radius curves and no. 4 turnouts.

Tangent's new model needs only a hazmat placard and maybe a bit of weathering to look right at home on any transition-era or later HO scale layout.

– Steven Otte, associate editor

Athearn ACF Center Flow covered hopper

An American Car & Foundry (ACF) 4,600-cubic-foot-capacity covered hopper is the latest freight car to join the Athearn Genesis lineup. The HO scale model is offered in three body styles and features see-through etched-metal running boards, factory-installed and painted wire grab irons, and 100-ton trucks with rotating bearing caps.

The prototype. American Car & Foundry started production of the 4,600-cubic-foot-capacity Center Flow in January 1965. From the start of production through August 1971, the cars featured a single stiffener that ran horizontally along the car side. Cars built after that had parallel horizontal stiffeners

near the top of the side. By the end of the production run in October 1981, more than 15,000 ACF 4600s were built.

Our sample is decorated as Louisville & Nashville no. 200570, part of the railroad's 200400 through 200599 series. The first 50 cars, 200400 through 200449, were built by American Car & Foundry at its Huntington, W.Va., plant in April 1965. The remaining 150 cars were constructed in August 1965. The last 50 cars (200550 through 200599) had gravity-pneumatic outlets; the rest had gravity outlets. The Athearn model accurately depicts the former.

Model details. The L&N car is based on an early 4600 covered hopper with a high brake wheel and single horizontal

stiffener. Athearn also offers the model with an early body and low brake wheel and, a late body. A group photo of the three body styles can be seen on the next page.

The model features a one-piece plastic body with a separate roof, slope sheet braces, and discharge gates. There are small gaps where the roof meets the sides on all three of our samples. The end cages are separate castings with a mix of plastic and wire grab irons. The L&N car has two body panels, accurate for an early production car. Post-1972 covered hoppers have seven panels.

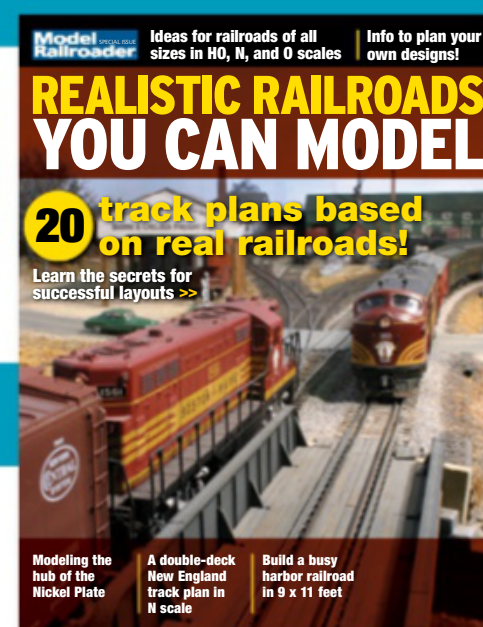
The roof is equally well detailed. The L&N car has a continuous pressed steel hatch cover with separate, factory-applied and painted wire grab irons.



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Early, high brake wheel
Early, low brake wheel

Late body, round hatches

Facts & features

Price: \$49.98; three-pack, \$147.98

Manufacturer

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

Era: 1965 to present (depending on livery)

Road names: First run: Louisville & Nashville; Burlington Northern (as-delivered scheme); Western Pacific; Atchison, Topeka & Santa Fe; General Chemical; Kansas City Southern; and Soo Line. Second run: Burlington Northern Santa Fe; BN (1991 scheme and August 1975 repaint); Chicago, Burlington & Quincy; Pennsylvania RR; and Union Pacific.

Features

- 36" metal wheelsets, correctly gauged
- Body-mounted McHenry scale couplers, at correct height
- Weight: 4.8 ounces

Athearn offers five different trough hatch covers and one style of round cover.

Framing the hatch covers is a painted etched-metal Apex Tri-lok running board with L-shaped wire corner grab irons. The running boards have 13 supports per side, correct for a pre-1975 car. Models depicting post-1975 covered hoppers have nine supports.

The blue paint is smooth and evenly applied, and the yellow printing is opaque and legible. The lettering placement matches a prototype photo in Steven D. Johnson's *Louisville & Nashville Color Guide to Freight and Passenger Equipment* (Morning Sun Books Inc., 2000).

Test time. The model's dimensions closely follow prototype drawings published in *ACF Center Flow CF 4600* by

Eric Neubauer (Society of Freight Car Historians, 1994). The Genesis-series car has correctly gauged 36" metal wheelsets. The body-mounted McHenry scale couplers are at the correct height. At 4.8 ounces, the model correctly matches National Model Railroad Association Recommended Practice 20.1.

I took the three samples we received (L&N, Burlington Northern, and Western Pacific) to our Wisconsin & Southern Troy Branch staff layout. The covered hoppers performed flawlessly while being pushed and pulled through no. 5 turnouts and 30"-radius curves.

Conclusion. For a half century, the ACF 4600 Center Flow has been earning its keep on North American railroads. Athearn has done a great job covering the various body styles and detail options on its HO scale Genesis model. This well-executed covered hopper will be a standout in any freight car fleet.
— Cody Grivno, Group Technical Editor

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Stations don't need depots

Make no mistake about the original ownership of this Joint Line trackage roughly 12 miles north of Pueblo, Colo. The locomotive leading the Burlington Northern Santa Fe (BNSF) freight in the background, still wearing the proud Warbonnet paint scheme, hints at it. However, the real giveaway is the classic Atchison, Topeka & Santa Fe (ATSF) design of the station sign, as recognizable as one of the road's distinctive cantilever signal masts.

The Joint Line connects Denver and Pueblo. The Denver & Rio Grande Western (D&RGW) first laid track between the two; Santa Fe surveyors found a roughly parallel route soon after. Officials agreed to joint operation as traffic grew, combining parts of both lines to create a southbound and northbound track. Union Pacific (UP) and BNSF, their successors, continue this arrangement today.

The cottonwood branches framing the station sign and the barren space beyond suggest it's a relic of an earlier time, perhaps what remains of a site sporting a depot, section house, and other structures. Close inspection shows otherwise. It's relatively modern and well-maintained, indicating some importance. Indeed, it is. It marks a specific location on the railroad, alerting crews with "Hey, look at me!"

Surveyors know the term "station" as a precisely located reference point. Railroaders give it a similar meaning, little



A BNSF Ry. southbound headed by a diesel in the Atchison, Topeka & Santa Fe's classic warbonnet scheme passes Bragdon, Colo., in September 2008. Tom Schmieder photo

changed since the late 19th century, when the Standard Code defined it as a place designated on the timetable by name. Today's General Code of Operating Rules (GCOR) and Northeast Operating Rules Advisory Committee (NORAC) definitions read almost identically.

The timetable to which these codes refer is an employees' timetable. It contains a list of stations for each line, their milepost locations, and the railroad facilities located there. Some information shows symbolically. For example, Bragdon's listing in the station column of BNSF

Colorado Division Timetable No. 6 of 2009 shows "X(2)", "X" meaning crossover and "(2)" indicating that there are two.

Bragdon received more attention in a 1953 ATSF timetable, when a tower guarded the Rio Grande and Santa Fe grade crossing there. The tower earned the station the symbol "C",

designating it an "office of communication." By that time, Bragdon no longer merited an "f", or flag stop, whether or not a depot building remained.

Many railroads elaborated on Santa Fe's office of communication designation with "D" and "N" symbols. N indicates a station manned around the clock. These are typical of yards, towers, junctions, and other critical locations. D indicates stations which might be open only on weekdays or only during specified hours. Each road's timetable gave the hours these part-time stations were open.

"Open," in this sense of the word, means that an operator is on duty. A dispatcher (DS) could send a train order to the operator to be delivered to a train. Also, the operator could "OS" ("On Sheet") the train, recording the train's arrival or departure and reporting it to DS for entry on his train sheet.

A station can mark a point at which the method of operation changes. BNSF timetable no. 6 made Bragdon the point at which Track Warrant Control with Automatic Block Signals ended and

Centralized Traffic Control (CTC) began. A southbound train from Denver needed a track warrant to reach Bragdon. For example, the dispatcher (DS) could issue one with box 2 checked, reading "PROCEED FROM CREWS TO BRAGDON ON MAIN 1." Centralized Traffic Control governed movements from Bragdon to Pueblo. Signal indication alone was enough for DS to continue the southbound's movements, without the need for a track warrant.

A station can also mark a limit of authority. The track warrant example above gives the limits of Crews and Bragdon. In 1953, when timetable and train order was the method of operation, a train order corresponding to this track warrant would include the phrase "RUN EXTRA CREWS TO BRAGDON."

Signs can locate stations on a layout just as the sign in the photo locates Bragdon. Most of the stations on my own layout are kit-bashing or scratchbuilding projects yet to come off the workbench. However, each station has a sign on the fascia, as well as the location's track diagram. You see, stations don't need depots. **MR**



A STATION CAN MARK A POINT AT WHICH THE METHOD OF OPERATION CHANGES. IT CAN ALSO MARK A LIMIT OF AUTHORITY.
— JERRY



Baltimore & Ohio RS-1 no. 9185 has just dropped a string of hoppers on the interchange track at Dundon, W.Va. Brooks Stover photographed the scene on his S scale Buffalo Creek & Gauley layout, last seen in our December 2016 issue ("Changing seasons on a finished layout"). Brooks scratchbuilt the locomotive shell from styrene to fit on an American Models chassis.





It's the third shift at U.S. Steel's Clairton Works steel mill as Union RR no. 17 pulls a string of cars. Tom Wilson modeled the scene on his HO scale Pittsburgh & West Virginia RR. The buildings on Maple Street are Downtown Deco plaster kits, and the plant gate building is a modified Walthers structure. Greg

Komar photo

Send us your photos

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.



A pair of Georgia & Florida Electro-Motive Division GP7s leads a southbound freight of pulpwood and paper products toward Vidalia, Ga. Ashby Trevey of Jacksonville, Fla., photographed the action on his HO scale G&F RR layout, which is set in the 1960s. The Athearn Genesis locomotives and Kadee cars are all custom painted. The trestle is scratchbuilt.



A Canadian Pacific Alco S-2 brings a single ore car to the mine. Mike Bishop of Nanaimo, B.C., photographed the action on the HO scale Free-Mo modular layout belonging to the Oceanside Model Railroaders of Parksville, B.C. The club built the layout in memory of member John Hughes, who gave the rolling stock to the club. The engine is from Atlas and the cars are Roundhouse products.



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

Schedule of Events

AZ, PHOENIX: Sahuaro Central Swap Meet at Adobe Mountain Railroad Park, 22822 N. 43rd Ave. Saturday, October 26, 2019, 9:00am-1:00pm. \$5.00, children 12 and under free with paid admission. All scales, 100+ tables, layouts, train ride. Contact: www.azmodelrr.com

CA, SACRAMENTO: T.T.O.S. River City Toy Train Meet. Scottish Rite Center, 6151 H Street, Zip Code: 95819. Saturday, September 28, 2019, 10:00am-3:00pm. Single \$5.00, Families \$9.00, children under 12 free with adult. Free parking. For information or table reservations, contact John DeHaan, 707-642-8023

CO, COLORADO SPRINGS: Train Expo Colorado (TECO) hosts its next model train show at Chapel Hills Mall Events Center, October 12-13, 2019. Saturday 10:00am-5:00pm and Sunday 10:00am-4:00pm. Admission: \$6.00/person or \$10.00/family. Senior and military discounts. Contact Elizabeth 915-491-4819 or <https://www.tecoshow.org>

CT, ESSEX: New Haven RR Historical & Technical Association train show September 7, 2019 at Valley Railroad Co. Modeling clinics, dealers, film & slide shows. Contact Rick Abramson 203-590-3221 or nhrh379@charter.net Information at www.nhrhta.org

CT, GREENWICH: Southern Connecticut Model Train Show. Greenwich Civic Center September 22, 2019, 9:00am-3:00pm. Adults \$7.00, under 12 free. Valley HO-Trak Layout & more. Clinics, 150 tables; trains, books, artwork, DVD's. Door prizes, free parking, refreshments. Ron's Books, PO Box 714, Harrison, NY 10528, 914-967-7541. ronsbooks@aol.com, www.southerncttrainshow.com,

CT, WINSTED: Whiting Mills Annual Train Show, 100 Whiting Street. October 19 & 20, 2019. 10am-4pm. Admission Free. Parking Free. Enjoy Train Layouts, Photos, Artists, White Elephant Train Tables Sales and More. Handicap accessible. Contact Roger Moreau @ 860-379-3383. Emails: sales@rrhobbysupply.com www.whitingmills.com

DE, ROXANA: Indian Summer Train & Toy Show. Roxana Fire House, Route 20, between Millsboro & Fenwick Island. Saturday, September 28, 2019, 9:00am-3:00pm. Admission: \$5.00 adults, children 10 and under free. Operating layouts, refreshments, door prize. For information contact Bill Ziegler, 302-537-0964 or www.delawareseasiderailroadclub.com

FL, DEERFIELD BEACH: South Florida Railway Museum Model Train Swap Meet and Flea Market. St. Paul Lutheran Church, 701 W. Palmetto Park Road, Boca Raton, FL. Saturday, November 23, 2019, 9:00am-2:00pm. Admission \$2.00. Bill Steffen, 561-441-6952, www.sfrm.org

FL, DELAND: 69th FLORIDA RAIL FAIR. Volusia County Fairgrounds, Tommy Lawrence Arena, 3150 E. New York Ave. (SR44 and I-4). Saturday October 5, 2019, 9:00am-4:00pm. Adults: \$7.00, under 12 free. Operating layouts. Miller, 3106 N. Rochester St., Arlington, VA 22213, 703-536-2954, Email: rrshows@aol.com

FL, LARGO: Suncoast Model Railroad Club Train Show/ Open House, September 21, 2019. SHOW- Minnreg Hall, 6340 126th Ave. N., Largo. Saturday 9:00am-3:00pm. Admission: \$7.00, Children \$2.00 and under 11-free. Free parking. Food/snacks. OPEN HOUSE- Clubhouse, 12355 62nd Street N, Unit A. Visit www.suncoastmrrc.com Contact: irvbatten@yahoo.com

FL, OCALA: Lions Semi-Annual Train Show. First Christian Church, 1908 SE Fort King St. Saturday, November 2, 2019, 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 27, 2019. 9:00am-3:00pm. Admission \$5.00. Trains (all scales), memorabilia and collectibles to buy, sell and trade. Individual tables welcome. For information or table reservations contact. Eastside Trains, 641-456-1998, e-mail eastsidetrains@gmail.com

IL, ST. CHARLES: 28th Annual Chicago Railroadiana and Model Train Show. Kane County Fairgrounds, 525 South Randall Rd. Sunday, October 20, 2019, 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, FORT WAYNE: Garrett Model Railroad Club & RxR Mania - Model Train & Toy Show and Sale at 2000 N. Wells Street, Zip 46808. (Old YWCA) Saturday October 19, 2019, 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, INDIANAPOLIS: The Indianapolis Model Railroad Show and Open House. Manual High School Gymnasium, Saturday, September 14, 2019, 10:00am-3:00pm. Admission \$5.00, children 12 & under free. Free parking. Naptown & White River Model Railroad Club. Contact: Steven Handly, 317-786-8627, E-mail: naptownmrr@gmail.com

MA, TAUNTON: OLD COLONY MODEL RAILROAD CLUB 19th ANNUAL MODEL RAILROAD SHOW AND SALE, Taunton Holiday Inn, Myles Standish Industrial Park, Exit 9 from Route 495. September 22, 2019, 10:00am-3:00pm. Adults \$5.00, children under 12/scouts in uniform free. Contact Dennis Ingalls, 508-285-3963, email dingalls@comcast.net

MI, WYOMING (GRAND RAPIDS): Greater Grand Rapids Fall Train Show. Saturday, October 12, 2019. HSB Inc., 5625 Burlingame Avenue SW. 10:00am-3:00pm. Adults \$5.00, under 12 free. 203 vendor tables of Trains, and supplies. Contact Ken Skopp, 616-667-9680, kwskopp@outlook.com. www.grvrrc.org

MO, SEDALIA: 7TH Annual Sedalia Rails Train Show. Liberty Park Convention Hall, 3rd Street & Highway 65. November 2, 2019, 9:00am-3:00pm. Admission \$5.00. Children under 12 free. Dealer tables \$15.00. Operating layouts, ride outdoor steam railway, door prizes and refreshments. Call 660-525-1741 or Email: klbird530@gmail.com

MS, GULFPORT: 615 Pass Road, Zip: 39507. November 9-10, 2019. Saturday 9:00am-5:00pm, Sunday 10:00am-5:00pm. 2 Days with 20,000 sq. ft. Indoor Display Space, 20,000 sq. ft. of Outdoor Trains. www.MCMRCM.org, 228-284-5731.

NJ, EAST RUTHERFORD: METCA/NYSME Train Show, St. Joseph's School, 120 Hoboken Road, Zip: 07073. Saturday, November 2, 2019, METCA/NYSME members 8:00am, Public 9:00am-2:00pm. Admission: \$5.00 Adults 16+, FREE for METCA/NYSME families. NYSME Club layouts open FREE to attendees. Info: www.METCA.org; Doug Schembs, Secretary@METCA.org - 908-208-8134 or contact@modelengineers.org

NJ, ROCKY HILL: Pacific Southern Railroad, 26 Washington St., 41st Annual Exhibition, October 26-27, 2019. Shows on the hour, 10:00am-12:00pm and 2:00pm-4:00pm. Museum quality, completely scenic, 90' x 45' HO layout, 90 car coal train and 30' circus train. Donation \$10/person. Contact: www.PacificSouthern.org or Carl Pate 860-633-2052.

OH, CLEVELAND: Great Berea Train Show, Cuyahoga County Fairgrounds, 19201 E Bagley Rd. Middleburg Heights, OH 44130. NMRA MCR Div. 4. October 5-6, 2019, NEW SHOW TIMES 10:00am-4:00pm. This is an all gauge Train Show with over 350 tables. 440-785-9907, www.thegreatbereatrainshow.org

OH, DAYTON: 44th Annual Dayton Train Show, NEW MONTGOMERY COUNTY FAIRGROUNDS, 645 Infirmary Road, 45417. Sponsored by: Division 3 Mid Central Region NMRA, November 2-3, 2019. Saturday 11:00am-5:00pm and Sunday 11:00am-4:00pm. Admission: \$8.00 per adult, 12 and under free with paid adult. Gail Yarnall, PO Box 341233, Beavercreek, 45434, 937-301-0746. NMRA.Div3@gmail.com

OH, HIGHLND HTS: North East Train Society, Highland Heights Community Center, 5827 Highland Road, Zip 44143. Saturday, November 9, 2019 10:00am-3:00pm. Admission: \$5.00, kids under 12 free with adult. For information call 440-357-8890 or www.northeasttrainsociety.com

OH, HOLMES COUNTY: Old Eli's Train & Toy Show. Heritage Center, 3558 SR. 62, Millersburg, OH 44654, between Berlin-Winesburg, Saturday, October 19, 2019, 10:00am-3:00pm. Adults \$5.00, under 12 free! \$10.00/table, no refund, 150+ tables. Contact: Galen Hoover, PO Box 45, Mt. Hope, OH 44660, 330-763-1184.

OH, MT. HOPE: CJ Trains Fall Train and Toy-Show. Mt. Hope Event Center, 8076 St. Rt. 241, Zip 44660. Saturday, November 2, 2019, 10:00am-4:00pm. Admission: \$5.00, under 12/FREE. \$25.00/dealer table. 600+ tables. Contact, Jon Ulbright, 330-262-7488, cathijon@sssnet.com. www.cjtrains.com (GPS info: 8076 St. Rt. 241, Millersburg, 44654)

OH, NORWALK: Norwalk Model Train/Toy show, at Ernsthausen Center, 100 Republic St. Sunday, October 20, 2019 10:00am-3:00pm. Admission \$5.00 per person. Sponsored by: Lake Erie & Southern Railroad. For information contact: Larry Noftz, 9 1/2 E. Main St., Norwalk, OH 44857. 567-424-5619.

PA, HAWLEY: Model Train Show & Sale. Hawley Fire Department, 17 Columbus Ave. Sunday, October 13, 2019, 9:00am-3:00pm. Admission \$3.00, under 12 free with adult. Bill Dellinger, 618 Fern St., Hawley, PA 18428, 570-226-3206.

PA, HORSHAM: 14th Annual Main Street Hatboro Train Show. Keith Valley Middle School, 227 Meetinghouse Rd. Saturday, December 7, 2019, 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

PA, LANCASTER: Brass Expo & Customer Craftsman Models 2019. Wyndham Lancaster Resort & Convention Center (Lancaster Host), 2300 Lincoln Hwy. E (Route 30), Lancaster, PA. November 23-24, 2019. www.brassexpo.com/724-285-3090

PA, NEW CASTLE: BLRHS Fall Train Show. Shenango Twp VFD Social Hall, 2424 E. Washington St., 16101. Next to Dunkin Donuts, Sunday, October 6, 2019, 10:00am-3:00pm. Adults \$5.00 (\$4.00 if you mention Model Railroader ad) Children under 12 free. Info: blrhs.org, or Clark McKim cmckim1@verizon.net 412-974-0935

SC, COLUMBIA: Jamil Temple, 206 Jamil Road. Saturday, October 12, 2019, 9:00am-3:00pm. Admission \$5.00, under 5 FREE. Over 200 vendor tables. Lots of G, O, HO, S, N gauge. More info at CarolinaTrainShows.com

SC, SIMPSONVILLE: Simpsonville Activity & Senior Center, 310 W. Curtis Street. Saturday, October 26, 2019, 9:00am-3:00pm. Admission \$5.00, under 5 FREE. Over 200 vendor tables. Lots of G, O, HO, S, N gauge. More info at CarolinaTrainShows.com

TX, TEMPLE: 37th Annual Temple Model Train Show by Centra Mod Inc. Central Texas Area Model Railroaders, Frank Mayborn Convention Center, 3303 North 3rd St. September 21-22, 2019, Saturday 10:00am-5:00pm and Sunday 10:00am-4:00pm. Adults \$7.00, Seniors & Military \$6.00, under 12 Free. FREE Parking! Contacts: Craig Caddell, 254-760-3761: David Douglass, 254-727-2155

VT, RUTLAND: Vermont Train Show & Swap Meet, September 21, 2019, Holiday Inn, South Main Street (Route 7). 10:00am-3:30pm. Admission \$6.00, children under 13 FREE. Info/dealer tables: Paul 802-259-2123 e-mail p_a_r@vermontel.net or John 802-774-8412 phone/text.

WA, CHEHALIS: Lewis County Model Railroad Club, Annual Fall Model Railroad Swap Meet and Show. Southwest Washington Fair Grounds, Blue Pavilion Building, 2555 N. National Ave. October 12-13, 2019. Saturday, 10:00am-4:00pm and Sunday, 10:00am-3:00pm. Admission \$5.00. Free parking Contact information: Ted 360-985-7788 or TedsTrains@LewisCounty.com

WA, SPOKANE: River City Modelers Fall Train Show, Spokane Fairgrounds, 404 North Havana. Sunday, October 13, 2019, 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, EAU CLAIRE: West Wisconsin Railroad Club, 18th annual Train Show at Eau Claire Indoor Sports Center 3456 Craig Road, October 12-13, 2019. Saturday 10:00am-5:00pm, Sunday 10:00am-4:00pm. Admission: Adults \$6.00, 6-16, \$3.00, under 5 free. Sellers, Displays, Operating Layouts and Concessions. Paul 715-559-6552 or email: TrainShow@WestWisconsinRailroad.Club

WI, MONROE: Green County Model Railroaders 41st Annual Model Train Show & Swap Meet. The Stateline Ice and Community Expo, 1632 4th Avenue West. Saturday & Sunday, September 28-29, 2019, 10:00am-4:00pm. For information contact Kevin Johnson, 608-558-9332, or www.gcmrrinc.org

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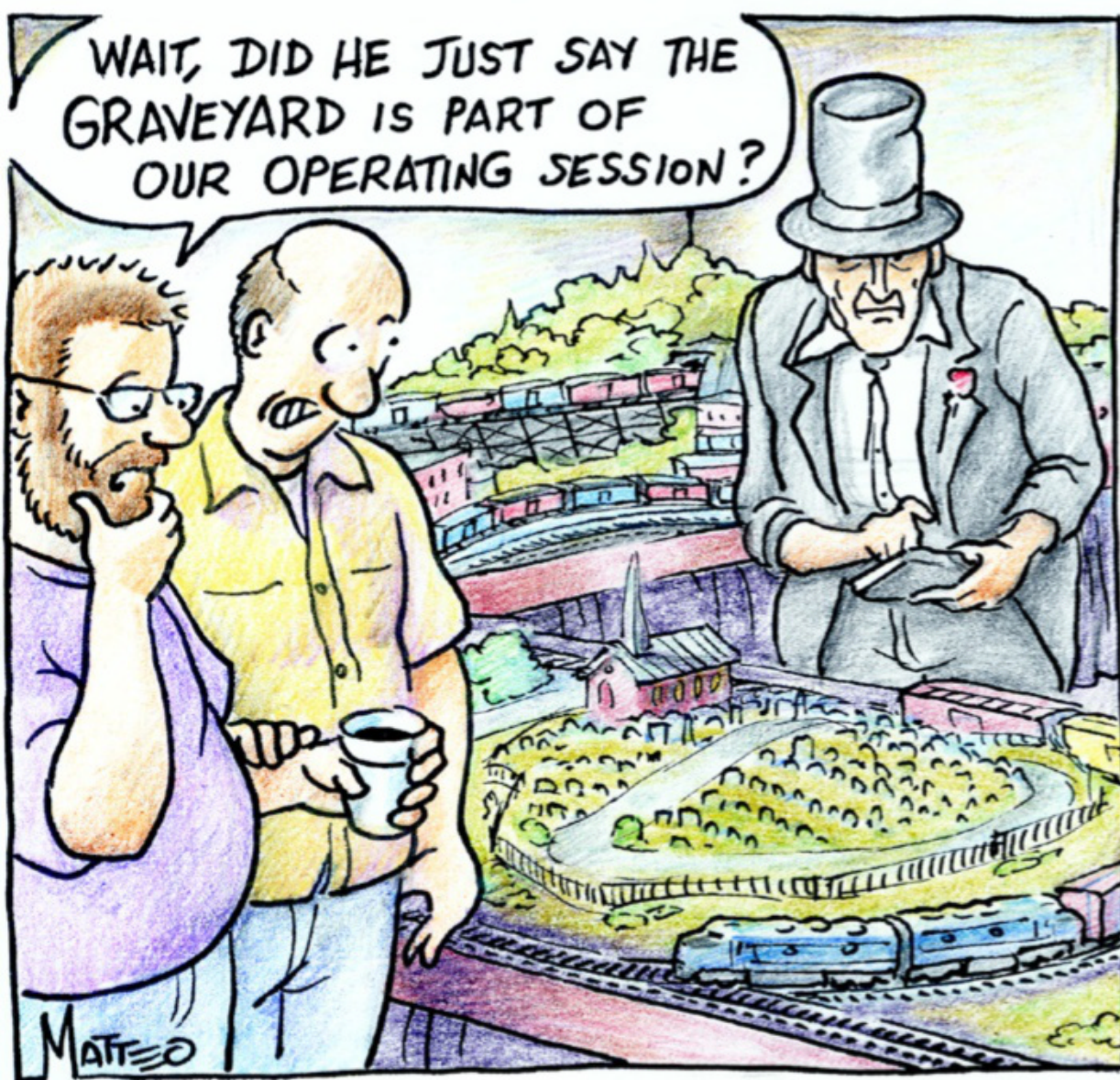
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Why paying close attention matters

What – an airplane photo in a model railroad magazine? Blasphemy! But it did get your attention, and getting one's attention is what this month's commentary is all about.

There are times when an activity, be it work or play, deserves our undivided attention. That the highway accident rate is so high shows we're not as good at doing that as we should be.

The accompanying photo shows a younger me seated comfortably in the cockpit of a Schweizer 1-35 high-performance sailplane. Moments before, a fellow who knew how to fly one of these birds was seated on the wing explaining what I needed to know to stay out of trouble.

Pilots have a quaint saying: "Airplanes is airplanes." But that's true only to a certain point. Beyond that, each of them can bite you in rather nasty ways. So you can bet I was paying close attention to everything that the learned fellow was telling me.

He was apparently a good teacher, and I a rapt student, as this first and all subsequent sailplane flights went very well, including one time as a fill-in act in an air show. That I'm here to tell you about it is a testimonial to Schweizer's solid designs.

Now let's talk about trains. I've dozed off in my share of clinics, no matter how great the presenter or the subject matter. But I've seldom missed the important stuff. I've learned about applying electrostatic grass and weathering with PanPastels, picked up some Photoshop Elements tricks that've saved me a lot of time, and absorbed more information than I'll ever use about 40-foot boxcars.



Before his first flight in a high-performance sailplane, Tony tried to remember everything an expert had just told him about flying it. Tony Koester collection

But most of all, I've learned that I'll never, ever know it all. So I pay close attention to learning from those who do. I can't recall a subject-matter expert ever telling me to buzz off when I asked him or her about a technique or tool or source of information; these good folks wouldn't attend National Model Railroad Association meets on their own dime if they didn't want to share their hard-won information with the rest of us.

As a frequent presenter at such events, I can tell you that I also learn from attendees. There's a wealth of information in the collective wisdom of such gatherings, but it's not always laid out on the table where we can scoop it up. If we're paying close attention to what we see and hear, we can usually figure out who knows what and ask pertinent questions.

I'm sure you remember someone asking a lecturer a

question, and he or she saying, "Good question! I'm glad you asked that." In most cases, that was a sincere response, as it made a point the presenter overlooked but could now cover in more detail. It also showed that his or her talk was hitting home, and that the attendees were indeed paying close attention.

Classrooms and clinics share a common expectation: that attendees will put as much into learning as the presenter puts into delivering information. Many hours went into preparing the presentation, so it's the least we can do as audience members to seek out nuggets of information that are meaningful to us. No one, batter

or lecturer, hits a thousand; we shouldn't expect that. But the harder we work to glean useful information from a talk, the more informed the speaker will seem.

"You'll want to drop some flaps for takeoff, and I'd go to low-tow to keep the tow line taught. This is a very slick aircraft. Off tow, just have fun. For landing, keep the airspeed at 50 knots; as you add landing flaps, keep adding forward stick. Don't get below 50 knots! The nose will be very low; you'll feel like you're standing vertically on the rudder pedals with a great view of the runway. But be sure to round out, and don't bounce it!" **MR**



MOST OF ALL, I'VE LEARNED THAT I WILL NEVER, EVER KNOW IT ALL. SO I PAY CLOSE ATTENTION TO LEARNING FROM THOSE WHO DO.
– TONY



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The Union Pacific Excursion Train from Kato USA includes 7 unique cars, each one a prototype from the Union Pacific's fleet of heritage cars. Highlites from the set include the Business Car, "Kenefick" (pictured right), the specially painted Museum car (pictured above), and the unique power car which is used to power the train's onboard amenities and has different trucks on both the front and rear.

This 2019 new release of the UP Excursion Train will be available as a standard release as well as with pre-installed interior lights. Also being re-released this year will be the Union Pacific Water Tender 2-Car Set, designed to accompany Kato's FEF-3 locomotives or other large UP Steam locos!



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