

HOW TO FIX **WARPED DIESEL HANDRAILS** p.22



Model Railroader®

**New Bachmann
diesel tested** p.60

May 2017
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PICTURE PERFECT

**Learn about Pelle Søbørg's
new Midwestern layout** p.40

**Our fast-working
contributing
editor has built
another great
HO scale layout.**



**5 ways to enhance
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passenger cars** p.26

PLUS

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Add a rail shipper: stock pens along a fascia p.36

**BONUS
ONLINE
CONTENT
CODE PG. 4**



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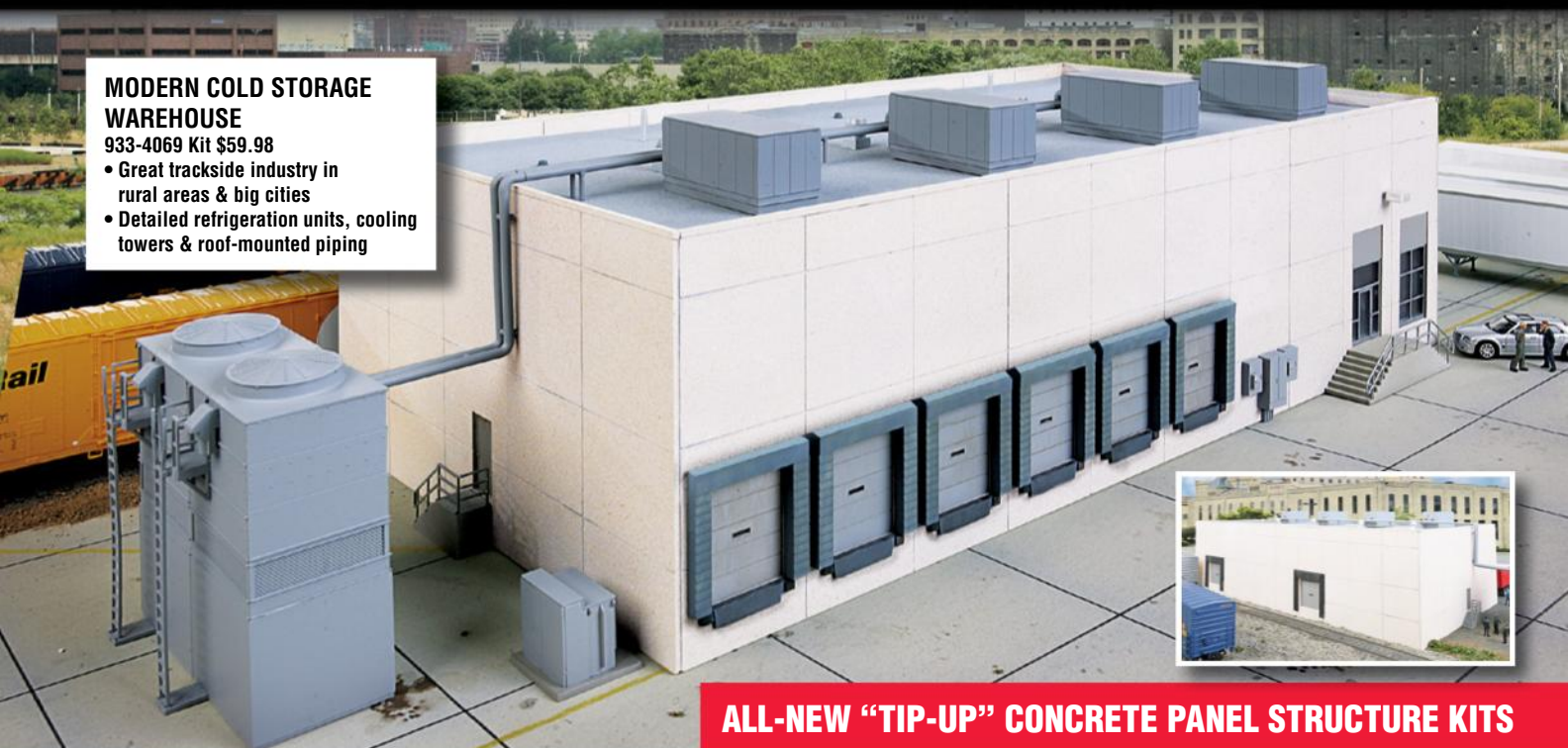
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Preproduction models shown assembled and painted, some details and colors may vary. ©2017 Wm. K. Walther, Inc.

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On the cover: Pelle Søbørg's new HO layout still features the Union Pacific, but now rolling through the Midwest. Pelle Søbørg photo



Next issue

In June, Rod Stewart puts the finishing touches on his Grand Street and Three Rivers RR HO scale masterpiece, we wrap up our Beer Line project layout, and more!

MREXTRA

www.ModelRailroader.com
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Video on
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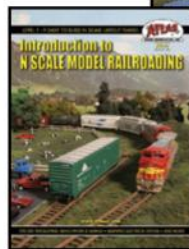
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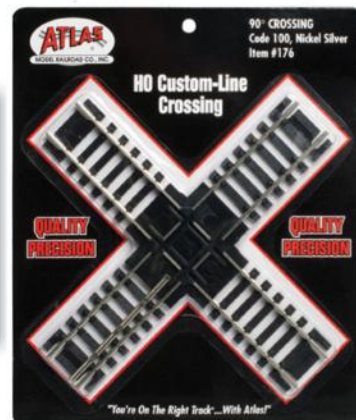
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Guess who built another incredible layout?

Our friend Pelle Søeberg, one of *Model Railroader's* contributing editors, has built an all-new HO scale layout, as you can see on this month's cover. Pelle's story starts on page 40.

At this point you might be saying to yourself: hold on a minute, didn't Pelle just build a Mojave Desert layout, which was sort of a reboot of an earlier desert layout? And didn't he have even another layout featured in *Model Railroader* in the late 1990s, modeling Tehachapi Pass?

The answers are yes, yes, and yes. And if you're counting, this is Pelle's third layout in about a decade.

All have been HO scale layouts modeling the present-day Union Pacific RR; this is the first to model a location other than the Southern California desert.

Pelle loves to build layouts, as he explains in his story.

For him, it's all about the journey, not the destination. His most recent layout was taken down just 14 months after it was completed. I would not be surprised to get an e-mail from Pelle before the end this year that details his plans for yet another layout, with an attached photo of his train room, once again showing empty walls and an empty floor (he sent me a photo like that after the last layout was taken down).

Pelle's not the only model railroader who thrives on the journey, or construction, aspect of our hobby.

Later this year in *Great Model Railroads 2018* and in January's *Model Railroad Planning 2018*, we'll report on two other prolific builders, Andrew Dodge and his O scale Colorado Midland Ry., and Doug Tagsold on his Colorado & Southern Ry., modeled in 1:72 scale (you'll

have to wait for the article for an explanation about that).

Most of us are not building layouts at the pace that Pelle, Andrew, and Doug have set. Nor do we need to be. One of the best things about model railroading is that we can each set our own construction pace.

Summer is just a few weeks away, which means the annual National Model Railroad Association convention is fast approaching. This year the convention is in Orlando. I know, I know, it's hot in Florida in mid-summer. But don't let that keep you away. A national convention is an ideal place to broaden your model railroad knowledge and meet lifelong friends for the first time.

At the end of convention week is the National Train Show, on Aug. 4, 5, and 6.



In the past there have been more than 130 booths and exhibits at the show. This year's show includes an "Ask the Collectibles Appraiser" area, 44,000 square feet of floor space for modular layouts, and a 2,500-square-foot Lego display (it doesn't matter how old you are, Lego trains will still make you smile).

We'll be there too, just look for the *Model Railroader* and *Model Railroader Video Plus* booth.

NEIL BESOUGLOFF

Model Railroader. Model railroading is fun!

Contributing to Model Railroader

We welcome contributions from readers, including articles, photographs, and drawings. For more information on submitting material, call us at 262-796-8776 and ask for an MR staff member or e-mail us at mrmag@mrmag.com. Model Railroader assumes no responsibility for the safe return of unsolicited material. We assume unsolicited material is intended for publication by Kalmbach Publishing Co. unless otherwise noted. We assume letters, questions, news releases, and club news items are contributed gratis.

What was the last model you built?

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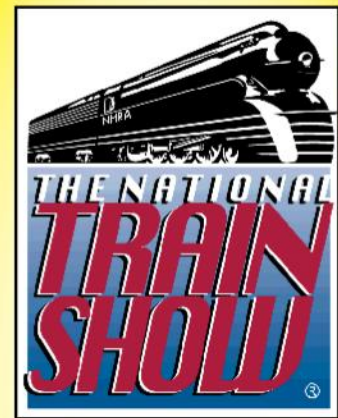
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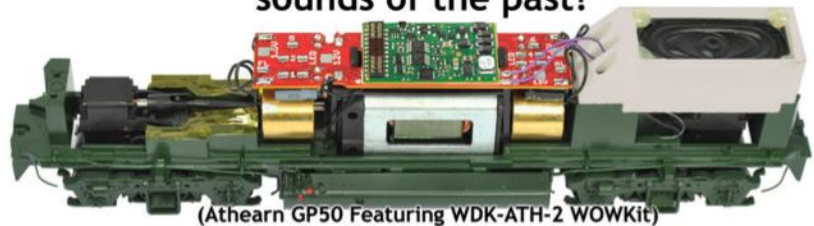
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HO scale



Amherst
Show
report

General Electric Tier 4 GEVo diesel locomotive.

ScaleTrains.com displayed a test model of this six-axis road unit. The Tier 4 GEVo will be decorated for Canadian National, BNSF Ry., CSX, General Electric, Norfolk Southern, and Union Pacific. Operator line models have a common body configuration with angled engine exhaust cab, walkway tread, and non-operating ditch lights. Rivet Counter

line models feature railroad-specific details and factory-applied detail parts. Direct-current HO scale Operator Line models with a 21-pin plug sell for **\$99.99**. Rivet Counter line models are priced at **\$149.99** (direct current with 21-pin plug) and **\$219.99** (with ESU LokSound Select Digital Command Control and sound decoder with "Full Throttle"). ScaleTrains.com, 844-987-2467, www.scaletrains.com. Ken J. Johnson photo

Plenty of variety at 2017 Amherst train show

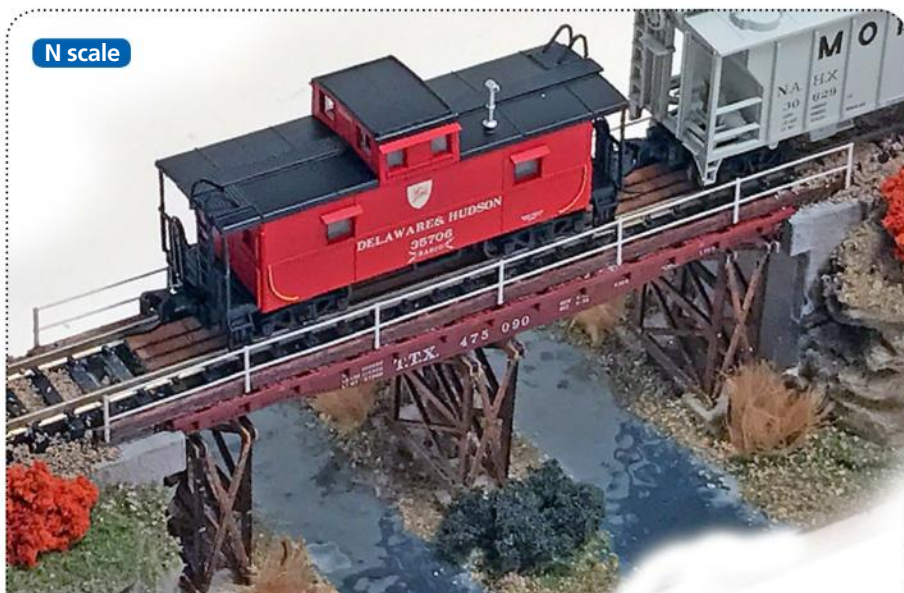
The 2017 Amherst Railway Society Railroad Hobby Show was held in late January at the Eastern States Exposition Fairgrounds in West Springfield, Mass. The two-day show featured manufactur-

ers, railroad historical societies, operating layouts, vendors, and clinics.

Items on display at the show are featured on the following pages. We couldn't fit every announcement into our

print report. For more announcements and photos, visit our website at www.ModelRailroader.com. Look for the show report under the "News & Reviews" link at the top of the page.

N scale



Flatcar bridge. The N Scale Architect has released this repurposed flatcar with photo-etched railings, two laser-cut concrete abutments, and three laser-cut wood trestle supports. The N scale kit (**\$35.95**) includes rail and road wood treadway options. The N Scale Architect, 607-746-8416, www.thenarch.com

All scales



Prodigy WiFi. This device from Model Rectifier Corp. lets users of the firm's Prodigy Digital Command Control system (sold separately) run trains wirelessly with an app for Apple or Android smartphones. The Prodigy WiFi (**\$119.98**) can be used with up to eight smartphones. Model Rectifier Corp., 732-225-2100, www.modelrec.com



HO scale locomotives

- **Electro-Motive Division SD40-2 diesel locomotive.** CP Rail (dual flags scheme), CSX (dark blue and yellow), Kansas City Southern (*Southern Belle* scheme), Norfolk Southern (horsehead silhouette), and Union Pacific (road name and number on long hood). One road number per scheme. All-wheel drive, SoundTraxx Sound Value diesel sound package, and E-Z Mate Mark II couplers. \$209. Bachmann Trains, 215-533-1600, www.bachmanntrains.com
- **Early Baldwin Locomotive Works 2-8-8-2 steam locomotive.** Norfolk & Western: class Y-1 with 56" drivers and rectangular tender. Oregon RR & Navigation Co.: Class MC-1 with rectangular tender. Southern Pacific: Class MC-1 (Sierra version with 90-R tender, Colton version with 98-SC tender), MC-2 (Cab-Forward, one number each with 90-R and 98-SC-1 tender), AC-2 (Sport cab with 120-SC-2 tender), and AC-3 (square cab with 120-SC-4 tender). Union Pacific: Class MC-1 with rectangular tender. All models have 57" drivers unless noted. Factory painted and lettered brass model. \$2,750. The Coach Yard, www.thecoachyard.com

HO scale freight cars



- **Pennsylvania RR class X32 50-foot boxcars.** Double-door boxcar: Detroit & Mackinac; Delaware & Hudson; Detroit, Toledo & Ironton; Manufacturers Ry. Co.; Norfolk & Western; Northern Pacific; Oregon, Pacific & Eastern; Pennsylvania RR (shadow and circle keystone); Tennessee, Alabama & Georgia; Virginian Ry.; and Wabash. Single-door boxcar: Pennsylvania RR (circle and shadow keystone). Three road numbers per scheme. Injection-molded plastic models with metal wheels. \$24.95. Bowser Manufacturing Co. Inc., 570-368-2379, www.bowser-trains.com

HO scale structures

- **Spark Plug Lighthouse.** Resin kit with pewter detail parts, one-piece rock (rip-rap) base casting, optional awning, and flashing light unit. \$150. Crow

HO scale



American Car & Foundry 4,600-cubic-foot-capacity three-bay Center Flow covered hopper. Athearn displayed a pre-production sample of its next Genesis series freight car, scheduled for release in December 2017. The HO scale car will be offered in seven road names and three body styles. The model will feature photo-etched running boards and 100-ton roller-bearing trucks with rotating bearing caps. A single car will retail for **\$49.98** and a three-pack will be priced at **\$147.98**. Athearn Trains, 800-338-4639, www.athearn.com

HO scale



Culver's restaurant. Walthers debuted its next Cornerstone Series kit. The HO scale Culver's restaurant (**\$49.98**) features a printed drive-through menu board, factory-printed building logos and a street sign, one-piece windows with frames printed in silver, three outdoor tables with umbrellas, separate trash receptacles, and an air conditioner. Wm. K. Walthers Inc., 414-527-0770, www.walthers.com

N scale



60-foot heavyweight passenger cars. Atlas showed pre-production samples of a baggage car, coach, combine, Railway Post Office, and observation car. The N scale 60-foot cars will feature separately applied diaphragms and interior details. Road names, price, and release date have yet to be announced. Atlas Model Railroad Co., 908-687-0880, www.atlasrr.com



HO scale

Goldie Electric Co. This two-building laser-cut wood kit is the latest offering from Bar Mills Scale Model Works. Goldie Electric Co. (\$134.95) has a footprint of 10" x 14" and includes resin and metal details, a forklift, and a Woodland Scenics pickup truck. The HO scale model is available direct only. Bar Mills Scale Model Works, 207-929-3400, www.barmillsmodels.com



O scale

Independent Brand Northwest Pears 40-foot double-sheathed refrigerator car. The Lowell Smith Signature Series has added a new paint scheme to its lineup of refrigerator cars. The custom-decorated Atlas O model features positionable ice hatches and sprung die-cast metal trucks. The O scale car sells for \$92. Lowell Smith Signature Series, www.lowellsmith.net



HO scale

Pennsylvania RR X58 class boxcars. A new run of 50-foot boxcars is available from Tangent Scale Models. The X58 boxcar is decorated for Lehigh Valley, Conrail, Penn Central, and Pennsylvania RR. Each road name is offered in one to six road numbers; the boxcar is also available ready-to-run painted Conrail Red, PRR Freight Car Red, and PC Green but unlettered. The HO scale X58 boxcar (\$44.95) has prototype-specific details, wire grab irons and "trombone-style" uncoupling levers, and Kadee scale couplers. Tangent Scale Models, 828-279-6106, www.tangentscalemodels.com

River Products, 401-723-0065,
www.crowriverproducts.com



• **Carbone's Service Station.** Laser-cut wood kit with Tichy Train Group doors and windows, laser-cut peel-and-stick shingles, and color signs. \$65. Nick and Nora Designs, 302-229-6010, www.nickandnoradesigns.com

HO scale details and accessories

• **Illuminated River Point Station Ford F-350 hi-rail trucks.** Features 14 light-emitting diodes with four different light patterns, strobe-flashing headlights and taillights, four flashing grill lights, and slick top with six flashing lights. Can be operated on 9V to 12VDC only. Available lettered for several railroads and painted white but unlettered. \$85. East Coast Circuits, 201-506-1448, www.eastcoastcircuits.com



• **Ford F-Series Super Duty pickup trucks.** Single- and dual-rear wheel regular cab versions. Multiple stock colors; also available with commercial, municipal, and emergency graphics. Hi-rail versions lettered for BNSF Ry., Canadian National, CSX, Norfolk Southern, and Union Pacific. \$21 to \$23 each. River Point Station, an ITI Co., 401-467-6907, www.riverpointstation.com



• **53-foot tug/pilot/yacht.** Craftsman kit with laser-cut wood superstructure,



1



2



3



4



5

1 FMC 5347 single-door boxcar. This HO scale Master Line car is offered in seven paint schemes. It sells for **\$39.95**. Atlas Model Railroad Co., www.atlasrr.com

2 59-foot cylindrical covered hopper. Six new schemes have been added to

this Walther's Mainline HO scale model. The car retails for **\$29.98**. Wm. K. Walther's Inc., www.walthers.com

3 Electro-Motive Division GP50. Athearn released this HO scale Genesis series Burlington Northern diesel in four road numbers. The

model is offered in DC (**\$169.98**) and with a SoundTraxx Tsunami sound decoder (**\$269.98**). Athearn Trains, www.athearn.com

4 Dry-Flo covered hopper. Atlas offers this ex-BLMA N scale covered hopper in six road names (**\$32.95**).

Atlas Model Railroad Co., www.atlasrr.com

5 40-foot insulated boxcar. This N scale model (**\$36.95**) is lettered for CP Rail. The boxcar is available in two road numbers. Eastern Seaboard Models, www.esmc.com

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HO scale



Atchison, Topeka & Santa Fe Topeka-built class Bx-94 and Bx-97 boxcars. Moloco unveiled a new run of Santa Fe boxcars. The Bx-94 is offered in the 1989 repaint with 24" circle-cross herald, Mineral Brown with the "Super Shock Control" slogan (one road number), and red repaints (TS 12-77, 2-78, and 5-78). The Bx-97 car is available in the 1988 Mineral Brown repaint (reporting marks only, three numbers) and red repaint (TS 5-78). Each boxcar is offered in two numbers per scheme unless noted. The HO scale models sell for **\$53 each plus \$9.99 shipping** (free shipping for six or more cars) and are available direct from the manufacturer or select retailers. Moloco, www.molocotrains.com

HO scale



Greenville 7,100-cubic-foot-capacity auto parts boxcar. ExactRail released this boxcar in new paint schemes, including Penn Central (1973 as delivered); Conrail (with New York Central reporting marks in three road numbers and Penn Central repaint); Detroit, Toledo & Ironton (1973 as delivered); Norfolk & Western (1973 as delivered); and Western Pacific (1973 as delivered, seven numbers). Each road name is offered in six numbers unless noted. The Platinum line HO scale model (**\$44.99**) has wire grab irons and brake rods, CNC machined metal wheelsets, and Kadee no. 58 couplers. ExactRail, 866-945-1701, www.exactrail.com

resin hull, and pewter and resin detail parts. Measures 7 1/4". Waterline model, \$89.95; full-hull version, \$109.95. Sea Port Model Works, 603-926-8518, www.seaportmodelworks.com

N scale freight cars



• **Gunderson Rail Services 70-foot Husky-Stack well car.** Pre-production sample shown. TTX (Forward Thinking logo) and BNSF Ry. (red Burlington Northern patchout). Each road name offered in two road numbers. Die-cast metal body, body-mounted Magne-Matic couplers, separate brake hardware, and new American Steel Foundries Ride-Control trucks. Well accepts 48-foot intermodal container. \$27.90 to \$28.90. Micro-Trains Line Co., 541-535-1755, www.micro-trains.com

O scale details and accessories

• **Extended metal draft-gear boxes and lids.** For nos. 804, 805, 816, and 740-series couplers. Four pairs of extended metal draft-gear boxes, lids, and lid screws. \$4.50. Kadee Quality Products Co., 541-826-3883, www.kadee.com

Electronics/controls

• **Select Direct Micro Digital Command Control and sound decoders.** For narrow-bodied N scale diesel locomotives. Six lighting outputs. Number 73100: Retail version for retrofitting locomotives with sound and Digital Command Control produced before 2016. Number 73199: For upgrading direct-current locomotives also offered with factory ESU sound. \$109.99 each. ESU LLC, 866-591-6440, www.esu.eu/en

• **Loco Genie.** Wireless control board with remote. For direct-current trains. Multiple Loco Genie-equipped engines can run on the same track. No programming or addressing necessary. Includes speed, sound, direction, and lighting control. Walk-around range of 70 feet. In Digital Command Control, Loco Genie works like a standard 28-function sound decoder with wireless control. Compatible with all scales and dead-rail systems.

\$79.98. Model Rectifier Corp., 732-225-2100, www.modelrec.com

- **Light-It decoder.** Lighting decoder with built-in white light-emitting diode (can be disabled). Works with direct current and Digital Command Control. Up to three LEDs may be controlled separately. Includes built-in resistors. Functions as National Model Railroad Association signal decoder with 18 aspects. Each output individually dimmable. 15-pack, \$99.95. NCE Corp., 585-265-0230, www.ncedcc.com



- **Tower-LCC.** General purpose 16-line I/O node. Features National Model Railroad Association CAN bus Layout Command Control (LCC) 16-line logic level interface. Each line may be used as an

N scale



Milwaukee Road substation no. 12. Custom Model Railroads has released this laser-cut acrylic kit. Substation no. 12 features tab-and-slot construction and cast insulators. The N scale building measures 7" x 4¼" x 3½" and is priced at **\$117**. Custom Model Railroads, 410-889-0010, www.cmrtrain.com

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HO scale



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input and/or an output (up to six EventIDs per line). Powered directly from LCC bus connections (requires powered LCC bus [20 ma. bus load] plus I/O current). Onboard switching regulator provides 5V power for external interface modules. Includes internal logic elements. Compatible with Java Model Railroad Interface. Dual RJ45 connectors for LCC loop through connections. Dual 10-pin I/O connectors (+5V, Gnd, and 8 data lines per connector). Four light-emitting diode display status. \$69.95. RR-CirKits Inc., 704-843-3769, www.rr-cirkits.com

Scratchbuilding supplies

- **Double-sided permanent adhesive transfer tape.** For bonding flat, smooth surfaces like wall sections or roofing material. Adhesive sets permanently in one hour. Can be cut with scissors. 3 3/4" x 12" sheets. Four-pack, \$9.99. Chooch Enterprises, 425-273-4794, www.choochenterprises.com



- **Shake roof sheets.** Factory-weathered flexible vinyl. Includes roof cap material and double-sided adhesive transfer tape. Can be cut with scissors. Small (HO and N scales), medium (HO), and large (HO and O scales). Sheets measure 3 3/4" x 12". \$12.99. Chooch Enterprises, 425-273-4794, www.choochenterprises.com **MR**

N scale

4-4-0 American steam locomotive.

Model Rectifier Corp. offers this locomotive decorated for Baltimore & Ohio; Atlantic Coast Line; Boston & Maine; Chicago, Burlington & Quincy; Chicago & North Western; and four other railroads. The 4-4-0 American has a five-pole Mashima motor with flywheel; a metal boiler, chassis, and cylinders; and separately applied metal handrails. Direct-current N scale models are priced at **\$269.98**. Versions with Digital Command Control and sound list for **\$339.98**. Model Rectifier Corp., 732-225-2100, www.modelrec.com



Large scale

WOW501 WOWSound large scale sound decoder.

Train Control Systems offers this decoder for steam (no. 1600 with Version 4 of WOWSteam) and diesel (no. 1605 with Version 4 of WOWDiesel) locomotives. The large scale decoder features 5A motor output, 8A overall current rating, a built-in Keep Alive capacitor, screw terminals and mounting holes, two audio amplifiers, two speaker outputs, six 1A programmable light functions, and Audio Assist. The decoders measure 3" x 1.4" x 5" and sell for **\$199.95** each. Train Control Systems, 215-453-9145, www.tcsdcc.com



CORRECTION

The Philadelphia Chapter of the Pennsylvania RR Technical & Historical Society commissioned and owns the painting of a steam switcher on the Delaware Avenue Branch, shown on page 66 of *Model Railroad Planning 2017*. Prints are sold at artist Pete Lerro's website, www.lerroproductions.com. A correction to the story's track plan is in our track plan database at www.ModelRailroader.com.

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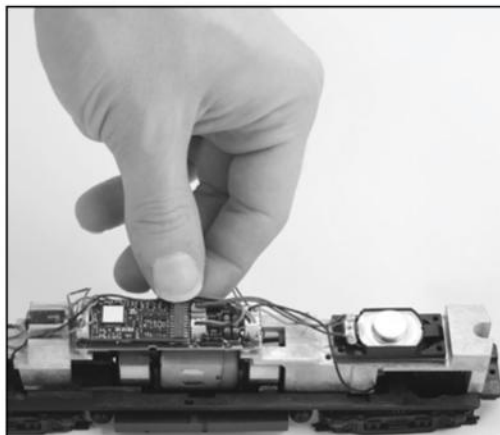
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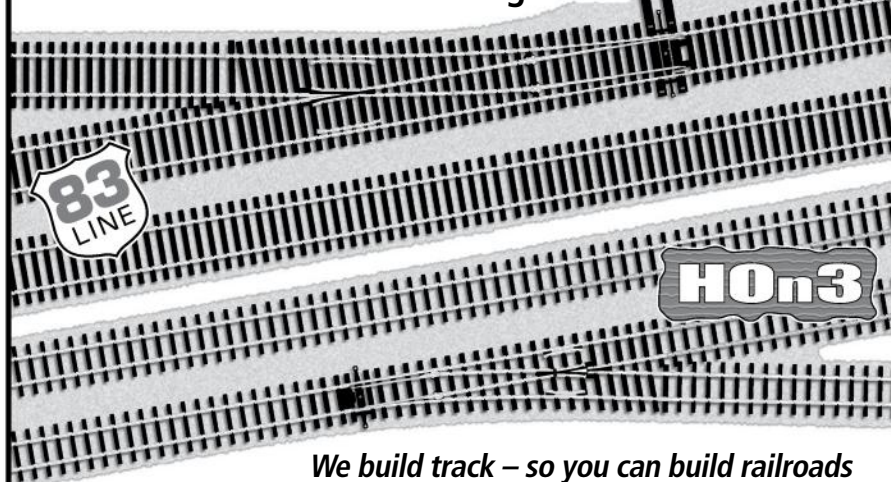
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Though its TILX reporting marks brand this tank car as belonging to Trinity Industries Leasing Co., the lettering on the side clearly denotes who it's leased by and what it typically carries. The lack of a hazmat placard tells us it's currently empty. Thomas E. Hoffmann photo

Spotting differences in tank cars

Q I'm seeking information on types of modern day tank cars – specifically, the differences in tanks used for corn syrup as opposed to petroleum products. I'd like to avoid the embarrassment of spotting the wrong type tank car at a given industry. Thanks.

Richard Anthony, Roanoke, Va.

A Tank cars often carry substances like food ingredients or volatile chemicals that at all costs must be protected from contamination. Therefore, they almost always spend their entire lives in dedicated service, carrying a single commodity from A to B, then returning empty. You'll never see a car carrying crude oil one trip and corn oil the next.

That's part of the reason few tank cars are owned by the railroads themselves. Instead, large industries, like food processor Cargill (reporting marks CMFX) or chemical company DuPont (DUPX), own their own fleets. Industries that don't want to maintain their own fleets lease them long-term from companies like Trinity Leasing (TILX) or Union Tank Car Co. (ULTX). (Note that all those reporting marks end in X; that indicates a car owned by a company other than a railroad.)

While experience may teach you to spot the subtle differences between types of tank cars, it's easier to go by the markings on the car. Tanks are almost always stenciled with the commodity they carry, whether it be refined oil, waste oil, corn oil, corn syrup, kaolin slurry, liquefied natural gas, liquid sulfur, sulfuric acid, or whatever. Cars that carry a dangerous cargo, like oil, acid, or flammable gas, will have another indicator, the hazmat placard. This diamond-shaped sign will have a number in the middle that denotes the cargo carried; 1203 is gasoline, for example. You can look them up online at en.wikipedia.org/wiki/Lists_of_UN_numbers.

So if you have an industry on your layout that calls for tank car service, get one that's lettered for the commodity to be carried and you can be assured it's the right kind of car.

That's the answer if you power your layout with direct current. If you're using Digital Command Control, a bigger gauge bus wire will help, but the best solution for voltage drop is power boosters employed at strategic locations around your railroad.

Q I'm trying to find an MR back issue from a number of years ago that featured an article on modeling the Southern Ry.'s Murphy branch. The article included a track plan. Is this issue available, and if so, how would I go about ordering a copy?

Daryl Blake, Box Hill, VIC, Australia

A You're right, that really was a number of years ago. More than 30 years, actually. The Southern Ry.'s Murphy Branch was published in our October 1984 issue. If you don't have that magazine in your back issue stash, you can read it online in our All-Access Archive, which includes every issue of MR since Vol. 1, No. 1. You can find the archive here: www.ModelRailroader.com/AllAccess

Q After about 40 years out of the hobby, a happy accident brought me back to model railroading. Having worked with the machining trades most of my working life, I've decided to start with an HO scale module of a locomotive backshop. I always wanted to model a first-generation diesel shop with locomotives in various stages of overhaul, especially with the long hood removed and all the internals exposed. Did any manufacture ever offer a non-operational locomotive as I describe, in HO? Prior to writing this note, I searched the web to see if anyone offers an EMD 567 or Alco 244/251 prime mover in HO scale. I also plan to equip the shop with a wheel lathe and a boring mill, but can readily scratchbuild these machine tools.

William Ottney, Smiths Falls, Ont.

A Walthers devotes an entire section of its catalog to locomotive servicing and backshop structures and details. The company offers an HO scale EMD 567 prime mover kit for \$9.98 (part no. 933-3119). I've never encountered a model or kit of any other prime mover, though. Nor am I aware of anyone that offers a locomotive model with the hood removed and interior details showing. If you scratchbuild one, that prime mover

Q I'm wondering what's the best gauge wire to use as a bus wire for a very large layout of 6 x 15 meters (20 x 50 feet)?

Terry Vincent, Australia

A As you may know, the higher resistance is in a wire, the more the voltage

through it drops. The longer a wire is, the higher the resistance, so voltage drop is a serious issue in a layout your size. To minimize resistance in your power bus, I'd recommend using 14, 12, or even 10 AWG for your main power bus. You can step down from there to 16 or 18 AWG for individual power districts.

model would be a great place to start. Check out Marty McGuirk's book *The Model Railroader's Guide to Locomotive Servicing Terminals* (Kalmbach Publishing, 2002) for more useful info.

Q Is it OK to sand down the top dirty layer of a track cleaning block (like a Bright Boy) and keep using it?

Nathan Penn

A I don't see a problem with doing that. Since the Bright Boy is itself abrasive, you might find it more efficient to use a small wire brush. But track cleaning blocks will pick up contaminants and lose their flexibility over time, plus they don't cost much, so replacing them on a regular basis is probably your best bet.

Q Are there areas of the U.S. where gray track ballast predominates? Living in the U.K., I'm too far away to make a survey for myself.

Don Lyons, Sudbury, U.K.

A Gray is a fairly common color for track ballast. A few railroads are known for their special ballast colors (the most well-known being the Chicago & North Western's "Pink Lady" granite), and in the old days, cheap materials such as cinders or mine tailings might be found on lesser-used tracks and sidings. But other than that, most railroads used whatever kind of hard stone was available in the largest quantities for the lowest price. So while color may vary around the U.S. – you'll see more tan shades out west, for instance – most ballast in the U.S. is some shade of gray, be it granite, limestone, basalt, or some other stone. Check out prototype photos or official engineering manuals for the line you're modeling if you want to be absolutely correct, but in general, you won't be far off using a medium gray for most main lines east of the Mississippi River.

Q I'd like to know which passenger trains the Pennsylvania RR's T1 4-4-4-4 Duplex regularly pulled.

Steven Ward Jr., Slaughter, La.

A Rob McGonigal, editor of *Classic Trains* magazine and our in-house Pennsy expert, responds: "Fleet production of the T1 began just as passenger diesels started to arrive on the PRR, so they were never (or only very briefly) regular power on the top trains like the



Because the class T1 4-4-4-4 arrived on the Pennsylvania RR about the same time as passenger diesels, the articulated steam engines saw service mostly on lower-tier trains. One such was the Chicago-to-New-York *Liberty Limited*, seen here stopped for engine servicing at Fort Wayne, Ind., in 1949. Robert A. Hadley photo

Broadway Limited. I do recall seeing multiple photos of T1s on the *Manhattan Limited*, which was kind of a third-rate NYC-to-Chicago train."

In the photo files of the David P. Morgan Memorial Library, I found a few more pictures of T1s heading up heavy-weight passenger consists, but they were either early test runs or second- to third-rank trains like the *Liberty Limited* (pictured above) and the *Golden Arrow*. Though their Art Deco-influenced streamlined prowls would look great on your layout heading up a crack streamliner, on the prototype, they were more often found pulling secondary trains.

Q Really like the magazine. However, it would be nice if you would publish more articles about S scale.

Oakley Warren, Wyandotte, Okla.

A We agree. However, with the exception of project stories, the majority of our articles are contributed by our readers, the modelers themselves. So few modelers work in S scale that we get only a few such article submissions a year – and those are usually from the same handful of contributors. We'd love to have more on S, O, G, N, even Z scale. If you model in S scale, consider contributing a how-to or layout visit on your own railroad. We'd be glad to look at it.

However, if you take a closer look, you may find that we have more articles relevant to S scale modeling than you

think, even if they aren't strictly about S scale. Prototype drawings, scenery articles, stories on operation, scratch-building articles, painting and weathering tips, even track plans that can be scaled to your size – there's something to be gained in these pages no matter what scale you model in.

Q In the February installment of Ask MR, a response to a question from Dick Walker of London, Ont., identified the compound Pb_3O_4 or lead (II, IV) oxide as "red lead or cinnabar." As a geologist, I feel the need to point out that while "red lead" is a valid common-use name for the compound in question, cinnabar actually refers to a different mineral: HgS or mercury (II) sulfide. The correct mineral name for Pb_3O_4 is, in fact, minium, which as mentioned in the February column was also the old Latin name for the compound. It's somewhat easy to confuse minium and cinnabar (both have similar density and hardness in addition to being red in color and quite toxic to humans).

John Christoph, Tempe, Ariz.

A It's even easier to confuse them if you believe everything you read on the internet. As the Romans who named minium would say, mea culpa.

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

Horseshoe curves work better in N scale

Caliente, Calif., is a little town on the Union Pacific between Bakersfield and Tehachapi. Fans of the railroad's Tehachapi Pass know Caliente for its horseshoe curve; the rest of the world likely has never heard of it. If you're modeling Tehachapi Pass, as I am, Caliente will probably be high on your list of places to include, right up there with the famed loop.

The horseshoe curve at Caliente is typical of such curves, often found on mountain railroads. A line will follow a river or creek upstream, then cross the stream, reverse direction, and continue climbing on the opposite bank. Back in the 1870s, the Southern Pacific followed Caliente Creek from the San Joaquin Valley up into the mountains. At Caliente, the railroad crossed the creek, doubled back on itself, eventually wound its way over to the Tehachapi Creek canyon, and topped the mountains at the town of Tehachapi.

What does this discussion have to do with N scale? Well, for one thing, a horseshoe curve in N scale has some design advantages over HO, assuming we're looking at a typical basement space, and it's more than just a matter of N scale's smaller size. It has to do with the size of the trains relative to the size of the operators running them.

On layouts built in any scale, we often need return curves at the ends of peninsulas. Such a curve can be viewed from the outside (as is the case with the model of Caliente at the HO scale La Mesa Club in the San Diego Model Railroad Museum), but a horseshoe curve can also be viewed from the inside. That's where I want to be, because that's where I most enjoy watching trains



"Caliente" is a Spanish word for "hot," and it's a hot spot on Jim Kelly's N scale layout. Jim talks about the advantages of N scale in planning a mountain railroad. Jim Kelly photo

at Caliente in real life. And that's where N scale's planning advantage comes in.

The N scale advantage. My 18"-minimum-radius curves give me a 3-foot diameter half-circle return curve, which I placed at the end of a 30"-wide aisle. The entire curve scene requires only 4 feet of width and gives me enough space to model the features I'm really interested in at the curve itself while allowing me to minimize the space given to the trackage leading to it.

Building the same scene in HO using roughly equivalent 33" minimum-radius curves would give you a curve 5½ feet across, a scene at least 6½ feet wide, and either more layout depth along the sides or a wider aisle than you'd probably want unless you're building a very large home or club layout. Since the trains enter this alcove on one side and come out on the other, the aisle can be a little narrower, as you don't need room for operators to pass each other.

In N scale I can have my horseshoe curve as well as

more layout on the far side of the backdrop in less space than the curve alone would require in HO. My high backdrop completely isolates the rest of the layout for a wrap-around effect.

A stereophonic valley.

I enjoy being able to stand inside the horseshoe, particularly as the track is climbing the whole way. The lead locomotives are on my right, the caboose is 2" lower and on my left, and in the middle are the mid-train helpers. This is the way I most enjoyed viewing the prototype, and it brings back fond memories.

The experience will be even better once I have more locomotives equipped with sound so I can have diesels rumbling in each ear. Jim FitzGerald, who introduced me to Tehachapi Pass and Caliente back in 1979, lik-

ened the experience in the Caliente Creek Valley to railfanning in stereo.

Pros and cons. On a layout set in the mountains, turnback curves are scenic assets that help us gain longer mainline runs. On prairie railroads, curves are usually a design challenge necessitated by the fact that we've come to the end of the basement.

Why this particular curve? There's some neat stuff at Caliente – highways, a grade

crossing, and a post office. Throw in the confluence of Caliente and Tehachapi creeks, and a couple of bridges, and it's pretty darn interesting for a little town in the middle of nowhere. For me the history of the place and my memories make it even more meaningful.

I love having Caliente just a few steps away in my basement. **MR**



ON A LAYOUT SET IN THE MOUNTAINS, TURNBACK CURVES ARE SCENIC ASSETS THAT HELP US GAIN LONGER MAINLINE RUNS. - JIM

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Replace warped handrails on an HO scale diesel

Cody Grivno used a Smokey Valley Railroad Products kit to replace the plastic handrails and stanchions on this HO scale Athearn Ready-to-Roll locomotive. The inset photo shows how the plastic stanchions faded and warped after 10 years on the layout. Bill Zuback photos



When we built our HO scale Wisconsin & Southern project layout in 2007 we purchased an Athearn GP40-2 diesel locomotive in WSOR colors. The Ready-to-Roll model featured Celcon handrails and stanchions, which were a big step up from the formed-metal stanchions and steel handrails then used on Athearn "blue box" locomotive kits.

In the following years, the color of the plastic handrails started to fade. Then the stanchions began to warp and the

handrails started to pull away from the model. It looked as if the locomotive sideswiped a freight car. We set the model aside until repairs could be made.

Fortunately, I remembered that Smokey Valley Railroad Products produces brass stanchions and handrail kits for an assortment of HO scale locomotives. Kit no. 30 is designed for Athearn GP38-2 and GP40-2 diesel locomotives. The kit includes stanchions and formed brass handrail pieces.

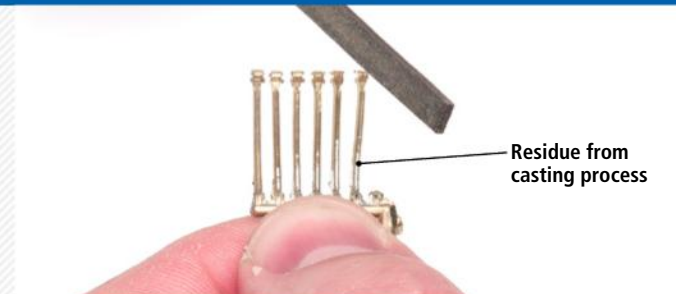
There are a few caveats with the kit. First, it was designed for Athearn Blue Box kit locomotives. Some modifications were necessary when adding the stanchions to this Ready-to-Roll model, which I'll cover in step 3.

Also, some tweaking of the handrail sections may be necessary. The handrails are formed into their basic shape, but a little fine tuning with smooth- and serrated-jaw needlenose pliers makes the handrails look a lot better.

STEP 1 PREPPING THE MODEL



When I first noticed the plastic stanchions and handrails warping, I tried to fix the problem by gluing the mounting pins at the bottom of each stanchion and at the ends of the handrails into their corresponding holes using Loctite's Plastics Bonding System. Fortunately, I was still able to remove the one-piece handrail and stanchion assemblies with a no. 17 blade. I rocked the blade until each pin



released from its hole. I was careful not to shave off the plastic pins, as I needed the holes open for the new castings.

Some of the replacement cast brass stanchions had flash along the edges. I removed the excess metal using jeweler's files and sanding sticks. Do this with a light touch, as the castings are soft and bend easily. If a stanchion is bent, straighten it with smooth-jaw needlenose pliers.

STEP 1 (CONT'D)

Gloves keep skin oils off brass castings

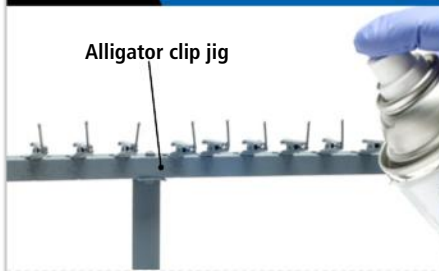


Once I had the flash removed from the stanchions, I soaked the brass parts in white vinegar for about 15 minutes. This removed the casting residue and lightly etched the metal.

I washed the stanchions in warm water with dish soap added. Then I rinsed the castings and let them air dry. I cut each stanchion from the part tree in preparation for painting and priming.

STEP 2 PRIMING AND PAINTING

Alligator clip jig



Insignia Red, Model Master no. 4714



This handy homemade jig with alligator clips across the top proved the ideal tool for painting stanchions. Each stanchion has a pin at the base that fits into a hole in the locomotive shell. The pins fit perfectly in the alligator clips. Once I had the jig loaded, I sprayed the stanchions with Rust-Oleum Painter's Touch 2X Flat Gray Primer (no. 249088). This has become my go-to spray-paint primer, as it's compatible with metal, plastic, and wood and doesn't fill in fine details. I let the primer dry for 24 hours, the factory-recommended drying time, before proceeding.

The biggest concern I had about replacing the stanchions was finding a color that matched Athearn's Wisconsin & Southern red. Fortunately, Model Master no. 4714 Insignia Red, when applied over the Rust-Oleum Flat Gray Primer, proved an almost perfect match.

STEP 3 INSTALLATION

Handrail section 1

Handrail section 2

Handrail section 3



Fine-tune bends with needlenose pliers

I started installation by attaching the stanchions on the engineer's side of the long hood with medium-viscosity cyanoacrylate adhesive (CA). I made sure the stanchions were parallel with the edges of the hood doors.

Then I added the handrails. The Smokey Valley kit includes three pieces of brass wire that need to be trimmed to length. I used smooth- and serrated-jaw needlenose pliers to fine tune the bends where the handrail goes up to the cab and down the stepwell. I used CA to secure the handrails to the stanchions.

Next, I brush-painted the brass handrails with Model Master Reefer Gray (no. 4886), a close match to the Rust-Oleum Primer. Once the gray dried, I brush-painted the handrails Insignia Red and Model Master Reefer White (no. 4873) as shown at right.

Prime handrails with Reefer Gray before applying Insignia Red and Reefer White



STEP 3 INSTALLATION (CONT'D)

I worked my way around the rest of the locomotive using the stanchions first, handrails second installation pattern. I had to make a few modifications along the way. First, I removed the L bracket on the back of the eight tall stanchions on the brakeman's side of the long hood so they would seat tight against the walkway duct.

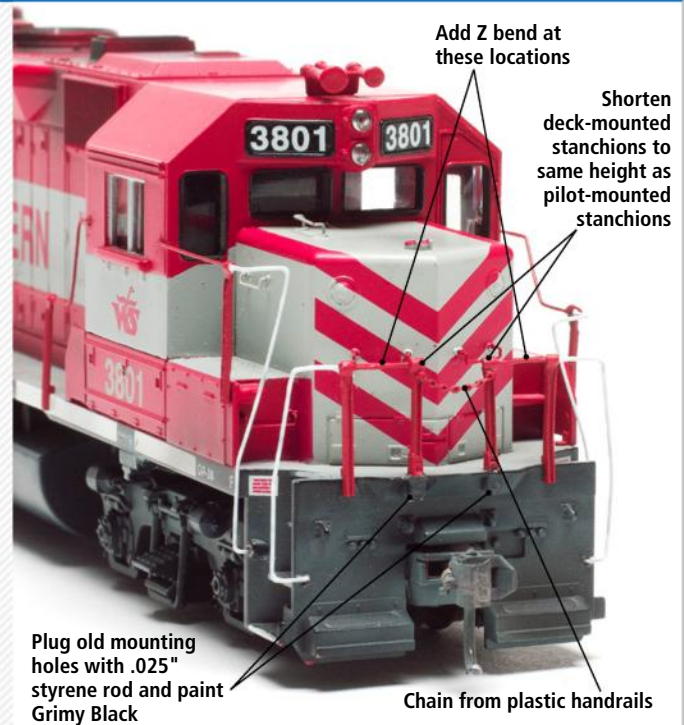
Second, I shortened the two deck-mounted stanchions on the front and rear of the locomotive so they'd be the same height as the pilot-mounted stanchions.

I also added a Z bend in the handrails on the front and rear of the locomotive, as the deck-mounted stanchions are slightly forward of the pilot-mounted stanchions.

Before I discarded the plastic handrails, I cut off the molded chain that spans the two deck-mounted stanchions. I attached it to the brass stanchions with CA.

Finally, I filled the two holes on the front and rear pilots where the plastic handrails used to attach with .025" styrene rod. Then I painted the plugged holes with Model Master no. 4887 Grimy Black so these areas would blend in with the rest of the pilot.

With that, the handrail installation was complete. It took about two days, working on and off, to install the handrails. Now Wisconsin & Southern no. 3801 is ready to go back into service. **MR**



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Model Railroader MAGAZINE



Upgrading streamlined passenger cars

Cleaning crews are at work inside as mechanics on the ground give the trains a last check before their morning departure. V.S. Roseman shares tips for upgrading Walther's Mainline and other passenger cars to improve appearance and operation.

Detail kits make it easier to bring your models to the next level

By **V.S. Roseman** • Photos by the author

Today, you can make an HO scale streamlined passenger train from a wide variety of state-of-the-art plastic models as easily as placing the cars on your layout. These passenger cars come ready-to-run and are decorated in a variety of roadnames and color schemes.

However, most of the less expensive passenger car models come with only basic details. Walther's offers an affordable selection of Budd prototype streamlined passenger cars in its Mainline series. These completely assembled full-length cars will negotiate 18" radius

curves, come with interiors, and have sprung diaphragms and metal wheels. In addition, the cars are designed to accept easy-to-install upgrade kits that modelers can add as time or budget permits.

The Walther's 910-220 Interior Detailing Kit has a light-emitting diode (LED) lighting strip, formed stainless steel electrical contacts, and die-cast metal trucks with blackened metal wheels. This kit has body-mounted extra-length coupler drawbars that still permit operation on 18" radius curves.

Exterior detail kit 910-200 has pre-formed stainless steel handrails for one car plus standard length coupler draw-

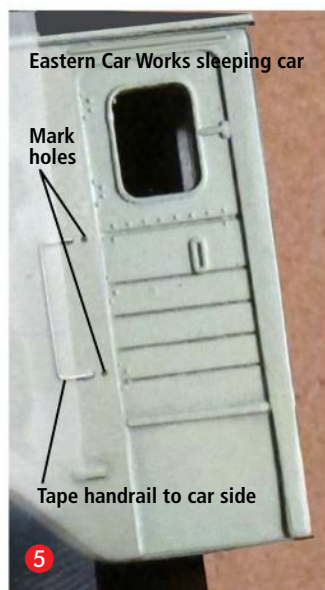
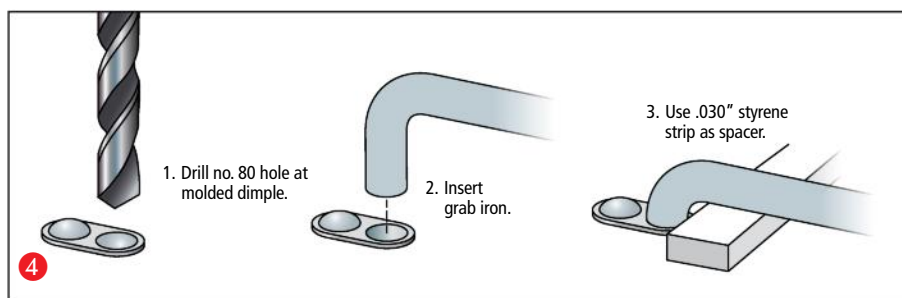
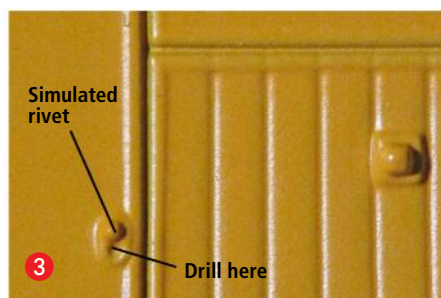
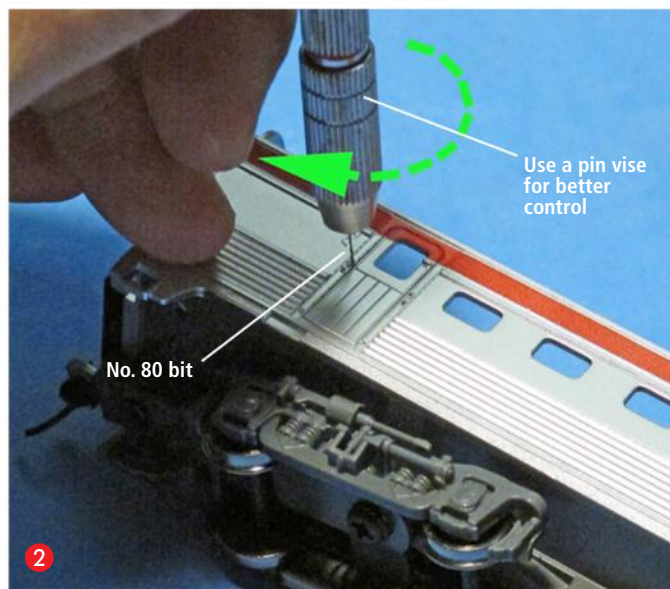
bars for tighter coupling (these require 24" minimum radius curves).

These kits are designed for easy installation in Walther's Mainline cars, and many of the parts can be used to upgrade other brands of passenger cars, as well.

Installing the Walther's Mainline upgrading sets will improve your passenger cars' operation and appearance. Your passenger trains should get attention, and you'll have the satisfaction of operating your upgraded streamliners.

V.S. Roseman of Brooklyn, N.Y., is a prolific modeler and writer who has written more than 130 articles.

UPGRADE 1 **ADDING HANDRAILS**



Adding handrails is an easy activity for a rainy day or while listening to music. I installed a Walther's 910-200 handrail set on a Walther's Mainline dining car in photo ①. Drill the dimple in each bracket with a no. 80 bit in a pin vise. A pin vise, seen in photo ②, is an excellent hand tool to hold these tiny drill bits. Power tools are usually too big and cumbersome for this light work and are difficult to control at the very slow speeds required. The Walther's cars have molded brackets, shown in photo ③, that exactly match the handrails in the upgrade kit, so no wire bending is necessary.

The sequence is shown in figure ④. Insert the ends of the wire handrail and put a dot of cyanoacrylate adhesive (CA) on the inside of each leg, or apply cement carefully around the mounting holes on the outside using a toothpick or similar applicator. Slip a piece of .030" thick plastic strip between the handrail and the body as you place the handrail to ensure a uniform distance from the carbody.

On other brands of cars, such as the Eastern Car Works sleeping car shown in photos ⑤ and ⑥, hold or tape one of the handrails in place and use it as a guide to drill the mounting holes, far left. Once cemented in place, the brackets can be simulated by adding a plastic nut-bolt-washer casting at each end of the handrail.

Some makes of cars simulate handrails with molded on strips. These can be carefully scraped, sliced, or filed off before installing the freestanding wire handrails.

UPGRADE 2 WEATHERING



Intercity passenger cars in the era of private railroad operation were usually washed after each run, as seen in photo ①. In many cases, station crews would wash all the windows of a streamliner at important station stops.

Even when the trucks and underbodies of a train are cleaned, by the time the train makes its first stop out of the terminal, there's usually some road dirt showing. Brake applications produce a rusty looking powder. A little weathering under the car shows off the detail and adds realism to your models.

Look at color photos in train books and magazines, such as the Amtrak car in photo ②, or watch some prototype videos. Notice the color of passenger car underbodies to see what these actually look like in service.

While weathering media and degree of weathering is a matter of personal preferences, I like paint washes. If you've never done this kind of weathering, experiment on an old junk car or on a sheet of plastic.

To make a wash, as used on the car in photo ③, begin with an earth color of your favorite paint and add thinner. The more thinner you use, the more transparent the wash will be. Evaluate the results to see if you're satisfied or want a more pronounced effect. Once the wash is dry, you can add more layers of color. If clear flat is available for the paint you're using, a few drops will keep the wash from becoming too runny. Read paint directions, because some clear flats are an overcoat and aren't designed to mix with paint.

Don't brush over the colors too much or you'll start to remove previous layers you've applied. You could also remove the original paint on the car.

When weathering passenger car trucks, mask or remove the wheels so you don't get paint on the wheel flanges and treads. Paint left on wheel treads comes off on the rails and creates dead spots in the track. The faces of the wheels can be painted a brown rusty color using as little paint on the brush as possible.

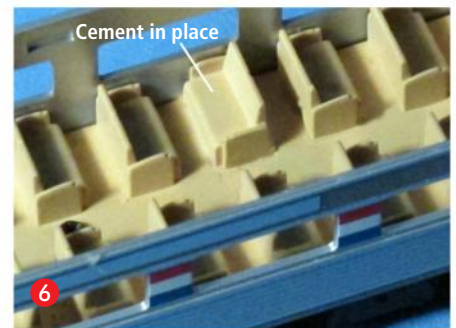
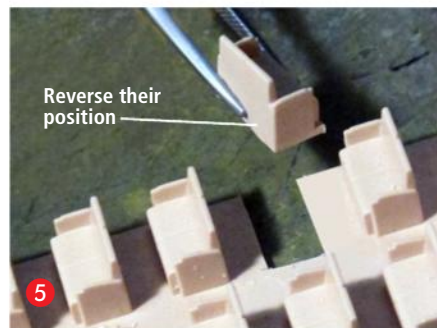
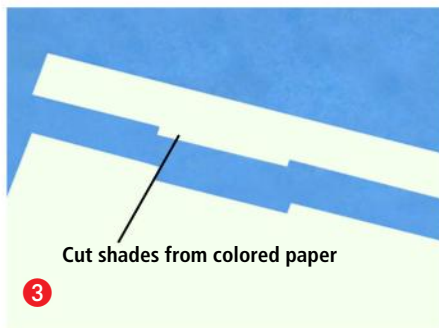
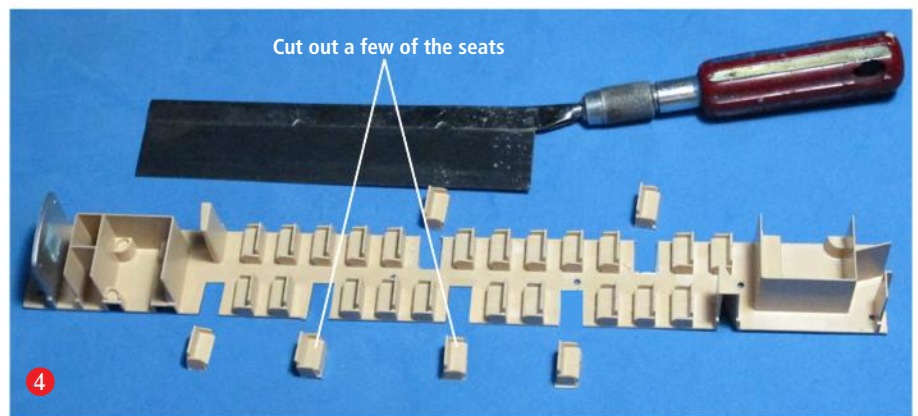
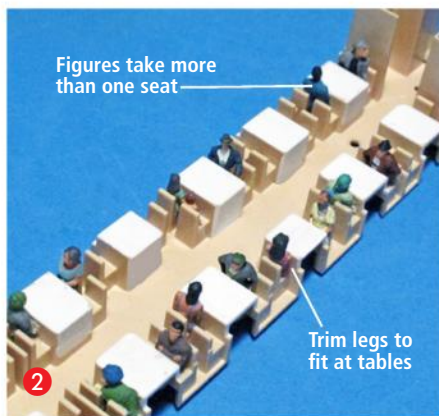
UPGRADE 3 ADD PASSENGERS AND INTERIOR DETAILS

A detail often omitted from model passenger trains is the riders, and this is probably the easiest upgrade of all, seen in photo ① at the top of the next page. Several companies make seated HO scale figures.

The Walthers 949-6034 figure set has 30 seated, painted figures designed to fit in most model passenger car seats

without modification. To fit into narrow seats or next to tables in parlor cars, lounge or dining cars, use a flush cutter to trim the figure or file it to fit. In some double coach seats, only a single figure may fit, as shown in photo ②. Many figures need to have their legs cut off to fit into the seats due to the thickness of the model car's floor.

UPGRADE 3 ADD PASSENGERS AND INTERIOR DETAILS (CONT.)



To reach the car interior on the Walther's Mainline cars, remove the roof. Instructions are provided in the interior detail sets.

There's also a video on the Walther's website (www.walthers.com/exec/page/videos) of the recommended method of releasing the roof. Scroll down to Walther's Showroom Update Episode 6. The segment on roof removal comes after a GP38 description. Jim Hediger's Workshop Tips column in the November 2015 *Model Railroader* has additional information.

Virtually all streamlined cars had adjustable roller shades. An easy way to make shades is to cut them from colored paper or .010" styrene sheet, shown in photo 3. Tape these to the pillars between the windows in the model with clear or frosted tape. An alternative would be to mask a strip of .010" clear styrene and spray your shades on. Then remove the

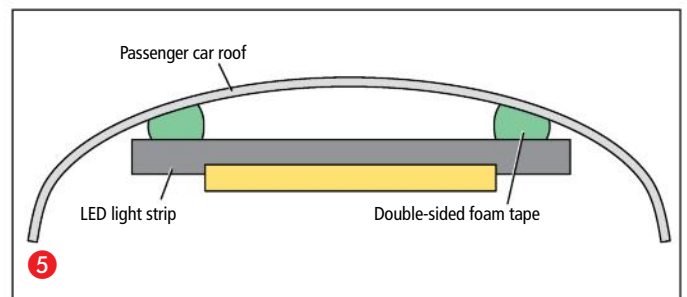
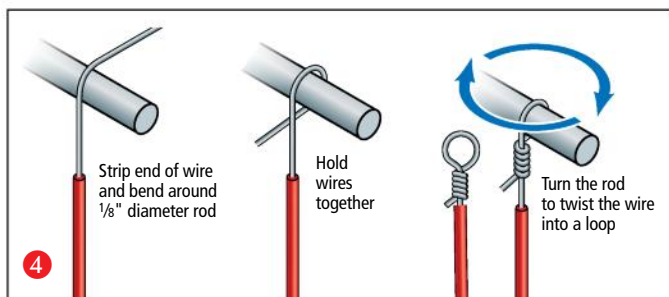
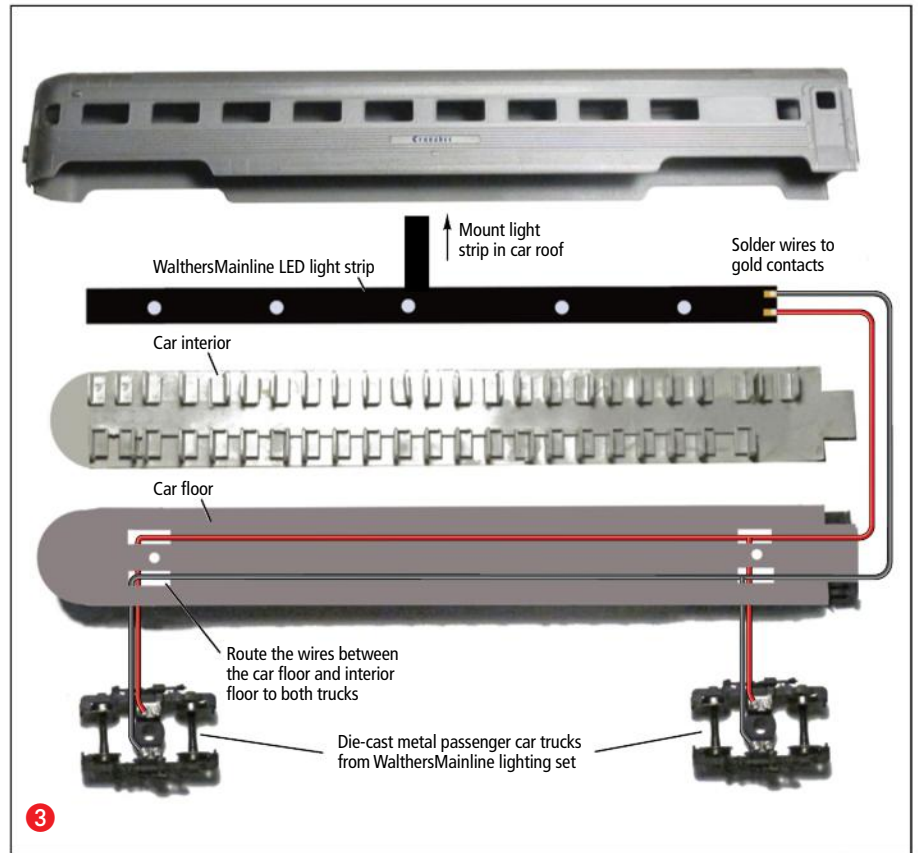
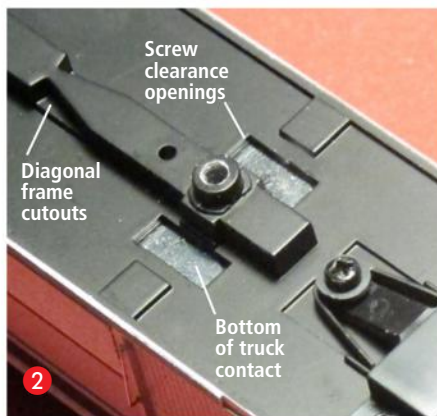
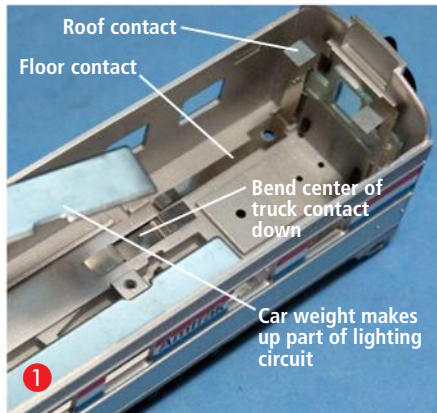
masking and fasten the plastic strip inside the windows with clear tape.

Some lounge cars and even some coaches had venetian blinds. Plano Model Co. (www.planomodelproducts.com) sells several sets of etched stainless steel venetian blinds for passenger cars. These can be glued to the inside of the glazing at the top of the window.

If you can't turn your passenger trains after a trip, coach passengers will be riding backward on their way back to the home terminal. An easy solution is to arrange some pairs of facing seats in your coach interiors. Many coaches had reversible seats, and groups would sometimes arrange them to ride together.

Saw out some seats and reverse their direction, as shown in photos 4 and 5. With passengers seated both ways, photo 6, your coaches will look good going either direction.

UPGRADE 4 INTERIOR LIGHTING



It's a very striking effect to see a passenger train snaking through the shadows of dark station canopies or near a tunnel entrance with car interiors illuminated. But a 10- or 12-car train lit with incandescent bulbs uses enough current to affect engine performance. The WaltherMainline 910-220 interior detail kit includes an LED lighting strip that uses very little current.

The set includes a pair of die-cast metal GSC-41-N-11 trucks with contacts on the axles to pick up power from the track through all four wheels. The screws that secure the truck sideframes to the bolsters touch on floor contacts in the car. These contacts pass power through the weights in the floor to contacts that take power up the end walls to the roof, where they connect to the light board. The contacts, also part of the kit, are shown in photo 1.

To reduce problems with lights flickering, unscrew one left- and one right-hand sideframe screw on each truck about one quarter of a turn to improve contact between the trucks and car. Another solution I found was to slightly bend the floor contact, shown in photos 1 and 2, so the center

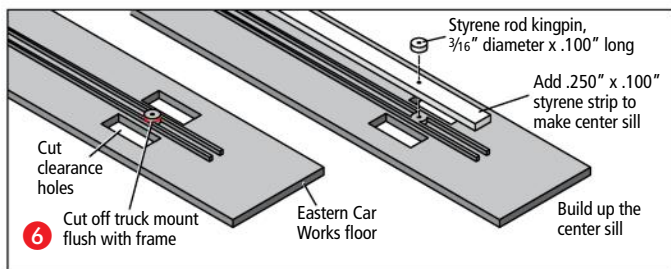
portion arches downward toward the truck before fitting the floor contact into the opening in the car floor.

This lighting set can be fitted to other brands of cars. Photo 3 shows an exploded view. Carefully solder a wire to each of the two gold contacts on the light board.

The illustration at top right shows how to run the wires. Allow about 2" of extra wire length in the body so you can remove the roof without pulling on the wire.

If you're using the Walther trucks, strip off about 3/4" of insulation from the end of each wire, then follow the procedure in 4 to make a loop. Secure the wire to the truck by slipping the loop through a sideframe screw and tightening it. Do this on both sides of both trucks as shown in photo 3. NorthWest Shortline (www.locobackshop.com/NWSL.html) and Walther (www.walthers.com) are two suppliers of "superflex" wire, which is excellent for this application.

Mount the board to the roof of the car with double-sided foam tape as shown in figure 5. I like to add a plastic strip

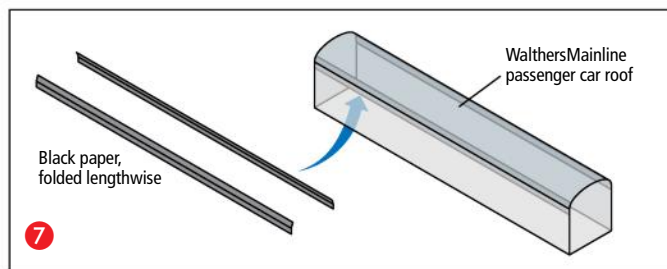


standoff if necessary so the LEDs don't touch the plastic roof on non-Walthers cars.

To install Walthers metal trucks on other brands of passenger cars, you may need to modify the floor to get the correct ride height on the car. The distance from the top of the rail to top of the roof on most prototype lightweight streamlined cars is 13'-6", or in HO scale, almost exactly $1\frac{7}{8}$ ".

I modified an Eastern Car Works sleeping car floor as an example. Illustration 6 shows what I did. The clearance holes are approximately $\frac{1}{4}$ " wide by $1\frac{3}{32}$ " long.

These dimensions aren't critical as long as the truck sideframe screws don't foul the openings on curves. These openings can be used to thread contact wires from the trucks into the car. I made the openings by drilling two adjacent holes in the floor and using a file to square the openings.

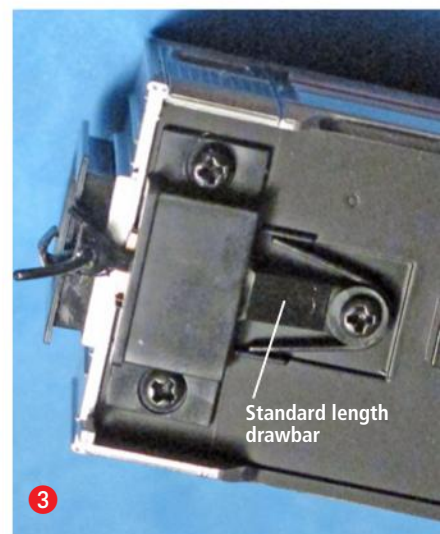
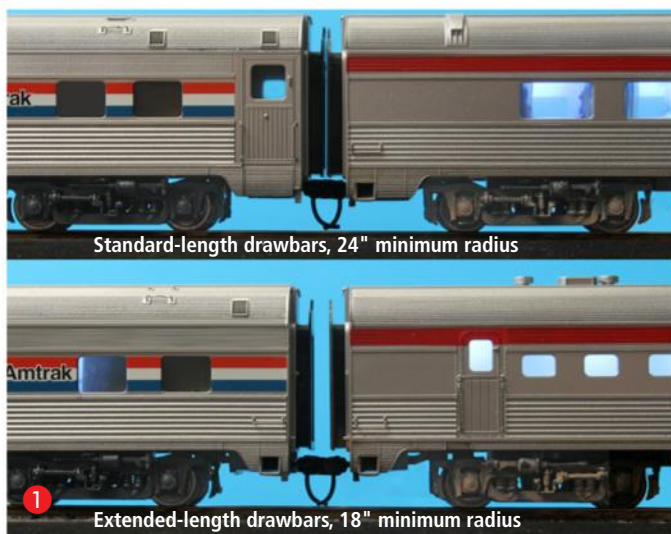


I drilled the $\frac{3}{16}$ " diameter styrene rod kingpin with a no. 56 bit, then tapped it to accept a 2-56 screw. You could use a self-tapping screw. If necessary, make diagonal notches on the sides of the center sill as on the Walthers center sill shown in photo 2 to clear the truck sideframes on curves.

If you're lighting brands of cars other than Walthers, or if you want to use different trucks than those that come in the WalthersMainline lighting kit, you could use the Walthers-Proto 920-1060 lighting set, which has only the light strip.

Some illuminated passenger car models have a light leak at the seam between the roof and the body. To fix this, I cut two strips of black paper about $\frac{3}{8}$ " wide by the length of the car and fold them in half the long way. I secure them as shown in 7 using clear tape.

UPGRADE 5 BODY MOUNTING COUPLERS



WalthersMainline passenger cars come with "talgo"-type truck-mounted couplers. There's usually little difference between truck-mounted couplers and body-mounted types when your train runs forward. However, switching operations that require pushing cars through turnouts or around curves can cause talgo trucks to derail. Body mounting the couplers generally offers better operating reliability.

Walthers' swinging drawbar coupler mounts provide the advantages of body-mounted couplers and prototypically close coupling, seen in photo 1, yet permit cars to negotiate tighter radius curves than ordinary rigid coupler boxes.

Full, illustrated instructions come with these kits and photos 2 and 3 show a finished installation.

After completing the installation, if the draft-gear box doesn't swing easily and center by itself, try slightly loosening one or both of the screws of the coupler box cover. A shot of Kadee Greas-Em or similar graphite lubricant for locks should help reduce any friction.

To use the plastic trucks with the body-mounted couplers, saw off the draft-gear box and arm of the plastic truck and discard. Replace the plastic truck on the car with its screw and install the couplers as described above. **MR**

A scenic showcase



An intermodal train crosses the Fraser River on Scott Lamoureux's N scale Canadian National Ashcroft Subdivision. The Cisco Bridge is the focal point of the 7 x 10-foot model railroad.

Cisco Bridge is the centerpiece of this N scale Canadian National layout

By **Scott Lamoureux** • Photos by the author

A pair of spectacular bridges, a roaring river, soaring mountains, and frequent Canadian Pacific and Canadian National trains are some of the highlights of Cisco, British Columbia, nestled deep in Canada's Fraser River Canyon. Cisco was a natural source of inspiration for my new 7 x 10-foot N scale Canadian National Ashcroft Subdivision layout. As a CN modeler, I knew from the beginning the centerpiece of my layout had to be the "high" Cisco Bridge, a combination truss arch over the Fraser River with an approach on the east bank.

The high bridge was built in 1914 by the Canadian Northern Pacific Ry., a predecessor to CN. The engineers had to contend with both a difficult river crossing and locating the new line over the existing CP right of way. The result was two bridges that cross the river within sight of each other, yielding an iconic Canadian railroad scene. My goal was to re-create this magnificent scene by focusing on long sight lines and big scenery.

Setting the stage

The layout features a large, irregular oval closed with a semi-permanent duckunder. For the Cisco scene, I wanted to maximize the perspective view looking toward the bridge and yet leave as much space as possible to build it. Though that plan sounds great, in reality I had a modest 10 x 10-foot basement room to work in, further constrained by a door and access to the furnace. The peninsula where Cisco is located extends five feet along the wall. I was able to expand the peninsula an extra two feet by curving the benchwork away from the wall to allow for door clearance.

My original plan was to portray both bridges at Cisco, but after placing the first bridge, it became clear that there wouldn't be enough space for the CP bridge. A short length of non-operational track represents the CP instead.

A cutoff built in 1977 to connect the CN and CP, necessitated by a major

derailment and fire on the CN bridge, is represented with cosmetic track as well. Canadian National and CP have directional operations in the canyon, giving me the option to run trains from either road.

Bridge before scenery

Scenery is my favorite part of the hobby; my previous structure experience was limited to some simple building kits. For this layout to work I had to build the bridge first before committing to this railroad (and tearing out my old layout).

Plans for the Cisco Bridge were published in the January 2000 issue of *Mainline Modeler*. The drawings accompanied an article by Doug Hole, who built an HO version of the bridge. His craftsman-ship set a high standard to aspire to.

The full-size Cisco Bridge is 810 feet long, including 425 feet for the main truss-arch section over the river. I uniformly compressed the bridge to 80 percent scale. I also added a curve to the plate girder approach sections to fit the space.

Reference material on Cisco Bridge is abundant on the internet. There have been several major derailments and fires on the bridge over the years, resulting in many detail changes.

I began work by forming the main beams from Evergreen styrene strips. I added cross braces from Micro Engineering (HO) and Central Valley (N) kits. I used the braces that best matched the prototype, which meant I could only use a few parts from each kit.

I fabricated the deck from styrene strip and used telescoping square brass tube to join the two arch halves and stabilize the deck.

There were several key details that I completed prior to final assembly of the bridge. I installed the catwalk and constructed the long maintenance walkways using Gold Medal Models etched parts and styrene. The walkways have suffered from neglect on the prototype. The ends were removed so it no longer spans the full length of the bridge.

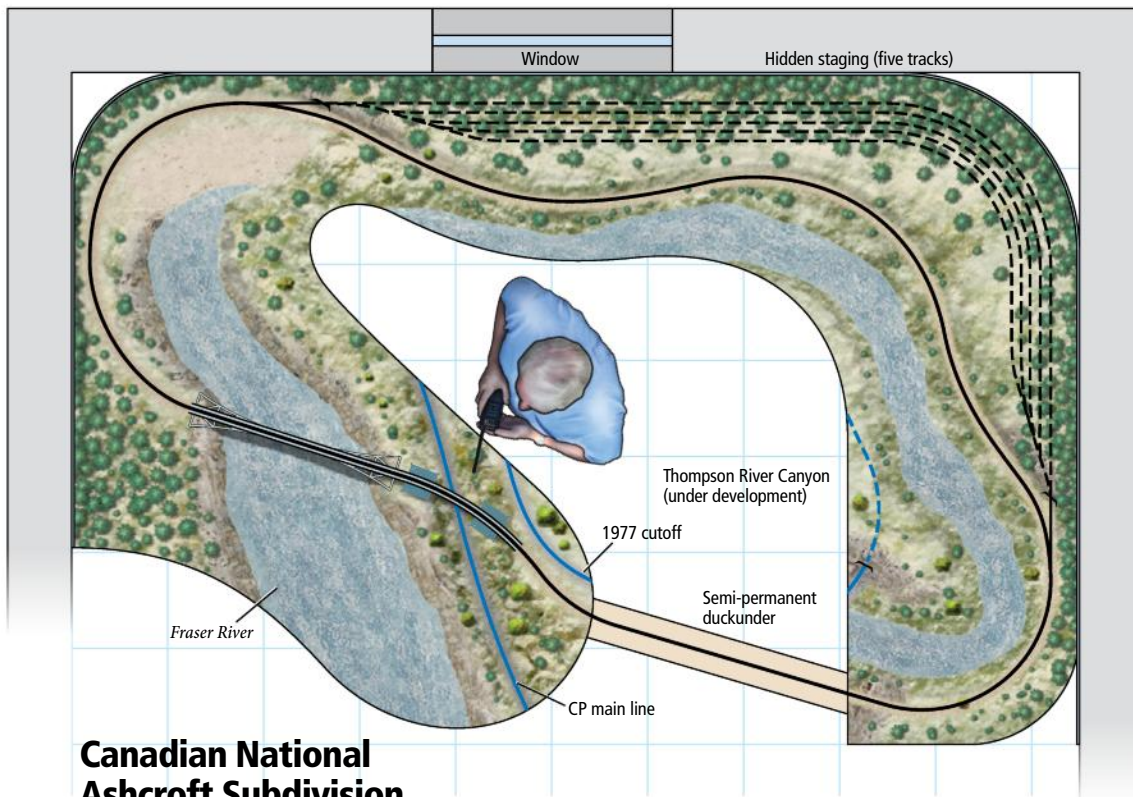
Modeling the approach

With the arch section of the bridge largely complete, I turned my attention to the plate girder approach sections that are composed of two short pillars and five decks.

The pillars proved challenging, as they have a distinct style of cross-bracing not available commercially. I didn't want



This construction photo shows how Scott combined styrene, commercial plastic castings, and etched-brass parts to build the truss arch portion of the bridge.



Canadian National Ashcroft Subdivision

N scale (1:160)
Room size: 10'-6" x 7'-0"
Scale of plan: 1/2" = 1'-0", 12" grid
Illustration by Rick Johnson

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

to compromise on this detail, so I made custom etchings. I designed the braces in Inkscape (www.inkscape.org), a free online drawing program. I had the braces etched from .010" brass.

I assembled the pillars with cyanoacrylate adhesive (CA). The glue, in conjunction with the tab-and-slot construction, yielded a strong assembly. The first pillar went together fine, but I had to modify the etched-brass braces for the second pillar.

I included railings and walkways on the approach. I made the ballasted deck from styrene. Then I added the etched walkways after painting and weathering the concrete deck.

The final components were the concrete support pylons. I made the pylons from clear pine and had the gusset plates and bridge shoes custom etched. To avoid damaging the delicate parts, I left off the deck railings during this phase. I installed them after most of the scenery was complete.

Painting and assembly

I airbrushed the bridge components with acrylic paint. I first applied a weath-

The layout at a glance

Name: Canadian National Ashcroft Subdivision
Scale: N (1:160)
Size: 7 x 10 feet
Prototype: Canadian National
Locale: British Columbia
Era: modern
Style: around the walls
Mainline run: 28 feet
Minimum radius: 15"

Minimum turnout: none
Maximum grade: none
Benchwork: open grid
Height: 46"
Roadbed: Woodland Scenics foam
Track: code 55
Scenery: foam board
Backdrop: 1/8" hardboard
Control: NCE Digital Command Control

ered black-gray mix, followed by Polly Scale Southern Pacific Daylight Orange. [The Testor Corp. discontinued the Polly Scale line. Model Master enamel no. 2770 GO Mango is a close match. – Ed.]

I again turned to *Daylight Orange* to paint the pillars and arch, keeping the coverage thin so some of the black would show through. The incomplete paint coverage matches the prototype.

I sprayed the bridge ties Rail Brown and the walkways a dirty aluminum color. Finally, I ballasted the approach deck and secured the code 55 track and code 40 guardrails.

The bridge diorama

With the bridge painted, I made a diorama for the Cisco Bridge scene using a 2 x 4-foot piece of birch plywood and foam board. This makes the bridge scene easy to remove in case I need to relocate.

After test fitting the bridge, I screwed the pylons to pieces of hardboard. Then I secured the hardboard to the foam with acrylic caulk. [Solvent-based caulk will dissolve foam. – Ed.] When everything was secure, I mounted the bridge to the pylons using brass tube pins and CA.



Scott built the Cisco bridge scene on a 2 x 4-foot piece of plywood. He built the surrounding scenery using foam board and plaster castings.

To model the spring runoff in June, when the river level is highest, I positioned the bridge deck 11½" (153 scale feet) above the water. This is less than the prototype 210 feet, but it looks OK.

Mountain scenery

To re-create Cisco's mountain scenery, I first rough cut pieces of foam board. Then I added plaster rock castings I made using commercial and home-made silicone rubber molds. I secured the castings with caulk. On the west bank of the river I cast the rocks in place to simulate a continuous rock face.

I tinted the castings with black and umber washes applied with a brush and spray bottle. Then I painted the surrounding scenery with a base of brown latex paint topped with grout powders, fine ground foam, and static grass.

I modeled the crumbled rock from leftover plaster that I broke and sieved into coarse, fine, and dust piles. I soaked the plaster in washes of artist paints. I secured the crumbled rocks with diluted matte medium.

At this stage, I was confident enough to tear out my old layout and build new benchwork. With foam landforms, Atlas code 55 flextrack, and a hand-painted backdrop, the layout quickly took shape.

For the Douglas fir trees, I made forms by twisting craft wire. I then painted the wire with textured brown spray paint. I ground up brown and green craft store lichen in a blender and sprinkled it on the forms, which I'd brush-coated with full strength matte



Most of the visible track is shown in this photo. A hand-painted backdrop further reinforces the mountain scenery of the Fraser River Canyon.

medium. I sprayed the lichen with alcohol so the matte medium would soak in.

When that was dry, I dusted the trees with Krylon Camouflage Olive spray paint. So far, the layout has consumed hundreds of trees and more than 1,500 feet of wire.

The last item needed to round out the layout was the river. At the suggestion of a friend, I poured a thin layer of leveling cement over the plywood base. This solution worked well, giving a nice clean edge to the river along the banks.

I painted the river a muddy brown-gray color to simulate the turbid river during spring flow. I stippled on heavy



Meet Scott Lamoureux

Scott started modeling as a youth with a Christmas HO train set from his parents. When he returned to the hobby he shifted to N scale. Scott lives in Kingston, Ont., with his wife, Linda, and two teenage children. He is a permafrost scientist and geography professor who works throughout the Arctic.

gloss medium for waves and lightly dry-brushed zinc white on some of the wave caps. Then I applied a coat of Pledge Multi-Surface (Future) floor polish, which adds convincing highlights and texture.

A learning experience

Although it took more than two years to complete, I'm very happy with my N scale Canadian National Ashcroft Subdivision. I learned a lot of new techniques while building the layout, especially how to design and etch metal parts.

It's wonderful to watch long trains move through the scene far above the river below. Being able to compose breathtaking scenes where the landscape dwarfs the trains is, to me, one of the great advantages of N scale. **MR**



The west end of the Basalt, Colo., yard on Andrew Dodge's O scale Proto:48 Colorado Midland layout had few operational opportunities. He remedied that by modeling a portion of a stock pen between the tracks and fascia.

MODEL STOCK PENS along a fascia

Rail-served businesses don't need to have a large footprint

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

FEW MODEL RAILROADERS

have enough space to fulfill all of their modeling wishes. When designing my O scale Proto:48 depiction of the Colorado Midland Ry., I faced this problem at multiple levels, but there were always solutions.

Two questions in particular came up, and one solution solved both. First, what prototypical industries or freight-generating facilities could I model along the main line of my Colorado Midland between Leadville and Basalt, Colo.? Second, what could I fit into the limited space between the track and the edge of the layout or between the track and the transition to the backdrop?

The solution, however, was right in front of me if I simply followed the prototype. In some circles, the Colorado Midland was known as the “stockman’s railroad.” Major stock movements occurred in the early summer when the high mountain pastures provided plenty of grazing space, and again in the fall when the animals would be shipped to areas at lower elevations and more moderate winter weather. Since I modeled the Midland in fall, I would have a great need for stock pens and all the operational opportunities they would provide.

However, this still brought me back to the space issue, since modeling stock pens in O scale can consume up to 8 square feet of space. Having 2, maybe 3, feet of layout depth at a maximum didn’t leave me with many options. Or looking at it from a more positive perspective, what could I do to solve the space problem while enhancing a somewhat dull, uninteresting scene?

Making every inch count

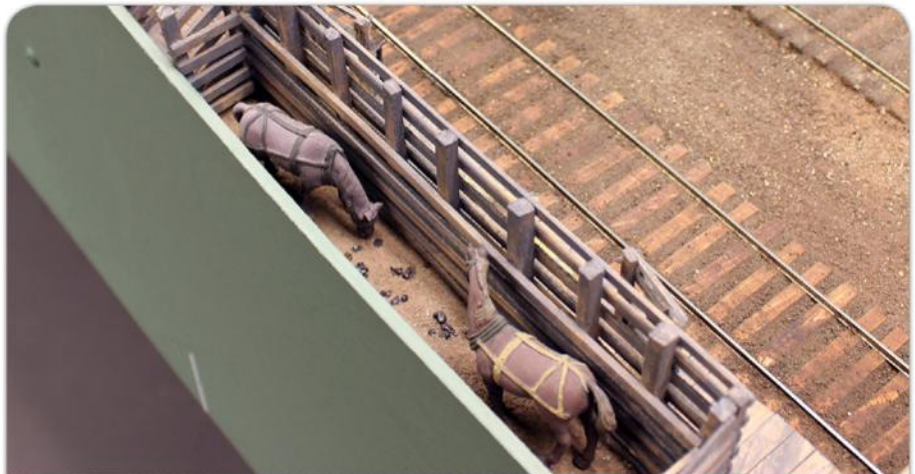
In the early 1900s, Basalt shipped 32 carloads of livestock each year. This number didn’t include animals unloaded and reloaded under the 28-hour rule that the federal government instituted in 1873 for the welfare of the animals. I’m unaware of any record as to the size and location of the pens, which afforded me a little bit of modeler’s license.

The east end of the yard included the station, hotel and eating house, water tank, section and bunk houses, and engine facilities. The west end was almost devoid of any points of interest, as seen in **fig. 1**. To fill that void and create more switching activity, I built a stock pen between the fascia and the track, as shown in the image on the opposite page.

All I needed was a few inches to include two loading ramps, pens, and some human-interest items. Operators



Fig. 1 Before the stock pen. Here’s what the Basalt yard looked like before the stock pen was added. Because of switching activity at the ice house at distant center, Andrew decided not to locate the stock pen along the backdrop.



Andrew didn’t overlook any details on his stock pens. He used small clumps of solder, painted brown, to simulate horse manure.

Detailing a stock pen

Since this article features stock pens, one detail that shouldn’t be overlooked is manure. Visitors and relatives have reminded me that I needed to include that detail to make a believable scene.

Modeling manure is easy and improves the overall effect of the scene. I took a hot soldering iron, passed it by the end of the solder, and then tapped the solder-laden tip on a piece of sheet metal. The solder solidified immediately into small clumps. With paint, those silver clumps became convincing manure.

To model the hay, both clean and used, I used hemp rope. I cut the strands into 3 scale foot lengths to match the size of cut hay. Because rope is twisted in multiple groupings for strength, I pulled the strands apart and soaked them in water for a day or two so they would “relax.”

To model used hay, I put the rope into a bowl with coal dust and swirled it around until the hay looked used. Small pieces of the coal in the mix added to the appearance of dirty hay or straw that needs to be replaced. – *Andrew Dodge*



Fig. 2 More space, more detail. This loading-chute area is correct in width along the tracks, but the pens are greatly shortened due to the close proximity of the fascia. The shortened stock pens still meet the function of the prototype.



Fig. 3 Protecting the pens. The turnouts at Basalt can be reached without having to lean over the stock pens. The fascia further protects the pens from damage.

could now busy themselves moving cars for loading, unloading, and cleaning. Besides stockcars, boxcars would be used to deliver hay, straw, and feed grain.

Fade to aisle

I have six stations on the modeled portion of my layout, and Busk was the

only one without stock pens. Busk is deep in a mountain valley and was the eastern entrance to the almost 2-mile-long Busk-Ivanhoe Tunnel under the Continental Divide. The sole photographic record of any of the Midland's stock facilities was taken at Ivanhoe. Restricted by the topography and Loch Ivanhoe, which the railroad crossed on a

causeway, the pens I've incorporated into my layout conform to the design of the prototype.

The prototype photo, taken at the turn of the 20th century, shows a long set of pens extending well out into the meadow with only a narrow loading area along the track almost opposite the station. It would have been nice to include all of the pens, but that would require extending the layout approximately 4 feet into the aisle. The practical solution, like at Basalt, was to cut off the pens at the fascia's edge. See **fig. 2**.

Operating considerations

When planning sidings requiring switching, such as industrial or commercial areas, it's important to keep in mind the practical issues of being able to reach cars for coupling, uncoupling, and re-railing, as well as lining turnouts. Stock facilities can be a busy place where it's essential to easily switch cars without reaching over the layout and potentially breaking things. However, the fascia does afford the stock pens some protection, as seen in **fig. 3**.

My solution to the stock pen question met all my requirements of achieving visual points of interest, practical needs of modeling in a limited space, and the functions of operating a model based on a prototype. **MR**

Andrew Dodge has written articles for Model Railroader, Model Railroad Planning, and Great Model Railroads. His story "How to model buildings using Plexiglas" appeared in the April 2014 MR.



I think the "Off the Rails" series is the best. From episode 1 to the current episode, I love Gerry's advice and money-saving tips. I hope you never run out of ideas because I think you really help model railroaders like myself with a lot of little problems.

— ROCCO MALEY



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CAPTURING THE MIDWEST in HO scale

Sectional construction and a Great Plains locale set this model railroad apart

By **Pelle K. Sæborg** • Photos by the author



We all have our preferences when it comes to model railroading. Some like operation most, some like collecting trains, and some specialize in modeling structures, locomotives, or cars. Others are experts in scenery, weathering, or electronics. And then there are the generalists who do a little of everything, which is the category I belong to.

Over the years, trains have almost become secondary to me. They are my excuse to create scenes in 1:87.1 scale that capture the essence of an area. My joy is in the construction, so I tend to lose interest in my layouts when they're finished. To me it's the journey, rather

than the destination. Operation has never really appealed to me. I've participated in operating sessions and found it entertaining, but it has been on much larger layouts than I have room for.

My previous layout only lasted for 14 months after it was completed, and for the last six of those months, my mind was focused on developing ideas for the next layout. During the Christmas holidays in 2013, my desert-scenery layout was cut up in sections and moved to a friend's basement.

Standing in my completely empty train room, imagining all the things I could build there, must be close to what an artist feels looking at a white canvas. Everything is possible and nothing has

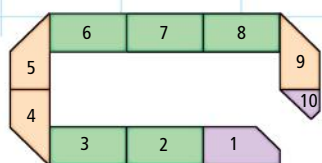
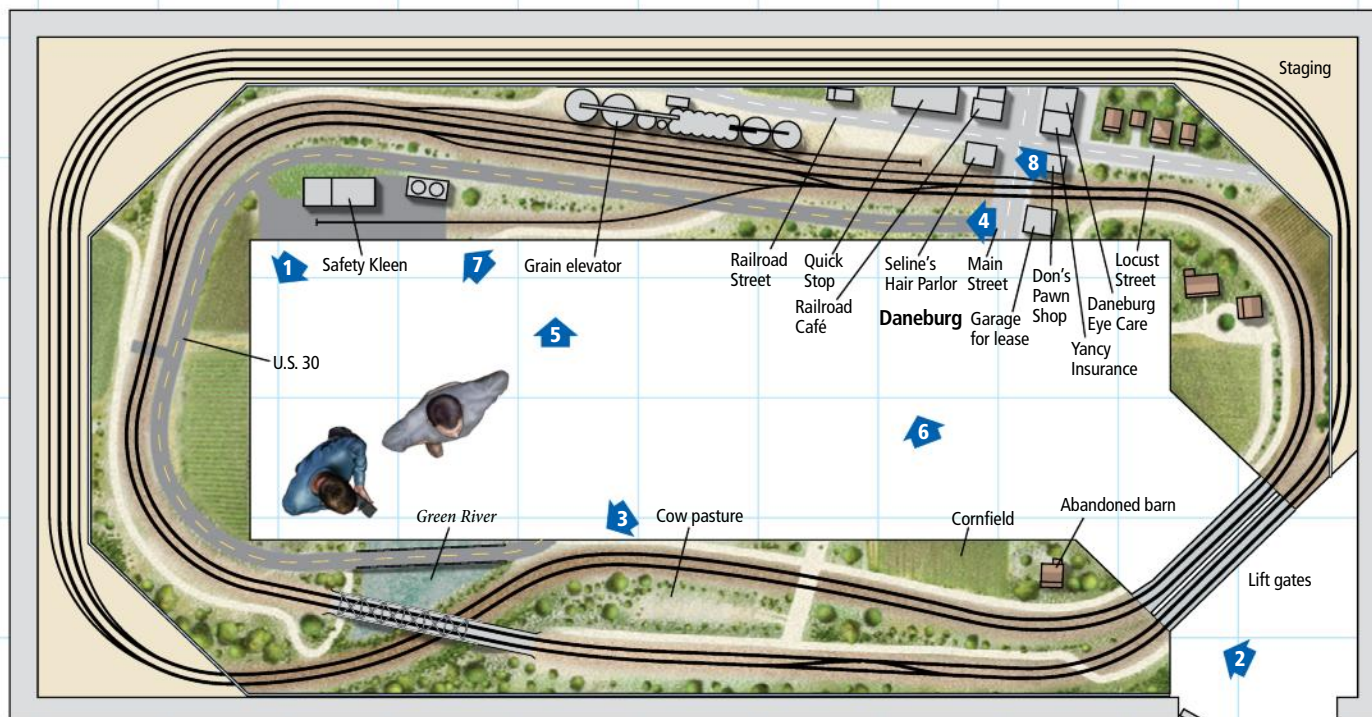
gone wrong yet. Two and a half years later, a new layout fills the room – and as you read this, I'm probably planning my next model railroad project.

Picking a theme

My train room measures 11 x 22 feet, which means I have to accept some compromises to model in HO scale. I really must get my priorities right, as I can't have it all. Actually, I can only have a fragment of what I want. Instead of getting frustrated over all the things I can't do, I define my wishes for the layout I want to build and make a prioritized list. It's more a matter of what can be left out rather than what can be crammed in.

1 Nothing says "Midwest" like a Union Pacific freight rolling past a cornfield. Pelle Søbørg's new HO scale UP Daneburg Subdivision aims to capture the atmosphere of the Great Plains without modeling any specific prototype location.





- Standard straight section 62 x 32 inches (155 x 80 cm)
- Standard corner section 62 x 32 inches (155 x 80 cm)
- Non standard sections

Union Pacific Daneburg Subdivision

HO scale (1:87.1)
Room size: 11 x 22 feet
Scale of plan: $\frac{5}{16}" = 1'-0"$, 24" grid
Numbered arrows indicate photo locations
Illustration by Pelle Søborg and Rick Johnson
Find more plans online in the
ModelRailroader.com Track Plan Database.

The layout at a glance

Name: Union Pacific Daneburg Subdivision
Scale: HO
Size: 11 x 22 feet
Prototype: Union Pacific
Locale: Freelanced, based on eastern Nebraska and western Iowa
Era: present-day
Layout style: around the walls
Mainline: 60 feet (excluding staging)
Minimum radius: 33"
Track: flextrack: code 83 (main), 70 (sidings), and 55 (spurs)
Turnouts: no. 6
Maximum Grade: 1 percent
Height: 46" to 50"
Scenery: extruded-foam insulation board
Backdrop: photographic
Control: Lenz DCC

I wanted to model a Class 1 railroad, so it didn't make much sense to switch to another prototype. My previous layout featured the modern Union Pacific RR, so I stayed with the UP. That way I didn't have to buy new locomotives, which can be costly. I also wanted to model a main line so I can run different types of trains. To capture the flavor of a main line, I have to be able to run relatively long trains – 30 to 35 cars, depending on their length. Modern trains require long staging tracks and broad curves, both of which take up space.

Scenery-wise, I wanted to model a completely different location. My last two layouts both featured Southern California desert scenery. This time I turned my attention to the heartland of America. I've traveled through the Midwest several times, mainly Iowa and Nebraska, and I like the area's small, rural towns and endless cornfields. The Midwest seemed to offer the modeling challenges I was looking for, and the UP runs right through it.

Until recently I'd never imagined I would model the Midwest, so on previ-

ous trips to the region (I live in Denmark), I didn't take a single photo with modeling in mind. Pretty stupid, I'd say. So before I started on my new layout, I took one more Midwestern trip to get the pictures I needed and take in the atmosphere one more time to have it fresh in my memory.

Planning

I'm the sole operator on my layout, so operational possibilities aren't my main focus. My previous layout had some potential, but the only operation that actually took place was when I did a little switching at Daneville – the one town on the layout – and at Duolith Cement, the largest industry on the layout. My ambition for operation on my new layout was limited to some switching.

The lesson I learned from cutting my previous layout into sections for removal was that no matter how careful you are, you can't do it without doing some damage. So after three permanent layouts, this time I built a sectional layout. [See the March 2016 MR. – Ed.] I wanted it to



2 This view from near the entrance of Pelle's train room shows most of the layout. During operation, the doorway is spanned by two lift-out bridges.

be movable rather than portable. I didn't have any intentions of taking it to shows and such, but I wanted it to be easy to move if I end up selling it or moving to another place.

I had one more wish for my new layout – I wanted a bridge somewhere. I love bridges and couldn't find a way to work one into my previous layout, so a bridge was a high priority this time.

I sat down and did some thinking. I could save quite a bit of space if I put staging between the backdrop and the wall. The staging wouldn't be directly accessible, but it wouldn't be completely impossible to reach if necessary. If a problem occurs, I can remove a section of the backdrop. On my previous layout I only needed to access the staging twice, so this isn't something I expect to do often.

The track plan consists of a double-track main line, two sidings, and an industrial spur. One siding serves the grain silos and the other is at the other side of the main line

in connection with an industrial track. A couple of crossovers connect the tracks.

I had to use modeler's license in my track plan design. To make one of the sidings long enough, I had to place one of the turnouts right next to a crossover, which isn't UP practice.

The staging consists of just four tracks. They typically hold two eastbound and two westbound trains that I can run when visitors come to see my model railroad.

Benchwork

I designed a sectional system using standardized rectangular layout segments. These segments rest on an L-girder frame mounted on triangular gussets that attach to the wall studs. By avoiding any legs on the floor, I gained a lot of free space under the layout. This gives the impression of an aisle wider than it really is.

I used 1 x 2 lumber for most of the framework. Only

the braces were made from 2 x 2s.

I assembled the framework with screws only, no glue, to make it easier to dismantle if needed. When you don't use glue, the lumber has to be cut very precisely. I use a circular saw with an adjustable cutting angle.

The size of the layout sections was defined by the size of my train room. Each section measures 32 x 62 inches. The layout sections were made from 1/2" plywood screwed and glued together. I used medium-density fiberboard (MDF) for my previous layout, which is more sound deadening than plywood, but also quite a bit heavier. Keeping the weight of the sections down was a priority, so I went with plywood this time.

The sections with the town and grain elevator scenes were fully covered with sheets of plywood. For sections with hilly terrain, the subroadbed was made of plywood and the surrounding landscape of extruded-foam insulation board. The layout sections are attached to each other with bolts and wing nuts.

The staging tracks run along the walls and are hidden behind the backdrop.

MORE ON THE WEB

Magazine subscribers can watch video of trains on Pelle's layout. Look in the Online Extras box at ModelRailroader.com.





3 Since Pelle's previous layouts had no bridges, a double-track bridge was a priority for this one. He built the bridge from a Central Valley Model Works kit.

One of the benefits of a sectional layout is that I could remove the layout sections to gain full access to the staging area while I was working on it.

Track

I didn't apply the sound-deadening layer I used on my previous layout to this one, as the material is very heavy. Instead, I used two layers of cork. The 2 mm-thick base layer is wider than the roadbed, so the ballast will rest on cork instead of on plywood. It was my theory that if the ballast, which will turn hard as glass when it is glued down, rested on something soft and flexible instead of

directly on plywood, it would reduce the wheel noise.

I've used commercial flextrack and turnouts for all my previous layouts and didn't see any reason to deviate from that on this layout. When painted and weathered, flextrack looks realistic enough for me, and it's quicker and easier to install than handlaid track.

There isn't much straight track on my layout. Of course, the shape of the layout room makes some curves unavoidable, but I also introduced slight curves into track that could have been totally straight. Fluid track is so much more interesting to look at than straight track that curves only where it meets each corner of the room.

Making authentic scenes

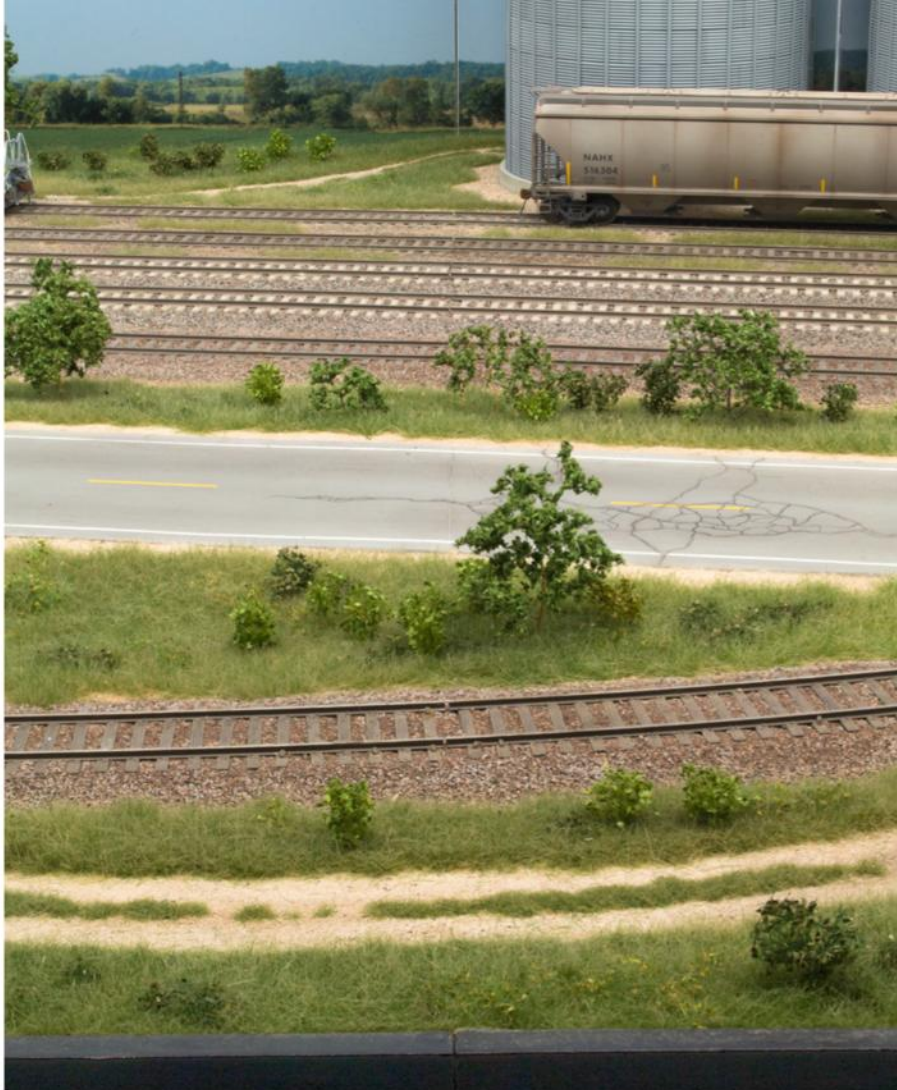
If you want to model a real place in HO scale, you'll soon find out that not many places will fit without being

dramatically scaled down. I don't have room for modeling a specific place or area, but a fictitious place can look just as authentic. I base my freelanced place on fragments from real places. That way I can create a place people think they have visited.

I first visit the area I want to model. While there, I focus not on the details, but on the big picture – what gives the area its atmosphere. I look for the ordinary things rather than spectacular things. In the actual modeling I understate rather than overstate to make my point. If you overdo a scene with too much detail, there's a risk your layout will turn into a caricature.

I take pictures of buildings I want to model. The buildings in the town on my layout are modeled after buildings in a variety of towns and places, so even though the town on my layout is a fictitious place, several of the structures are models of actual buildings.

4 The grain elevator complex in Daneburg, inspired by a prototype in Lexington, Neb., is the largest industry on the layout. Though selectively compressed, it still looms realistically over the trains.



5 Breaks between layout sections can be hard to conceal when they cross backdrops or roadways. The gap between sections in this photo falls just left of the tree in the foreground.

I try to be very selective in what I put in the scene. We have a tendency to incorporate more structures and other elements than space allows. That won't work if you want a realistic scene. Elements spaced too closely will spoil the illusion of a real place.

I also avoid distracting objects – in other words, anything that sticks out. That doesn't mean you can't have a signature structure that attracts attention, like my grain silo complex. It just has to look as if it belongs in the scene.

The choice of colors plays an important role in achieving a realistic looking layout. Pay attention to the colors of the scenery in the real world. For example, a grass field might just look green to you, but if you take a closer look, you'll notice that it has many shades

ranging from fresh green to beige and golden shades. It's the same with concrete. It might appear uniform gray at first glance, but can contain many gray, brown, and even black shades, depending on how old it is. The same applies to surfaces and materials like brick, asphalt, wood, and more.

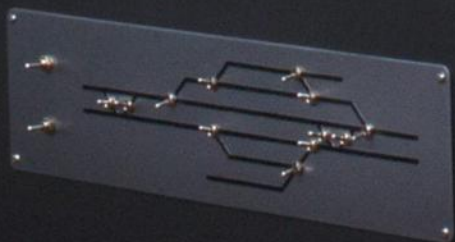
A well-made backdrop that blends with the scenery will expand your layout many miles. I made mine from photographs taken on my trip to the Midwest. To create an illusion of vast open spaces, I kept the horizon on the backdrop low. There isn't a lot of scenery on it, mostly a dominating blue sky.

The icing on the cake is the details you apply to the scene. People tend to think that my layouts are very detailed. In fact, they're not. Realism isn't directly proportional to the amount of details you apply to a scene. If a scene is cluttered with small details, they more or less neutralize each other. It's much better to apply only a few details at selected locations. They will be easier for the



6 The four-track staging yard is inaccessible behind the backdrop at Daneburg, so Pelle uses a camera (whose monitor is visible on the wall) to watch trains there. He can remove a backdrop section to reach the yard if needed.









Meet Pelle Søbørg

Pelle Søbørg, a resident of Farum, Denmark, is a *Model Railroader* contributing editor. He has also written a number of books on model railroading, the newest of which, *Build a Sectional Layout*, will be published this August.

section before moving to the next. In many ways, that was a rewarding way of doing things because it didn't take as long to see something finished as it did on my previous model railroads.

However, there are some issues that make a sectional layout less than optimal. You can't avoid seams cutting through the scenery where the sections join. These are especially noticeable on roads and tracks, where there is no scenery to camouflage them. Backdrops have the same problem. Each layout segment has an associated backdrop section attached to it, leaving a vertical seam between the backdrop sections.

A learning process

We modelers have been blessed with many new scenery products in recent years. Working with different scenery materials than I've been used to has been a learning process for me, and it's been a

pleasant surprise how realistic the scenes I create with them appear. The experience I gained making the photo backdrop for my previous model railroad helped me to create a backdrop for this layout that blends better with the scenery.

Learning is what it's all about. My next layout should

be even better than this one. Right now I'm pretty pleased with the result, but when I look at pictures of my previous model railroads, I sometimes wonder how I could have been pleased with them at the time. Maybe that will happen with this layout, too. **MR**

7 The other rail-served industry on the layout is the Safety-Kleen oil-recycling plant, based on a prototype in Grand Island, Neb. Other than the storage tanks, the structures are all scratchbuilt.

8 Quiet homes built from laser-cut wood kits sit along Locust Street in Daneburg. Pelle feels the key to realism in a scene like this is not overloading it with details.

viewer to spot and automatically attract his eye. That way, you control what you want a viewer to look at. He'll see the detail and not the lack of details elsewhere, giving him the impression that your scene is very detailed.

Sectional vs. built-in

Building a sectional layout is somewhat different from building a permanent layout. On a permanent layout, you can customize the shape of your benchwork to fit your track plan. On a

sectional layout, it's the other way around. You have to design your track plan to fit the layout sections.

My previous layouts were all permanent, and I preferred to finish one task before moving to the next. First I built the benchwork, including the subroadbed. Then I laid all the track. I followed the same process on my new layout up to that point, but from there on, I did things differently. Ordinarily I'd next build the road base, then make the terrain on the entire layout from extruded-foam insulation board. After that, I'd pave all the roads, painting and weathering. Finally, I'd apply scenery.

Instead of working on the entire railroad all at once as before, I finished each section one at a time on this layout. I finished subterrain, roads, scenery, structures, and even details like road signs and utility poles on each layout

REALISM ISN'T DIRECTLY PROPORTIONAL TO THE AMOUNT OF DETAILS YOU APPLY TO A SCENE. - PELLE



Resin supports and a plywood core are some of the materials senior editor Dana Kawala used to scratchbuild the North Avenue viaduct. The highway overpass spans the 4-foot width of the HO scale Beer Line addition.

Making a multimedia HIGHWAY OVERPASS



A variety of materials and scrapbox parts make up the North Avenue viaduct

By **Dana Kawala** • Photos by Bill Zuback and the author

Originally my assignment for the *Model Railroader* staff's HO scale Beer Line addition was to build a modest roadway that went up a hill and across a short highway overpass above a set of tracks. However, the more I looked at the mock-up, the more I thought we could come up with something better. Why not make the viaduct cross the entire 4-foot width of the layout? Editor Neil Besougloff agreed and handed me a thin plywood sheet from our workshop scrapwood pile. The plywood ended up being just the first piece of a multimedia project that would also involve styrene, resin, foam, and white metal parts.

My model would loosely represent the North Avenue viaduct. The prototype was a 1,385-foot-long reinforced concrete bridge that carried its namesake roadway across the Milwaukee River and some of the industries along its banks. The bridge opened in 1921 and was demolished and replaced in 1990.

I approached the structure more as a scenic element than a replica of the North Avenue viaduct. It's not a stand-alone model; its primary purpose is to enhance the overall scene. My goal for the bridge was to create interesting sight lines for those operating, viewing, and photographing the layout. The road surface provided another elevated plane on which we could showcase scale vehicles, while the tracks snaking under the

bridge added a tunnel effect to the urban canyon setting of the Beer Line.

Even though I wasn't following the prototype girder for girder, I used prototype photos as inspiration. Instead of modeling the large arches that held up the span across the river, which is barely present in the scene, I focused on a portion of the viaduct that crossed the industries and tracks on the west side of the river. Although our Beer Line takes many geographical liberties, the viaduct did actually cross over Tews Cement, an industry on our layout. In fact, the company stored supplies under the viaduct, as we've depicted in the scene.

According to written descriptions, parts of the overpass that spanned railroad tracks used plate girders, while those that didn't used shallow concrete arches. I followed suit on the model using girders from a Micro Engineering Tall Steel Viaduct kit in two locations where the overpass crossed the tracks. For the shallow arches, I used an innovative material called Balsa-Foam.

For me, the real standout features of the overpass are the bridge piers from Crow River Products. If we hadn't found those parts, it wouldn't have made sense to build the model. I searched online and in stores, and couldn't find anything else that looked like the concrete piers used on 1920s to 1940s highway overpasses. These resin parts required a lot of filling and filing, as well as some

splicing to get the correct width, but the results were well worth the effort.

As important as getting the structure's look right was making sure the overpass stayed upright on a portable layout built to be connected in different configurations. The moment of truth for me came in November 2016 when the entire Beer Line layout was loaded onto a trailer for a pothole-plagued trip to Trainfest in neighboring West Allis, Wis. Thankfully the beefed-up bridge supports and my liberal use of epoxy kept North Avenue standing tall.

Follow along as I show you some of the key elements of this multimedia scratchbuilding project. Hopefully, you'll find a useful tip or two for your model railroad.

Beer Line series

Jan. 2017: The Beer Line addition

Feb. 2017: Benchwork and tracklaying for the Beer Line addition

March 2017: Scratchbuilding Steinman Lumber Co.

April 2017: Mix kitbashing and scratchbuilding to model Ben-Hur Freezer Co. in 17 x 31 inches

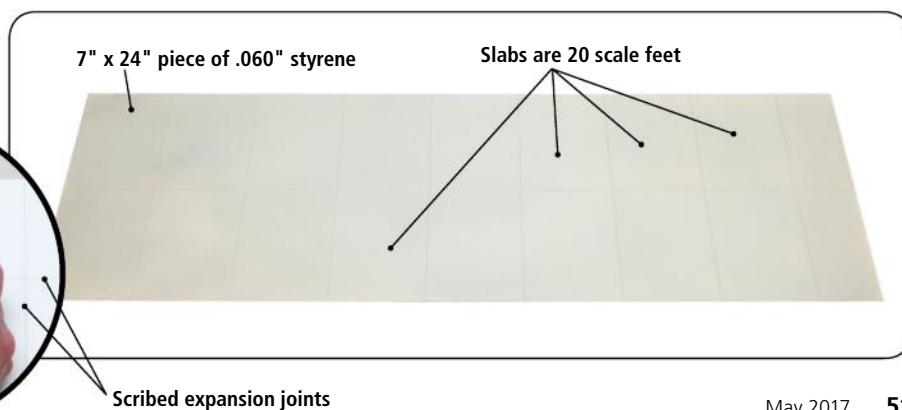
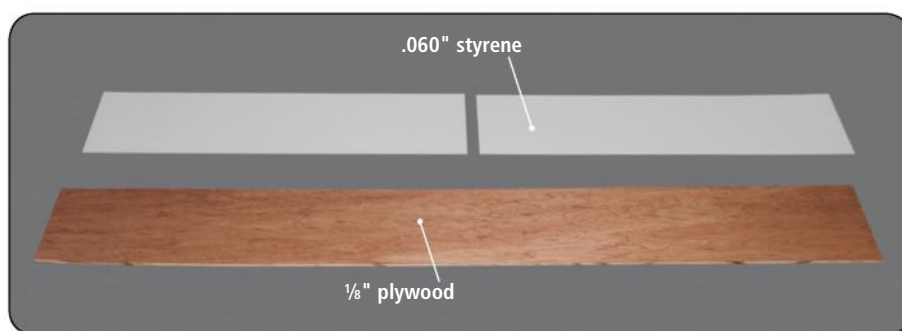
May 2017: Building the North Avenue viaduct

June 2017: Using different techniques to build a cement plant complex

1. PLYWOOD AND STYRENE BRIDGE DECK

Using a 120-tooth blade in a table saw, I cut a 7" x 48" strip of 1/8" thick plywood. I then painted the plywood with Rust-Oleum Painter's Touch 2X Flat Gray Primer followed by Flat Black spray paint. The underside of the overpass wouldn't be visible from normal viewing angles, and the black paint would help to further conceal it.

I used a utility knife and a metal straightedge to cut two 7" x 24" pieces from two 12" x 24" sheets of .060" plain styrene for the road surface. Next I used a scribing tool and a metal straightedge to scribe simulated expansion joints. I worked slowly and made only a few passes to avoid cutting through the styrene. The expansion joints are spaced 20 scale feet apart.

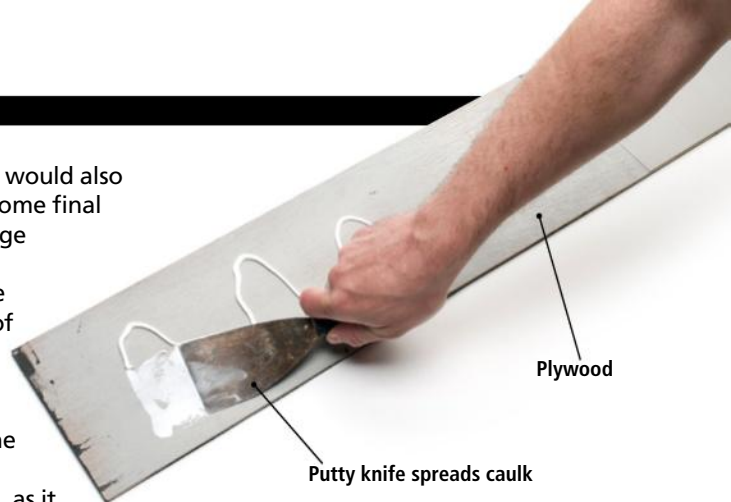


1. PLYWOOD AND STYRENE BRIDGE DECK (CONT'D)

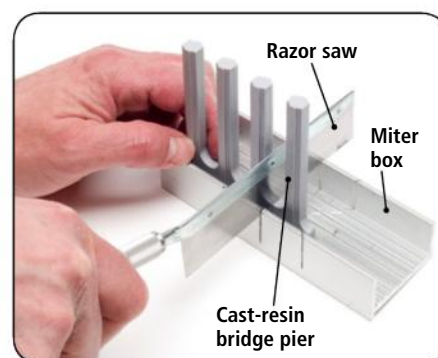
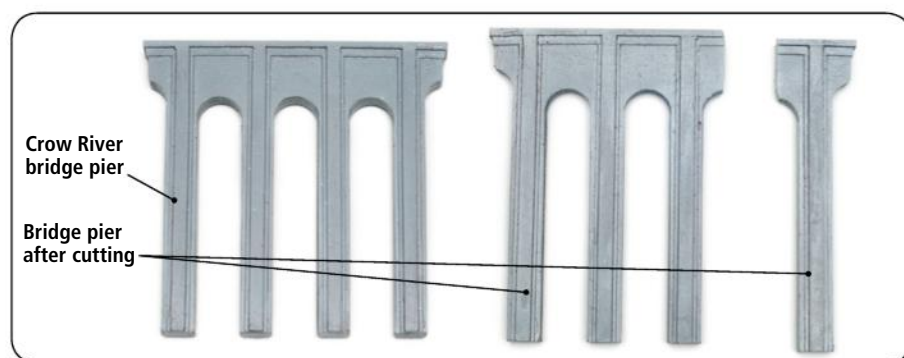
After using fine-grit sandpaper to remove any plastic shavings from its surface, I took the styrene to the spray booth. I applied a couple coats of Rust-Oleum Gray Primer then added a few coats of Rust-Oleum Camouflage Sand and Painter's Touch 2X Granite and Stone colors. I found I got the best results by holding the spray can a foot or more away from the styrene and spraying in light passes. Because the paint was almost dry when it hit the styrene, the multiple coats and shades of gray gave the road surface a realisti-

cally mottled surface that would also provide a good base for some final weathering once the bridge was assembled.

Next, I spread adhesive caulk on the top surface of the plywood and carefully pressed both pieces of styrene in place. After final weathering, the seam between the two pieces wouldn't be visible, as it would blend in with the other expansion joints on the road surface.



2. CAST-RESIN BRIDGE PIERS



Making the bridge piers was the most time-consuming part of the project. Most HO scale highway overpass kits that I found model round support columns that are common in 1950s and later construction. Luckily I found resin castings from Crow River Products that were a close match to the arched concrete piers seen in prototype photos of the 1921-vintage North Avenue viaduct.

Unfortunately the Crow River castings were only 3 1/2" wide. Even though the overall width of the overpass model would be 7", I couldn't simply place two piers together. On the prototype, the piers were only under the road surface, while the sidewalks were cantilevered from the sides of the bridge. Therefore I'd need bridge piers that were 5" wide to match the width of the planned road surface.

To get a single 5" wide pier required splicing two castings. That meant I needed 12 castings to make my six bridge piers.

Using a miter box and razor saw, I cut a pillar off of each pier. I made each cut in the center of the arch so that the splice that followed would be as even as possible.

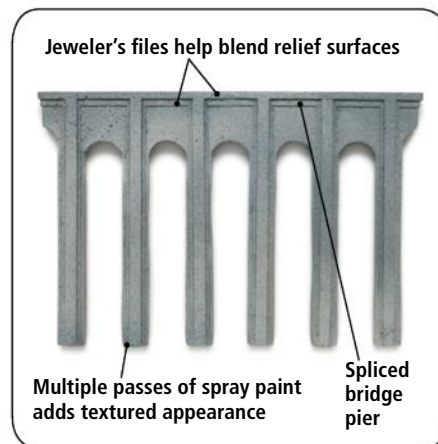
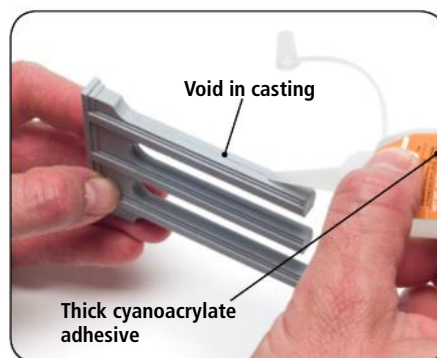
Because the parts are resin, there were many voids and other imperfections that had to be filled and filed away. For example, many of the pillars had a cavity running down one or more sides. To deal with these imperfections I used thick gap-filling cyanoacrylate adhesive. After the CA dried I used sanding sponges and files to smooth the surfaces. I also used a flat file to smooth the cut ends of each casting.

I washed the parts in our workshop sink with warm water and a little dish soap, then dried them thoroughly. Next, I glued the cut ends together with CA and placed a metal straightedge along the bottoms of the pillars to make sure the

pier stood square. Then I dabbed CA accelerator along the seam on both sides to instantly cure the CA.

I used sandpaper to smooth the seam between the two parts. Small jeweler's files were useful for blending together the narrow relief surfaces in the castings.

After a week of splicing, sanding, and filing, I took the six complete piers to the spray booth. Using the same technique as I described when painting the road surface, I painted the pillars with Rust-Oleum spray paint. The key is to build up the color with light passes.



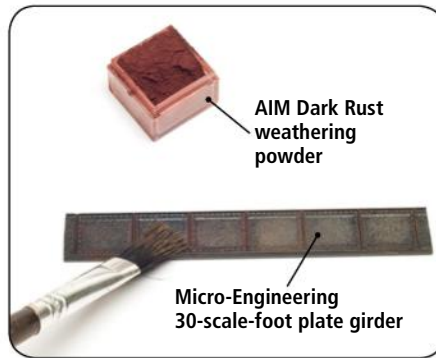
3. MOUNTING THE PIERS AND PLATE GIRDERS

I marked the pier locations on the scenery base. The first pier at each end is $3\frac{1}{2}$ " from the edge of the layout. Although the spacing between the model piers looks equidistant, it actually varies from $7\frac{1}{2}$ " to $8\frac{3}{4}$ " to account for the tracks and other structures underneath.

Next, I found the center of the bridge deck's 7" width and drew a centerline along the underside of its 48" length with a steel rule. Then I measured $1\frac{1}{2}$ " from each long edge and drew guidelines. These mark the outermost edges of the supports. Finally I marked the centerlines across the bottom at each support location.

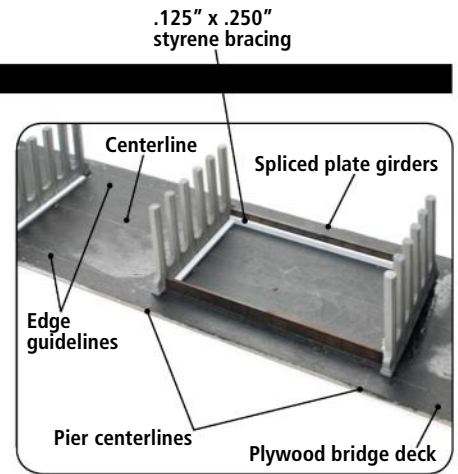
To attach a pier to the deck I used 5-minute epoxy. This thick 2-part adhesive comes in a syringe-like tube and creates a stronger bond than CA. After sanding the top of a support to make sure it was flat, I applied a bead of epoxy and secured the part to the bottom of the bridge deck. I used a steel rule to make sure the part was properly aligned along the centerlines and guidelines.

Within the 5 minutes before the epoxy started to set, I used a machin-



ist's square to check and adjust the vertical alignment of the support. Next, I used epoxy to secure a 4" length of .125" x .250" styrene strip across the width of the pier on both sides. Once the bridge was built the bracing wouldn't be visible from normal viewing angles.

The outermost spans cross railroad tracks, so following the prototype, I modeled steel plate girders in those locations, using parts from a Micro Engineering Co. HO scale Tall Steel Viaduct kit. For each side, I spliced two 30-scale-foot girders end-to-end using CA. Then I sanded the joint smooth. Eventually I had four spliced girders.



I also cut four $3\frac{3}{8}$ " segments and four .125" styrene I-beams for the end spans.

After spray-painting all the girders and the I-beams Flat Black, I applied A.I.M. Products light and dark rust weathering powders. I used my fingertip to blend the powders on the girders. Then I sealed the surface with a light mist of Testor's Dullcote.

Following the guidelines on the bottom of the bridge deck, I glued the girders in place with 5-minute epoxy. Then I added .125" x .250" styrene strips on the inside surfaces of the girders to keep them square. I also used epoxy to glue the I beams in place between the girders on each end section.

4. Balsa-Foam ARCHES

I turned to Balsa-Foam from American Art Clay Models as the medium for the shallow arches of the interior spans. Balsa-Foam cuts easily and can be quickly sanded to shape. This made it ideal for modeling the shallow arches. Its surface also has a coarse texture that when painted does a credible job of simulating concrete.

Two of the interior spans measured 8" between support centerlines.



Taking into account the thickness of the supports, I'd need four $7\frac{3}{4}$ " long shallow arches, one for each side, in those locations. The third interior span measured $7\frac{1}{2}$ ", which meant I'd need two $7\frac{1}{4}$ " long arches for that span.

I made a pattern out of thin cardboard for the $7\frac{3}{4}$ " supports. First I marked and measured $\frac{1}{2}$ " to mark the height of the support. Then I marked the center of the support, measured down $\frac{3}{8}$ ", and made another mark. Finally I used a French curve to help me draw the line connecting the marks, making the arch.

Using my hobby knife, I cut out the cardboard pattern and set it atop the $\frac{1}{2}$ " thick sheet of Balsa-Foam. Replacing the knife's blade with a fresh one, I then carefully cut out one arch, moved the pattern and cut out a second arch.

I set one arch flat side down on a self-healing cutting mat. Then I carefully drew the knife along the arch's length, resulting in two identical $\frac{1}{4}$ " thick arches. Next I held all four pieces together and smoothed the



arches with a sanding sponge to ensure the arches were consistent.

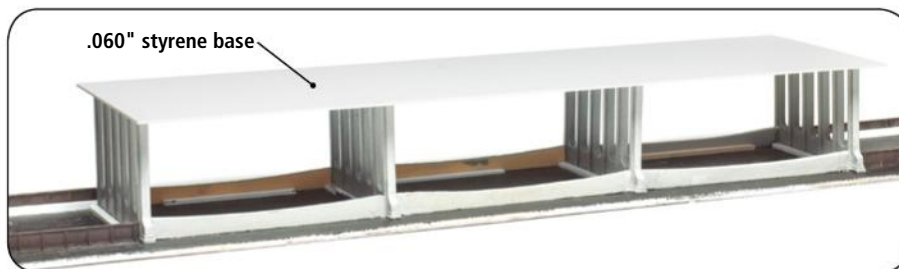
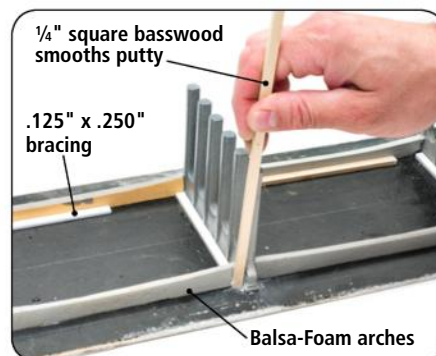
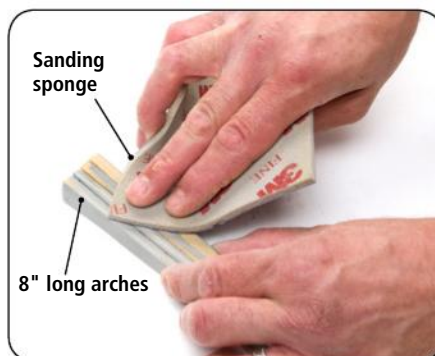
The process was identical for the shorter span, except I only needed two arches.

Because the material is quite porous, I had to apply several light coats of spray paint. I did my best to match the color of the arches to the bridge supports.

4. BALSA-FOAM ARCHES (CONT'D)

I then used epoxy to cement the painted parts and .125" x .250" styrene bracing between the piers. I filled gaps between the arches and the bridge supports with Squadron White Putty. A 1/4" square strip of basswood proved a useful tool for making sharp corner joints with the putty.

At this point the bridge had spent most its time upside down, and I was concerned about how well it would support itself when turned upright. I cut a 7" x 24" rectangle from .060" styrene sheet to serve as extra support for the center section of the overpass. After applying epoxy to the bottoms of the pillars on the four interior piers, I carefully set the styrene rectangle in place with a gentle press. I let the epoxy set overnight, and the bridge was rock solid when I turned it right-side-up the next morning.



5. RAILINGS AND EDGING

Each Rix Products HO scale railing section is 50 scale feet long, so I needed seven sections per side. Although they interlock, the connected sections tended to bow upward. I carefully filed the ends and dry-fit the parts until they rested flat. I then glued the parts together with plastic cement and filled any gaps with white putty. I filed everything smooth, including the flash along the tops of the rails.

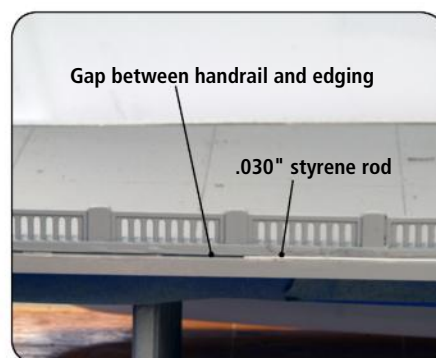
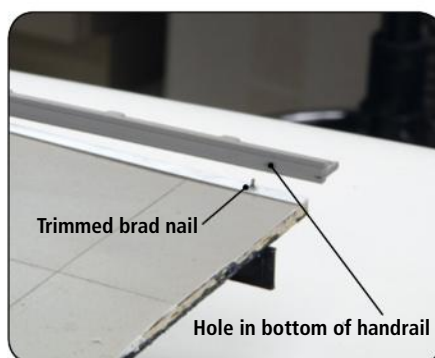
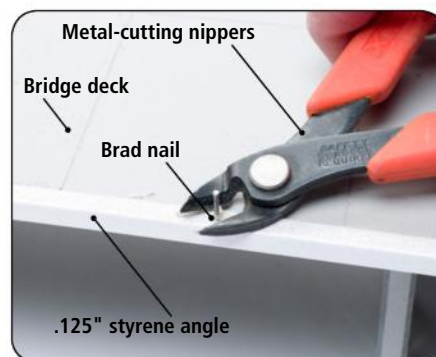
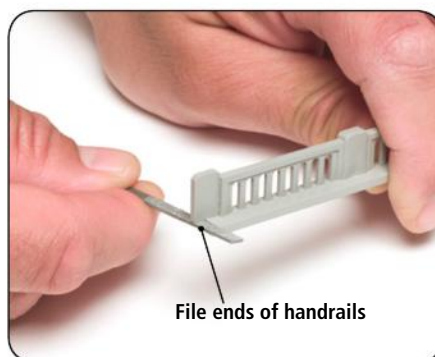
I set the spliced railing sections along the sides of the bridge deck. They were both about 5/16" too long, so I removed the excess with a razor saw. Then I spray-painted the railings with the same colors I'd used on the piers.

Next, I used CA to attach .125" styrene angle to the long sides of the deck. This material would also provide a surface to mount the railings.

Because of their length, I had to rely on more than a glue joint to secure the railings. I made my own alignment pins to keep the long sections straight.

After marking the centerline along each angle, I made eight equidistant marks along each centerline. Then I used a no. 59 drill bit in a pin vise to make a 3/16" deep hole in each location. Using epoxy, I glued 19-gauge brad nails into the 16 holes. I cut off the nail heads, leaving 3/16" of the nails exposed.

Using a Microbrush, I dabbed black model paint on each nail. While the paint was still wet, I carefully set the railings straight down on the pins, then



lifted them off. The resulting black dots showed where I needed to drill.

After spreading a bead of epoxy along the angles, I pressed the handrails in place, making sure the pins and holes matched up. Then I used rubber bands to hold the parts in place overnight until the epoxy fully cured.

There was still a gap between the bottom of the railings and the top of the edging. I filled the gap with .030"

styrene rod attached with plastic cement. After I filed the surface flat, the gap was no longer visible. I filled other imperfections with white putty, then painted the sides of the bridge deck with the same gray colors as I'd used on the railings. On the spans that would be over the tracks, I applied black weathering powder to the sides of the deck and railings to simulate soot residue from locomotive exhaust.

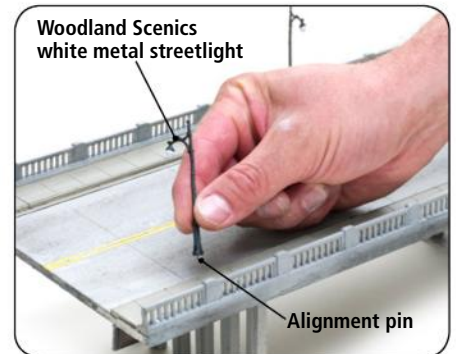
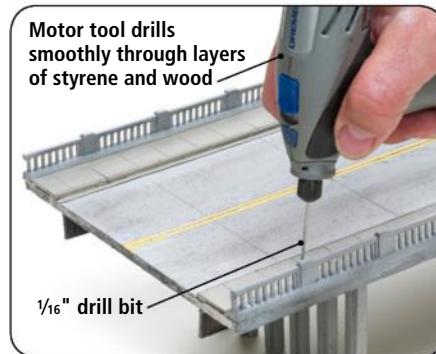
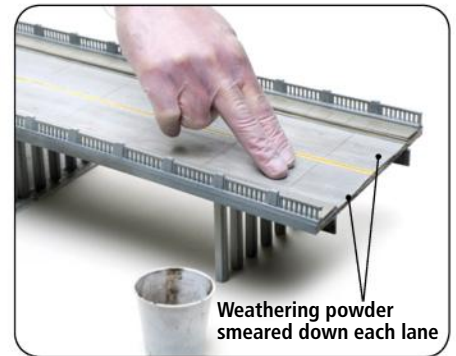
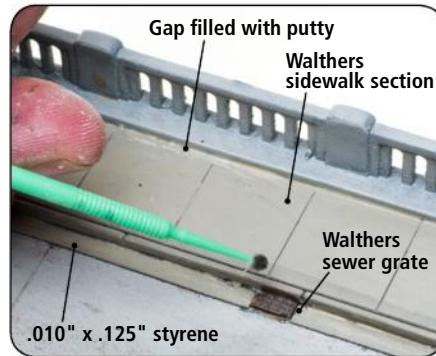
6. SIDEWALKS AND STREETLIGHTS

I used parts from three Walthers Cornerstone Concrete Street System kits for the sidewalks. After airbrushing the sidewalk sections with Testor's Model Master Concrete acrylic paint, I used CA to glue the sections to the deck along the railings and filled any gaps with white putty. I also used sewer grates from the Walthers kits that I painted with Testors Model Master Rust.

Once the grates were in place, I glued .010" x .125" styrene strips that I'd painted Concrete to the bridge deck between the grates. To finish off the gutters, I used a Microbrush to apply black paint above the sewer grates to simulate the openings in the curbs.

In the 1940s pavement markings varied from state to state, and center-lines could be white, yellow, or black. According to my research, Wisconsin used yellow solid lines to indicate no passing zones. For the overpass, I masked the lines with blue painter's tape, then applied Testor's Cadmium Yellow with a brush. Both lines are 1/16" wide with a 1/16" space between them, about 5 1/2 scale inches.


To weather the road surface I applied an India ink and alcohol wash. Next I mixed Earth and Grimy Black A.I.M. weathering powders in a cup. Using a brush I spread the powder down the center of each lane. After putting on a latex glove, I blended the powders into the road with my fingers.



The streetlights are non-operating white metal castings. I painted the posts Flat Black and the globes Flat White. A coat of Microscale Kristal Klear makes the globes look like glass.

I staggered the streetlights between the two sides of the street and placed them 100 scale feet apart. I used a Dremel Stylus motor tool with a 1/16" drill bit to make holes in the sidewalk to

fit the streetlights' alignment pins. I also added a drop of CA to the tip of each pin before inserting it.

After touch-ups and weathering, I set the overpass on the layout using adhesive caulk under its center base. Once the layout was scenicked, the styrene base was completely concealed. Scale vehicles, figures, and a few scraps of trash finished off North Avenue. 

Materials list

American Art Clay Co. Inc.
www.amaco.com
43013P Balsa-Foam soft-density
6" x 9" x 1/2" sheet (2 pack)

Crow River Products
crowriverproducts.com
Kit 209C HO scale highway
overpass support (12)

Evergreen styrene
106 .010" x .125" strip (8 pieces)
189 .125" x .250" strip
210 .030" rod (8 pieces)
274 .125" I-Beams (2 pieces)
294 .125" angle (8 pieces)
19060 .12" x 24" .060" plain
sheet (2 pieces)

Micro Engineering Co.
80-167 HO scale 30-foot plate
girder (8)

Microscale Industries
MI-9 Micro Kristal Klear

Monroe Models
2901 AIM weathering powders
(Dark Rust, Grimy Black, Light
Rust, Medium Earth)

Rix Products
628-0104 HO scale early
highway overpass railings
(4 packages)

Rust-Oleum
Painter's Touch Ultra Cover
2x spray paint

249078 Satin Granite
249127 Flat Black
249415 Gray Primer
249855 Satin Stone Gray
Specialty Camouflage
263653 Sand

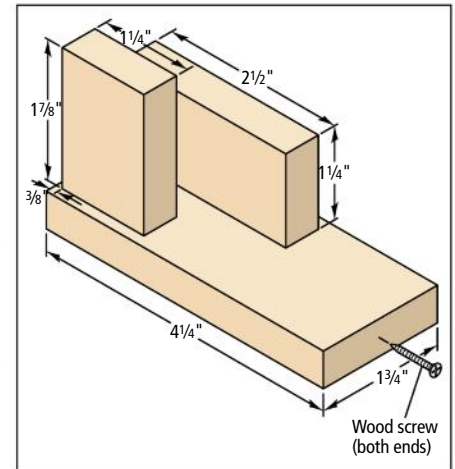
Testor Corp.
1260 Dullcote
4611 Cadmium Yellow
4675 Model Master Rust
4873 Model Master Reefer White
4876 Model Master Concrete

Wm. K Walther's Inc.
933-3155 HO scale concrete
street system, straight sections
(3 packs)

Woodland Scenics
D48 HO scale Street and Traffic
Lights (non-working)

Miscellaneous
1/8" plywood 7" x 48" strip
19-gauge brad nails
2-part epoxy
Adhesive caulk
India ink (diluted with 70 percent
isopropyl alcohol)
Gap-filling cyanoacrylate
adhesive
Plastic cement
White modeler's putty

Make a tripod holder for your smart phone



My solution for mounting my iPhone was to cut three pieces from a sheet of $\frac{1}{2}$ " balsa wood into the above dimensions. I used wood glue to attach the pieces.


I drilled a hole into the bottom plate to clear the machine screw, then screwed two flathead wood screws into each end of the bottom plate, leaving about $\frac{1}{2}$ ".

After setting the cradle into position, I attached a couple rubber bands to one screw, ran them under the tripod head and attached them to the opposite screw. I slipped the camera into the cradle and was ready to shoot.

I did this to get steady video for a clinic presentation, but you can do it just for fun. The videos turn out great!

An alternative approach

Shortly after writing this, I received an ad from Amazon.com for a "selfie stick," an extendable rod designed to allow a smartphone user to photograph himself. It also looked like it might allow me to extend my reach and take stable video of my model railroad.

I ordered one, which came as a two-pack that had threaded brass plates installed for under \$5. I screwed one of them to my tripod, slipped my iPhone 6 into it, and proceeded to shoot video. It worked! It might be an alternative if you don't build your own. 

Lou Sassi is from Willow Spring, N.C., and is a longtime contributor to Model Railroader magazine.

Lou Sassi found out that it was difficult to shoot a video with his iPhone without shaking, so he built a holder for his phone that attaches to a conventional tripod. Now he can shoot a video without using his hands.

A simple holder made out of balsa wood makes shooting a video much easier

By Lou Sassi • Photos by the author

One day while working on a keynote presentation for my local National Model Railroad Association Division, I decided to use the video capabilities of my cell phone and incorporate them into the presentation.

I usually end my clinics with a still photo of a train pulling away from the camera. It seemed much more interesting to finish with a video of a trackside run-by of one of my On2 $\frac{1}{2}$ Sandy River trains. But after a couple attempts of taking a video, it was apparent that handholding the phone was not an option. It was just too difficult to hold the phone without shaking it. It was even

more noticeable when shooting small-scale subjects.

Since I had a camera tripod, I decided to mount the phone to its head. This way, I'd only touch the phone to turn it on and off. The only problem was my phone has no accommodation for tripod mounting. So I decided to make my own phone holder to work with my tripod.

Making the holder

My tripod has a mounting plate that attaches to a camera with a machine screw. The entire camera then simply snaps in place on the tripod head.

Train Orders and Form D's

Business had me driving home from Vicksburg, Miss., to Baton Rouge, La., on U.S. Highway 61 late one afternoon. It was a familiar drive, made more enjoyable when Illinois Central Gulf's Woodville Branch threaded through stately oaks robed in Spanish moss and neared the highway. I hit the gas when I spotted a coupler bearing a marker; never before had I seen a train here.

The branch was Mississippi's first railroad. It was incorporated as the West Feliciana RR in 1831, connecting St. Francisville, La., with Woodville, Miss. Service had fallen to once or twice per week and the line was nearing abandonment when I chanced upon the short local in 1978.

This memory inspired me to describe how easy it is to implement some basic dispatching practices. Let's design operation for a West Feliciana layout, comparing timetable-and-train-order (TT&TO) with the contemporary Form D Control System (DCS) and Track Warrant Control (TWC) versions that TT&TO spawned. Track authority is conveyed in a similar manner under DCS and TWC, so we'll treat them as one. We'll operate only extra trains, those without a timetable schedule, which is typical for a line with light traffic.

The table above contains the stations I named and shows how their names might evolve if the line would follow contemporary DCS rules.

Let's imagine a day when Woodville has several loads of woodchips for the paper mill at St. Francisville. Under TT&TO, the dispatcher (DS) completes train order No. 1: ENG 8147 RUN EXTRA ST

| WEST FELICIANA STATIONS | | |
|-------------------------|------------------------|------|
| TT&TO | Northward (read up) | DCS |
| Woodville | | Wood |
| Ashwood | | Ash |
| Laurel Hill | | Hill |
| Wakefield | | Wake |
| St. Francisville | | Fran |

FRANCISVILLE TO WOODVILLE AND RETURN TO ST FRANCISVILLE. This order creates Extra 8147 North and authorizes it to occupy the main track and run from St. Francisville to Woodville. It must reach Woodville before returning as Extra 8147 South.

Under DCS, DS radios Form D W-1 to Extra 8147, dictating: CIRCLE LINE 2 OPERATE IN NORTH DIRECTION ON WOODVILLE MAIN TRACK BETWEEN FRAN AND WOOD. The crew notifies DS after arriving at Woodville, fulfilling the first Form D. Only then can DS issue Form D W-2 to authorize the train to return: CIRCLE LINE 2 OPERATE IN SOUTH DIRECTION ON WOODVILLE MAIN TRACK BETWEEN WOOD AND FRAN.

Note the subtle distinctions between the two forms. The train order addresses Engine 8147, creating the train Extra 8147 North, while the Form D's address Extra 8147 North. One train order authorizes movement in both directions, but the same movement requires two Form D's under DCS rules.

If only one train would run on the branch this day, DS might instead have dictated Form D W-1: CIRCLE LINE 2 OPERATE IN BOTH DIRECTIONS ON WOODVILLE MAIN TRACK BETWEEN FRAN AND WOOD. This gives exclusive right to Extra 8147. It could go north to Laurel Hill to pick up some pulpwood flats, come back south to deliver them at St. Francisville, then run north again to spot empties at Woodville. The authority remains in



Illinois Central Gulf GP10 8147 leads a train of wood-chip hoppers near Wakefield, La., late one August 1978 afternoon, perhaps operating as Extra 8147 South. Jerry Dziedzic photo

effect until DS cancels it, as he would when the crew notifies him it has tied up at St. Francisville at day's end.


Its counterpart, Order No. 1, might then read ENG 8147 WORKS EXTRA BETWEEN ST FRANCISVILLE AND WOODVILLE. This particular wording creates Work Extra 8147, with no direction named, and authorizes it to operate as freely between these two stations as does the bidirectional Form D. The train order remains in effect until DS annuls it, another subtle distinction. Annulling a train order and cancelling a Form D are alike. The term itself changed as the system evolved.

Each example must show a time complete for train orders or a time effective for Form D's. The dispatcher gives the time after the instructions are read back correctly. "Complete" corresponds with "effective", as "annul" does with "cancel."

Our West Feliciana crew wouldn't need a full-time dispatcher or operator. TT&TO, DCS, or TWC paperwork could be prepared in advance of an operating session, ready except for a time complete or effective. Current editions of the Northeast Operating Rules Advisory Committee (NORAC) and General Code of Operating Rules (GCOR) can be found online to consult for more detail. Train order, track warrant, and Form D images are easily searchable. (Search for "NORAC Form D".) A clearance card

should accompany a train order, but it could be omitted to start with.

Safety demands such strict procedures. Precisely worded instructions in a prescribed form make their meaning clear to all who will act on them. Write a few orders or Form D's for your next session, adding another detail for your crew to enjoy. **MR**



THE TRAIN ORDER ADDRESSES ENGINE 8147, CREATING THE TRAIN EXTRA 8147 NORTH, WHILE THE FORM D'S ADDRESS EXTRA 8147 NORTH.-JERRY

Getting the most from automatic functions



Hurricane damage forced these Virginian & Ohio Electro-Motive Division and Alco diesels to detour over Larry's Piedmont Southern rails. Just as full-size railroads had to integrate control systems on locomotives from different manufacturers, DCC decoder manufacturers have various ways of controlling automatic sound and lighting effects. Larry Puckett photo

In the November 2016 DCC Corner column, I wrote about remapping decoder functions to make it easier for operators to access the growing number of user-triggered functions available with decoders from different manufacturers.

However, there are also a growing number of automated functions and features that can be activated without operators having to touch a button, or which occur as a side effect of another action. Let's take a look at a few of these as offered in some of the most common sound decoders.

One feature common to many sound decoders is the brake squeal. At one time you had to hit a function button each

time you wanted the brakes to squeal. In most current decoders the brake squeal is activated when some threshold is reached, usually due to a change in throttle setting. However, there can be some interesting interactions.

For some time I tried to make the brakes squeal on my ESU LokSound Select-equipped Atlas Alco S-2 switcher. I tried all kinds of different combinations of on-and-off thresholds using configuration variables (CVs) 64 and 65, to no avail.

Then someone on the LokSound Yahoo Group mentioned that you need to crank up the deceleration momentum value in CV4. I had set the value to 12, and that was too low a threshold for an audible squeal. Setting CV4 to a value of

30 brought the brakes to life and a value of 80 really drew them out when I reduced the throttle setting.

SoundTraxx Tsunami and Train Control Systems WOWSound decoders have their own idiosyncrasies with brakes. With SoundTraxx you have to turn on automatic brake squeal by setting CV198 to 4, and then adjust the sensitivity setting in CV196 (default is 3). The brakes then squeal when function 11 braking is used or when there's a rapid reduction in the throttle setting. WOWSound uses a minimum speed step setting for the point at which brake squeal starts. This is entered using indexed CVs 201 to 204.

If you're not happy with the default setting of 15, I suggest you go to the

programming section of the WOW-Sound website for the exact values if you don't use Java Model Railroad Interface's (JMRI) DecoderPro. [JMRI is available for free download at www.jmri.sourceforge.net. – Ed.]

The brakes on WOWSound decoders only squeal when brakes are applied using F7. The brake sounds are changed at random, so they're a little different every time.

Another neat sound feature I bet many folks don't use or know about is the ability to adjust the automatic notch rate with some decoders. This feature allows you to change how quickly the locomotive engine RPM sounds ramp up as you advance the throttle.

With SoundTraxx Tsunami2 and Econami decoders you can use CV114 to set the number of speed steps between the notches at anywhere from 1 to 15 steps per notch. Older Tsunami decoders use CV116. This makes a big difference in the sound you get from your decoders as you advance the throttle.

The SoundTraxx approach forces the increase in locomotive RPMs to a constant rate of change – set it to 7 and you max out at about speed step 50 (assuming you are using 128 speed steps). If you operate your locomotives at prototypically slow speeds, that's fine. At speeds above step 50 there will be no more increase in RPM.

LokSound Select decoders basically spread the notches out evenly over the lower half of the speed table, and the rate can't be changed.

With WOWSound decoders you can set the number of steps between each notch independently. That way you can bunch up the RPM increase in the lower speed steps, then spread it out more in the higher speed steps as the locomotive picks up speed.

As with the brake squeal setting, the notch steps are entered using indexed CVs 201 to 204. The programming section of the WOWSound website has the exact values. I find the notch step feature especially useful with yard switchers that don't often get out of the lower speed step range, but may have to notch up a bit to shove a long cut of cars around.

Also keep in mind that all these decoders offer some form of manual notching, which allows the engineer to control the point at which RPMs increase. Manual notching usually works

by controlling the speed with the throttle and using function buttons to change the RPMs.

Now let's talk about Rule 17. As I wrote in the November 2016 column, this rule actually covers an array of rules related to the use of headlights. In most cases, decoders offer automatic headlight dimming whenever the locomotive comes to a stop.

All three of these manufacturers' decoders take this a step further, allowing you to set up the headlights so both the front and rear lights can remain on in both directions, with dimming when running in the opposite direction.

WOWSound decoders are probably the easiest of the three to program for Rule 17. I just write a value of 56 to CV61 and then program CVs 49 and 50 to a value of 40. SoundTraxx is more complex, since the CVs involved also program a large array of lighting features. Setting CVs 49 and 50 to 145, and on Tsunami2 and Econami decoders CVs 57 and 58 to 253, did the trick in my case.

LokSound decoders require changing several function CVs after setting index CV31 to 16 and CV32 to 2. Once these are set, program CV257 to 16, CV266 to 1, CV268 to 0, CV273 to 16, and CV282 to 2. If you have problems, try resetting the index CVs before programming each of the function CVs.

Finally, here's one that may drive you and your engineers crazy. It's possible to set features to occur when the locomotive reverses direction. For example, you could set it to sound the horn and ring the bell automatically each time the locomotive reverses direction. But this would probably get old fast, and most railroads didn't require this when doing repeated switching maneuvers.

Other automatic features can be programmed to activate when the grade crossing whistle or horn is activated. One typical use would be to have the ditch lights flash and the bell ring when the horn is blown for a crossing.

Most of what I've discussed isn't a concern when locomotives are operated

individually. However, consists can complicate things. Some of the differences in the ways decoders implement various functions are negligible, but others may take some planning, and a few make it difficult to operate mixed consists.

For example, a WOWSound decoder's F7 braking function and LokSound's Full Throttle brake feature would fight one another. [See more about LokSound's Full Throttle features in the April DCC Corner. – Ed.] Also, these features wouldn't work well together in universal consisting, since the brakes would only activate on the lead locomotive.

I know of some folks who've gone whole-hog and decided to standardize their locomotive fleet using one brand of decoder. But replacing all your decoders


is a prohibitively expensive option for most modelers.

With a little advanced planning when installing decoders, you could easily use the same types of decoders in locomotive models you plan to operate in consists. Also, as I wrote in the November 2016 DCC Corner column, similar functions can be remapped to the same throttle buttons.

Using advanced consisting, as I described in the July 2016 column, allows you to control which functions respond to throttle commands when operated in a consist. More importantly, there are some differences in

functions that don't matter in a consist. For example, you don't have to worry about headlights, horns, and bells in the center locomotives, since they would be off anyway.

Programming all these features to work automatically the way you want them to can get a bit complicated. In some cases it can be difficult to find out how various interactions work, or the function may not be fully documented in the manuals. Consequently, I've found DecoderPro to be the best reference for figuring this out.

In most cases the sliders and selection boxes are grouped according to function, making it easier to set up complex features. For more on programming these and other decoders, visit my website at www.dccguy.com. 





Bachmann SoundValue HO scale EMD E7A

For those modeling passenger service in the last half of the 20th century, General Motors' Electro-Motive Division E-units are essential. This EMD E7A from Bachmann Trains would make a fine addition to an HO diesel roster. The model captures the lines of its sleek post-war prototype and comes in a version equipped with Bachmann's dual-mode SoundValue decoder, which was developed in conjunction with SoundTraxx.

Prototype. From 1945 to 1949, EMD produced 428 E7A (cab equipped) and 82 E7B (cabless booster) diesel-electric locomotives for railroads across the United States. The E7A locomotives had the same side panels as earlier E3 and E6 locomotives, but had the more blunt "bulldog" nose that would be found on

later E8 locomotives as well as EMD's F unit freight diesels.

Like other E units, the E7A rode on six-axle trucks in an A-1-A configuration with two drive axles and an unpowered idler axle between them. For its prime mover, the E7 used two 12-cylinder 567A diesel engines that produced a combined 2,000 hp.

Delivered in 1945, a pair of E7A locomotives had the distinction of being the first road diesel-electric locomotives to serve on the Pennsylvania RR. Over the next few years Pennsy purchased more E7s than any other railroad. Designated the EP20 class on the PRR, the roster totaled 60 E7 locomotives, including both A and B units. Some of the EP20s soldiered on during the Penn Central and Conrail years.

Pennsylvania no. 5901 is the sole surviving E7A and is on display at the Railroad Museum of Pennsylvania in Strasburg, Pa.

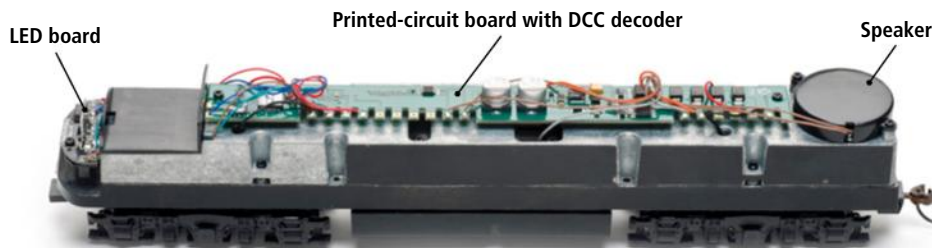
The model. The dimensions of the Bachmann E7A match prototype drawings in *The Model Railroader Cyclopedic: Vol. 2, Diesel Locomotives* (Kalmbach Publishing Co., out of print). The model's well-defined molded detail, including rivet seams and grills, matches the drawings as well as prototype photos.

Separately applied detail parts include the airhorns, windshield wipers, and handrails. There is clear window glazing in all the cab and side windows. Bachmann offers a few body shell variations to match specific roadnames. The shell on our review sample matches no. 5881 as it was delivered, with small number-boxes. Also correct for the Pennsy prototype is the single headlight above the nose door.

As delivered in the late 1940s, the E7s were painted with Dark Green Locomotive Enamel and five gold pinstripes. Our review sample is decorated as the prototype appeared after being repainted in the early 1950s with a Tuscan Red body and five Buff pinstripes running along the sides. With "PRR" inside the key-stone herald on the nose door and no



Our review sample is sharply decorated in the Pennsylvania RR Tuscan five-stripe paint scheme. Separate detail parts include handrails, horns, and windshield wipers.



The flywheel-equipped motor and truck-mounted gearboxes are surrounded by a die-cast metal chassis. The SoundValue decoder is included on the main PC board.

striping across the side window glass, the paint scheme on the Bachmann model resembles that of a PRR passenger diesel painted after 1953. However, at that time, the EP20s would have started to receive larger number boxes and train-phone antennas, which aren't on the model.

The lettering and striping matches prototype photos. Initially, the PRR five-stripe version of the model is available only in one road number. Hopefully Bachmann will add other road numbers, as the EP20s commonly ran in pairs or multiple units.

Mechanism. After removing the front coupler, I carefully lifted off the plastic locomotive shell. The die-cast metal chassis consists of two halves that enclose the flywheel-equipped motor. The main printed-circuit (PC) board, which includes the SoundValue decoder, runs along the top of the weight. A smaller PC board on the front of the chassis includes a surface-mount light-emitting diode (LED) for the headlight. A downward-facing round 28mm speaker in a plastic enclosure is attached to the rear of the chassis.

Truck-mounted gearboxes transfer power from the motor to all six axles. All-wheel drive and almost 1.5 pounds of weight make the Bachmann E7A a powerful puller. Single-handedly, the locomotive can pull 28 free-rolling passenger cars on straight and level track. The E7A also pulled nine passenger cars up our layout's 3 percent grade.

All-wheel electrical pickup and an 18" minimum radius allowed the locomotive to easily handle the tightest curves and yard ladders of no. 5 and no. 6 turnouts.

MORE ON THE WEB

Subscribers can watch a video of the Bachmann SoundValue E7A in action. Click on the link at ModelRailroader.com

DC performance. After I applied 5V to our DC test track, I heard the sound of the dual 567s rumble to life. The rpm level increased and decreased with the throttle setting. All the sound effects are automatic, including forward (two toots), reverse (three toots), and stop horn (one toot) signals, as well as a bell that rings when the E7A travels at less than 10 scale mph. The sounds are momentarily interrupted whenever the direction switch is flipped, which I found distracting.

The model rolled smoothly at 1.5 scale mph with 6V applied to the track and accelerated to 80 scale mph at 12V. A prototype E7 could be geared for 85, 92, 98, or 117 mph top speeds.

DCC performance. The locomotive also featured smooth performance on our DCC test track, as shown in the charts at right. I could adjust configuration variables (CVs) to fine-tune the locomotive performance by customizing speed tables and adding acceleration and deceleration momentum.

A list of all the decoder's supported CVs are available on the Bachmann website. Additional programming information can be found in the Tsunami user manuals at www.soundtraxx.com.

The decoder has the same excellent sound quality and much of the functionality of a Tsunami decoder. Although there aren't any brake or coupler sounds, user-triggered features include important effects like the bell, headlight, dimmer, and short and long horn blasts. I also easily set the decoder for manual notching, which allowed me to use function buttons to increase or decrease the engine rpm sounds independently from the throttle setting.

The SoundValue decoder doesn't have the built-in equalizer of the Tsunami, but I still appreciated that I could easily set the volume level for each supported sound effect. This let me make sure that

Facts & features

Price: \$299 (DCC sound), \$199 (DC, no sound)

Manufacturer

Bachmann Industries Inc.

1400 E. Erie Ave.

Philadelphia, PA 19124

www.bachmanntrains.com

Era: 1945 to 1980s

Road names

DCC with sound: Pennsylvania (five-stripe, Tuscan); Baltimore & Ohio; Chicago, Burlington & Quincy; New York Central; Southern. DC with no sound: Atlantic Coast Line, Louisville & Nashville, Milwaukee Road, PRR (single stripe, Tuscan), Union Pacific

Features

- All-wheel drive and electrical pickup
- Die-cast metal chassis
- Eight-pin DCC socket (DC version)
- Can motor with dual brass flywheels
- Light-emitting diode (LED) headlight
- Minimum radius: 18"
- Plastic E-Z Mate Mark II knuckle couplers at correct height
- RP-25 contour metal wheels in gauge
- Weight: 1 pound 7.5 ounces

PERFORMANCE TESTS

| | |
|--------------------------|----------------------------|
| DRAWBAR PULL | 4 ounces |
| | 28 HO scale passenger cars |
| SCALE SPEED (DC) | |
| VOLTS | SCALE MPH |
| 6 (start) | 1.5 |
| 7 | 20 |
| 9 | 60 |
| 12 | 80 |
| SCALE SPEED (DCC) | |
| SPEED STEP | SCALE MPH |
| 1 | 1.5 |
| 7 | 38 |
| 14 | 76 |
| 28 | 90 |

I could always hear the horn above the sound of the engine.

The decoder supports programming on the main as well as on the programming track. I easily changed the decoder address to match the locomotive number. I also advance consisted the model to run with another manufacturer's SoundTraxx Tsunami-equipped E unit.

With realistic sound and exceptional pulling power, the Bachmann SoundValue E7A would look right at home hauling a streamliner along an HO scale main line. — Dana Kawala, senior editor



Digitrax Evolution advanced DCC starter set

Digitrax adds another advanced command station, the DCS210, and a new DT500 throttle to its Digital Command Control (DCC) lineup. The new throttle and command station are also key components of the firm's Evolution DCC starter set. [Another new Digitrax product, the DCS240 advanced command station, was reviewed in the December 2016 issue. – Ed.]

In 2016, Digitrax began a process of overhauling its non-decoder Digital Command Control (DCC) product line. First Digitrax announced in February that the UR91 simplex radio receiver would be discontinued. In November came the word that simplex throttle production would be discontinued as of February 2017, and DCS100/200 command station production would come to an end after 20 years.

DCS210 Command Station. The DCS210 advanced DCC command station booster combination is essentially a little brother to the DCS240. The DCS210 has 100 address slots: less than the 400 slots available on the DCS240 but more than the 20 slots available on the Zephyr XTRA starter set. The number of slots determines the maximum number of locomotives and consists that the system can handle. Like the DCS240,

the DCS210 has the LOCO RESET button on the front of the unit that makes it easy to clear all the address slots.

There's also the EZ Route quick start button on the its front, which allowed me to set up routes and control turnouts from the DT500 throttle.

Because these new command stations require clean DC power, a new 15VDC 5-amp switching power supply is also included. Like the DCS240, the DCS210 features a dual power option that supports either the included 5A power supply or a more powerful 8A power supply (not included).

While the DT500 throttle is available separately, the DCS210 command station is available only as part of the Evolution starter set. The DT500 throttle is available in either a tethered, infrared-ready version or duplex radio wireless version. Depending on the throttle type, either a UP5 connector panel (tethered) or UR92 duplex radio/infrared transceiver (wireless) is included along with a 2-foot connector cable and an LT1 LocoNet cable tester. A UR90 infrared receiver (sold separately) is required to upgrade the tethered/IR version of the DT500 to infrared wireless operations.

Unlike the DCS240, the DCS210 doesn't have a built-in USB/PR3 computer interface, so those who wish to add that

capability will need to purchase a PR3 Xtra separately.

DT500 throttle. On the surface the only apparent difference between the DT500 and its predecessors, the DT400 and DT402, is the DT500 designation. However, as soon as I installed a battery in the throttle I saw a big difference – instead of instantly turning on like other Digitrax throttles, the DT500 just sits there. Finally, Digitrax has incorporated an on-off switch into a throttle. By pressing the PWR key on the DT500, I could turn the unit on and off. No more fumbling with the slippery battery cover and flipping the battery around inside to turn the unit on or off.

The DT500 also sports power-saving features designed to help conserve the battery. If left unused for more than 3 minutes, the throttle will go into power-saving mode. While in this state it will ping the system every 60 seconds and maintain control of locomotives. Hitting the EXIT key or moving the control knob will cause the throttle to wake up. If left alone for 20 more minutes, the DT500 will fully turn off. Adjusting the brightness of the display backlight or turning it off also extends battery life. These power-saving features can be turned on and off in the throttle configuration.

More new features. While the DT500 is backwards-compatible with earlier command stations, the special features of the DT500 work only with the DCS210 and DCS240 advanced command stations. The most powerful is the Query Mode. By pressing the PWR then the DISP key, the right throttle knob allowed me to scroll through a series of 32 separate pieces of information. Included among these are the hardware and software versions of the device being queried, input voltage, track voltage, current being drawn from the device, and the number of address slots in use, idle, free, and in consists.

I could also adjust the track voltage with voltage trim mode using another series of key clicks and the throttle knob. For example, the HO scale track voltage can be adjusted over a range of 14.5V to 18V. There are other voltage ranges for N and O scale. On previous Digitrax systems, this adjustment required opening the command station's case and turning a small knob.

Like its predecessors, the DT500 can be customized. Among the 27 different options are the ability to turn on the 20 minute shut down, turn off key clicks, turn on the fast clock, turn off ballistic tracking, alter the function of keys for F2 and F3, change the display backlight brightness, and turn off the power-saving mode. Most important is the ability to reset the throttle to factory defaults. For most folks these settings are a good starting point, but it's easy to experiment with other options.

Easy upgrades. Most new components in the Digitrax non-decoder product line now share the ability for users to upgrade firmware. This requires a PR3 interface and the DigiIPL software that can be downloaded free from the Digitrax website. This feature allows users to keep all their devices up to date the same way you regularly update your computer operating system and smart mobile devices, extending their useful lifespans while adding new features.

It's equally important to upgrade any old UR92 duplex radio transceivers on a layout to guarantee all the new features on the DT500 operate correctly. For example, I couldn't get the new DT500 Steal/Zap feature to work until I upgraded the UR92 firmware. I could then use one throttle to "steal" or select a locomotive

Facts & features

Price: \$450 (tethered, Infrared-ready), \$660 (duplex wireless)

Manufacturer

Digitrax, Inc.
2443 Transmitter Road
Panama City, FL USA 32404
www.digitrax.com

Features

- DCS210 advanced command station/booster
- DT500 throttle with on/off button
- PS615 15 VDC 5 amp power supply
- UP5 throttle connector panel or UR92 duplex transceiver
- Supports up to 100 locomotives and 100 throttles
- User-updatable firmware
- External reset button for clearing mobile decoder information
- External button for EZ Routes setup
- Improved programming track output with higher voltage
- Non-volatile flash memory—no internal batteries required for DCS210
- Easy track voltage setting using throttle
- Support for either 5 or 8 amp output dependent on power supply

already in use by another throttle, while automatically de-selecting it from the previous throttle.

A winning combination. Digitrax reports that it developed the Evolution starter set for new DCC users, as an upgrade path from their Zephyr Extra set, or as a replacement for older DCS100/200 units. The features of the DT500 add so much to the operational capabilities of the DCS210 that the components should be purchased as a set. Likewise, many of the advanced features of the DT500 throttle are only available when used with an advanced command station like the DCS210 or DCS240.

The combination of the command station, throttle, and suitable power supply in the Evolution starter set offer anyone wanting to get into DCC an impressive entry point with plenty of power and the ability to expand in the future. Furthermore, it offers Digitrax owners a convenient way to upgrade their current system with new features and pick up the new DT500 throttle in the package. —
Larry Puckett, contributing editor

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QUICKLOOK

Wheels of Time HO 62-foot bulkhead flatcar

Price: Bulkhead flat: \$38.95; 3-pack, \$116.85; 12-pack, \$467.40. Plain deck (no bulkheads): \$35.95; 3-pack, \$107.85; 6-pack, \$215.70.

Manufacturer

Wheels of Time

P.O. Box 846

Mountain View, CA 94042

www.wheelsotime.com

Era: 1966 to 1998 (as decorated)

Road names: With bulkheads: Southern Pacific, Golden West Service, St. Louis Southwestern (Cotton Belt). Plain deck: CP Rail (6 numbers), Kansas City Southern (6 numbers), St. Louis Southwestern (also available painted brown but unlettered and data only). Twelve road numbers per scheme unless noted.

Comments: Long strings of bulkhead flatcars loaded with finished lumber were once a common sight snaking their way out of the Pacific Northwest

and over the Rockies. Wheels of Time's new HO scale body style reproduces those cars with considerable fidelity, excellent printing, and fine details.

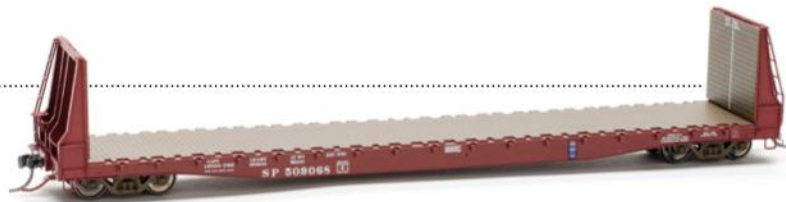
Wheels Of Time's model is molded plastic, with separately applied bulkheads, ladders, grab irons, uncoupling levers, and brake gear. A sheet steel weight is sandwiched between the underframe and the deck. The car weighs 4.1 ounces, which is 1.15 ounces light based on the National Model Railroad Association's Recommended Practice 20.1. A load would be the easiest way to bring it up to recommended weight.

The parts are well tooled, with well defined molded detail, open stake pockets, and three rows of nail holes down the center of the deck. The wire grab irons and metal brake platform are well made, and the ladders are close to scale thickness.

Our sample's Oxide Red paint was smooth and even, as was the brown paint on the deck and bulkhead planking. The white printing is crisp and opaque, and even the smallest type is legible under magnification.

All the dimensions I measured matched those on a drawing I found in the 1974 *Car Builder's Cyclopedia* (Simmons-Boardman). The model is equipped with Kadee magnetic knuckle couplers, which were mounted at the correct height. The car's blackened metal wheelsets were in gauge. It handled the 18" curves and no. 4 turnouts of our Beer Line layout well.

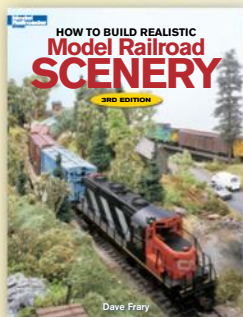
A unit train of these beauties hauling dressed lumber out of the Pacific Northwest would be impressive. A well-weathered model would be a great addition to a work train on a more modern layout, too. – Steven Otte, associate editor



Make a Scene

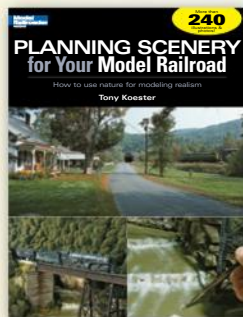
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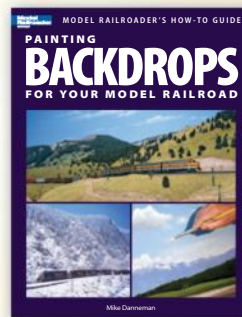
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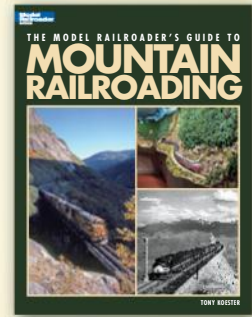
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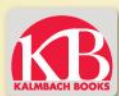
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QUICKLOOK

Kato N scale SDP40F diesel locomotive

Price: Direct-current, \$125; with ESU LokSound Digital Command Control and sound, \$250

Manufacturer

Kato USA Inc.
100 Remington Rd.
Schaumburg, IL 60173
www.katousa.com

Era: 1988 to 1994 (as decorated)

Road names: Atchison, Topeka & Santa Fe (three road numbers) and BNSF Ry./Maersk (one number)

Comments: Yes, we reviewed the passenger version of Kato's N scale Electro-Motive Division SDP40F in the September 2016 issue. But the freight version is more than new paint on an existing shell. Above the cab on the injection-molded plastic shell is a rooftop air conditioner and two ground plates with Sinclair antennas. The rooftop steam generator equipment,

doors on the sides of the cowl body, and rear classification lights are all prototypically plated over.

Between January and May 1985, 18 former Amtrak SDP40Fs were rebuilt at Santa Fe's San Bernardino, Calif., shops. The six-axle road units were reclassified SDF40-2s and numbered 5250 through 5267. During the rebuild, the steam generator stacks and vents were removed, a new front door was added, the nose was modified, and front handrails were installed, among other modifications.

Though the front end was rebuilt, crews still had a difficult time reaching the cab using the front step and grab iron. To remedy this, the SDF40-2s were modified a second time. Starting in 1988, new front step wells were added and the nose was notched.

The Kato model depicts the post-1988 SDF40-2s. The model's dimensions

closely match prototype drawings published in Robert C. Del Grosso's *BNSF Railway Company 2007 Locomotive Review and Diagrams II* (Great Northern Pacific Publications, 2007).

The Santa Fe model weighs 5.7 ounces. The wheels are correctly gauged, and the couplers are at the correct height. The direct-current model moved at 1 scale mph at 1.2 volts. With a drawbar pull of 1.45 ounces, the locomotive is capable of pulling 35 freight cars on straight and level track.

I also tested the SPD40F on our Red Oak project layout. The locomotive comfortably negotiated the 13" radius curves and Peco no. 6 medium turnouts.

Kato did an excellent job capturing the distinct lines of Santa Fe's SD40F-2 diesel locomotive. The notched nose, rooftop details, and plated over parts give this model a sense of history. —
Cody Grivno, associate editor



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High in the Appalachians in 1954, a Baltimore & Ohio EL-3a spots empty hoppers at the New River Mining Co. Michael Tricker of Ashford, Middlesex, U.K., photographed the scene on his HO scale B&O Paquetin Division layout, which was featured in the June 2013 *Model Railroader*.



Union Pacific gas-electric motorcar no. M66 has left the passenger station at Waverly and is passing Waverly Yard tower as it begins its morning run to Bucky's Crossing. Rod Vance of Farmville, Va., kitbashed and superdetailed a Bachmann doodlebug to make the HO scale motorcar. He shot the photo on his HO scale Willow Creek RR.

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/Submission/contribute>. For our photo submission guidelines, contact associate editor Steven Otte at sotte@mrmag.com.



A Chicago, Burlington & Quincy Electro-Motive Division SW1000 backs toward the main line after dropping off some empty cars. Garry Boyd of Cadiz, Ky., shot the photo on his HO scale CB&Q Heartland Division layout, set in 1962. Garry scratchbuilt the metal-clad grain elevator.



The Halmark & Sons Circus train has arrived, and the roustabouts have started unloading quickly to get set up for the afternoon performance. Paul Dolkos shot the photo on the 1950s-era O scale diorama built by Harold Fleming of Great Falls, Va., a circus modeler.

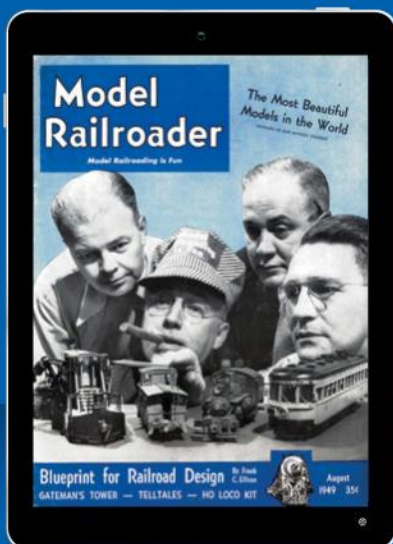
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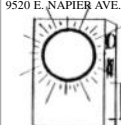
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Schedule of Events

CA, SAN LUIS OBISPO: San Luis Obispo Train Day: May 13, 2017, 10:00am-4:00pm. Trains, Extensive HO Layout, Swap Meet, RR Art, Wine-Rail Excursion, Food and More! \$5.00, Kids \$3.00. Take Amtrak's Coast Starlight®. San Luis Obispo Railroad Museum, www.slormm.com

DE, ROXANA: Spring Fling Train & Toy Show. Roxana Fire House, Route 20, between Millsboro & Fenwick Island. Saturday, May 6, 2017, 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, BROOKSVILLE: Regal Railways presents Toy Trains & Hobby Show. Hernando Fairgrounds, 6436 Broad St. Saturday, May 20, 2017, 9:00am-2:00pm. Adults \$5.00. Vendors, videos and operating layouts. Serving lunch items. Contact: Joe at 727-244-1341 or visit: www.regalrailways.com for more information.

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

IA, DAVENPORT: 6th Annual Davenport Model Railroad & Memorabilia Swap Meet. Mississippi Valley Fairgrounds, 2815 W. Locust St. Saturday, May 6, 2017, 9:30am-4:00pm. Admission: \$5.00. Tables \$20.00. All scales, operating layouts, food available, free parking. This is Iowa's Largest Train Show. Info: 563-391-6431, 8:00pm-10:00pm

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

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

NC, SPENCER: Model Train and Railroadiana Show at the North Carolina Transportation Museum. May 12-13, 2017, Friday 12:00pm-7:00pm and Saturday 9:00am-5:00pm. Speakers, train rides, newly opened 1905 Back Shop! Details: nctrans.org or 704-636-2889, ext. 251

NY, BALDWIN: The Sunrise Trail Division NER/NMRA Spring Meet. First Church Baldwin Methodist, 881 Merrick Road, Zip: 11510. April 29, 2017, 10:00am-4:00pm. Admission: \$7.00, under 12 and Scouts in uniform free w/adult. Operating layouts, clinics, White Elephant table. Lunch available. Contact: Steve Perry, sepperry@optonline.net, 631-744-6462, www.sunrisetraildiv.com

OH, COLUMBUS: The 9th Ohio N Scale Weekend, "For N-Scalers by N-Scalers" Franklin County Fairgrounds, Hilliard, Ohio. Presented by Central Ohio N-Trak. May 20-21, 2017, Saturday, 10:00am-5:00pm and Sunday 9:00am-3:00pm. Set-up Friday May 19th, 1:00pm-8:00pm. Event registration \$10.00. Event info www.centralohiontrak.org or e-mail ohionscaleweekend@yahoo.com

PA, ALLENTOWN: East Penn Traction Club 23rd National Trolley Meet. Allentown Fairgrounds. May 19-20, 2017; Adults \$23.00 in advance, \$25.00 at door. Information www.eastpenn.org or Charles Long, 215-247-1951 or prtpc17@navpoint.com

SC, GREER: Greer Model Train Show. National Guard Armory, 105 Woodruff Road, Zip: 29651. Saturday, May 20, 2017, 9:00am-3:00pm. Admission \$5.00, under 10 FREE. Over 100 vendor tables, Thomas the Train & Friends, Railroad collectibles. Contact Todd at 843-307-8674, southcarolinatradeshow@gmail.com or www.SouthCarolinaTradeShows.com

TN, JOHNSON CITY: George Carter Railroad Museum Train Expo. East Tennessee State University indoor Minidome, 1081 John Robert Bell Drive. June 2-3, 2017, Friday 10:00am-8:00pm and Saturday 10:00am-4:00pm. Admission \$5.00, under 12 free. Free garage parking. Vendors, working layouts, live steam. Contact Roger Teinert 423-791-4937 or William Hensley 865-257-6605.

TX, AUSTIN: Austin Area Train Show, Williamson County Expo Center, 210 Carlos Parker Blvd., Taylor, TX (minutes past Dell Diamond). May 6-7, 2017, Saturday 10:00am-5:00pm and Sunday 10:00am-4:00pm. Admission \$7.00 (12 and under free w/adult). Clinics and self-guided layout tour included. Information: visit <http://centexnmra.org/trainshow.html>

TX, JEFFERSON: TRAIN SHOW. Jefferson Historical Museum, 223 W. Austin, Zip: 75657. May 20-21, 2017, Saturday 10:00am-5:00pm and Sunday 11:00am-4:00pm. Admission includes layout tour of R.D. Moses T&P Model Railroad. Separate amusements include steam train ride and Jay Gould's private car tour. 903-665-2775, www.jeffersonmuseum.com

VA, FISHERSVILLE: 31st Annual Shenandoah Valley Model Train and Railroad Show. Augusta Expoland, 277 Expo Road. Sunday, May 7, 2017, 10:00am-4:00pm. Adults \$5.00, children under 12 free. Vendor tables \$20.00. Contact: Bill Kauffman at 540-209-2698, kauffmanb@gmail.com or visit www.acmrrc.org/annual-model-train-show

WI, SPOONER: Railroad Heritage Day, June 17, 2017. Spooner Elementary School, 1821 Scribner St. Model train show, layouts, vendors. Tour railroad museum inside restored 1902 Chicago & North Western depot. Train rides on Wisconsin Great Northern. Presented by Spooner Railroad Memories Museum. Admission \$1.00. Contact David Masterjohn, 715-491-5030.

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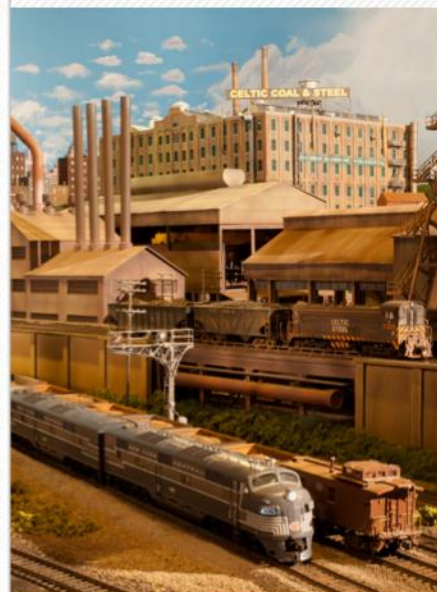
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Pragmatic prototype modeling

A friend is embarking on building a layout. Like many of us, he has a favorite prototype – by coincidence, the same segment of the railroad I’m modeling – and he wants it to reflect its primary attributes. Eager as he is to get started, he – again, like many of us – has some concerns:

“I’m stuck between wanting to be as prototypical as possible, yet impatient to get a layout built and running ASAP. As a beginner, I know I don’t have the experience that many modelers have, so trying to scratchbuild the downtown area of my hometown as it appeared in the 1950s seems pretty daunting.

“That said, the only people who are likely to see my layout are my wife and kids – and they aren’t going to know the difference if I have Norfolk Southern’s ‘Nickel Plate’ ES44AC no. 8100 pulling a string of 40-foot wood reefers or an NKP GP7 pulling double-stacks!”

He concluded that he wants to be as realistic as possible for his own sake, but he’s willing to bend the visual effects a little for the sake of simplicity. Maybe.

Another good friend, Ray Breyer, offered him some advice that’s worth sharing:

“If you want to be a ‘protosincere’ modeler,” Ray suggested, “there are a few things to keep in mind:

- Do as much research as practical, and don’t be afraid to ask questions.

- Keep in mind that what reality looks like and what a model ‘needs’ to look like are actually two different things.

- Stick firmly with your goal, which should be modeling a single year, or even a single month. Fewer distractions and alternatives mean faster progress!



Modeling a specific time and place – as I have here Metcalf, Ill., ca. 1954 – doesn’t require that everything be a perfect replica. As long as it looks the part, that’s often good enough. The depot was scratchbuilt by Randy Laframboise, but the elevator is a stock Walthers kit, and the grain bins are Resin Car Works castings. Tony Koester photo

- Realize that you’ll never know every little detail about what you want to build, and don’t let that be a hindrance to your progress.

- Don’t be afraid to do something one year and go back and fix mistakes a few years down the road.

- Be a pragmatic modeler. Be as accurate as your time, finances, skills, knowledge, and artistic vision allow.

- Finally, keep in mind that you can never actually model each and every rivet, and that you don’t actually need to, especially once the trains finally start rolling.

“Look to those who are better modelers than you are for inspiration, guidance, and advice,” Ray added. “But never fall into the trap of thinking that, just because you’re not as good as they are, you should give up and do nothing.” His conclusion was equally on

the mark: “Keep firmly in mind that building a model railroad isn’t a contest. Nobody’s judging you, this isn’t life or death, and model railroading is supposed to be fun. I fell into the trap of trying to model my pet prototype ‘perfectly.’

I ended up with a case of modeling paralysis for a decade, simply because I couldn’t fit exactly what I wanted into my layout space. I finally wised up, scaled back, and became a proto-freelancer. Nine months later, I’m almost done laying track. And I’m much happier!”

Ray added a footnote: “If the rivet counters give you grief, just remind them that some of the hobby’s most respected modelers are freelancers!”

I started to write that, as one who is doing his best to model a specific prototype, I try to follow that prototype’s example to the best of my

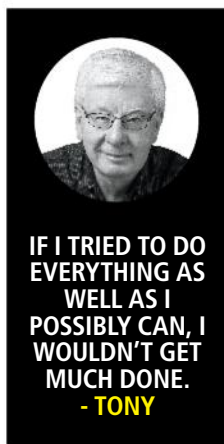
ability. But that’s not true. If I tried to do everything as well as I possibly can, I wouldn’t get much done. It would take way too long.

Building a model railroad, especially a basement-size model railroad, is all about compromise. Allen McClelland’s famous “Good Enough” principle applies perfectly here. I do things as well as I think is required to convey the impression of that prototype in that particular time and place.

I try to do everything from room preparation to model building to operating procedures to the same level of quality and realism. There’s little sense in doing X to extreme tolerances while doing Y to a lesser standard.

The end result has proven pleasing. To me, it is indeed “Good Enough.” I’ve gotten a lot done in a decade and a half. My crew seems to enjoy running the railroad.

So I have high hopes for my neophyte friend finding satisfaction in this hobby, especially if he heeds Ray’s advice. It worked for me. **MR**





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