

Model Railroader

February 2024
Trains.com

90
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O scale special!

- **Lighting and weathering tips boost realism** p.40
- **Rebuild resolves compromises** p.34
- **Paint and weather boxcars** p.24

Animate!
Power an excavator with Arduino p.29

PLUS

Operate a real interlocking tower p.62
Vote in our modeler's Hall of Fame p.59
Build a road bridge p.46

Ed Rappe's O scale PRR layout models central Pennsylvania. p. 34

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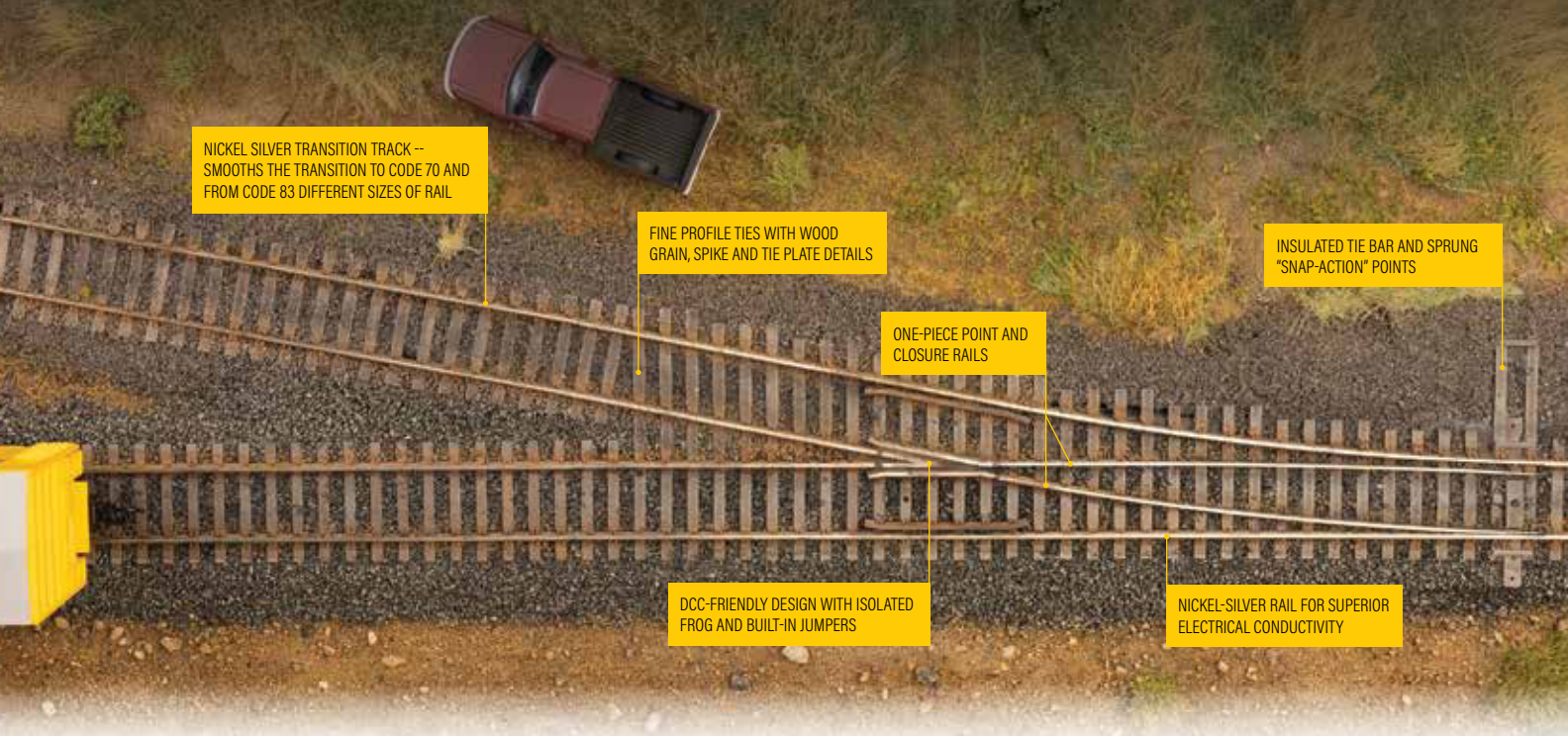
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MR pays a visit



On the cover: Ed Rappe's Pennsylvania RR, seen in the cover photo is just one of the O scale features in this month's issue. Paul Dolkos photo



Next issue

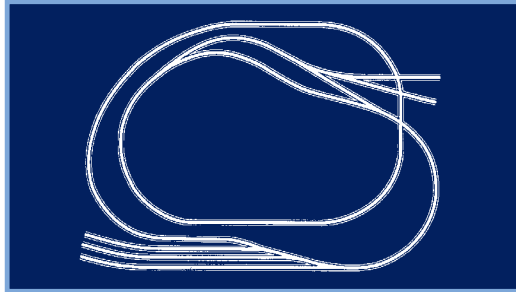
In March, find out how the staff built structures out of wood, plastic, and Hydrocal for our project layout. Plus, two HO scale layout visits, weathering freight cars, and more!

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If you enjoy watching a long train work its way up and down the grades of a long winding main line, the N7 is the layout for you. On this layout, yard tracks are available for breaking up and storing long trains, and a passing track with two industry spurs is available to provide additional operating diversions.

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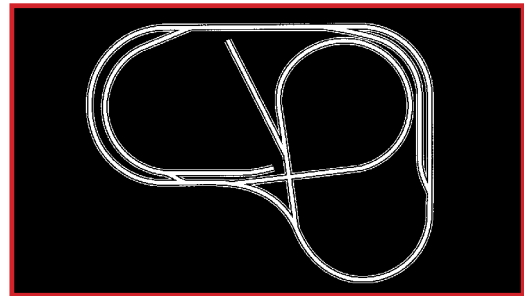
From Book #9: *Beginner's Guide to HO Model Railroad*

Minimum Table Size Required: 6' x 8'

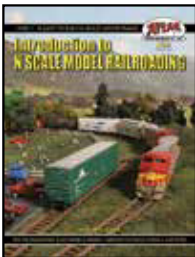
Code 83 Item #10007-83, Code 100 Item #10007

Products Required: Straight sections, radius sections, Snap-Switches, rerailers, terminal sections, a crossing, bumpers, rail joiners and the necessary electrical components

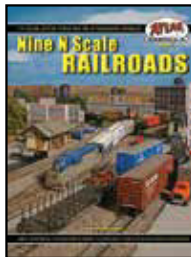
Since it is built on an extended platform, there are many possibilities with the HO-7; such as longer runs, longer trains and more realistic operations.



Books & Instructional Guides



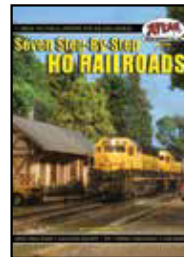
Item #6: *Introduction to N Scale Model Railroad*



Item #7: *Nine N Scale Railroads*



Item #11: *Atlas HO Layouts For Every Space*



Item #13: *Seven Step-by-Step HO Railroads*



Item #12: *The Complete Atlas Wiring Book*



Item #360/361: *N or HO Track Planning Templates*

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Model railroading: the beginner's guide

How do you start your journey into this great hobby that we call model railroading? The team at *Model Railroader* and Trains.com are making it easier than ever to begin, starting with the beginner's guide. We're also relaunching the popular beginner's email series. If you're just starting out, Trains.com is the place to go for all the guides to get your perfect start in the hobby.

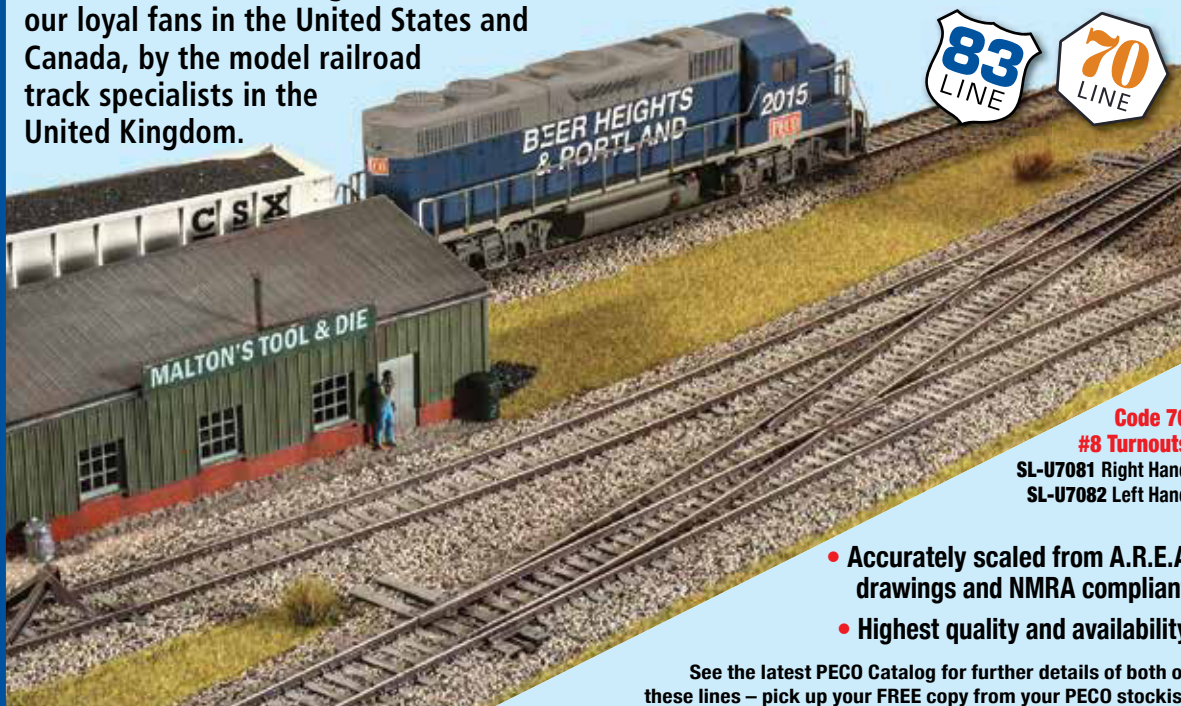


Spaces to Places IV: A flash of finishing flourishes

Host Gerry Leone may be dangerously close to finishing the town of Westcott, but he's still found plenty more to do with scenery, structures, lighting, and those little details that help turn a space into a definitive place on his HO scale model railroad. Scan the attached QR code with a smartphone camera or tablet to watch the video and the rest of the Spaces to Places series!

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Lessons from the dawn of the hobby

Looking through old issues of *Model Railroader*, it doesn't take long to realize the issues of the day have been around a lot longer than we might think they've been.

Hand-wringing about how we're going to get the youth interested in our hobby before it dies out, for example, has been appearing in these pages for almost as long as the magazine has been around. But some things do change, one being the popularity of the various scales in the hobby.

In the 1940s, O scale was losing ground to HO scale, but it was still referred to as the King of Scales. Lionel O gauge trains were among the most popular toys. Upstarts like HO and OO scales were displacing O, but many saw them as too small to be reliable. And the hobby was more focused on building models that would run, rather than complete, scenicked

model railroads that operated like the real thing.

But O scale never went away, as evidenced by the two layouts we visit in this issue. Ed Rappe has been in the magazine before; we last visited his layout in the March 2000 issue. The one who introduced him to the hobby was none other than John Armstrong, whose O scale Canandaigua Southern inspired Ed to go big.

Another O scaler in this issue is Mike O'Connell. He's back with a look at another part of his Pacific Railway & Navigation Co. Mike is the founder of Chooch Enterprises, now a part of Wm. K. Walthers and producer of scenery textures such as streets, retaining walls, tunnel portals, and cast-resin freight car loads.

While both layouts are large, HO modelers can find inspiration in both with the

realization that modeling in their preferred scale would require only half the space devoted to these empires (N scalers could get away with a quarter of the square footage).

Another longtime O scale modeler returns this issue with a project to create maintenance of way equipment for his On30 Sandy River & Rangeley Lakes layout. Contributing editor Lou Sassi has been modeling in this scale, which uses HO gauge track with 1:48 models, to replicate Maine narrow gauge railroading.

On30 may be the most accessible way to get into the world of O scale, since most of the equipment will easily operate on track built to typical HO scale standards.

Finally, we take a look at Tangent Scale Models' O scale three-compartment tank car. This brass/plastic hybrid shows just how much detail



can be packed into models built to $\frac{1}{4}$ " = 12" scale. This is a phenomenal model.

As we continue to celebrate 90 years of *Model Railroader*, we'll naturally touch on topics that have been prominent for decades. At the same time, we'll keep looking ahead to what's coming out in the future.

Things are looking bright!

Model Railroader

Model railroading is fun!

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N scale



Alco 4-8-8-4 steam locomotive. This N scale model of the Big Boy steam locomotive is available from Kato USA decorated as Union Pacific No. 4014 to match the 2021 Excursion tour appearance. The ready-to-run locomotive features two motors with brass flywheels and can negotiate curves with a radius as tight as 11". A tinted light-emitting diode headlight

is mounted on the deck, which turns with the front of the locomotive. Many separately applied details are featured on the model. The direct-current model is available for \$399, while versions with DCC are \$499. The locomotive with both DCC and sound retails for \$599. Kato USA, 847-781-9500, katousa.com

Atlas commemorative locomotive unveiled

As mentioned last month, Atlas Model Railroad Co. partnered with New Jersey Transit to wrap a prototype locomotive to commemorate Atlas' 100th anniversary. New Jersey Transit ALP-45DP No. 4503 with its brand new paint scheme (in the form of a wrap) was placed into service on NJT's Raritan Valley Line on November 17, 2023.

An official unveiling and press event was held in New Jersey's Newark Penn Station later in the month. Atlas company officers, employees, and NJT officials were present for the ceremony. A photography contest was also held in conjunction with the release of the prototype locomotive on NJT rails. Neither party has mentioned how long the wrap will stay on the locomotive.

Atlas announced HO and N scale models of the commemorative ALP-45DP locomotive and two Bombardier multi-level passenger cars, decorated in special centennial paint schemes. The Founders Car multi-level trailer features the years that Atlas has been in operation as well as the names of founders Stephan J. Schaffan Sr. and Stephan J. Schaffan Jr. The cab car is adorned in a scheme which thanks the company's loyal customers, while the toilet car features a cartoon from Stephan J. Schaffan Jr.'s collection. The locomotives are available individually. However, the cab car and trailers are only available in three-packs. For more information on the prototype locomotive and commemorative models, visit shop.atlasrr.com.



New Jersey Transit No. 4503 was placed into service on the railroad's Raritan Valley Line on November 17, 2023. The wrap commemorates the centennial of Atlas Model Railroad Co. and was created through a partnership between the two New Jersey-based companies.

Atlas Model Railroad Co. photo

HO scale locomotives



• **Alco RS3 Phase I and III diesel locomotives.** Phase I: Penn Central; Boston & Maine; Delaware & Hudson; Delaware, Lackawanna & Western; Great Northern; Louisville & Nashville; New York, New Haven & Hartford; New York Central; Providence & Worcester; Reading Co.; Rock Island; and Southern

Ry. Phase III: Interstate, Maine Central, and Pennsylvania RR. Direct-current model, \$219.95; with DCC and sound, \$319.95. Bowser Manufacturing Co. Inc., 570-368-2373, bowser-trains.com



• **Electro-Motive Division SW9 diesel locomotive.** Erie-Lackawanna; Atchafalaya; Topeka & Santa Fe; Boston &

Maine; Canadian National; Canadian Pacific; Illinois Central; Louisville & Nashville; New York Central; and Union Pacific. Four road numbers per scheme. Also available painted red and yellow but unlettered. Detailed cab interior. See-through etched-metal parts. Road-specific details. Light-emitting diode lighting, including operating beacons or flashing lights where appropriate. MoPower capacitor included. Direct-current model, \$239.95; with DCC and sound, \$349.95. Rapido Trains Inc., 905-474-3314, rapidotrains.com



HO scale freight cars



- **FreightCar America 100-ton bulkhead flatcar.** Canadian National with Duluth, Winnipeg & Pacific reporting marks in 12 road numbers and International Railcar Services Inc. in 13 numbers. Also available painted Mineral Red with data only. Injection-molded plastic and die-cast metal construction. Aurora Janney plastic knuckle couplers without trip pins. Trucks with rotating bearing caps. Plastic pipe load available separately. \$51.10. Otter Valley Railroad, 877-885-7245, ovrtrains.com



- **Pennsylvania RR F30 series flatcars.** F30A camp and maintenance-of-way cars: Norfolk Southern and Conrail. F30 general-service car: Lehigh Valley, Penn Central, and Pennsylvania RR. F30D piggyback car with trailer load: TTX and PRR. F30D tie service car with concrete tie load: Burlington Northern and Burlington Northern Santa Fe. Multiple road numbers available per scheme. Multiple undecorated versions also available. Die-cast metal chassis. Prototype-specific trucks with turned-metal wheels. Cars without load: single, \$54.95; six-pack, \$329.70. With tie load: single, \$64.95; six-pack, \$389.70. Camp cars: single, \$69.95; three-pack, \$199.95; six-pack, \$399.95. With trailer load: single, \$79.95; six-pack, \$479.70. Rapido Trains Inc., 905-474-3314, rapidotrains.com

HO scale

Cripple Creek Oil & Gas.

This HO scale model (\$29.99) features a motorized beam pump with a rotating crank and counterbalance weight, a weathered shed, two figures, and Jack the German shepherd. The base has concrete and gravel textures. The model measures 3" x 4 1/4" x 4 5/8" at full arm extension and requires a 4.5 volt power supply (sold separately). Menards Inc., menards.com/trains



- **Trenton Works 6,348-cubic-foot capacity boxcar.** Canadian National. Multiple road numbers available. Prototype-specific handbrake styles and housings, brake platforms, and running boards. Full underbody detail. Single car, \$64.95; six-pack, \$389.70. Rapido Trains Inc., 905-474-3314, rapidotrains.com

HO scale passenger equipment



- **CAF Viewliner II baggage car.** Amtrak. Two road numbers available. Detailed trucks with rotating bearing caps and shock absorber construction. Optional kinematic couplers included. \$87. Kato USA Inc., 847-781-9500, katousa.com



- **Pullman-Standard Day-Nite coach.** Northern Pacific with or without Chicago, Burlington & Quincy reporting

marks. Multiple road numbers per scheme. Multi-color interior. Fully detailed interior configuration. Era-specific trucks and skirt. Interior light-emitting diode lighting. Conditional release. \$129.95. Rapido Trains Inc., 905-474-3314, rapidotrains.com

N scale freight cars



- **Pennsylvania RR Class G26 mill gondola.** Lehigh Valley, Norfolk & Western, Penn Central, and Pennsylvania RR. Multiple road numbers per scheme. Twelve possible model variations. Three body variations. Prototype-specific brake gear with ratchet or Ajax brakewheel as appropriate. Dalman or National B-1 truck frames. \$37.25. Eastern Seaboard Models, esmc.com



- **Pullman-Standard 4427 covered hopper.** Northern Pacific, Cargill, Far-Mar-Co, Gold Kist, Milwaukee Road, Peavey, Producers, Rock Island, and West Central. Three to six road numbers per scheme. Photo-etched, stainless steel running boards. 100-ton ASF trucks. ExactRail line. \$34.99. ScaleTrains, 844-987-2467, scaletrains.com

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Kato N scale Siemens ALC-42 Charger



The **Siemens ALC-42 Charger**, the latest long-distance diesel locomotive in Amtrak's fleet, has joined Kato's N scale lineup. The newly tooled model features an injection-molded plastic shell; a five-pole motor with all-wheel electrical pickup; and a mix of molded and separate, factory-applied detail parts.

Amtrak placed its first order for 75 ALC-42 Chargers in 2018. The units will ultimately replace the passenger carrier's General Electric P42 diesels, some of which are more than 25 years old and built to earlier emission standards.

In mid-2022, Amtrak ordered 50 more ALC-42 Chargers. The prototype diesels are rated at 4,200 hp and feature a Cummins QSK95 16-cylinder diesel engine, head-end power, and Positive Train Control. The diesels meet the Environmental Protection Agency Tier 4 emission standards.

To capture the smooth lines of the full-size ALC-42, Kato used a multi-piece injection-molded plastic body on its N scale model. The roof and curved piece framing the front windows are separate pieces.

Most of the details on the shell are molded, such as the grab irons, door handles, and vents. I was impressed with the screens over the engine compartment cooling room. They're molded and painted in such a way to give the illusion there are separate fans under the screens.

Other rooftop details include molded antennas, the exhaust stack, and an air conditioner above the cab. A freestanding plastic Nathan K5LA air horn is located on the roof above front electrical equipment compartment.

One of the distinguishing features of the full-size ALC-42 are the side panels for the engine cooling compartment. Clear plastic inserts fit behind the openings. The grill detail is printed on the front of the plastic.

The ALC-42 has a split-frame mechanism. The modern passenger diesel is fitted with an offset motor (not centered in the chassis) and dual flywheels. The universal running from the rear truck to the motor is longer than the one on the front truck. The model uses the same printed-circuit board as the ACS-64.

The trucks are one-piece plastic castings molded in dark gray that clip to the gear towers. The wheel faces have plastic inserts that allowed the manufacturer to capture details found on the prototype. Like other Kato models, the ALC-42 has leaf-spring-style electrical pickups.

The model features directional golden-white light-emitting diode lighting. When moving forward, the headlights, ditch lights, and number boxes are illuminated. In reverse, the rear headlight is on. The model has red light tubes for the front and rear marker lights, which don't operate in DC.

From the box, the engine cooling compartment corridor is dark. This section of the locomotive can be illuminated using Kato's interior lighting kit (11-211), sold separately.

Our sample is neatly painted in Amtrak's phase 6 paint scheme. Graphic placement matches the many prototype images I found online, though I noticed some of the smaller warning labels and the builder's stickers were omitted. In addition, the m.u. and HEP receptacles

should be picked in light blue and red as appropriate, and the rooftop antennas should be aluminum.

We received a direct-current sample. At 1.4 volts (V) the modern passenger hauler moved at 4 scale mph. At 12V, the ALC-42 was rocketing down the track at 236 scale mph. That's well above the prototype's maximum speed of 125 mph. The model's dimensions closely follow published data on the Siemens website.

If you model contemporary Amtrak long-distance trains in N scale, you'll need a few Kato Siemens ALC-42 Chargers in your diesel fleet. With multiple paint schemes and DC, DCC, and DCC with sound options available, there's something for everyone. – *Cody Grivno, senior editor*

Facts & features

Price: Direct current, \$140; with Digital Command Control motor decoder, \$230; with DCC and sound decoder, \$340

Manufacturer

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

Era: April 2021 to present (as decorated)

Road names: Amtrak (Phases 6 and 7 in three road numbers each, "Day One" scheme in one number).

Features

- Body-mounted Kato couplers with modeler-installed trip pins, .015" low on both ends
- Correctly gauged wheels
- Weight: 4.3 ounces

Tangent O scale tank cars



Tangent Scale Models, known for its line of highly detailed N and HO scale injection-molded plastic freight cars, is now offering a General American Transportation Corp. (GATC) 1928-design 6,000-gallon, three-compartment tank car in brass. The models, available in two-rail O scale (5'-0" gauge wheels) and Proto:48 (4'-8" gauge wheels), were produced for Tangent by Sam Model Tech in South Korea.

The full-size 6,000-gallon, three-dome tank cars were built by GATC between 1928 and 1942. Examples could still be found in service into the 1970s. The tank cars were given the Interstate Commerce Commission designation ICC 103, indicating they were general-purpose, non-pressure cars.

With three domes, the GATC 6,000-gallon tank car stood out when compared to the more numerous single-dome cars. Why three domes? Because the car was divided into three roughly 2,000-gallon compartments, each with its own expansion dome. This allowed the car to carry various grades of liquids such as gasoline, kerosene, and oil.

Other products transported in the multi-compartment tank cars included acetates, acids, alcohol, various oils, printing ink, sodium silicate, solvents, tallow, and varnishes.

Tangent has a well-earned reputation of producing accurately detailed scale

models, and its O scale tank cars don't disappoint. The rivet detail is crisp on the body and underframe. There are no gaps where the domes attach to the body.

The tops of the domes, which are the first thing most people will see on the models, feature safety valves and detailed manway covers with formed-metal handles. The middle dome also has handrails on the sides.

Details on the body include a free-standing tank handrail mounted on standoffs, factory-installed and painted wire grab irons, and metal ladders. I appreciated that the walkways had woodgrain detail, appropriate for cars of this era. Steel running boards began appearing on tank cars starting in the mid-1940s.

The two capped outlets on the ends are for the heating coils. Steam heat from a stationary source was piped into the coils, making it easier to unload thicker commodities. The steel tank band and turnbuckle detail was nicely rendered.

Similar to most other tank cars, the brake system is out in the open on this GATC car. Tangent didn't skimp on the details with the AB system, including the air line, brake rods, release rod, and retainer. The metal chains connecting the caps on bottom outlets to the center sill further added to the realism of the tank cars.

We received two samples, an O scale model decorated for Magnolia Petroleum and a Proto:48 version lettered for Cosden & Co. Petroleum Products. The paint on both models was smooth and evenly applied, and the printing was crisp and opaque. The lettering placement on the Magnolia Petroleum car closely followed a prototype image in *Steam Era Freight Cars Reference Manual, Volume Two: Tank Cars* (Speedwitch Media, 2008).

Both cars ride on sprung 50-ton, spring-plank solid-bearing trucks with raised foundry data. The 33" metal wheelsets have front and rear face profile and internal ball bearings. The wheelsets, except for the treads, are painted a Rail Brown color.

The Tangent Scale Models O scale GATC 6,000-gallon, three-compartment tank cars accurately capture the lines of their full-size counterparts. Whether you're an O scale modeler or prefer following Proto:48 standards, these finely detailed brass models are definitely worth a look. The cars are only available direct from the manufacturer. — *Cody Grivno, senior editor*

Facts & features

Price: \$524.95

Manufacturer

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

Era: 1928 to 1970s

Road names: Two-rail — Cosden & Co. Petroleum Products, General American Transportation Corp. (1958+ and 1968+ black lease schemes), and Magnolia Petroleum. Proto:48 — Celanese, Cosden & Co., General American Transportation Corp. (1958+ and 1968+ black lease schemes), Magnolia Petroleum, and Protex Industries Inc. Two to three road numbers per scheme.

Features

- Kadee No. 740 Type E couplers, at correct height
- Prototype-specific brake wheel
- Weight: Scale car, 14.5 ounces; Proto:48 model, 14.2 ounces (1.5 and 1.2 ounces too heavy, respectively, per National Model Railroad Association Recommended Practice 20.1)

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Rapido HO scale Northeastern caboose



After locomotives, the next most distinctive thing on a railroad was its cabooses, and Rapido's new HO scale Northeastern caboose is one of the best models of this classic and widely used rolling office.

Prototype history. The Reading Co. started building steel eight-wheel cabooses in 1924 following, mostly, a United States Railway Administration standard design for a wood-sheathed caboose. Reading modified the design with steel sheathing, and later a Duryea cushion underframe.

Other railroads in the anthracite region liked the design, and either copied or bought what became known as Northeastern cabooses. Examples include Central of New Jersey, Lehigh & Hudson River, Lehigh & New England, Lehigh Valley, Pittsburgh & West Virginia, and Western Maryland.

With the advent of Conrail on April 1, 1976, many of these cabooses were repainted blue and soldiered on into the 1980s. Even before that time, they were sold to other railroads. These cars were built in the hundreds — Reading built more than 300, and Lehigh Valley built 150 — and many still exist in collections and as lone roadside examples.

The model. Rapido's model is made from injection-molded plastic with lots of separately applied detail parts, including full underbody and interior details. The interior is lighted, and the model includes a Rapido Lighter magnetic

wand to turn the lights on and off. Extra parts included black oil lanterns and red-painted window rock screens.

My sample was painted in Lehigh Valley's late Cornell Red scheme with a yellow stripe. The paint was smoothly applied and opaque. The lettering is sharp and well-defined. I could read even the smallest text in the COTS panel. Grab irons, ladders, and step edges are all picked in orange. My LV model has the correct three-step cast "tender-style" steps and single end window. Rain gutters span the pairs of side windows, and the window behind the stove is blanked.

With the lights on in the interior, I could see the coal stove still in place. By the 1970s, this caboose would have been fitted with an oil heater and tank. A simple detail to add would be the oil fill cap to the right of the pair of windows with the blanking panel.

Measuring up. The model weighs 2.4 ounces, about half of the 4.5 ounces suggested by National Model Railroad Association Recommended Practice 20.1. The trucks have turned metal wheels on plastic axles, and the car is equipped with Rapido's McDonald-Cartier metal knuckle couplers, which on my sample were about .020" low.

The model measures within scale inches of the drawings published in the March 1982 issue of *Model Railroader*. The caboose had no trouble operating through the Atlas No. 4 turnouts of my home switching layout.

Rapido Trains has produced another exceptional model of a popular prototype. These cars ended up on other railroads beyond those listed below. I know I'm going to put more of these on my shopping list. What about you? — *Eric White, editor* [MR](#)

Facts & features

Price: \$99.95

Manufacturer

Rapido Trains Inc.
500 Alden Rd., Unit 21
Markham, Ont., Canada
L3R 5H5
rapidotrains.com

Era: 1972-1976 as decorated, 1924-mid-1980s in service

Road names: Lehigh Valley, Central RR Co. of New Jersey, Chessie System, Conrail, Lehigh & New England, Reading Co., and Western Maryland, all in multiple road numbers

Features

- Blackened turned-metal wheels, correctly gauge
- Detailed, illuminated interior
- Macdonald-Cartier metal knuckle couplers, .020" low
- Optional user-installed parts, as required
- Railroad-specific details
- Weight: 2.4 ounces (2.1 ounces too light per National Model Railroad Association Recommended Practice 20.1)

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Belfast & Moosehead Lake No. 18, a former Boston & Maine 4-6-0 Ten-Wheeler, backs its mixed freight toward the Burnham Junction, Maine, water tank for a drink before making the 33-mile run to Belfast, Maine, on Sept. 21, 1941. Roger W. Grant photo, David P. Morgan Memorial Library collection

A Maine short line you could model

Q I'm interested in modeling a Maine short line in HO scale. What can you tell me about the Belfast & Moosehead Lake RR in the steam era?
Joel Norman

A The Belfast & Moosehead Lake looks like a great subject for modeling. A standard gauge railroad from its completion in November 1870, the B&ML was for more than 100 years majority owned by the city of Belfast.

Starting in 1870, the B&ML was leased by the Maine Central (MEC), which connected to the B&ML at its northwestern terminus of Burnham Junction, and operated as its Belfast Branch until 1925. The line hauled mostly poultry feed from the interchange to agricultural dealers along the route, plus smaller amounts of coal, lumber, leather, fish oil, and fertilizer.

Northbound freight consisting mainly of processed fish, shoes, and other manufactured goods originated mostly at Belfast. Other sources of revenue were milk from a large creamery at Unity, Maine, and other farm products from towns along the way. Passengers and mail were carried in a coach or combine tacked onto two of the line's three daily locals.

Sanborn fire insurance maps of Belfast from 1923 (available online from the Library of Congress at loc.gov/item/sanborn03430_006) show a railroad serving a busy, prosperous waterfront. Major rail-served industries include a fertilizer plant, a lumber and cement dealer, a sardine cannery, and a coal dealer, all of which also had interesting waterfront operations.

But as the line's profits started to decline, the MEC backed out of its lease in 1925, turning the B&ML back over to the City of Belfast. The railroad bought its own steam locomotives and started running trains under its own name for the first time. After World War II, the steam fleet was replaced by three new General Electric 70-tonners.

The railroad lost its Railway Post Office mail contract in 1960 and ended passenger service the same year. The railroad remained profitable until the 1980s, when declining local industry eventually left it with no online freight customers. The B&ML became a tourist line until closing down in 2007. Two years later, though, preservationists reopened the line as an excursion railroad, which still runs today.

For more information about the B&ML, including links to web resources, see our website at trains.com/mrr/beginners/ask-trains/modeling-a-maine-short-line/ for my longer answer to this question.

Q I need some ideas. Though modeling coal mines is popular, what about the coal's destination? The coal needs to go someplace. Steel foundries, shipping ports, and power plants seem typical, but these require a lot of layout space. Any suggestions for other, more compact industries that receive coal?

Joe Kubala

A Though these days coal is mainly used by large industries like those you mention, back in the day, there used to be a lot of smaller industries that received coal. An obvious one is the small-town coal dealer. Before oil and gas took over as the most prevalent fuels for household heating, every town of appreciable size had one or two coal dealers. All that's needed to model one is a small office, a delivery vehicle or two, and a way to unload the coal. Many dealers would use a trestle, like the one pictured in my HO scale home layout, allowing the coal to be dumped into bins or piles underneath. Larger ones might have an elevator to lift the coal into silos; smaller ones might use a movable conveyor that extends under the hopper gates to unload the black gold. Check out our December 2012 issue for several articles on modeling the coal business.

Not all power plants are large; some industries are big enough to have their own small powerhouses or boiler houses that are powered by coal. Railroad shops, paper mills, brick factories, glass works, iron foundries, and other industries could have their own powerhouses, receiving one or two carloads of coal per week. Just add a small brick building with a tall smokestack and connect it to the main plant with electric wires.

Food-processing industries like produce canneries, creameries, and breweries may have standalone boiler houses that provide steam to sanitize cans, pasteurize milk, and heat fermentation vessels. These would operate and look much like a powerhouse, except instead of electric lines, the building would be connected to the plant with steam pipes.

From the mid-1800s to the mid-1900s, gas for lighting homes, businesses, and streets was provided by coal-gas plants. These were characterized by a large telescoping tank (called a gasometer or gas holder) and a brick process building with

Send questions to senior associate editor Steven Otte at AskTrains@Trains.com.



A coal hopper is delivered to the unloading trestle at Buckeye Coal in Mason, Ohio, on Steven Otte's HO scale Cincinnati, Lebanon & Northern. Steve described how he scratchbuilt the trestle in the December 2012 *Model Railroader*. Steven Otte photo

smokestack. Though they were mostly shut down by the 1960s, in the steam era that many of us model, coal-gas plants would be common in large and small towns alike. For more on how coal-gas plants work and how to model them, check out my "Ask MR" column from August 2023.

One last industry requires little to no modeling at all: a team track. Industries without their own rail spurs might still require the occasional hopper of coal. Add a portable conveyor to a paved area alongside a spur and you can spot a coal hopper there for unloading into wagons, trucks, or trailers.

Q I'm excited to lay track on my HO scale shelf layout. I have a few track laying questions. I'm using the new Walther'sTrack turnouts with the metal tab on the side for powering the frog. Can you point me toward a video or article showing how to wire this?

Also, what are the latest hobby paint brands and colors for weathering the rail and ties? I know there have been a lot of changes in paint over the last few years.

Finally, I would like to wire and weather the track in the garage before assembling the sections in my office. Any tips for laying and then cutting the track at a layout section joint?

Philip Bailey

A I'll be happy to answer your track laying questions. We don't have a video specifically about powering the frogs on the new Walther's turnouts because they've only been out a couple years. But we just used them on our 2024 project layout, Freemont Mills, and powered the frogs with Tam Valley Depot Frog

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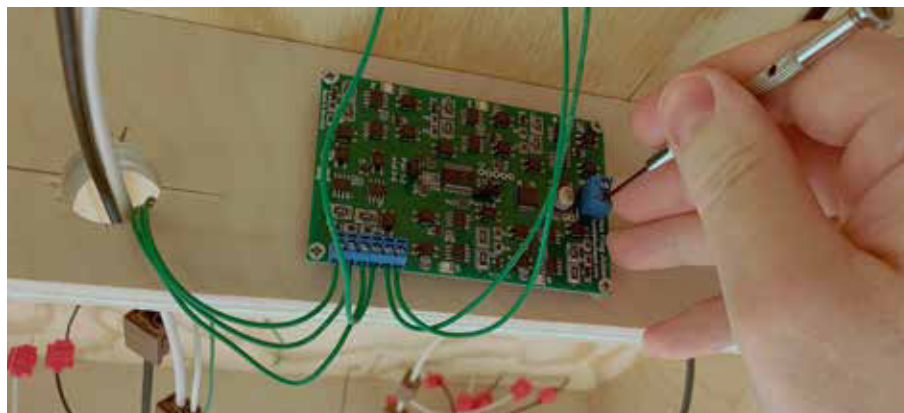
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Ask MR



The *Model Railroader* staff used a Tam Valley Depot Hex Frog Juicer to power the frogs on the Walther'sTrack code 83 turnouts we used on our Freemont Mills project layout. Steven Otte photo

Juicers. Check out the article on page 53 for an explanation of how we wired that layout module.

We have lost a few hobby paint lines over the years, but there are still a lot out there, including Revell, Vallejo, Humbrol, Tamiya, and Tru-Color Paint. If your favorite brand doesn't have colors specifically called Rail Brown and Railroad Tie Brown, there might be something similar under names like Roof Brown, Dark Earth, Dark Leather, or Dark Skin Tone. Most hobby paint makers' websites let you sort their wares by basic color; just filter for brown.

If I were to assemble a layout like yours with separable sections, I would secure the track to the layout surface as a single piece; remove a couple ties on either side of the section joint; solder the rails on each side of the gap to two slivers of printed-circuit board (PCB) that will take the place of those ties; cut a gap in the copper on top of the PCB so it doesn't create a short circuit between the rails; secure the PCB to the benchwork with screws so the ends of the rail won't move; and only then carefully cut the rails at the section gap, using a razor saw. This will minimize the movement of the rail ends so they will align properly whenever you rejoin the sections.

I hope that answered all your track questions. If not, look in the Kalmbach Hobby Store for Jeff Wilson's book *Basic Trackwork for Model Railroaders*.

Q I want to replace some wheelsets on my 1:32 passenger cars but don't know where to measure the railroad car wheels' diameter. I'd like to keep the wheel sizes the same with the new as the old so I don't need to deal with

altering the height of my couplers. Is the wheel diameter measured next to the flange or out on the edge?

Bruce Jahn, Livermore, Calif.

A According to the National Model Railroad Association's Recommended Practice (RP) 25, Wheel Contour, the diameter of a model wheelset is measured at the widest part of the tread, next to the flange.

The tread of a railroad wheel — be it on a model or the prototype — isn't cylindrical, but is a section of a cone. The tread slopes at an angle of 3 degrees, making the diameter of the wheel tread closest to the flange wider than the diameter at the inner edge. That's not much of a difference, though, even in large scale. So the difference in diameter between the inside and outside of the tread will be negligible.

On the prototype, wheels come in all kinds of sizes. Today, most railcar wheels come in one of four different sizes: 28", 33", 36", and 38". Although there are exceptions, the rule of thumb is that 100- and 110-ton capacity freight cars ride on 36" wheels; passenger cars also use 36" wheels; auto racks and low-profile 70-ton piggyback cars have 28" wheels; and 70-ton cars, which includes most older cars, roll on 33" wheels. Some intermodal cars fitted with 125-ton trucks have 38" wheels.

As you mentioned, it's important to make sure that you replace your cars' wheelsets with wheels of the same size. So don't go by the rule of thumb, but rather measure your car's wheels before buying replacements. A scale rule should be accurate enough to tell you what size wheels you're dealing with. **MR**

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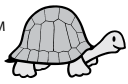
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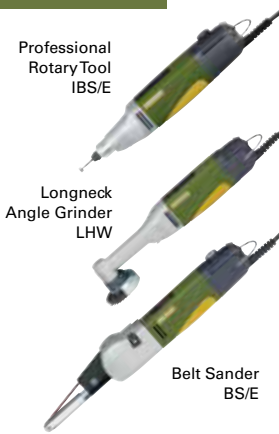
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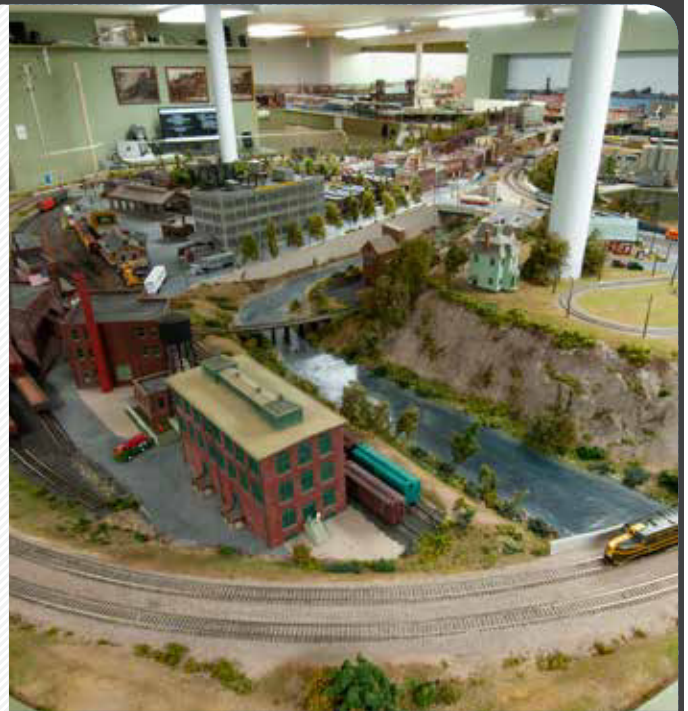
More train clubs should share their interesting histories

Your article about the Pacific Southern Railway Club in the November issue ["A railroad that gives back"] reminded me that there are many train clubs that have long histories and unusual stories of how they began and what they had to overcome to stay around.

I have been a member of a model train club since 1984. Its beginnings trace back to an after-school activity in Webster Groves High School that began in the mid-1930s. In the spring of 1938, the members voted to begin an official club and find a location outside the school to build a layout. The St. Louis-San Francisco (Frisco) gave them permission to use one of the two waiting rooms in a local depot. The club eventually purchased the depot. Today they still hold a monthly open house to entertain the public and raise donations to help maintain their circa 1910 depot and layout.

I think it is a safe bet that there are many more clubs out there that are at least 60 years old and have a history we would love to hear about. The question is how to get those clubs to let us know about them and tell their story.

Kenneth Rimmel, Affton, Mo.



The Pacific Southern Railway Club, featured in our November 2023 issue, was founded as a private layout and taken over by a club when its owner died. Lou Sassi photo

Measuring DCC currents

"Measuring current, usually milliamps, is inconvenient, so you will rarely do it." So said Allen Gartner in his November "DCC Currents" column. I will agree with that, but it's current that does the most expensive damage to model railroad components when measuring it is neglected or done incorrectly.

Current (amperes) is where heat comes from in a circuit. You can run a 12V motor on 16V and never realize it until the day you have enough cars in a train or weight in a loco to increase the current past the motor's maximum. Excess voltage means only excess speed, while excess current means heat that will damage parts often deep inside the motor or locomotive. Guess how I know.

A single AC ammeter of the traditional swing-needle type (not a digital readout) will show you where your track gauge is too tight or your grade is steeper than you think. It will also show the effect of binding in the locomotive. I bought my swing-needle AC ammeter online for less than \$10.

Christopher Reed, Uxbridge, Mass.

Use heat gun to shrink tubing

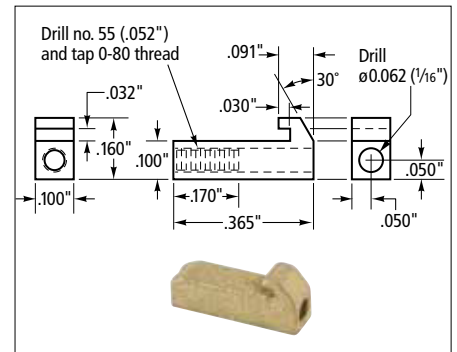
I appreciated Eric's article on heat-shrink tubing [November] but was curious why he didn't mention the micro-heat guns available from several hobby suppliers, including Micro-Mark. Having had a soldering iron or gun in my hand since age 9, now at 64 I know that using a soldering gun or lighter to shrink tubing is as imperfect as using either to dry your hair. Those are uncontrolled sources of high heat. I have tried both and nearly ignited things with the lighter or cooked them with the iron! As long as you avoid overheating and softening plastic locomotive shells, the heat gun is much easier to control.

Morgan S. Long

What's missing from this picture?

Larry Naus's article about using Caboose Industries HO scale sprung ground throws appears to be missing something. Step 3's photo 1 shows the bar stock milled and holes being tapped. Are there dimensions for the point rail clamps?

David Ray



Yes, David, there are dimensions for the milled point rail clamps. We failed to include the illustration for these clamps in the original article. The illustration above should go before photo 1 in step 3. Larry used a small hobby milling machine to make the point rail clamps. To make it easier on himself, he machined multiple clamps on a single bar of $\frac{3}{8}$ " square brass stock, which eliminates most of the handling and clamping problems with very small parts. He chose a nominal distance of $\frac{1}{4}$ " between each clamp detail, making it easy to keep track of his location as he progressed through the milling process. We apologize for the omission. **MR**

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

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Contributing editor Lou Sassi painted, decaled, and weathered these two On30 boxcars for his Sandy River & Rangeley Lakes layout. The maintenance-of-way cars add visual interest to his rolling stock fleet. Photos by the author

Paint, decal, and weather boxcars

While watching model railroad videos on YouTube, I happened upon one that provided me with an interesting project. The modeler had painted and heavily weathered some Bachmann 18-foot boxcars for his On30 railroad. They were unlettered and decrepit looking, just the thing you might see on one of the Maine 2-foot railroads in the 1930s.

Inspired by the video, I ordered a pair of Bachmann On30 boxcars from an online auction website. The models were painted Boxcar Red and had a minimal amount of lettering, providing a perfect starting point for my project.

Instead of following the video project, I painted, decaled, and weathered the boxcars to look like aging maintenance-of-way equipment (MOW) for my On30 Sandy River & Rangeley Lakes. To save money, full-size railroads often reasigned older freight and passenger cars to MOW service.

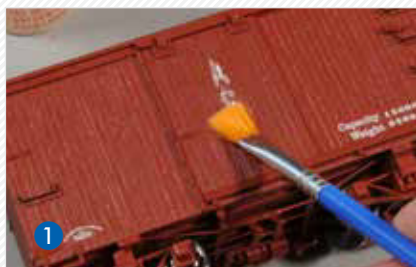
Boxcars are used as tool, material, and storage cars; tank cars can be found transporting water, fuel oil, or chemicals; and covered hoppers are used to store dried sand for locomotives. In earlier eras, stockcars made handy (albeit labor-intensive) tie haulers.

Heavyweight (and some lightweight) passenger cars were used as bunk, kitchen, material, outfit, storage, and tool cars. The passenger cars were modified with updated windows, safety appliances, and new or extra roof vents.

Depending on the situation, MOW cars might move in a solid train or be handled a few at a time as part of a freight train, near the end of the train.

Though I used On30 models for my project, you could adapt these techniques for other scales. A weekend project like this is a great way to develop a variety of modeling skills.

STEP 1 REMOVING LETTERING



Though the lettering was minimal, I wanted to remove it so it wouldn't be visible under the new paint. I started by applying a generous coat of Microscale Micro Sol to the lettering on the doors. After letting the decal setting solution sit for about 5 minutes, I scrubbed it with a stiff-bristled brush ①. I then wiped the same area



with a cotton swab dipped in mineral spirits to remove the rest of the printing ②.

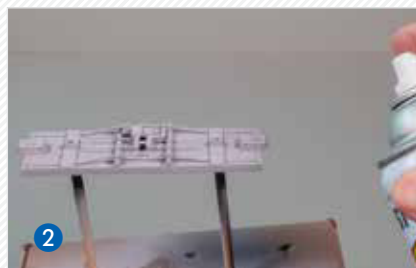
The Micro Sol and mineral spirits had no effect on the builder's stencil to the left of the door and the capacity data to the right. I used a cotton swab dipped in lacquer thinner to remove this lettering ③. Do this in a



well-ventilated area, preferably a spray booth, and wear appropriate personal protective equipment.

I worked quickly and used a light touch so the thinner wouldn't damage the paint or melt the plastic. As soon as the lettering dissolved, I wiped the surface dry with a piece of flannel cloth.

STEP 2 PRIMING AND PAINTING



Next, I removed the doors and disassembled both boxcars. Then I washed the models in warm, soapy water to remove any impurities that would affect paint adhesion. After rinsing both cars, I let them air dry.

I'm a fan of the worn wood effect Bachmann uses on its On30 boxcar floors, so I masked that area with blue painter's tape. To avoid handling the cars during the painting process, I placed two wood skewers in a cardboard box, spaced to match the truck

bolsters. Then I spray-painted both bodies with Rust-Oleum Light Gray Automotive Primer (2081830) ①. I used the same techniques for painting the underbody ②.

I spray-painted the doors on a piece of sheet glass ③. I painted the door backs first. Once the paint was dry to the touch, I flipped the doors over and painted the front.

While waiting for the primer to dry, I shifted gears and worked on the wheelsets. Using a pair of sprung

tweezers as a handle, I spray-painted the wheelsets Valspar Flat Labrador Brown (85046) ④. I later cleaned the wheel treads with lacquer thinner and a cotton swab ⑤. I carefully scraped paint off the axle ends with a No. 11 blade. Another option is to mask the treads with tape and the axle ends with liquid mask prior to painting.

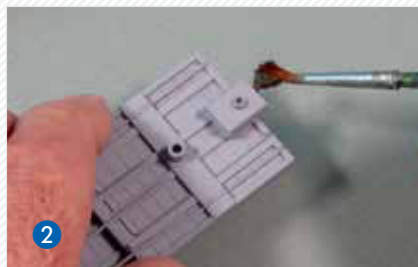
I let the primer on the boxcars dry for 24 hours. Then I applied Testor's Glosscote to the carbodies in preparation for decaling ⑥.

STEP 3 SWEATING THE DETAILS



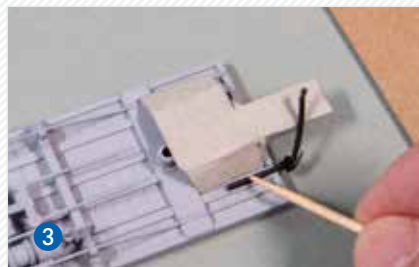
The Bachmann boxcars have many factory-applied parts, but they lack uncoupling levers. I fashioned mine from 24-gauge wire and two Taurus Products small eyebolts per lever, as shown on the car on the right ①.

I painted the uncoupling levers with the now-discontinued Model Master Rail Brown, then touched



them up after installation. The lever should be placed between the car end and brake rod on the B end.

Next, I replaced the plastic Bachmann E-Z Mate couplers with metal Kadee No. 28 offset-shank couplers. The Kadee couplers compensate for the low ride height. Since I don't use magnetic uncoupling ramps, I clipped



off the trip pins and painted the couplers Model Master Railroad Tie Brown ②.

I also added Hi-Tech Details O scale rubber air hoses (HTD-7501) to the boxcars. I used small cardboard jigs to keep the hoses at a 60-degree angle. Then I applied a 5-minute epoxy to the hoses for a stronger bond ③.

STEP 4 TIME FOR DECALS



I let the Testor's Glosscote dry thoroughly. Then I lettered and numbered the cars with Microscale Railroad Roman White alphabet set 90001. I started by cutting the letters and numbers as close to the graphics as possible, eliminating unnecessary clear decal film. Then I soaked them in tap water until they slid freely from the backing paper.

While the decals were soaking, I used a brush to apply Microscale



Micro Set to the area where the decals would be applied ①. The setting solution improves adhesion and softens the decals.

Next, I applied the letter and number decals. Satisfied with their position, I blotted off the excess water and Micro Set with a cotton swab.

Later, I used a paintbrush to apply Micro Sol to the decals ②. The solution softens the decals, helping them conform to irregular surfaces like the



woodgrain detail and the seams between the boards.

After the Micro Sol evaporated, I used a No. 11 blade to pop any trapped air bubbles ③. Then I applied another coat of setting solution. Patience is key here. You may need to repeat this process several times.

Once I'd removed all air bubbles, I applied Testor's Dullcote. This sealed the decals and gave the boxcars a uniform, flat finish.

STEP 5 ADDING WEIGHT

I like the rolling stock on my layout to weigh around 5 ounces. The two On30 MOW boxcars were less than 4 ounces each. However, there was plenty of room inside the boxcars to add weight.

I purchased steel adhesive wheel weights at a local auto parts store. Before installing the weights, I attached them to a piece of lightweight cardboard ① and painted them Model Master Engine Black.

The weights I used were lead-free. However, other wheel weights can contain lead. If you use those, wear nitrile gloves while handling the weights and wash your hands thoroughly after they've been installed.

STEP 5 ADDING WEIGHT (CONT'D)

Then, using a wood skewer, I placed a large glob of Weldbond on each car's floor. I pushed the weights into position, out of sight **2**.

After the weights were installed, I loaded the car with boxes, barrels, and other items from my scrap box **3**. I left the boxcar doors partially open so the items would be visible.

Since Bachmann truck sideframe assemblies are plastic, they're very light. I placed a round steel washer, painted black, to the underside of each sideframe with epoxy **4**. The hole in the center of the washer makes it easy to reach the truck-mounting screw. The washer increases the unsprung weight of the cars and helps them track better.



STEP 6 MULTI-STEP WEATHERING



I finished up the MOW boxcars by weathering them. First, I applied an India ink wash (2 teaspoons of ink to 1 pint of 70 percent isopropyl alcohol) to the underbody of both cars and let it dry **1**.

Next, I mixed Model Master Engine Black and tap water on a paintbrush to create a wash that I applied to the car sides and ends. Once the application was dry to the touch, I dipped a soft cotton cloth into 91 percent isopropyl alcohol and wiped off the

excess **2**. I used cotton swabs to get into the areas I couldn't reach with the cloth.

I applied a heavier wash to the roof, darker near the running boards and lighter along the edges **3**.

For the truck sideframes, I scraped black and rust-toned pigment sticks into powders with a grater. I placed a small bit of the pigments, along with a few drops of 91 percent isopropyl alcohol, in an artist palette. After wetting a semi-stiff-bristle brush with

the alcohol and removing a bit on a soft towel, I dipped the brush into the pigments. Then I brushed the various colors onto the sideframes **4**.

I also added rust to the door tracks, stirrup steps, corner brackets, and grab irons. I applied the mix of isopropyl alcohol and rust-toned pigments with a small brush **5**.

Finally, I used the dry powders and a soft-bristle brush to add streaks of rust to the car sides **6** and grime to the car ends. **MR**



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How to animate an N scale excavator



Stephen Sunshine used remote-control servos to operate this N scale TomyTec excavator. His techniques can be used to animate models in other scales.

Bring a static construction scene to life
using R/C servos

By **Stephen Sunshine** • Photos by the author

As a child, I would watch my Lionel train run around an oval of track on a Ping-Pong table for hours. While the trains were neat, the most interesting item on that layout was the cattle loader, where cows vibrated in and out of stockcars.

I now model in N scale, but I want my railroad to have the animation I enjoyed in my younger days. After searching for a suitable item to animate, I came across a TomyTec excavator. The construction vehicle is now the focal point of a building site on my model railroad.

The TomyTec excavator is articulated at four points, as shown in ❶, opposite. Point one, the turning joint, allows the

excavator to rotate 360 degrees. The second is where the boom meets the body. The third point is where the boom and arm connect. The final joint is where the bucket meets the arm.

To control the movements electrically, I connected each of these articulation points to a servo housed in a wood bracket mounted under the layout. Servos are used for motion control in remote-control (R/C) models, such as cars and planes, and in robotics.

I used servos instead of regular electric motors because a servo can be moved precisely to a specific position. A motor's motion has to be limited by some sort of cutoff switch.

Since this was the first time I used servos, I had to learn what they were and how they worked. A great online resource for hobby servo fundamentals is princeton.edu/~mae412/TEXT/NTRAK2002/292-302.pdf.

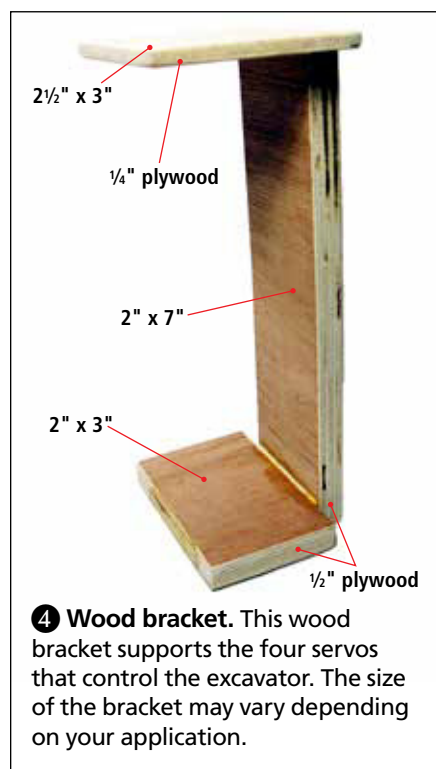
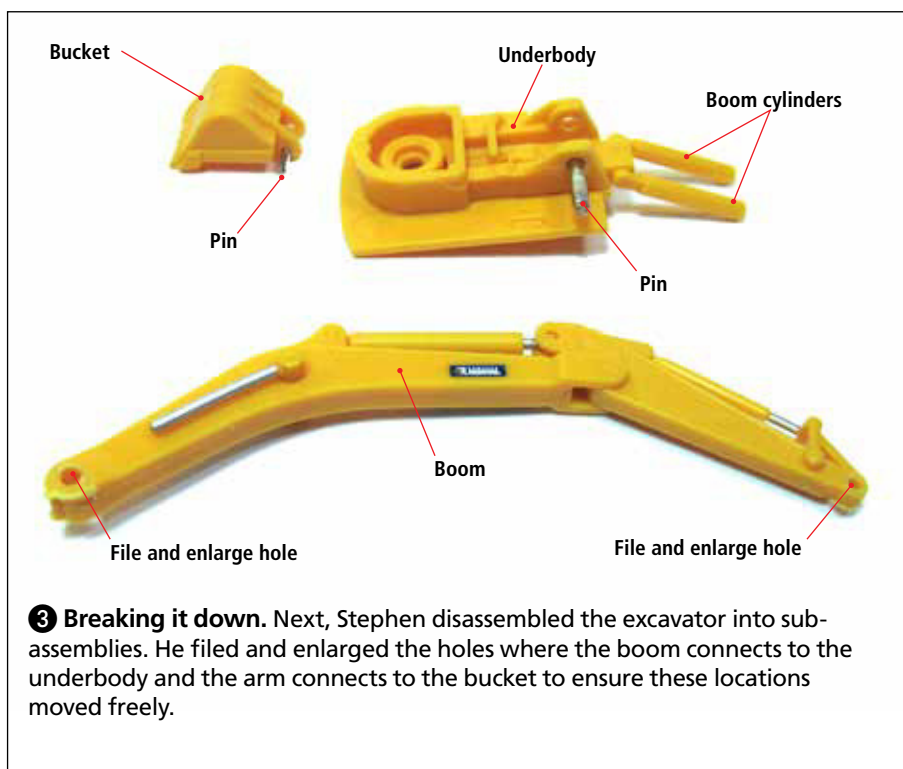
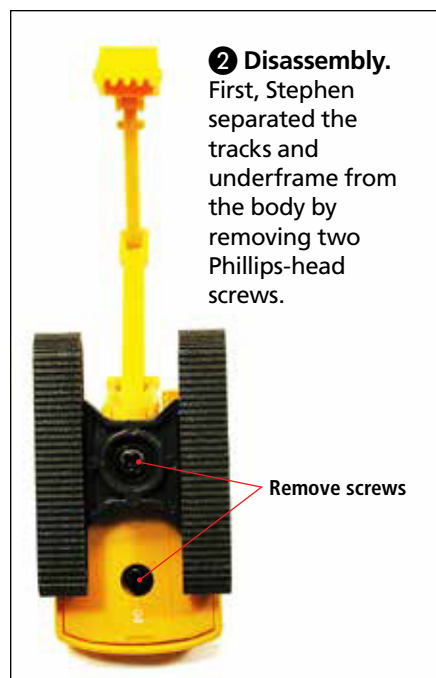
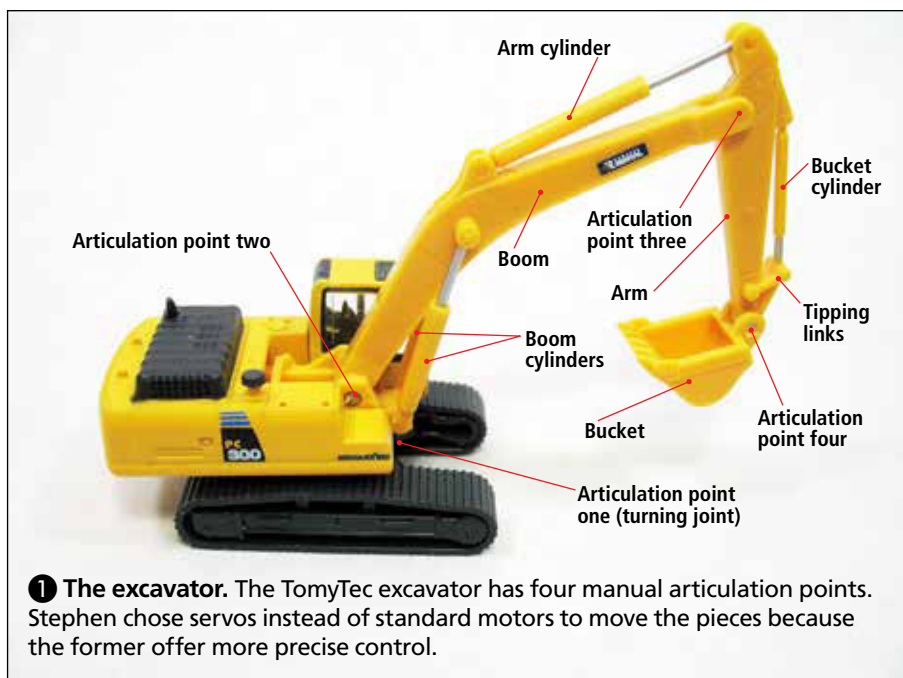
Excavator disassembly

To begin, I disassembled the excavator by removing two screws ❷. Then I carefully removed the pins securing the boom and bucket by tapping each with a small nail and hammer until they moved enough to be pulled out with needlenose pliers. I slightly enlarged the holes using a reamer and filed both sides of the holes so the parts would move freely ❸. I then reattached the boom and bucket but left off the cab and treads.

Next, I built a wood bracket that extends under the table about 7 inches, ❹. The bracket, made from ¼" (top) and ½" (back and ends) plywood, holds the four servos. The actual dimensions aren't critical, though the top should be big enough to hold the excavator and slightly larger than the hole cut in the tabletop for mounting. The bottom has to be small enough to fit through the tabletop hole and large enough to hold the servo that controls the rotation of the crane.

Then I put the excavator near one side of the top of the bracket, placing it close enough to the edge so the excavator can pick up dirt from the site when the boom is fully extended. Once I determined the excavator's position on the top of the bracket, I drilled a ½" hole in the plywood. I then glued an 8" length of ¼" styrene tube to the underside of the excavator at its pivot point (❺ on page 31). I bent a 2" piece of 22AWG solid hookup wire around the tube in the shape shown in ❻. This serves as a support for the styrene tube in the opening.

I attached a circular horn to the GWS S03N standard servo for articulation point one. I then glued a ¾" length of ¼" plastic tube to the center of the horn



with cyanoacrylate adhesive (CA). I then inserted a 2" section of $\frac{3}{16}$ " brass tubing into the plastic tube and glued it in place with CA. The brass tube allows for precise placement of the excavator above the bracket later on. I temporarily secured the servo on the bottom of the bracket with double-sided tape, as seen in **7**.

Later, I trimmed the 8" piece of $\frac{1}{4}$ " plastic tube so the excavator sat $\frac{1}{2}$ " above the bracket. I temporarily connected the servo to the controller to make sure the

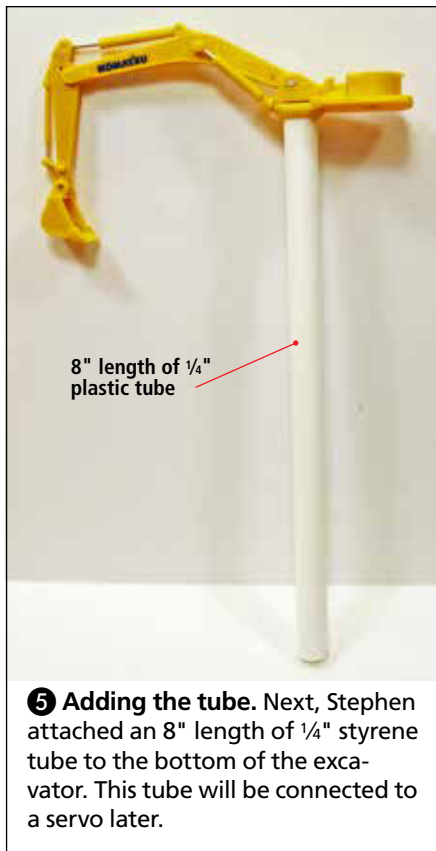
excavator moved freely. After the test, I secured the servo to the plywood base with a servo bracket.

Making the connections

I attached the 22AWG solid hookup wire support to the top of the wood bracket with CA, making sure the plastic tube was centered in the opening. Doing this limited the rotation of articulation point one, the pivot point of the excavator, to 180 degrees.

For articulation point two, I drilled a small hole in the boom to hold a bent piece of .015" piano wire. This wire passes through the bracket on the side of the excavator that's hidden from view and into a small-diameter styrene guide tube. I attached the wire to a single horn on a Power HD sub-micro servo and tested the installation. Then I glued the servo and guide tube to the $\frac{1}{4}$ " styrene tube with CA **8**.

To make the arm (articulation point three) flex and extend, I drilled two holes

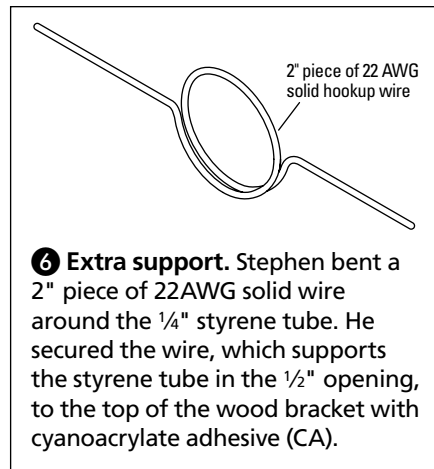


5 Adding the tube. Next, Stephen attached an 8" length of 1/4" styrene tube to the bottom of the excavator. This tube will be connected to a servo later.

in the boom and inserted small eyebolts made of 22AWG solid hookup wire.

Next, I drilled a 1/16" hole in the base of the boom and the 1/4" plastic tube. I also drilled a small hole at the top of the arm. I routed 26AWG stainless steel wire from underneath the wood bracket through a small guide tube, the 1/16" hole, and the small eyebolts on the boom to the hole at the top of the arm **9**, opposite. Once the top of the wire was in place, I connected the opposite end to a single horn on a second a Power HD sub-micro servo. Once again, I tested the installation before gluing the servo and the guide tube to the 1/4" tube.

I shifted gears and worked on the bucket, articulation point four. I bent two loops into the ends of a 1/2" long piece of 22AWG solid hookup wire. Then I glued the wire to the side of the bucket away from the aisle. I drilled two holes in the arm for 22AWG eyebolts. I tied 4 pound test monofilament line to each loop and routed it through the eyebolts and the same 1/16" hole I used for the boom wire. Once the monofilament line was through the bracket, I tied the ends to holes on the opposite sides of a cross horn on a third Power HD sub-micro servo. After confirming the bucket worked, I put a drop of CA on each knot I made in the monofilament line. I also attached the servo to the 1/4" tube **9**.



6 Extra support. Stephen bent a 2" piece of 22AWG solid wire around the 1/4" styrene tube. He secured the wire, which supports the styrene tube in the 1/2" opening, to the top of the wood bracket with cyanoacrylate adhesive (CA).



7 Making the connections. Stephen used GWS S03N standard servo to control the excavator's rotation. After attaching a circular horn to the servo, he added styrene and brass tubes with CA.

At this point, I connected the servos to a four-servo controller and ran a final motion test.

Final assembly

To reattach the cab and treads to the base, I separated the two treads from the plastic piece holding them together by cutting carefully with a razor saw and gluing them to the bottom of the base. Next, I reattached the cab to the underframe and positioned the excavator slightly above the surface of the wood bracket. Once in position, I glued the 1/4" plastic tube to the brass tube attached to the servo.

Since I needed to operate four different servos, I used a servo motor driver kit from Carl's Electronics (CK1403). The kit's contents are shown in **10**. The only items not included are the power supply, potentiometers, and knobs.

Materials list

Carl's Electronics
[electronickits.com]
CK1403 four servo motor driver kit

Fusionbeads
AW2322 26AWG stainless steel wire

Jameco Electronics
[jameco.com]
29082 1/2W, 10K Ω linear taper potentiometer with round shaft (4)
252736 5V, 2.5A DC power supply
644412 24AWG 9-conductor cable

Melton Tackle
714385 4 pound Suffix InvisiLine

Pololu Robotics and Electronics
[pololu.com]
519 GWS S03N standard servo
(Item is discontinued. Pololu's suggested replacement is Power HD standard servo 3001HB, item 1058).
1040 Power HD sub-micro servo
HD-1440A (3)

RadioShack
270-1803 Project enclosure
(2" x 2 1/2" x 5")

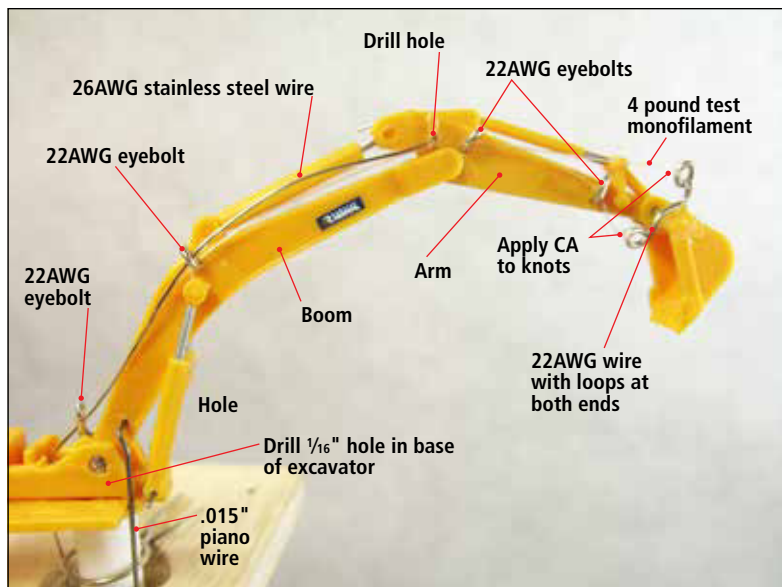
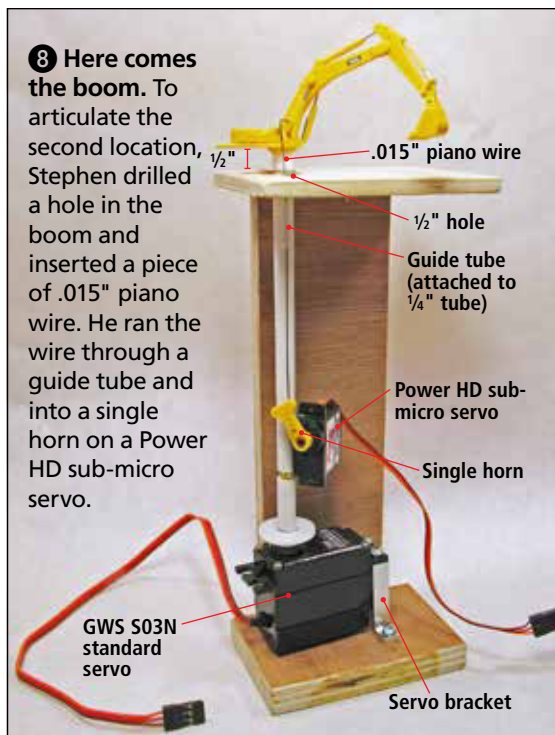
Miscellaneous
.015" piano wire
3/32" styrene tube
3/16" o.d. brass tube (2)
1/4" styrene tube
Knobs for potentiometer (4)

After soldering the components to the printed-circuit board **11**, I extended the wires from the kit to the potentiometers using 9-wire cable. I placed the potentiometers in a small project box that I purchased at RadioShack, though any project box will suffice.

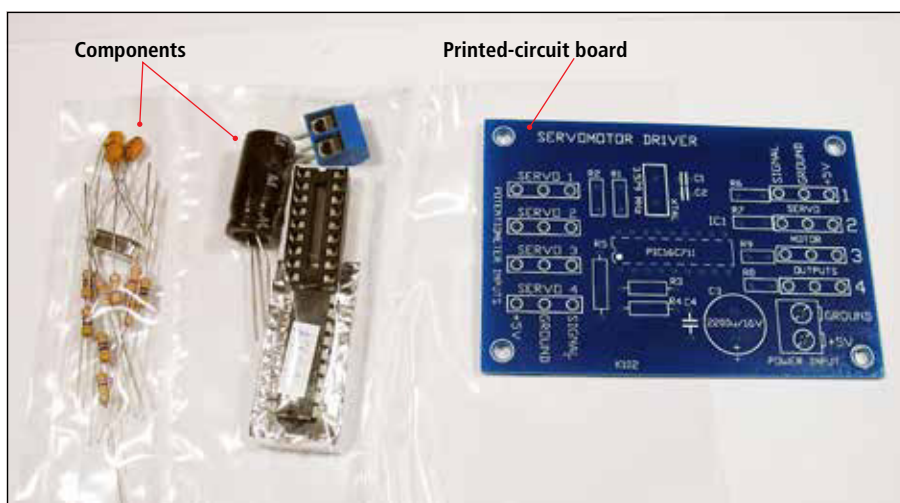
I made a color-coded diagram of the excavator and attached it to the front of the project box. Then I drilled four holes for the potentiometers and used color-coded knobs to match the diagram **12**. Now I can move dirt from the excavation site to a nearby dump truck.

If you're looking to add animation to your model railroad, try servos. They're easy to find and use, and will bring an otherwise static scene to life. [MR](#)

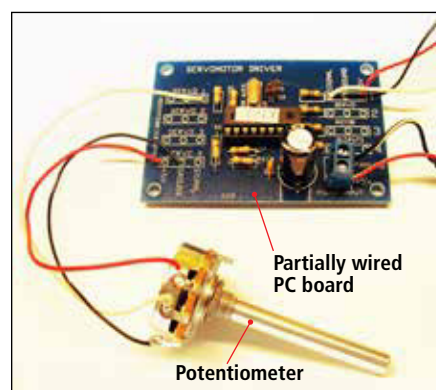
Stephen Sunshine lives in Putnam Valley, N.Y., where he models in N scale. This is his first byline in Model Railroader magazine.



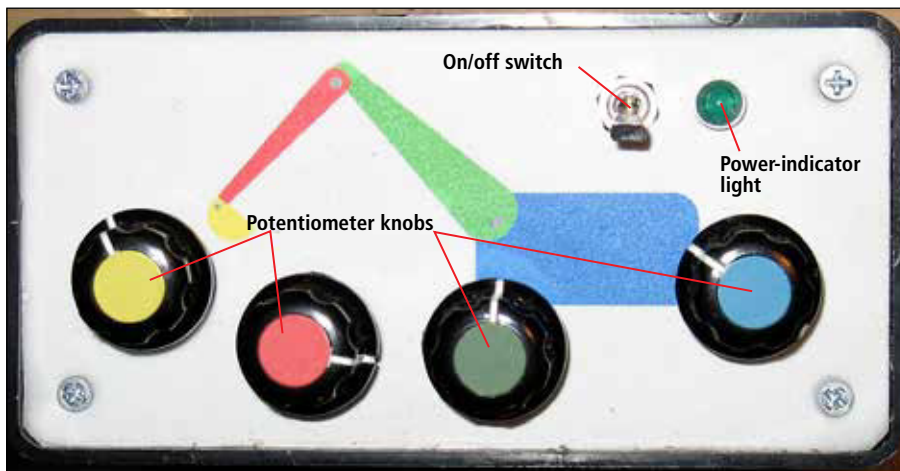
9 Bringing it all together. Stephen used a combination of wire and monofilament line to control the excavator's arm and bucket. He tied the fishing line to holes on opposite sides of a cross horn on a different sub-micro servo.



10 Controlling the action. With four servos to control, Stephen turned to this kit from Carl's Electronics. It requires a 5VDC power supply, potentiometers, and knobs.



11 Wiring the controller. After soldering the Carl's Electronics kit's components to the PC board, Stephen used 9-wire cable to extend the wires from the kit to the potentiometers. He then placed the potentiometers in a project box.



12 Fascia-mounted controls. Stephen made this color-coded diagram and attached it to the front of the project box. The potentiometer knobs are coded to match the excavator diagram.

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 Jan 20-21 Richmond, VA - Richmond Raceway
 Jan 20-21 Puyallup, WA - Western Washington Fair
 Jan 27-28 St. Charles, MO - Convention Center
 Jan 27-28 Sacramento, CA - Cal Expo
 Feb 3-4 Costa Mesa, CA - OC Fair & Event Center
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When the **PENNSY** still climbed the **MOUNTAINS**



This 43 x 60-foot O scale layout is set in central Pennsylvania in the 1950s

By Paul Dolkos and Ed Rappe • Photos by Paul Dolkos

The Pennsylvania RR has attracted Ed Rappe's interest since childhood. As a 3-year-old, he was mesmerized by an American Flyer PRR K5 running under the Christmas tree. It had a keystone number plate and square Belpaire boiler like the locomotives he saw at the station near his home. It was an influence he never forgot.

Over the years Ed built several small Pennsy-based layouts in HO and N scales as a result of job moves. His

interest in Pennsy locomotives led him to purchase a brass O scale K4s 4-6-2 for display on the fireplace mantle — with no thought of running it.

After moving to the Washington D.C., area, Ed discovered his new home was not far from that of O scale modeler and “Dean of North American track planning” John Armstrong. He called John and asked if he could visit. John responded with an invitation to his Sunday night trains get together. Ed had never seen an O scale model railroad and

was taken by the mass of the models. John's informal group, which included two very knowledgeable Pennsy modelers, was welcoming to the newcomer.

Several weeks later Ed brought his K4s to a meeting, and the Pennsy guys pointed out the detail shortcomings on his model — and how they could be corrected. Ed found that he enjoyed working in the larger scale, as it was easier to see and handle the detail on the models. With that experience, Ed made the decision to convert to O scale.

① Coal from the branch line mines is being set out at the Gray Tower interchange while an eastbound passenger train rolls by on Ed Rappe's O scale PRR Central Region layout.



② The General passes without stopping at Tyrone. The transcontinental sleeper behind the Railway Post Office is PRR's 10-roomette, 6-double-bedroom sleeper *Silver Rapids*. It was interchanged in Chicago's Union Station with Chicago, Burlington & Quincy's *California Zephyr*.





Learning about the Pennsy

With the encouragement of the Pennsy modelers in the group, Ed joined the Pennsylvania RR Technical & Historical Society (PRRT&HS). Its quarterly publication, *The Keystone*, became his go-to source for learning about the railroad's equipment, infrastructure, and operations. During the 1970s, the Pennsy fans in the D.C. group would drive up to central Pennsylvania to view and photograph former PRR lines.

In 1978, Ed and his family moved into a home in northern Virginia with a sizable basement. There, he began building an O scale model railroad influenced by the PRR route he visited with his friends. With selective compression, he chose to model features of the PRR's Middle Division run to Altoona and the Pittsburgh Division climb from Altoona, around the famous Horseshoe Curve, to the Gallitzin tunnels.

Due to the size and shape of the basement, Ed had to make a number of compromises with the prototype that would increasingly bother him as time went on. The one that bothered him the most was that his Horseshoe Curve had three

tracks climbing clockwise, while the prototype had four climbing in the opposite direction. Another compromise was a coal branch with only one mine on it.

While fun to operate, it bore little resemblance to operations on the PRR's busy coal branches. Another inconvenience was that the aisles were a bit narrow for towermen, train crews, and spectators to pass one another during operating sessions. But the railroad ran well, looked good, and was even the cover story in the March 2000 issue of *Model Railroader*.

Layout design

Based on the recommendation of several friends, Ed used 3rd PlanIt software to design a new layout. It enabled him to look at the interplay of factors such as route, elevation, grade, radius, turnout size, and aisle width in arriving at a design that took advantage of the available space. A track plan was developed over a two month period with a 355-foot-long dogbone mainline similar in concept to his prior layout.

A space-saving feature that carried over was a suspended staging yard at the

3 An A-B-A set of Alco cab units pulls a string of refrigerator cars around Horseshoe Curve. The scene is set in the early 1950s, when visitors had to climb 193 steps to reach trackside.

west end of the railroad with five tracks. At 76 inches above the floor, most visitors don't notice it when looking at the scene below. At the eastern end of the route, it has five through and three stub-end tracks.

Like the prototype, Ed's Horseshoe Curve has the four tracks that he always wanted. The Middle Division section of the main line is three tracks instead of the two on his prior layout. The additional track enables through trains to pass local freights working towns on the line. One non-prototypical feature in the track plan is the Altoona Cutoff, which connects Altoona with the Middle Division at Forge tower. It allows loop running around the perimeter of the layout, handy for equipment break-in and simple running during open house visits.

The layout has wide, curving aisles with a 3-foot minimum width and a lift section for access. In three locations, raised floor platforms were built to provide an eye-level views of the trains.

The layout at a glance

Name: Pennsylvania RR, Central Region

Scale: O (1:48)

Size: 43 x 60 feet

Prototype: Pennsylvania RR

Locale: central Pennsylvania

Era: 1952

Style: around-the-walls

Mainline run: 355 feet

Minimum radius: 60" (main), 50" (branch)

Minimum turnout: No. 8 (main), No. 5 (secondary)

Maximum grade: 2.2% (main), 3.5% (branch)

Benchwork: open grid

Height: 47" to 76"

Roadbed: Homasote

Track: code 148 and 125 flextrack

Scenery: plaster cloth and red rosin paper over cardboard lattice

Backdrop: styrene-covered masonite framed by 1 x 2 stud wall

Control: NCE DCC

Hidden PRR Middle Division and H&BT staging

Pennsylvania RR, Central Region

O scale (1:48)

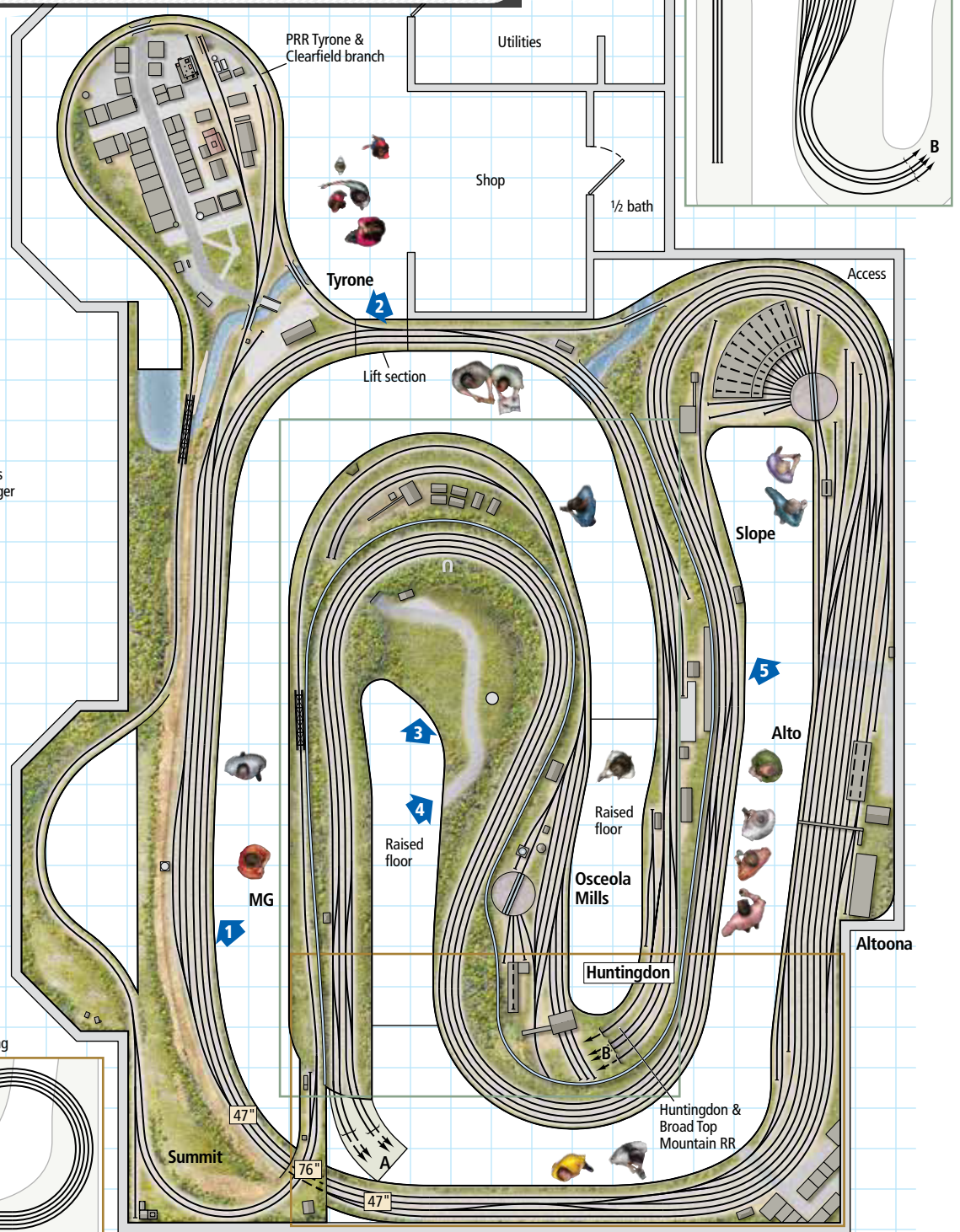
Plan size: 60 x 43 feet

Scale of plan: 1/8" = 1'-0" (24" grid)

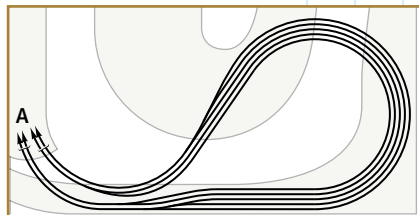
Numbered arrows indicate photo locations

Illustration by Rick Johnson and Kellie Jaeger

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



Above aisle PRR Pittsburgh Division staging





4 Pushing on the rear of the reefer block are two Baldwin BH-50 class Centipede diesels. First used in passenger service in 1947, the fleet of 24 units were regearaged beginning in 1952 for freight helper service. The class was retired in 1962.



The local switcher in Huntingdon is shoving two loaded milk cars onto the rear of mail and express train No. 95. To minimize delay, the Supplee car will carry the markers on the run to Harrisburg.

Handling milk traffic

A recently added, prototype-based operation on Ed's Middle Division is the handling of Supplee Milk Co. traffic. Here, a morning westbound train brings two empty milk tank cars to Huntingdon. One of the cars is spotted at the Supplee Milk creamery. The other car is interchanged with the Huntingdon & Broadtop Mountain RR (H&BT) for the run to a creamery at Bedford, Pa.

On Ed's railroad, the short line train runs a couple of feet and disappears into a hidden staging area, where the locomotive is uncoupled from the three-car train and turned for the afternoon return trip — now with the milk tanks loaded. A locally assigned PRR switcher collects the two loaded Supplee cars and couples them on the rear of a eastbound mail and express train for delivery to the milk company's Philadelphia processing plant. — *Paul Dolkos*

Layout construction

Layout construction began in January 2006 with the much appreciated help of friends in an informal Monday night trains group. The first task was to build and suspend the Pittsburgh Division staging yard. That was followed by building the Altoona yard and Middle Division main line.

Next, they built the four-track Pittsburgh Division main up the 2.2 percent grade west of Altoona, around Horseshoe Curve, and connected it with the previously installed suspended staging tracks on the west side of the Gallitzin tunnels. The main line route was completed in August 2009, just 31 months after starting construction. The Tyrone and Clearfield branch from Osceola Mills to the Middle Division mainline at Gray Tower was finished in November 2010.

Terrain was created using a cardboard web, covered with red rosin paper followed by plaster cloth. A top coat of Gypsolite was the brushed on the plaster cloth for rigidity and texture.

The rock faces are a layer of molding plaster hand-carved before it fully cured. The trees are dried goldenrod sprigs wrapped with floral tape, dipped in diluted white glue, and sprinkled with ground foam. Densely planted, they make a fair looking eastern forest.

Operations

Within Ed's train group, there are those who prefer running through trains on the mainline, while others enjoy local freight and branch line switching. The layout can accommodate both. Altoona serves as the division point between the Middle and Pittsburgh Divisions. All trains stop there for simulated crew changes. Passenger and diesel freight power run through Altoona, while the division-assigned steam locomotives are exchanged there.

With the exception of transfer runs to the Tyrone & Clearfield branch and a Middle Division local freight, most trains passing through Altoona are scheduled timetable moves that don't require switching in the yard. A dispatcher controls train movements by issuing verbal orders to the towerman, and in turn they control movement in their area by setting routes and signals using local control panels along the aisle.

The hidden staging yards at the east and west ends of the mainline route have five separate loop tracks that can hold



30- to 35-car trains. The staging yards are monitored by closed-circuit TV. At the direction of the dispatcher, towermen control movements in and out of staging. During scheduled operations, trains don't run through staging. They enter and lay over in staging as one train, and later, when scheduled, leave as a different one running in the opposite direction.

Most freight trains run over the two divisions of the layout without changes to the consist. When necessary, switching is handled by the Altoona yard crew. Two of the three 18-car stub-end tracks in Middle Division staging are used by the Altoona Turn and coal transfer runs serving the Huntingdon and Broad Top Mountain Railroad (H&BT) and Tyrone & Clearfield (T&C) branch interchange tracks.

The third stub siding is where an all-stops secondary passenger train is stored. An Altoona engine terminal crew assists with power changes and Pittsburgh Division helper operations. The operating schedule currently calls for 16 train moves over the mainline route between staging yards. It can be revised based on crew availability.

Signature signals

Ed wanted working Pennsy-style signals on his layouts, but for several years scenery was a higher priority. By 2019

the railroad was far enough along to consider a signal project. By that time the National Model Railroad Association's Layout Command Control (LCC) standards had been adopted and new products with advanced signal control capability had come on the market.

He began the project by studying PRR signaling practices in *The Keystone*. Based on those practices and things he observed on early field trips, Ed developed a plan with a mix of 55 block, interlocking, and dwarf position-light signals. The plan has 15 signal bridges — some Precision Scale brass imports, and several kitbashed Plasticville ones sized to fit the track arrangement. The well-detailed PRR signals are by Custom Signals and Atlas O.

The signals are controlled by RR-Cirkit's Signal-LCC boards distributed around the layout on a Cat 5e bus. Ed used JMRI Panel-Pro software to configure the Signal-LCC boards to determine the aspect to display and drive the signal head LEDs.

Ready to run, but more to do

Most of the layout's operational and scenery features are in place, but Ed views model railroading as a journey, not a destination to arrive at. In particular, he looks forward to refining operations and enhancing the scenery. [MR](#)

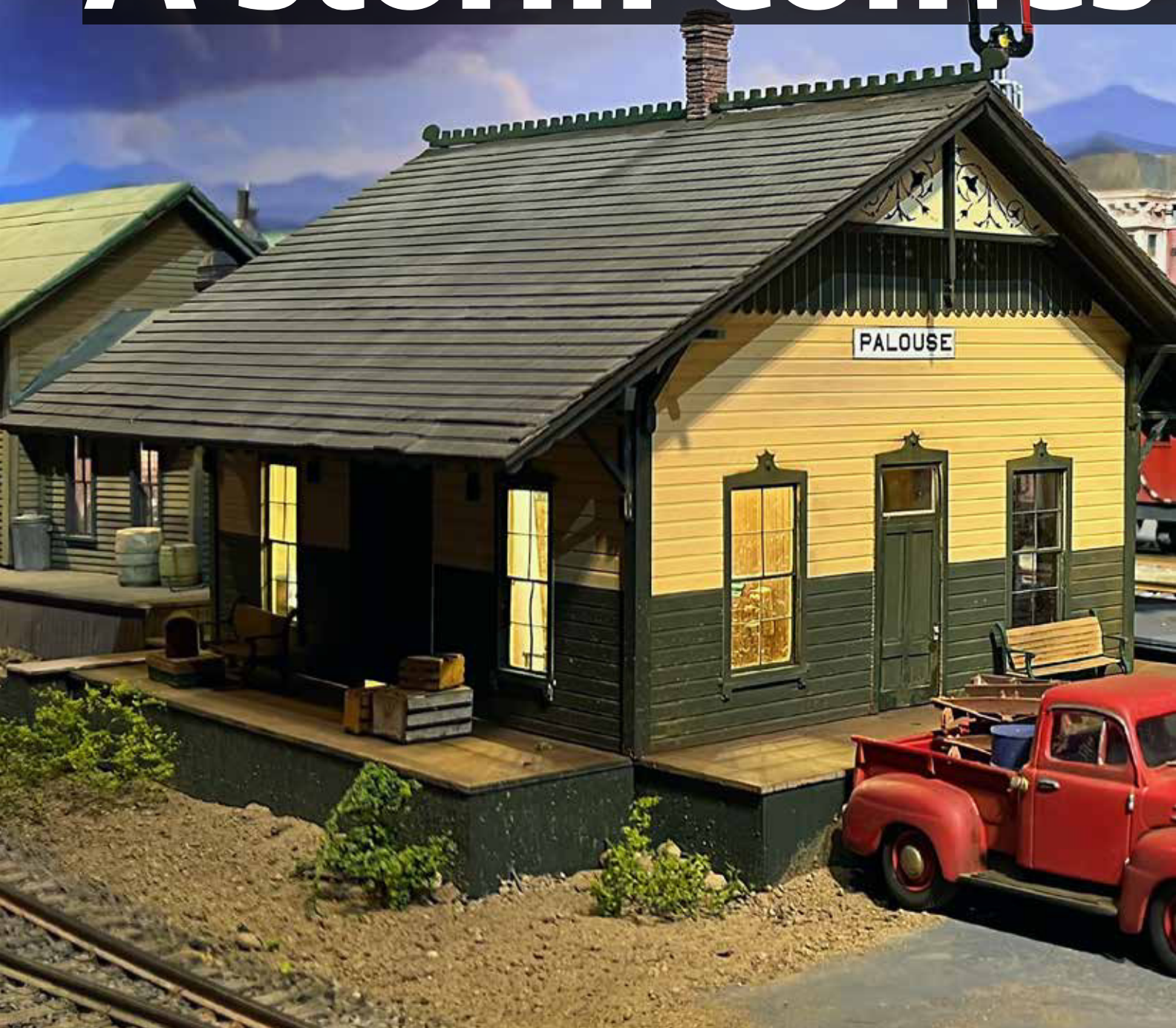
5 PRR J1 No. 6455, a 2-10-4, leads a manifest train past SLOPE tower near Altoona. In real life, the tower controlled a four track Middle Division interlocking at the base of the Pittsburgh Division's westward climb around Horseshoe Curve.

Meet Ed Rappe

Ed Rappe is a retired federal employee living in Williamsburg, Va. with his wife Judy. His working career was centered on developing and managing information systems supporting national defense. His capstone assignment was serving as Deputy Chief of Staff for Information Management, Military Traffic Management Command. This is Ed's fourth O scale model railroad. His pre-retirement layout in Fairfax, Va., was featured in the March 2000 issue of MR. Ed is a longtime member of the Pennsylvania Railroad Technical and Historical Society, and shares his interest in model railroading with friends in the Fords Colony Model Railroad Club.



A storm comes



Agriculture is the focus of this bustling three-railroad town

By Mike O'Connell • Photos by the author

Welcome back to my Proto:48 Pacific Railway & Navigation Co. model railroad, first featured in the September 2022 MR.

This time, we're in Palouse, Wash., a small farm town in the eastern part of the state that's served by the Great Northern, Northern Pacific, and PR&N.

Palouse is the heart of a large agricultural region that's the seventh-largest

to Palouse



producer of wheat in the world. The state also leads the nation in growing apples and pears. In town, you'll find cold storage facilities, grain elevators, and all the supplies the surrounding farms need.

It's late in the afternoon in the fall of 1955, and it's sunny at the moment, but there's a storm coming. Before that pleasant breeze from the northwest brings rain, allow me to take you on a tour of the town and how it operates.

The heart of town

The General Store is the center of town, both geographically and figuratively. It does double duty as the Post Office as well as giving the locals a place to get basic hardware, food, dry goods, and local baked goods. You'll often find a couple of local retirees spending their leisure time around the checkerboard on the front porch.

1 Station crew on the platform await Northern Pacific train W3, which will stop for water and get orders from the agent at Palouse Depot on Mike O'Connell's O scale Pacific Railway & Navigation Co. layout. The Great Northern caboose is on the GN main track on its way to Spokane.

The feed and grain store next door sells to smaller farmers. For egg producers, baby chicks are often on display after being shipped in via U.S. Mail.

J.E. Work Mining Supplies sells machinery to the silver mining districts of northern Idaho. It may seem out of place to sell mining supplies in a farming community, but the owner, Ed Work, does well with it.

Ruth's Palouse Diner, which serves the best scratch-baked pies and cakes around, also makes claim to be the center of town. This is where the crews tie up and "go for beans" in the middle of their switching duties. Western National Bank is next door and finances most of the farmers in the Palouse region.

An agricultural hub

Before arriving in Palouse, the crews switch the nearby East Spokane Cattle Pens and Armour Packing House. Today, all 10 cars have unloaded their cattle and are being washed down nearby. Cattle drovers from western Montana who ride the old 60-foot coach insist on clean cars prior to reloading. The PR&N dominates the stock trains in this region. Great Northern only serves

the Armour plant, which processes beef and pork.

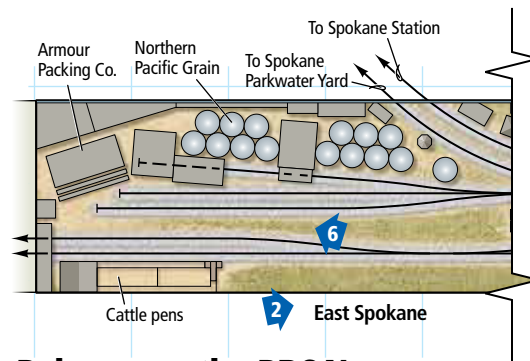
North Pacific Grain Growers Coop in East Spokane can hold wheat, barley, and oats. Large Coop growers can store grains for over 36 months and wait for a better price in the Chicago markets.

Northern Pacific serves a huge facility with 20 car service spots. Great Northern and Northern Pacific also share an interchange track nearby with cars usually originating from Spokane.

During the apple harvest season, the volume is so great that NP and GN stash cars on every available siding. Oftentimes in the fall, and if it's a good year, there could be as many as 1,000 cars hauling the harvest shipments.

Cascade Fruit Shippers acts as a transfer service and ships Washington pears from this location. During the peak season, pears are only stored for 24 hours before they are shipped, usually to the East. Palouse Cold Storage stores Washington apples here for immediate shipping or under long-term deep refrigeration, waiting hopefully for the market price to go up.

Albers Feed operates two mills in town. These are rather small facilities, but they are essential businesses for the



Palouse on the PR&N

O scale (1:48)
Size: 4 x 38 feet
Scale of plan: 1/4" = 1'-0", 24" grid
Numbered arrows indicate photo locations
Illustration by Rick Johnson and Kellie Jaeger

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

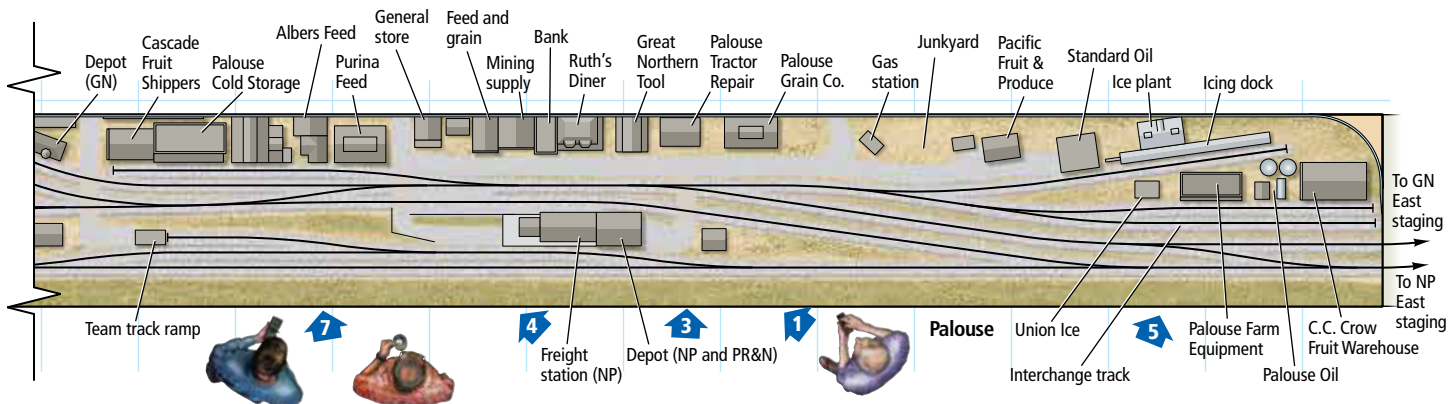
smaller farmers with smaller crops. And they can store a variety of special grains like rice, milled wheat, and barley.

Stations and other structures

The Great Northern's Palouse Station was built in 1905 and is solely owned by GN. Once an electric line, the station is only used for way freights and interchanges. The agent here makes sure all goods are handled quickly and efficiently. Two first-class trains come



2 This long view of Palouse, just part of Mike's 40 x 60-foot layout, looks east from the general store to the icing platform and fruit warehouses at the far end of town. The Northern Pacific depot and freight station are at center right. A storm is rolling in on the hand-painted backdrop.



3 Northern Pacific EMD F9 No. 6701A pulls out of Palouse Station with one of three daily passenger trains in tow.

The layout at a glance

Name: Pacific Railway & Navigation Co.

Scale: Proto:48 (O fine scale)

Size: 4 x 38 feet (Palouse), 40 x 60 feet (entire layout)

Prototype: Great Northern; Northern Pacific; PR&N; and Spokane, Portland & Seattle (elsewhere on layout)

Era: mid-1950s

Locale: Pacific Northwest

Style: walk-in multi-deck

Mainline run: approx. 1,200 feet

Minimum radius: 84"

Minimum turnout: No. 7 (spurs), No. 8 (main)

Maximum grade: 1.75%

Benchwork: modular

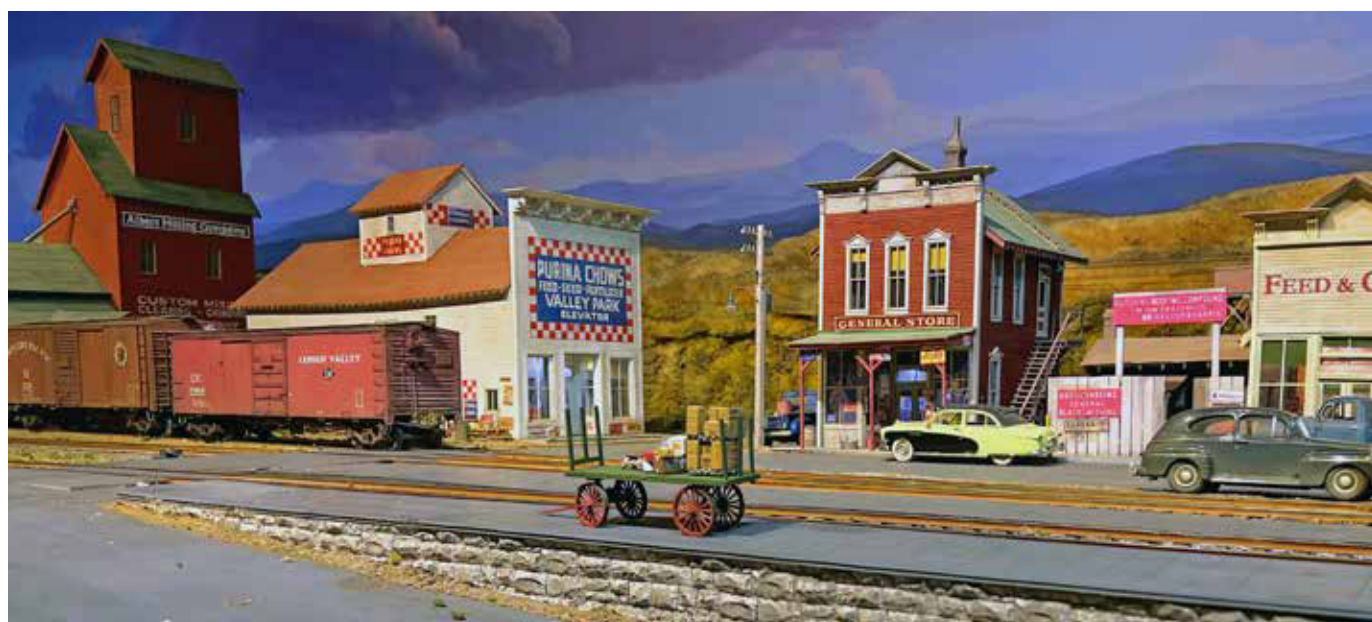
Height: 40" to 90"

Track: handlaid code 100 and code 125 rail with cast-resin pre-ballasted ties

Backdrop: hand-painted on 1/8" tempered hardboard

Scenery: plaster cloth and Sculptamold

Control: NCE DCC with wireless throttles



4 The Lehigh Valley boxcar is waiting to be picked up and shoved into the interchange track. The GN engineer left the rest of his train here while doing other switching in town because there's a strict 10-minute limit on blocking the road crossing.

5 Though a break in the clouds is illuminating Palouse Farm Equipment, the storm building to the north is looking pretty ominous. The GN boxcar of machine parts is in an off spot, waiting for space to open up on the town's team track.



6 The Northern Pacific reefer and PR&N stockcar have just been shoved into the NP interchange track. Both cars are bad order and will go to Spokane's Parkwater RIP track for repairs.

through in each direction, one being the Oriental Limited.

The Northern Pacific's Palouse Station is central to Main Street. Three passenger and three fast freight trains come through daily, east and west. The agent is in close contact with all the shippers and handles all the clerical duties for the railroad. Northern Pacific shares this union station with the PR&N.

The Palouse Oil Fuel Facility is one of two sources for diesel, oil, and gasoline in town. The other is the Standard Oil Co. facility, which is served by pipeline and truck but has no rail service.

Palouse Farm Equipment Co. provides machinery to area farms. Larger machines arrive on flatcars, unloading on a team track east of town. Farmers can expect fast turnarounds for equipment well before the harvest season.

Modeling lessons

I have learned so many skills in this hobby. There are several techniques that



I would like to explain in detail. Weathering my models to give them dimension, texture, and color is my favorite part of modeling. I weather in three stages. First, I tone down the initial color, for example Boxcar Red, by applying acrylic washes of other reds, whites, and brown umber. (I stay away from black, because black is usually too dark for colors to come through in our indoor layout lighting.)

Second, I like to brush on acrylic washes of colors adjacent to the initial color, such as yellow or orange for our example red car. This brings the model alive. Finally, I apply a final wash with earth tones to simulate the dust, dirt, and grime the car would accumulate when it's out in the weather.

Lighting is critical for me. I put a lot of time and energy into the layout's lighting. I once used fluorescent lights, but they caused an unpleasant glare and bleached out the colors in the layout. Fortunately, light-emitting-diode (LED) lighting came along just in time.



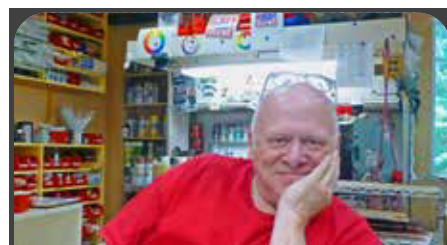
7 The GN boxcar has to have grain doors nailed across its doorways before it can be loaded with grain at the Albers feed mill. The pre-war, truss-rod wood boxcar would probably be scrapped by now if not for the demands of the grain rush.

Primarily, I use PAR 20 and PAR 38 lamps for overall lighting. They are dimmable and work very well in track lights.

You can even rig stage-lighting gels to change the overall colors of the lights. For example, Palouse is lit with cool LED lamps from the right and warmer LED lamps from the left. This gives the scene a nice feeling of depth with vivid colors. My previous article ["One Night in Spokane," September 2022] shows more examples of my use of lighting for dramatic effect.

I run the layout with Digital Command Control, so the wiring is not too complicated. But, as I got older, I realized I didn't want to duck under the layout to troubleshoot or repair wiring. So, we figured out a way to bring the wires to the front of the layout and create a cover of removable 1 x 6 Medium Density Fiberboard (MDF). Wires are not joined under the layout, only at the front. I also make sure everything is tagged so I know what's going where and how it gets there.

My last lesson concerns people, big and small. One thing I learned is how important it is to put miniature people on the layout. I thought the empty look would work, but having figures on the layout gives it life and purpose. There are so many 3-D miniature figures coming to market that it's possible to find almost any figure you might want.



Meet Mike O'Connell

Mike is an avid photographer

whose love of railroad history and architecture led him to found Chooch Enterprises, a supplier of model railroad details and scenery products. Now retired, Mike lives in Maple Valley, Wash., with his wife, Jeanne. They have four children and four grandchildren.

More important, though, are the people I have met through this hobby. When I started building the model railroad, I thought I could do it all by myself, letting my ego get in the way. Boy, was I wrong. Throughout the years I have met many wonderful people who have offered to help on the layout. Most of them turned out to be more talented and smarter than me! These people have become lifelong friends. In the layout room, I have a tribute wall full of their pictures. **MR**



This 670 scale foot long road bridge spans 26 tracks on Victor Hand's under-construction HO scale layout depicting the New York Central in the Hudson River Valley. The model is based on an NYC prototype in Harmon, N.Y.

Tips for building a road bridge

Commercial products and innovative techniques were used on this yard-spanning HO scale structure

By Victor Hand • Photos by the author

At the time of the construction of New York's Grand Central Terminal early in the 20th century, the New York Central & Hudson River RR made major improvements to its lines leading to the city, including electrification. To maintain the electric locomotives and m.u. cars, a large shop complex was built at Harmon, N.Y., 32 miles north of the city along the Hudson River. The Harmon

complex also included a passenger station with four tracks to facilitate changing from electric to steam locomotives, support yards, and equipment for servicing steam locomotives.

The site selected for the Harmon complex was about a mile south of the village of Croton-on-Hudson, near Croton Point. A road leading to Croton Point Park crossed the location, and the railroad built a long bridge to carry this

road across the tracks of the station, shop, and locomotive servicing facilities.

I have a representation of the Harmon complex on my HO scale model railroad. Of course, the road bridge is an important part of the scene. Follow along to learn the techniques I used to build it.

Victor Hand has been a model railroader since 1951. This is his second byline in Model Railroader.

The prototype



The full-size bridge, which measured approximately 1,125 feet, crossed 33 tracks. It consisted of 14 through plate girder spans, with 6-foot high girders ranging in length from 60 to 100 feet ①.

Between the second and third spans was a 40-degree bend in the bridge's alignment. The prototype measured 21 feet wide and was supported by fabricated steel structures set on 7-foot high concrete piers.

There were two stairways from the bridge to the shop and locomotive servicing facilities ②. Since the bridge crossed some tracks at an angle, four spans were skewed.

The prototype bridge was built by railroad forces at the same time as the shop and station facilities were built. Not surprisingly, it shares many design features with the nearby railroad structures.

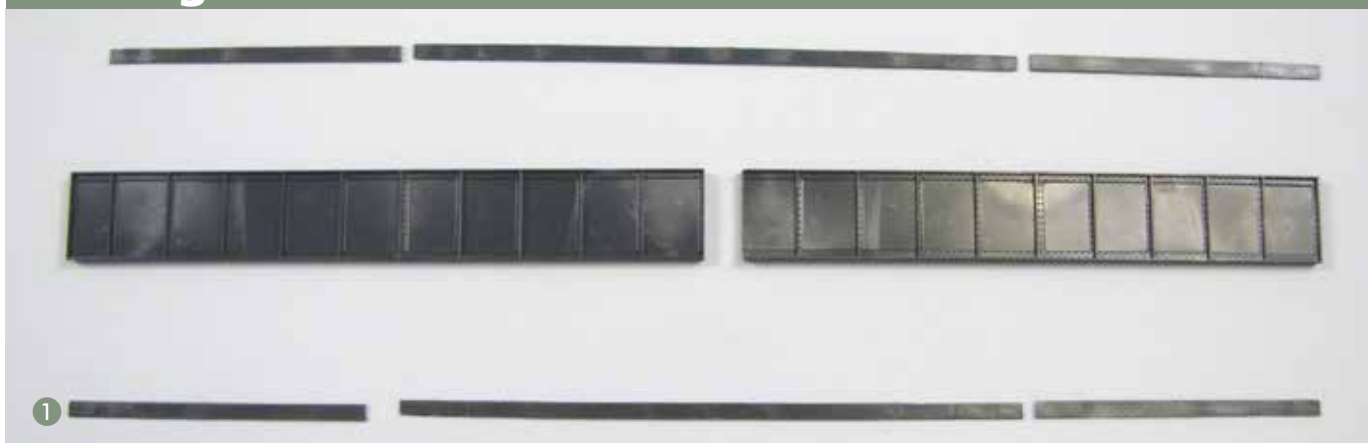


The bridge was grossly overbuilt, as 6-foot plate girders were used. In railroad service, spans of up to 50 feet are feasible with 6-foot girders. Under the lighter loading conditions of a highway bridge, these girders can support spans of up to 100 feet. Intermediate stiffening angles were riveted to the plate girders every 4 feet.

Most railroad plate girder bridges have extra stiffening angles near the ends to transmit the loads to the support structure, but these extra stiffening angles were for the most part not installed on the Harmon road bridge, as it was overbuilt to start with.

The bridge was a wonderful place for people to view activities around the station, shop, and coal dock from a public area, and many photos were taken from the bridge in the roughly 60 years that it existed.

Making it fit



My model of the Harmon complex was selectively compressed to fit the space available. I was able to include all of the tracks in the station area and around the coal dock, but I was forced to reduce the width of the shop significantly.

As modeled, my bridge consists of nine spans ranging from 44 feet to 92 feet, supported by eight intermediate support structures and abutments at each end. It crosses 26 tracks and is 670 scale feet long.

Commercial plastic bridge parts, supplemented with styrene sheet, strips, and structural shapes, greatly simplified

the construction process. There are four major suppliers of commercial bridge kits for the HO scale market, and I selected appropriate parts from all of them.

Central Valley Model Works produces a line of bridge kits and many types of girders and beams. Micro Engineering has a similar line of bridge kits and parts. The Walthers Cornerstone Engineered Bridge System features more than 20 bridges and accessories. The Walthers castings tend to be a bit thicker than other brands, so I thinned them down. Tichy Train Group has plate girders and rivet plates.

Making it fit (cont'd)

Commercial plate girders in HO range from 3'-6" to 9'-6" in height. I needed 6-foot girders with 4-foot wide panels, and Micro-Engineering 50-foot plate girders fit the bill. I fabricated 18 plate girders for the nine spans, ranging in length from 35 feet to 92 feet **1** (previous page).

Spans that were skewed at one end required girders of different lengths on each side **2**. I cut off the ends of the plate girder castings with the narrow panels. Then I sanded the sections square.

Where panels less than 4 feet wide were required, I used prototype photos to determine where narrower panels were needed. I then glued the plate girder pieces together. Once the panels were assembled, I installed top and bottom cover plates sourced from Micro Engineering and Walthers kits.

The four girders at the ends had rounded corners at one end. I re-created that look with Walthers parts.



Metal and magnets



I wanted my bridge to be strong and straight, so I attached the plate girders to a solid base. I first tried a 1/4"-thick piece of wood, but found it had a slight bow. Metal was needed.

I considered steel bar, but rejected it because it was too hard to cut without specialized tools. I couldn't find aluminum bar 2 1/2" wide (a scale 18'-6"). However, I did find 1/8"-thick aluminum bar 1 1/2" wide at the local hardware store.

The aluminum was easy to cut with woodworking tools (wear eye protection). I cut the aluminum to appropriate size, then used epoxy to bond the aluminum into a 1/4" bar that measured 2 1/2" wide.

Next, I cut the aluminum bar in four sections. Then I attached the plate girders to the side with cyanoacrylate adhesive (CA). I added vertical angle brackets on the inside of the plate girders every 8 scale feet. I applied thick CA around these parts to strengthen the assembly.

The deck is solid timber, so the floor structure of the bridge isn't visible from normal viewing angles. For this reason, I made no attempt to model the floor structure. Instead, I painted the bottom of the aluminum bar flat black.

I drilled a hole in the aluminum bar at the end of each bridge section. Then I used epoxy to secure a neodymium magnet in the hole. I used the magnets to attach the bridge to the support structures.

Adding supports





Next, I turned my attention to the support structures. I cut wood blocks 7 scale feet high for the piers. I sanded the piers to shape using prototype photos as a guide.

The piers range in length from 22 to 32 feet, depending on location. Following the prototype, I angled the ends of the piers. Three of the piers are 8 feet wide to support the wider steel structures at the angled point in the bridge and at the location of the two stairways ①, opposite page.

I made the narrower piers about 18 scale inches wide and added stripwood buttresses on each side. Then I drilled holes in the bottom of each pier for small magnets. I inset pieces of steel bar in the Homasote layout surface at the approximate location of each pier ②. This arrangement allowed the location of each pier to be adjusted during final bridge assembly.

I cut the abutments at each end of the bridge from cast-resin commercial parts. [Do this in a well-ventilated area and



wear a respirator and eye protection. – Ed.] After sealing the piers and abutments, I painted the resin parts an Aged Concrete color.

I built the steel support structures using Central Valley 16" lattice girders and .060" styrene angles ③. As before, I followed prototype photos. I added joint plates, made from .010" styrene, at appropriate locations.

I used end braces cut from some Micro Engineering parts to model the three wide support structures ④. I made the top girder of each support structure from styrene tube. Then I inserted steel wire in the tubes to give the magnets on the bottom of the bridge sections something to stick to.

Bridge shoes weren't evident in the photos. It seems that the girder ends rested on thin steel plates, which I re-created with .010" styrene strip.

I painted all of the bridge components weathered black.

Hitting the deck



I used ship decking with 1/16" planks, available from Micro-Mark, for the bridge deck ①. In the past I've used scribed wood for such decking, but found it has a tendency to shrink after it has been glued down. The ship deck planking is much more stable.

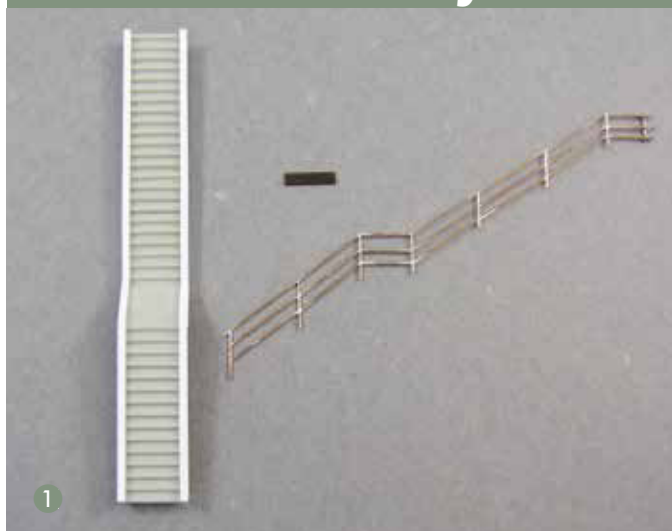
I cut the deck planking to size and fit it around the vertical angle brackets that extend up from the bridge floor ②. I used a brown, alcohol-based stain on the wood. I used the same product to stain the 4 x 8 guard timbers on the edges.



When I attached the plate girders to the bridge floor, I left 6-foot gaps where the stairways were located. I used epoxy to attach styrene filler blocks in the gaps at a skewed angle to match the tracks below the bridge.

Then I added neodymium magnets to the bottom of the styrene to give the stairways something to grab onto. I used large, triangular support brackets made from pieces of plate girder castings and styrene strip to support the styrene filler blocks.

Kitbashed stairways



I built the stairways around 6-foot wide injection-molded plastic sections from a Faller kit, which I cut to match prototype photos. I applied .188" styrene I-beam to the edges, as shown in ①. The stair treads are lengths of 2 x 4 stripwood glued to strips of paper for strength. I used the same technique for the landings.

The stairs on the prototype had standard New York Central pipe railings with vertical posts every 8 feet and three horizontal members.



I attempted to make the railings from .030" styrene rod, but found them too fragile. I settled on .032" phosphor bronze rod, soldered on top of drawings of the railings ②.

Following assembly, I cleaned and shaped the solder joints with small files. I installed the vertical posts into holes I'd drilled earlier in the I-beams on the edges of the stairs. I filled any imperfections with modeler's putty and sanded it smooth. I made the steel supports under the stairway from styrene lattice girders.

Finishing touches



After I'd assembled the bridge sections, I adjusted the support structures until they were in the right location and square to the ground. The magnets facilitated these adjustments. I attached the piers to the layout with acrylic caulk ①.

I didn't glue the joints between the top of the support structures and the bridge sections. Instead, I relied on the magnets to keep the bridge in place. This made it possible to remove the four sections for maintenance and to install track and ballast underneath.

The final step was to install the 3'-6" triangular support brackets at the top of each vertical column in the support structures where they meet the bottom of the plate girders



②. These brackets were designed by my friend Manuel Duran-Duran of the New York Central System Historical Society and were 3-D printed by Shapeways.

A patient modeler could make these brackets from pieces of plate girder and bits of styrene, avoiding the cost of 3-D printing. But there are a lot of these brackets, and the expense of 3-D printing was worth it to me. I glued the support brackets to the top of the vertical columns, but not the bottom of the plate girders. This allows the bridge sections to be removed when necessary.

The finished bridge is almost 8 feet long and is one of the highlights of my model of the Harmon, N.Y., facilities. [MR](#)



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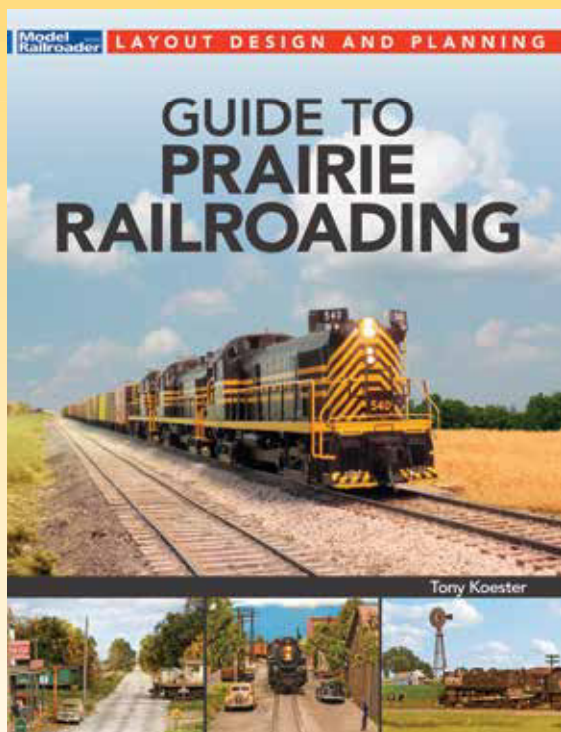


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Benchwork and track for **FREEMONT**

Part 2: Free-Mo module specifications dictated a lot of decisions on our HO scale project layout

By **Steven Otte** • Photos by the Trains.com Video staff

With the track on the Freemont Mills module laid and wired, editor Eric White (left) and senior editor Cody Grivno are pleased to run the first locomotive on the HO scale layout.

As I mentioned in the first installment of this series on our HO scale Freemont Mills project, this is the first time the MR staff's annual layout was built as a Free-Mo module. Modular standards like Free-Mo (Free-Mo.org) let modelers build small, self-contained sections of model railroad that can connect and operate with those built by others who follow the same standard.

Modular standards work by specifying the size, shape, track placement, electrical wiring, and other features of the module to guarantee interoperability. The selling point of Free-Mo is that unlike many other modular standards,

between the rigidly defined end plates, modelers are free to build almost anything they like. So we were surprised to discover just how much the Free-Mo standard does define.

It's true that within the bounds of the end plates, curves, reversing sections, and even elevation changes are allowed. But the standard also specifies the track code, minimum turnout size, minimum curve radius, turnout wiring, control system, electrical connections, accessory power — even aesthetic features like ballast color and what color paint to use when weathering track. A lot of layout building decisions that we tend to take for granted were taken out of our hands by these specifications.

Rest assured that we still found plenty of room for creativity within those boundaries, in the form of the structures and scenery. But those will be the subjects of future installments in this series. First, our project layout needed a sturdy base, bulletproof trackwork, and reliable wiring. Read on to find out how we accomplished this.

What's next

January: Welcome to Freemont Mills
February: Benchwork, track, and wiring
March: Structures
April: Scenery and details

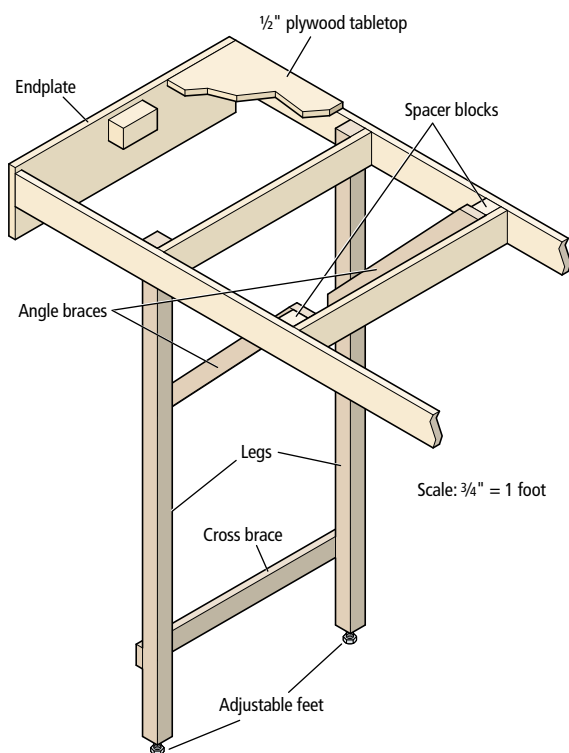
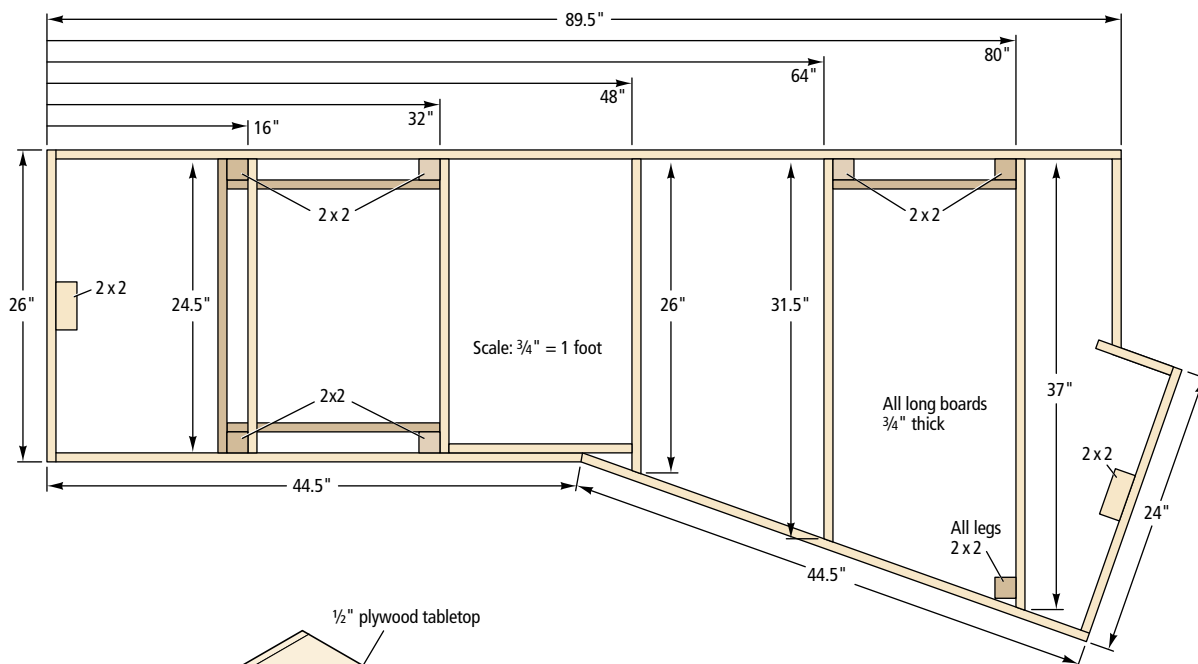
BENCHWORK

When we built the benchwork for the Freemont Mills module, we flipped the script — literally. Rather than start with the legs or other supports, then the framework, then the tabletop, we took a top-down approach.

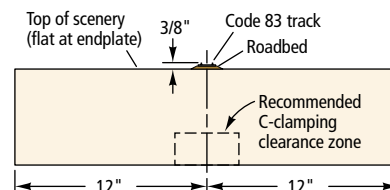
I transferred the track plan outline, full size, to the plywood tabletop, starting with a 1-foot grid. We cut out the tabletop, flipped it over, and attached the framework to the bottom. Then we attached the all-important endplates, and finally, the legs. This approach let us adapt our benchwork plan as we built and guaranteed the top would come out exactly the size and shape we wanted it to be.

We used conventional $\frac{1}{2}$ " plywood for the top. Since the track locations at the endplates are the most important for modular interconnectivity, I transferred those to the plywood first. Next I printed out full-size paper templates of the turnouts and punched holes in them so I could mark the frog and switch rod locations. Finally I drew in the flextrack connections between the turnouts. Since in my plan I had nothing nearly as sharp as the Free-Mo minimum radius of 42", I freehanded them rather than measuring with a trammel or template.

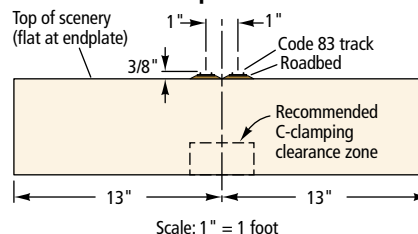
For the open-grid framework under the tabletop, editor Eric White ripped $\frac{3}{4}$ " furniture-grade birch plywood into 4" strips.



Single-track endplate



Double-track endplate



Joists made this way are less prone to warping and shrinkage than even high-grade dimensional lumber. We placed the side beams first, using wood glue and countersunk screws. Next, after making sure their placement wouldn't interfere with the locations of any under-table switch motors we might want to add later, we measured, cut, and added the cross pieces ①. The only tricky part was the angle where the module bends. We put an extra brace across the inside of this joint to keep it rigid.

Next we installed the endplates, the size and position of which were dictated by the Free-Mo standard ②. Eric cut these from $\frac{3}{4}$ " birch plywood.

The legs were a bit of a departure from our usual building methods, too. We usually prefer to build legs from L-girders and add casters to facilitate moving the layout, since our projects often shuttle back and forth from the workshop to the photo studio to the hallway outside. But the Free-Mo standard calls for adjustable feet, attached with T-nuts. So we built trestle-style legs from 48" long 2 x 2 lumber reinforced with 1 x 3 crossbars and 1 x 2 angle braces ③. Because of our angled fascia, one leg doesn't have a brace ④. Once these were bolted in place, we adjusted the feet to bring our track to the required 50" elevation. Our layout was now ready for track.



ROADBED AND TRACK

Free-Mo standard S2.4 says roadbed should be 1/4" cork or equivalent. We used Midwest Products cork roadbed (25-pack, No. 3013) because we already had a box under the Milwaukee, Racine & Troy. We also used some cork turnout pads we found in our inventory, as well as 1/4" sheet cork in the yard area.

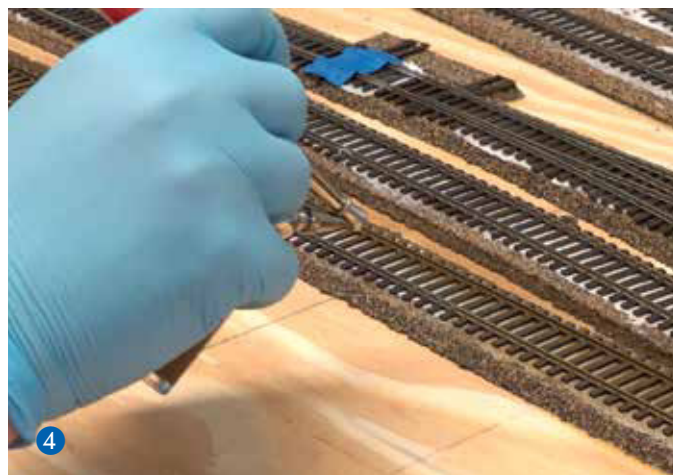
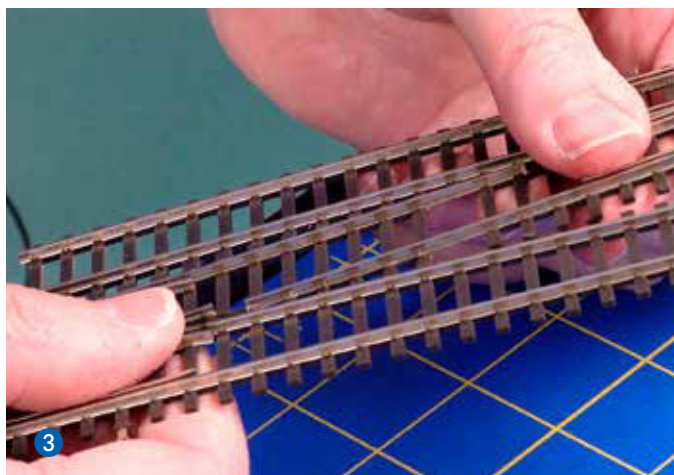
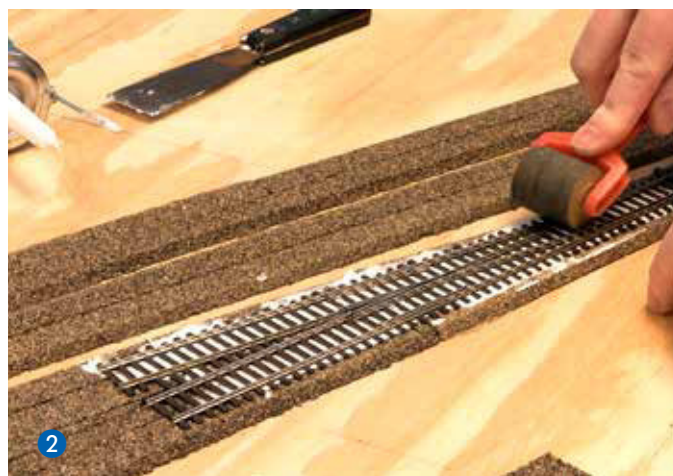
You can use adhesive caulk to glue down your roadbed. If you're laying track on an extruded-foam insulation board surface, you should use a foam-safe caulk like Liquid Nails for Projects, Loctite PL300, or DAP Dynagrip Foamboard. Since we were gluing ours onto plywood, we used carpenter's yellow wood glue ❶. We rolled down the cork firmly with a wall-paper seam roller and used pushpins to hold it in place while the glue cured.

When the glue was cured, we started adding the track. The Free-Mo standard specifies that track must be code 83 nickel-silver rail and that turnout frogs be powered. We were eager to try out the new Walther'sTrack system, whose turnouts are DCC-friendly. Walther'sTrack turnouts also have metal frogs with a convenient attached tab for wiring to a power-routing device like a Tam Valley Frog Juicer (see the next section).

Before laying the track, we marked the switch rod locations and drilled 1/4" holes through the cork and plywood for possible future installation of under-table switch motors. (We could have installed switch motors now, but we wanted to save that project for a future article.) We then used a putty knife to spread a thin layer of adhesive caulk onto the roadbed (carefully avoiding the switch rod areas) and pressed the track into it with the seam roller ❷. It's easier to put the turnouts in first, then add the flextrack to those, rather than the other way around. Track can be easily trimmed to length, but that's no so easy with turnouts. We again used pushpins to hold things in place while the adhesive cured.

Eric spliced together two Walther'sTrack turnouts to create the crossover at the double-track end of our main line ❸. He recorded a video of this process that we've posted to our website, Trains.com, along with others showing the cork and track-laying process.

After all the track was in place, senior editor Cody Grivno used an airbrush to weather the ties and rails with Roof Brown acrylic paint, as per Free-Mo standard S6.5 ❹.



WIRING

Like the benchwork and track, the wiring must also follow Free-Mo standards. Free-Mo is designed for Digital Command Control, so that means a wiring bus must run across the module. Actually, there are three buses: a track bus, an accessory bus, and a LocoNet bus, plus a booster common wire.

The first two are relatively simple. They are pairs of 14AWG wires that run from one end of the module to the other. The ends of the buses are connected to terminal blocks **1**. Attached to the terminal blocks are 18" long pigtailed with Anderson Powerpole connectors on their ends **2**. These connectors can be stacked and locked together in specific arrangements so it's easy to tell the track bus from the accessory bus. Contact tabs are crimped onto the wires, then the tabs are secured into the plastic housings, which snap together.

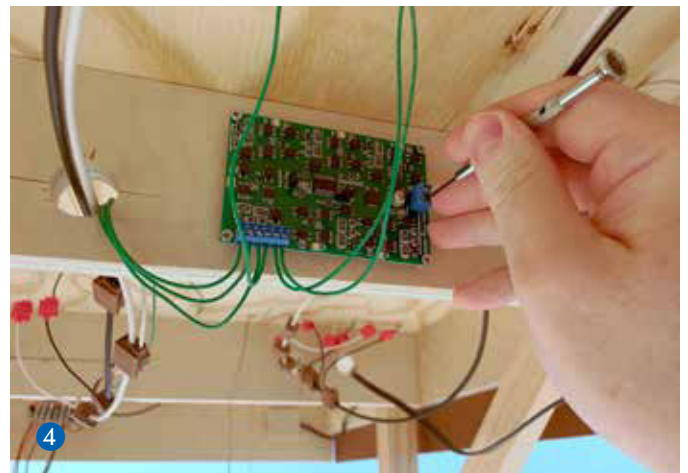
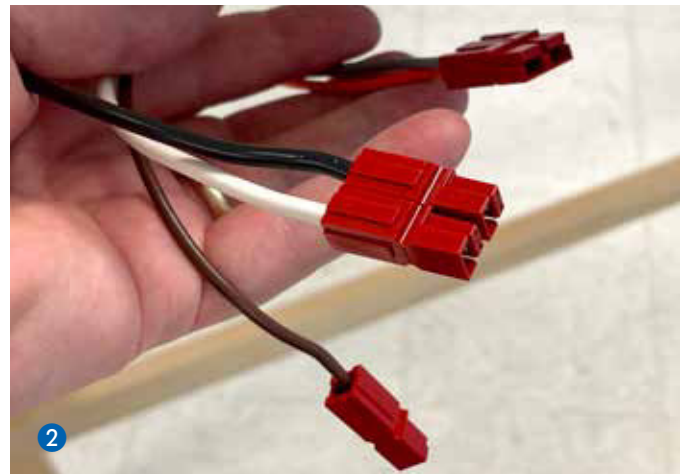
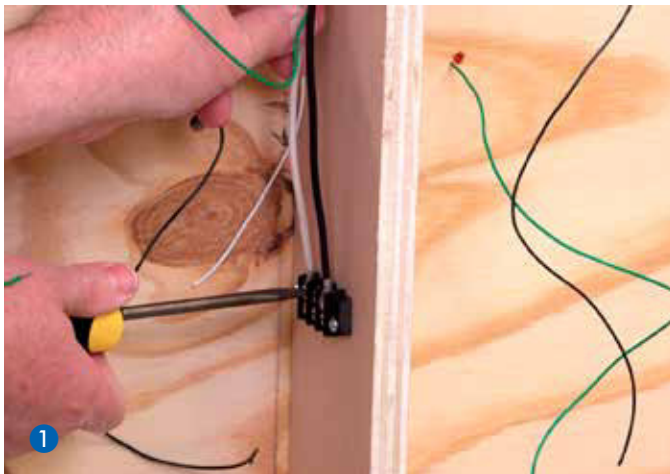
On our layout, the accessory bus simply runs through for now. When we wire the streetlights, they will be powered by the accessory bus. The track is connected with drop feeders using 3M Scotchlok insulation displacement connectors (also known as suitcase connectors). Free-Mo also specifies the wiring gauge for feeders **3**.

The third bus may be unfamiliar to some. LocoNet is the data bus for Digitrax DCC systems. The standard specifies a six-conductor telephone grade flat cable connected to an RJ12 jack at each endplate, and with a Digitrax UP-5 throttle jack mounted on each side of the module. So yes, that means Free-Mo runs on Digitrax DCC. But what if you want to run trains on your module at home, and you don't use Digitrax?

We had a Train Control Systems LT-50 handheld layout throttle we wanted to use, so we installed the TCS power panel as well as the Digitrax panel. We can switch between the two systems using a double-pole double-throw (DPDT) switch.

Free-Mo requires that turnout frogs be powered. We used Tam Valley Frog Juicers **4**. These DCC-only devices automatically send the correct polarity of current to the frogs with a single green wire attached to each frog, and a pair of wires connected to the DCC track bus.

With the wiring complete, we could turn on the power and test some trains. While all of this was going on, other staff members were busy building structures. Read more about that next month! – Eric White, editor [MR](#)



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This was one of John Armstrong's favorite scenes on his O scale Canandaigua Southern RR. John stuck with outside-third-rail power distribution because it made signaling easier. Paul J. Dolkos photo

MODEL RAILROADER HALL OF FAME

The "Dean," the "Wizard," and "Grundoon" left lasting legacies on our hobby

NOMINEES

By **Cody Grivno**

The 90th anniversary year of *Model Railroader* magazine is off and running. In last month's milestone issue, editor Eric White shared the news that we're starting the Model Railroader Hall of Fame. Each month, we'll present a slate of nominees. The list of names will then be put in an online survey tool. Scan the QR code at right to place your vote.

As a reminder, the two requirements for nomination into the Hall of Fame are that the person made a significant

contribution to model railroading and that they're deceased. The latter was done to stave off ballot box stuffing.

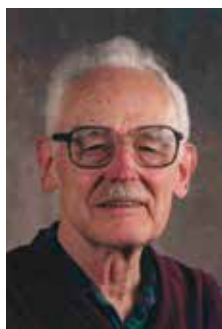
Is there someone you feel strongly should be nominated? Please send a letter or e-mail to the addresses listed in the front of the magazine. Though we'll take your suggestions under consideration, it's not a guarantee the person will be nominated.

The inductees in the inaugural class of the Model Railroader Hall of Fame will be announced in the December 2024 issue. [MIR](#)



John H. Armstrong (1920-2004)

Known as “The Dean of North American track planning,” John H. Armstrong made a major impact on the hobby. He was the author of 76 articles for *Model Railroader*, many focused on track plans he’d drafted for clients or track planning ideas.



John H. Armstrong

In addition to writing articles for the hobby press, John was also a book author. Among the five he wrote for Kalmbach was the influential *Track Planning for Realistic Operation*, which many modelers still consider the reference for model railroad design.

Professionally, John spent 34 years as mechanical engineer at the Naval Ordnance Laboratory. Following his retirement, he spent 10 years as an associate editor for *Railway Age* magazine, a trade publication for the rail transportation industry produced by Simmons-Boardman Publishing Corp. In 1978 John wrote *The Railroad — What It Is, What It Does*, a basic textbook used by professional railroaders.

John was also an active model railroader. His 24 x 34-foot O scale Canandaigua Southern, which first appeared in the January 1971 MR, also served as a vehicle to test his track planning ideas. A photo of the layout is shown on the previous page.

John passed away in 2004 after a short battle with cancer.

John Allen (1913-1973)

To a generation of hobbyists, John Allen needs no introduction. From the mid-1950s until his death, the “Wizard of Monterey” wowed model railroaders with articles and pho-

tos of his HO scale Gorre & Daphetid (pronounced “gory and defeated”) in the hobby press.

John started in the hobby in 1946, and within a decade was one of model railroading’s biggest names. Magazine readers were excited to get updates on the G-D Line, and manufacturers turned to John’s photography skills and layout to promote their latest products.

What made his modeling so influential? John used the three iterations of his G-D Line to expand the hobby’s boundaries. Walk-in scenery, weathered equipment, and regular operating sessions were just some of the things John was on the leading edge of.

My former colleague, the late Andy Sperandio, was a regular operator on the G-D Line in 1970 and ’71. On the 30th anniversary of John’s passing, Andy wrote, “John’s death in January 1973 at his home in Monterey, Calif., put an end to the realization of his dreams for the Gorre & Daphetid. I like to think, though, that his dreams live on in every model railroader he inspired. We owe so much to the man who showed us how dreams could be made into reality.”



John Allen

Gordon Odegard (1928-1991)

For more than four decades, Gordon “Gordy” Odegard’s name was on the masthead of *Model Railroader* magazine. Founder Al Kalmbach hired Gordy as a model builder in 1949.

His young career was put on hold not long afterward when he contracted tuberculosis.

Upon his recovery in 1953, Gordy returned to the magazine, working briefly in the art department before becoming an associate editor for *Model Railroader*. His skills as a craftsman and draftsman were regularly showcased in the magazine. Among Gordy’s nearly 300 bylines was the multi-part series “A USRA Mikado in brass,” which showed readers how to scratchbuild a steam locomotive. His drawings of the original Milwaukee Road *Hiawatha* were featured in MR’s 50th anniversary issue in January 1984. Gordy also worked closely with those who contributed prototype drawings to the magazine.

“Grundoon,” as he was known to his colleagues, was actively involved with many MR project layouts during his tenure. His signature piece, which he designed and built a large portion of, was the N scale Clinchfield, shown in the photo below.

Gordy died on July 8, 1991, after suffering a heart attack at the National Model Railroad Association national convention in Denver.



Gordon Odegard



Gorre & Daphetid No. 35, an 0-6-6-0 modified from a Pacific Fast Mail imported brass 2-6-6-2, holds back an ore turn moving downgrade through Helengon Gap toward Squawbottom, the lowest point on the Gorre & Daphetid Line. John Allen photo



This overall view introduced the N scale Clinchfield RR to *Model Railroader* readers in the November 1978 issue. Subsequent installments detailed how to build the layout, including its then innovative use of extruded-foam insulation board scenery. Pohlman Studios photo by Jerome Bojarski

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Two tower treasures

"3P 3X O to 3," barked the tower director, words rising above telegraph chatter and teletype clatter in the busy room. Levermen moved along the interlocking machine, operating levers that controlled the switches and signals to line the route. Visitors can try this today at a former Pennsylvania RR signal tower in Harrisburg, Pa., included in the National Register of Historic Places.

The PRR built Harris Tower in 1930 to serve the west end of the city's passenger station. After the road completed electrification of its lines east of Harrisburg in 1938, GGIs ruled under the wire while steam sped traffic to and from the west. The tower saw hundreds of movements every day from these engine changes, switching moves to combine or separate New York and Washington sections, and freights. The Harrisburg Chapter of the National Railway Historical Society acquired the tower in 1992. Volunteers re-created activity at the tower based on 1943 schedules and opened it to the public in 2008. All of the tower's equipment has been restored to working condition, making Harris a hands-on interactive exhibit.

Union Switch & Signal supplied the interlocking machine, a 113-lever Model 14, which operates 87 signals and 106 switches in the tower's territory, four to 16 tracks wide. A model board is a schematic marked with tracks and their designations, switch and signal

locations, and track occupancy lamps. The machine and its model board take up most of the tower's 37-foot length. The exhibit's computer program simulates movements through this trackage, trains appearing on the model board at appropriate times. Visitors move levers to route the trains as directed under the guidance of museum docents.

Following **"3P 3X O to 3"** with **"Omaha"** makes it as mysterious as a Peyton Manning play call, but it's simpler than this sounds. The route begins with 3P, a yard track. It continues over track 3X, passes through location O and ends on track 3 in the station. Visitors throw the levers needed in proper sequence, and the model board's occupancy lamps show the train's progress. PRR's levermen were so well-practiced during the tower's heyday that their hands flew over the levers.

The SoNo Switch Tower Museum in Norwalk, Conn., built in 1896, offers another hands-on experience. It overlooks Metro North's four-track main, originally New York, New Haven & Hartford. Officially South Norwalk Signal Station (S.S.) 44, New Haven employees called it "Norwalk" and Penn Central renamed it "Berk." The tower closed in 1984 and became derelict until the Western Connecticut Chapter NRHS founded the museum and opened it to the public in 2003. It



S.S. 44's levers beckon visitors colorfully. Red, black, and blue mark signal, switch, and lock levers, respectively. Part of the model board shows at upper right. Bob Gambling photo

has become a popular attraction in the city's trendy South Norwalk neighborhood.

Its track arrangement made S.S. 44 a critical location. Here, the single-track Danbury Branch joins the main and Norwalk's four-track swing bridge lies on the main just to the east. Further, the Branch was dark territory operated by timetable and train order and manual block rules. All this kept the operator busy without the benefit of additional staff that Harris Tower enjoyed.

S.S. 44's 68-lever machine controlled 46 signals and 21 switches. It was an Armstrong plant with waist-high floor-mounted levers. Harris, by comparison, used short levers mounted on a console. Switches at Harris were operated pneumatically, connected to the levers by electrical relays. S.S. 44

required strong-arming because it was purely mechanical, with levers connected to switches by weighty bell cranks and rods.

Steve McEvoy honored S.S. 44 with his *The Classic Railway Signal Tower*, hailed by renowned Bill Withuhn as the "best book, bar none" about the subject. Steve was modest when I asked what inspired the book, but his record speaks. Childhood visits to New York City subway towers led to a railroad career of almost 60 years that began as a New Haven operator, including time at Norwalk.

Harris and SoNo are each worth a visit, if only by internet search. Their displays bring this lesser-known aspect of railroading to life, worthwhile whether or not you catch the itch to build a tower into your operation. **MR**



HARRIS AND SONO ARE EACH WORTH A VISIT, IF ONLY BY INTERNET SEARCH. THEIR DISPLAYS BRING THIS LESSER-KNOWN ASPECT OF RAILROADING TO LIFE. — JERRY



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Early evening sees the old Shay clearing the last rock tunnel in Giant Canyon on its way to the mill with a load of logs. The scene is part of Greg Smith's On30 layout, which is just 2 x 7 feet and folds up into a self-contained box for storage. The track is Micro Engineering, the scenery is plaster cast in molds made from rocks in Greg's yard, and the rolling stock is from Bachmann Trains. Greg shot the photo.



It's been a long day at the East Bluff Terminal, but the railroad's fleet of EMD and Alco diesels has finally been serviced and readied for tomorrow's work. Joe Visintine photographed the striking night scene on his HO scale railroad, which is set in the early 1970s. The switchers are Proto2000 models that have been painted Southern Green and decorated with custom decals from Herald King.

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 fileupload.kalmbach.com/contribute. For our photo submission guidelines, contact Senior Associate Editor Steven Otte at sotte@kalmbach.com.



Nickel Plate Road class H-6b

Mikado No. 612 rolls through Cowden, Ill., with the morning freight from Madison. The Lima-built 2-8-2 is heading east toward Charleston on the NKP's Clover Leaf 4th Subdivision. Arthur Shale of Townsville, Queensland, Australia, photographed the action on his multi-deck HO scale NKP layout. The locomotive is a modified Bachmann United States Railroad Administration light Mikado.

The Rio Grande's Royal Gorge

pulls into Pueblo in early 1967 after a run from Denver. The scene takes place on Todd Shoffeitt's N scale La Veta Pass Route. The A-B-B-A set of EMD F3s are Kato models pulling a consist from Walthers, Centralia Car Shops, and Con-Cor. Pueblo Station is kitbashed from an old AHM (Pola) kit. Todd shot the photo.



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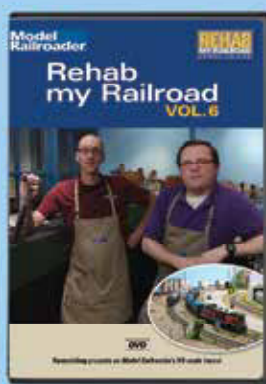
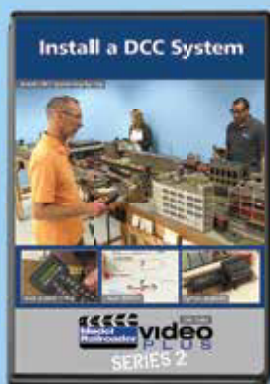
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Schedule of Events Rate: \$45 per issue (55 word maximum). Ads will contain the following information about the event: state, city, sponsoring organization and name of event, meet, auction or show, dates, location, times, admission fee, name and/or telephone number and/or email of person to contact for information. Name, daytime telephone number and street address of the person providing the information is also required but need not be included in the ad. Unless otherwise requested, ads will be published in the issue month that the event occurs in. Please specify issue date(s). **Word Ad Rates;** per issue: 1 insertion — \$2.03 per word, 6 insertions — \$1.89 per word, 12 insertions — \$1.77 per word. \$40.00 MINIMUM per ad. To receive the discount you must order and prepay for all ads at one time. Count all initials, single numbers, groups of numbers (i.e. 4-6-0 or K-27), names, address number, street number, street name, city, state, zip, phone numbers each as one word. Example: John A. Jones, 2102 South Post St., Waukesha, WI 53187 would count as 10 words. For MR's private records, please furnish: a telephone number and, when using a P.O. Box in your ad, a street address. **Model Railroaders** reserves the right to refuse listing. **All Copy:** Set in standard 6 point type. First several words only set in bold face. If possible, ads should be sent typewritten and categorized to ensure accuracy.

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Schedule of Events

AL, MOBILE: Model Train Show sponsored by South West Alabama Railroad Modelers (SWARM). Via Health, Fitness and Enrichment Center, 1717 Dauphin Street. March 2-3, 2024. Saturday 9:00am-5:00pm; Sunday 11:00am-4:00pm. Admission \$8.00, family \$15.00, under 10 free. Operating layouts, demonstrations, and dealers. Contact Charlie Boyer, 251-454-0572 (before 9pm CST), email: charlieboyer66@att.net, or Glenn Samuel, 205-914-0693, email: gasamuel@aol.com

CO, COLORADO SPRINGS: Train Expo Colorado (TECO) hosts its next model train show on January 27-28, 2024. Saturday 9am-5pm and Sunday 10am-3pm. Colorado Springs Event Center, Hall B 3960 Palmer Park Blvd., Colorado Springs, CO 80909. Admission: \$11/person, children 12 and under are free, senior and military discounts available. Contact Elizabeth 915-491-4819 or visit www.tecoshow.org

CO, DENVER: Rocky Mountain Train Show. April 6-7, 2024. National Western Complex, 4655 Humboldt St., Denver, CO 80216. Saturday, 9:00am-5:00pm, Sunday 9:00am-4:00pm. 3 acres of model trains, all scales, 30 layouts, 700 sales tables, clinics and more. Admission \$14.00, under 12/scouts in uniform FREE. Discounted tickets available for military/first responders through VetTix.org. Free Parking. 303-364-0274, www.RockyMountainTrainShow.com

GA, SAVANNAH: Coastal Rail Buffs 35th Annual Model Railroad and Train Show at Cottonwood Suites, 301 Governor Treutlen Dr. Pooler, GA 31322. January 27-28, 2024. Saturday 10:00am-5:00pm, Sunday 10:00am-4:00pm. Adults 2-day admission \$10.00; Students/Seniors \$7.00, Active-Duty Military \$5.00, under 12 FREE. Dealer tables, operating layouts in O, HO, N. Visit: www.coastalrailbuffs.com

IA, MONTICELLO: 2024 Train Show. 2 Days, February 3-4, 2024. Saturday 10am-4pm and Sunday 9am-2pm. Berndes Center, Jones County Fairgrounds, 766 N. Maple St., Monticello, IA 52310. Tables \$30. Admission: \$5, children under 12 free with paid adult. Monticello RR Club, PO Box 169, Monticello IA 52310 or email Ron Ackermann at rack611@gmail.com

IL, SPRINGFIELD: Springfield Railroad Society Annual Train Fair. Orr Building on the Illinois State Fairgrounds. Sunday, March 10, 2024. 10:00AM-4:00PM. Early bird shopping starts at 9:00AM for \$10.00. Admission fee \$5.00 from 10:00AM to 4:00PM. Free parking. Largest show in downstate Illinois! For info call Ray at 217-544-4295 or Mike at 217-899-3100 or visit www.springfieldtrainfair.com

IN, LA PORTE: Duneland Model RR Club Train Show and Swap Meet. La Porte County Fairgrounds Community Building, 2581 In-2, La Porte, IN 46350. Sunday, February 25, 2024, 9:30am-2:00pm (Chicago time). Adults \$5.00, youths 6-12 \$1.00, 5 and under free. Contact: Dave Novak at trains86@myyahoo.com or 219-778-3195. (Masks are optional.)

IN, LEBANON: Central Indiana Division/NMRA Train Show. Boone County 4H Fairgrounds, 1300 E 100 S, Lebanon, IN 46052. Sunday, January 28, 2024, 10:00am-3:00pm. Admission \$5.00/adult, 16 years and under free. Dealers, operating layouts, railroad-related activities, food, door prizes. Dealer tables \$16.00 each. Contact David Nance at 765-482-4075 or at LebanonTrainShow@gmail.com. More info at <http://cidnmra.org>

MA, AUBURN: Worcester Model Railroaders Annual Show at Auburn Elks Club, 754 Southbridge St., Auburn, MA 01501. Sunday, February 25, 2024, 10am-3pm. Admission: \$6.00, children under 12 free. Handicapped accessible. Two floors of dealers, exhibits, modular layouts. Contact: Ralph Kimball, 508-868-5189, ralphkimball@charter.net or www.wmrr.org

MI, SALINE: The Ann Arbor Model Railroad Club 54th Annual Train Show & Sale. February 17-18, 2024. Saturday 10:00am-4:00pm and Sunday 10:00am-3:00pm. Saline Middle School, 7190 N. Maple Rd., 48176. Admission \$7.00, under 10 free w/paid adult. Scouts in uniform free. 300+ tables, operating layouts, free clinics, free parking, shuttle buses. Visit: hvrhs.org/annual-train-show.html or 734-426-5100 Wednesday evenings

MN, ST. CLOUD: Granite City Train Show and Sale. River's Edge Convention Center, 10 4th Ave South, St. Cloud, MN 56301. Saturday, March 9, 2024, 9:00am-3:00pm. \$6.00, kids 10 and under FREE! Buy/sell model/toy trains, books, videos, railroad collectibles. Operating model & toy train display. Win a LIONEL train set 612-558-6484; GraniteCityTrainShow@gmail.com or visit: www.GraniteCityTrainShow.com

MN, WOODBURY: Newport Model RR Club Train Fair. Market. Woodbury High School, 2665 Woodlane Drive, Woodbury, MN 55125. Saturday, January 13, 2024, 9:00am-2:00pm. Admission \$5.00. Club Address: Newport Train Club, PO Box 0061, St. Paul Park, MN 55071. Contact: Don, 763-257-5443

NC, NEW BERN: 28th Annual Train Show. New Bern Riverfront Convention Center, 203 S. Front St., New Bern, NC 28560. February 24-25, 2024. Saturday 9:00am-5:00pm; Sunday 10:00am-4:00pm. Admission \$8.00 (good for both days), under 12 free w/adult. Operating layouts, over 90 vendor tables, food concessions. George Creathorne, 201-213-6907, or visit CarolinaCoastalRailroaders.org for more information.

NJ, BRICK: ECTP and Collectibles LLC presents The Brick Train Show. Elks Lodge, 2491 Hooper Avenue, Brick, NJ 08723. Sunday, January 21, 2024, 9:00am-2:00pm. Admission: \$7.00; under 12 free with adult. John LaLima 732-845-5966. Go to www.eastcoastrainparts.com and click on The Brick Show.

NJ, TOMS RIVER: ECTP and Collectibles LLC presents The Toms River Toy & Train Game Day Show. Elks Lodge, 600 Washington St., Toms River, NJ 08753. Sunday, February 11, 2024, 9:00am-2:00pm. Admission: \$7.00; under 12 free with adult. John LaLima 732-845-5966. Go to www.eastcoastrainparts.com and click on Toms River Show.

NY, ONTARIO/BUFFALO/HAMBURG: WNYRHS Train & Toy Show. February 17-18, 2024. Fair Grounds Event Center, 5820 South Park Ave., Hamburg, NY. Saturday 10:00am-5:00pm, Sunday 10:00am-4:00pm. 350+ tables. Adults: \$8.00, children 12 and under FREE. NMRA (WNY-Div) meeting Saturday 10:30. NMRA-Modeling clinics/demos, layouts (N-HO-S-O), LEGO, children's area. Bring the family! Stroller friendly! Contact: Art Toale, 716-837-1791, feebeelovr@yahoo.com

OH, TOLEDO: Greater Toledo Train & Toy Show. Owens Community College (SHAC), 30335 Oregon Rd., Perrysburg, OH 43551. Sunday, March 10, 2024, 11:00am-3:00pm. "Early Birds" 9:00am-3:00pm. Adults \$7, Early Bird Adults \$10, Children 12 and under FREE w/ paid adult. Contact: Randy Ramsey, 1566 South Ave., Toledo, OH 43609, 419-215-4181, email: toledotomymasters@gmail.com, website: www.tomymasters.org

OK, STILLWATER: The Heartland Toy Train Show. Saturday, February 17, 2024, 9am-3pm. Payne County Fairgrounds Expo Hall. 3 miles east of Stillwater on Hwy 51. 4518 Expo Cir E, Stillwater, OK 74075. Operating layouts and door prizes. Admission: \$5.00, kids under 18 free. For information: www.heartlandtoytrain.org

PA, ALLENTOWN: ATMA Spring Thaw Train Meet. Allentown Fairgrounds Agri-Plex, 1925 W. Chew Street, Allentown, PA 18104. February 24 & 25, 2024. Saturday 9am-4pm, Sunday 9am-3pm. Admission: \$10. Advance tickets \$15, admitted at 8am. 12 and under FREE with adult ticket purchase. For more information visit www.allentowntrainmeet.com or call 610-442-2859

SC, EASLEY: CRMHA Model Train EXPO 2024. February 16-17, 2024. Friday, noon-6pm. Saturday, 9am-3pm. Impact Center at Rock Springs Church, 207 Rock Springs Road, Easley, SC 29642. Admission: \$8.00 Adult, good for both days. Children under 10 are FREE. Trains of all sizes, operating layouts, model train vendors, a Kids Zone and more! Visit: www.crmha.org

TX, HOUSTON: Greater Houston Train Show presented by the San Jacinto Model Railroad Club. Saturday, February 17, 2024, 10:00am-4:00pm. Pasadena Convention Center, 7902 Fairmont Parkway, Pasadena, TX 77504. Operating Layouts, Classes on Railroads and Modeling Subjects, NMRA Contests, and Vendors from across the Southwest. Admission: \$5, under 12 FREE, \$10 per family. Concessions, free parking. Info: <http://sanjacintomodeltrains.org/>

WA, CHEHALIS: Lewis County Model Railroad Club, Annual Spring Train Show and Swap Meet. Southwest Washington Fair Grounds, Blue Pavilion Building, 2555 N. National Ave., Chehalis, WA 98532. April 6-7, 2024. Saturday 10:00am-4:00pm and Sunday 10:00am-2:00pm. Admission \$5.00. Free parking. Contact information: Ted, 360-985-7788, or email: TedsTrains@LewisCounty.com

WA, SPOKANE: River City Modelers Spring Model Train Show. Spokane Fairgrounds, 404 N. Havana. Sunday, March 3, 2024, 9:30am-3:30pm. Admission: adults \$8, 12 & under free. 200+ tables of Railroad-related items for sale, operating layouts, Free-MO. Operation Lifesaver & more. Free Parking. For table rental or general info, contact: Shirley Sample, 509-991-2317 or shirleysample13@gmail.com

WI, LA CROSSE: The 32nd Annual Great Tri-State Rail Sale. La Crosse Center, 2nd & Pearl Streets. Saturday, January 27, 2024, 9:00am-3:00pm. Admission \$5.00, under 12 free, 300 vendor tables. All Scales: Model, Toy & Antique Trains & Memorabilia. Information: 4000 Foundation, PO Box 3411, La Crosse, WI 54602, 608-781-9383. Visit: www.4000foundation.com

WI, MADISON: Mad City Model Railroad Show. February 17-18, 2024, Alliant Energy Center. 100,000 square feet of layouts, clinics, exhibits and vendors. Adults \$14, Seniors \$13, Children (5-15) \$6, under 5 Free. Two-day pass \$18. Saturday: 9am-5pm, Sunday 9am-4pm. Ticket deals: nmra-scwd.org

WI, STEVENS POINT: Central Wisconsin Model Railroaders 26th Annual Model Railroad Show. Holiday Inn Convention Center Hotel, 1001 Amber Avenue, Stevens Point, WI 54482. January 20-21, 2024. Saturday 9:00am-5:00pm. Sunday 10:00am-3:00pm. Adults \$5.00, kids 12-17 \$2.00. Many layouts, swap/sales tables, vendors. Contact Jim Miller, 715-340-0265; email: jimb67@gmail.com

All listed events were confirmed as active at the time of press. Please contact event sponsor for current status of the event.

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Model Railroader MAGAZINE



Next Issue

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MR pays a visit



Model Railroader Editor Eric White and his son, Alex, were kept busy during a special operating session for some out-of-town guests. Alex is the engineer on the eastbound hotshot led through Cayuga, Ind., by a trio of Bowser's new Alco RS3s. Tony Koester photo

It has been some time since I've had the honor of hosting then-*Model Railroader* Editor Andy Sperandio and his wife, Arlene, at our northwestern New Jersey home. So it was a special treat when MR Editor (and longtime friend) Eric White visited us recently. Better still, he brought along his wife, Leigh, and son, Alex.

The occasion was a long weekend of operating sessions on several local model railroads, including my Nickel Plate Road St. Louis Division. As you can see in the photo, we put Alex to work running one of the division's hottest eastbounds behind a trio of almost-new Alco RS3s.

They're out-of-the-box examples of the new 1600-hp road switchers from Bowser, and I challenge you to tell them apart from some much more expensive brass units that I also have on my roster.

Eric assumed the editor's chair when former Editor Carl Swanson moved down the hall to take the throttle of *Trains Magazine* following the late-Editor Jim Wrinn's untimely

passing. With merriment, Eric brings a new dynamic to MR, in that you'll find him at operating sessions, Railroad Prototype Modelers meets, and so on — usually on his own dime.

He's as deeply into this hobby as you and I are, and I think MR will benefit from his enthusiasm and depth of knowledge, as well as his eagerness to expand on what he already knows. And he's a nice guy. If you spot him at a convention or train show, don't be shy. He'd love to meet you and listen to what's on your mind.

Which reminds me: All too often, I finally get a chance to chat with a total stranger who stopped by for a visit and, as it turned out, has the potential of becoming a good friend. "Oh, I saw you at a convention a decade ago," he tells me, "but you were talking to someone else, and I didn't want to barge in."

Editors are always talking to someone, so don't let that stop you. Just say "Excuse me, but I'd like to introduce myself and say hello." If we're

actually busy, we'll thank you for stopping by and let it go at that. If we're just chatting, we'll either add you to the conversation or wrap up the old one and begin a new one.

Model railroad magazine editors have always been treated like visiting royalty when they stopped here or there to visit someone's model railroad or to give a talk at a convention. I have no idea why. But it does make our job easier and a lot more pleasurable when we're welcomed with open arms.

When I edited *Railroad Model Craftsman*, however, the editor of *Flying Models Magazine*, whose office was down the hall from mine, was amazed at this. The only way he received peer recognition was to enter and win model airplane contests. Otherwise, he was invisible.

Consider how a model railroad magazine editor who entered and won a lot of model railroad model contests would be regarded. I'm betting people would think favors were being granted!

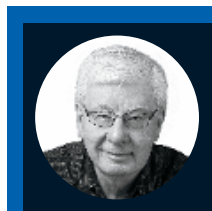
I have met all of the MR editors since John Page and Linn Westcott, except for Paul Larson, though I did correspond with him about articles he sent in to RMC after I assumed the task of lining up each issue's content in 1969 or '70. I even had the privilege of meeting Al Kalmbach when he visited the Purdue University Railroad Club.

I personally thanked Al for establishing such a useful, inspiring, and reputable magazine. I can therefore understand why we modelers go out of our way to welcome such people into our homes, model railroad clubs, and conventions. They do their best to help us enjoy our hobby to the fullest, and they derive enjoyment from doing that.

Back to Eric's visit. Henry Ford preached about "getting out and getting under" (see "Trains of Thought" in the December 2023 issue). You can't learn about what's going on from a comfy chair.

It was therefore a special treat to welcome an old friend and new MR editor to Nickel Plate country as he got a dose of NKP High Speed Service in dark timetable and train-order territory.

And it was good to see a member of a much younger generation so engaged with the hobby. **MR**



MODEL RAILROAD MAGAZINE EDITORS HAVE ALWAYS BEEN TREATED LIKE VISITING ROYALTY.... I HAVE NO IDEA WHY. — TONY

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