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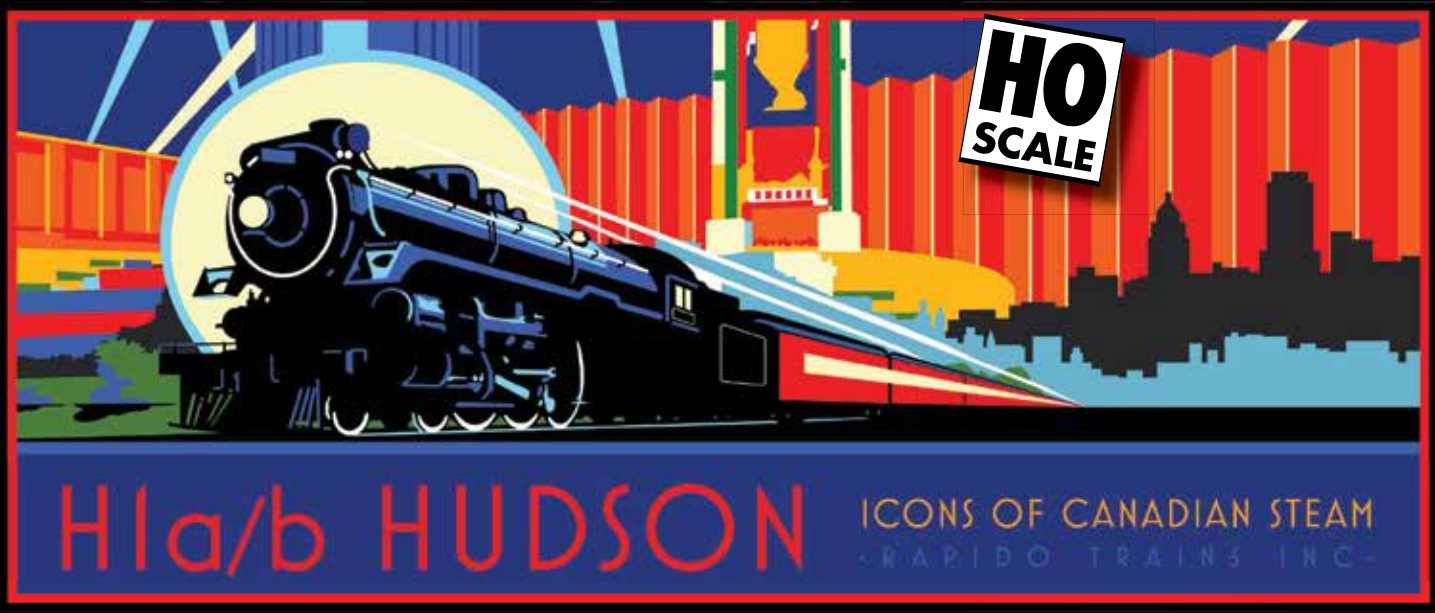

Pre-production sample and preliminary art shown, subject to revision.

Prototype photo courtesy of Adam Meeks.

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AUGUST 2023
Volume 90, Number 8

Features

In every issue

On the cover: It's break time for the plant shifter at the D. Lee Coal Co. tipple on Dale Ridgeway's HO layout. See page 59. Dale Ridgeway photo

Next issue

In September, see how a scratchbuilt structure can boost an old scene. Plus, visit two layouts, see how to install ditch lights, learn about prototypical operations, and more!

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Built by Others: Dave Foxx's HO scale Carolina Sandhills Lines layout

The first installment of the Built by Others article series showcases reader-built layouts inspired by trackplans and projects that originally appeared in the pages of *Model Railroader*. If you've built something inspired by a track-plan from MR, we'd love to hear from you, and possibly feature your layout on Trains.com! E-mail dpopp@kalm-bach.com for more information.

Olympia & Sand Creek, Episode 12

Work continues on the new section of the Olympia project railroad! Host David Popp tackles a variety of tasks in this episode of the Olympia & Sand Creek project series, including paint stripping a passenger car, building a retaining wall with flexible rock sheet, and widening the tunnel on the layout to accommodate wider cars, such as cabooses and passenger cars. Don't miss the action on Trains.com Video!

By Eric White

Tinkerers and mad scientists wanted

Model railroading is a hobby of tinkering and experimenting. Its roots come from engineers trying to work out huge construction problems in the era long before digital computing.

By the late 1800s, toy-making technology and experimental model building began to converge, and it became possible for hobbyists to begin imagining and building model railways for their own amusement.

In the early decades of the 20th century, it was often necessary to combine toys with handmade items to create scale models. By the 1930s, it was becoming easier to find scale model products, and this magazine started as a result of the surge in interest in the new hobby of model railroading.

At the time, it was still largely a hobby of machinists and craftsmen who had the skills and tools necessary to make what they wanted. They soon started to sell off excess stock, and companies such as longtime advertiser Wm. K. Walthers formed to distribute this bounty.

The first golden age began, and hobbyists could buy components to build scale models of locomotives and rolling stock. Getting your train to run was often a matter of the builder's ingenuity. Car batteries were common power sources, but there were modelers who built railroads using household 120V AC current to run their trains. Going up to the attic to run trains must have had a bit of Dr. Frankenstein's laboratory feel to it!

After World War II, advances in manufacturing, especially in miniaturization, plus a booming economy fueled the second golden era of model railroading.

Now we can go out and buy just about anything we want, from superdetailed locomotives to detailed, lighted structures, to digital control for our model trains.

Are we still tinkerers? Yes. Model railroading is a complex hobby combining multiple areas of expertise, and even though we can purchase off-the-shelf components, we still have to figure out how to get them to work together.

Sometimes it takes the craftsman approach to get different brands of track to fit together when no one company offers all of the turnout configurations your layout needs.

Sometimes it takes an electronics specialist to get multiple types of circuits to get a train to traverse a complex track plan.

Sometimes we need to learn a bit of chemistry so that perfect paint and weathering

job comes out just right, or all of those different types of materials stay together in the latest multimedia kit.

This will always be a hobby that encourages exploration, whether it's tinkering to get a train through a turnout or whipping up a batch of casting resin for a lake or stream. We're all tinkerers and mad scientists. Have fun!

Model Railroader

Model railroading is fun!

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Ron Smith found that a technique for building crossovers described by Larry Puckett in our May issue also works for multi-track crossings. Ron Smith photo

Technique makes diamonds easy, too

Larry Puckett's article on "Quick and easy crossovers" [Step By Step, May 2023] provided a nice tracklaying tip. I can confirm the technique works on Atlas N scale Code 55 track, as I have done the same thing with a pair of No. 7 turnouts (although I omitted the wiring step). After doing that successfully, I also tried it with a pair of Atlas diamond crossings. I have a junction where a single-track branch line crosses a double-track main using two 60-degree crossings. This was a little fussier than the turnouts, but the technique Larry described worked very well for this situation.

Ron Smith, DuBois, Pa.

Passing down love for the hobby

Thanks for publishing the article "A tribute to Tony Koester" in the June issue of *Model Railroader*. It captures so much of what a mutual interest in a hobby can mean to people of different generations. Incidentally, my daughter and one of my sons share my interest in model railroading. My daughter told me that years ago when she was shopping for track for her LGB Christmas layout, she knew more than the hobby shop clerk. I was proud!

Albert D. Guckes, Chapel Hill, N.C.

Fixing that formula

I found the article "Build a loop in segments" in the June issue interesting. I wanted to see what the result would be for an N scale application using metric dimensions. After a few corrections, I got the results I wanted.

In the Excel spreadsheet on page 48, the line number is missing. It starts at line 3. Furthermore, the formula in line 20 has many errors. It should be:

=MAX(INT(D17/(D13+D19+2*D19)); INT(D17/(D12+D13+2*D19+(D13-D12)/2)))

Then it gives the same results as written in the spreadsheet. Hope this helps.

Patrick Froucht

Not everyone has same scraps

I've been an MR subscriber forever, and a longtime pet peeve of mine is when a construction article says something like "I got the following key component from my scrap box" or some other source not everyone has. If the author can't tell readers where to buy critical components, MR shouldn't publish the article.

Philip Keogh

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.

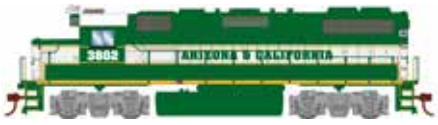
HO scale

Electro-Motive Division GP20 diesel locomotive. This new four-axle road switcher is available decorated for Wisconsin & Southern; Amtrak (fantasy scheme); Arizona & California; Atchison, Topeka & Santa Fe; Burlington Northern Santa Fe (fantasy scheme); Chicago, Burlington & Quincy (fantasy scheme); Commonwealth Ry.; New York Central (fantasy scheme); Penn Central; Toledo, Peoria & Western; Southern Pacific; St. Louis Southwestern; Union Pacific; and United States Army. The model is also available undecorated. Road-specific details include horn type and location, truck sideframes, turbocharger type, dynamic brakes, and more. The model features BLI's Paragon4 sound decoder and sells for $369.99. Broadway Limited Imports, 386-673-8900, broadway-limited.com

HO scale locomotives

- **Electro-Motive Division E8 and E9 diesel locomotives.** Southern Ry.; Baltimore & Ohio; Chesapeake & Ohio; Chicago, Burlington & Quincy; and Union Pacific. Road- and era-specific details including skirts, pilot, lights, and horn placement. Cab interior with seats and factory-installed figures. Constant, directional light-emitting diode lighting. RP-25 contour wheels and Proto-Max metal couplers. Direct-current A-unit, $199.98; direct-current two-pack, $399.98; A-unit with DCC and sound, $299.98; two-pack with DCC and sound, $599.98. WalthersProto. Wm. K. Walthers Inc., 414-527-0770, walthers.com

- **Electro-Motive Division E8A diesel locomotive.** Illinois Central and eight other schemes. Plastic and etched-metal road-specific details including lighting configuration, fuel tanks, roller bearing journal covers, pilot, and side grills. Dynamic brake options and head-end power or steam generator equipment as appropriate. Direct-current A-unit, $239.95; direct-current two-pack, $459.90; A-unit with DCC and sound, $349.95; two-pack with DCC and sound, $669.90. Rapido Trains Inc., 905-474-3314, rapidotrains.com



- **Electro-Motive Division GP38-2 diesel locomotive.** Arizona & California and seven other railroads. Two road numbers per scheme. Road-specific details such as horn type, dynamic brake equipment, cab roof equipment, trucks, radiator grills, and pilot. Operating light-emitting diode ditch lights and/or strobe lights as appropriate. DCC and sound ready with factory-installed speakers and 21-pin plug. Factory-installed Celcon handrails and formed wire grab irons. See-through cab windows. Die-cast frame and all-wheel drive and electrical pickup. $174.99. Athearn Trains, 800-338-4639, athearn.com

- **Q2 4-4-6-4 Duplex steam locomotive.** Pennsylvania RR in four schemes, unlettered, and painted brass. One to four road numbers per scheme. Brass-hybrid construction with brass boiler, cab, and tender body. Die-cast metal chassis. Separate, factory-applied details including handrails, grab irons, ladders, piping, whistle, brass bell, and more. Variable puffing smoke intensity and timing. Direct-current model includes 8-ohm speaker. Direct-current model, $799.99; with DCC and sound, $899.99. Broadway Limited Imports, 386-673-8900, broadway-limited.com

HO scale freight cars

- **89-foot flatcar with bi-level shielded auto rack.** Illinois Central Gulf rack on Trailer Train flatcar and six other schemes. Four road numbers per scheme. Also available undecorated. New body style. Swinging drawbars for 24" and larger curves. Modeler-installed bridge plates for early cars. Detailed

flatcar with Paragon II style rack with side shields. Die-cast underframe and 70-ton trucks with 33" RP-25 contoured metal wheelsets. Proto-Max metal knuckle couplers. WalthersMainline. $44.98. Wm. K. Walthers Inc., 414-527-0770, walthers.com

• **Pennsylvania RR class R7 wood refrigerator car.** Pennsylvania RR and five other schemes. Multiple road numbers per scheme. Warren truss single-sheathed body. Double-flush Miner swing doors. Lap seam or Hutchins roof as appropriate. Split K or AB brakes as appropriate. Archbar or 2D-F8 trucks with metal wheelsets. Rapido semi-scale couplers. Single car, $54.95; two-pack, $109.90; three-pack, $164.85; six-pack, $329.70. Rapido Trains Inc., 905-474-3314, rapidotrains.com

• **Samuel Rea Shops 4600 covered hopper.** Lehigh Valley and three other schemes. Three to 12 road numbers per scheme. Also available undecorated. Road-specific details including brake systems, outlet gates, crossover platforms, and routing boards. Separately-applied wire grab irons and uncoupling levers. Metal corner stirrup steps. Rubber air hoses. 100-ton Barber S-2 trucks with rotating bearing caps. Tangent Scale Models, 828-412-3886, tangentscalemodels.com

HO scale structures

• **Sanders Grocery and Supply.** Laser-cut wood kit with milled basswood and 3-ply birch plywood. Tab-and-slot wall and roof assembly. Peel-and-stick windows, doors, and trim. Rolled roofing. Clear window glazing. Foundation with first and second story floors. Color signage for a variety of businesses. Cast resin soda chest and white metal chimney. Cask for detailing wood decked porch. Measures 4¾" x 2½" x 3⅜". $38.95. American Model Builders Inc., laserkit.com

N scale locomotives

• **Electro-Motive Division F45 diesel locomotive.** Wisconsin & Southern; Great Northern; Montana Rail Link; and Atchison, Topeka & Santa Fe. Two road numbers per scheme. Detailed cab interior. Snowplow or plate welded pilot as appropriate. 4,000-gallon fuel tank. Flush-mounted porthole window glazing. Flexicoil-C sideframes with high brake cylinders. Die-cast metal frame. Bi-directional constant light-emitting diode lighting. All-wheel drive and electrical pickup. Body-mounted McHenry couplers. Direct-current model, $169.99; with DCC and sound, $269.99. Athearn Trains, 800-338-4639, athearn.com

N scale passenger equipment

• **Bombardier bi-level passenger car.** Metrolink (three schemes); New Mexico Rail Runnner; Sounder; and Utah FrontRunner. Multiple road numbers per scheme. Retooled Bombardier trucks with outside brakes. Detailed interior, tinted windows, weathered grills, and decorated diaphragms. Cab cars include horn and bell. Single car, $54.99; three-pack, $149.99. Athearn Trains, 800-338-4639, athearn.com

• **Canadian passenger car sets.** Two eight-car sets available painted for VIA Rail Canada and two Canadian National schemes. *The Rapido* includes one baggage car, one club-galley, one Dayniter, one cafe-bar-lounge, and four coaches. *The Ocean* includes one baggage car, one coach, one Dayniter, one cafe-bar-lounge, two *Bay*-series 10-5 sleepers, and two E-series 4-8-4 sleepers. New club-galley car tooling. Interior light-emitting diode lighting. Full underbody and interior detail. Metal wheelsets. E-series 4-8-4 sleeper *Edmundston* also available separately ($66.45). Eight-car set, $499.95. Rapido Trains Inc., 905-474-3314, rapidotrains.com

Club offerings

• **Chesapeake & Ohio camp car set.** Four-pack of N scale camp cars produced by Micro-Trains Line Co. for the C&O Historical Society. Includes three 50-foot ex-WWII troop sleeper cars and one ex-WWII troop kitchen car. Decorated in standard gray with black lettering. Equipped with Allied Full Cushion trucks, wheels, and standard Micro-Trains Line N scale couplers. Four-car set, $123.95. Chesapeake & Ohio Historical Society, 540-862-2210, chessieshop.com

• **Railroad Museum Friends 40th anniversary boxcar.** Lionel HO scale boxcar produced for the Friends of the Railroad Museum of Pennsylvania. Decorated with a painting and photo of the *John Bull* steam locomotive. Features metal wheels and couplers, positionable doors, and added weights. $40. Friends of the Railroad Museum of Pennsylvania, 717-687-8628, rrmuseumpa.org

TCS CS-105 DCC system

Last month I reviewed the new TCS LT-50 Digital Command Control/Layout Command Control system. This month we'll look at its more advanced CS-105 DCC/LCC system.

To my knowledge the LT-50 and CS-105 are the first DCC systems to actively support both LCC and RailCom. Let's start by exploring the attributes of the TCS CS-105.

The CS-105 is an advanced command station. It supports 9,999 locomotive addresses; 2,044 accessory addresses; and decoder functions 0-28. The integrated booster is powered by either a 12 or 15VDC power supply rated at 6 amps, provided with the unit. This allows the CS-105 to supply track power at either 12 or 15V and a full 5A. Unlike most boosters, TCS says the unit can operate at the full 5A continuously. Other DCC boosters only claim a peak output but require additional ventilation for continuous operation at or near peak.

The advanced circuitry allows the CS-105 to control up to 260 locomotives and consists. Of course, this really is a theoretical value based on processing power, since it would require something on the order of 65 amps or more to power that many locomotives. One other interesting feature is the ability to set up and control up to 300 ten-step macros. These could be used to line routes through yard ladders or complex trackage using a single macro command.

The CS-105 supports both programming on the main and service mode programming. A separate pair of screw terminals are provided for a service mode programming track.

The unit supports the National Model Railroad Association (NMRA) RailCom standard, which allows the command station to communicate bidirectionally with decoders. This allows you to read back CV settings from the decoder even when using programming on the main.

In the future, RailCom will allow computer programs to track the location of locomotives on layouts and report other information such as locomotive speed and direction. However, it does require decoders that support RailCom, which doesn't include many decoders already installed and available in the United States. The only commonly used decoders in the U.S. with RailCom are those from TCS and LokSound.

Layout Command Control (LCC) was developed to serve as a parallel communications and control system. The basic idea is it reduces the need for the DCC power bus to operate accessories, freeing up its resources for operating locomotives. However, it also potentially makes it easy to mix DCC components from various systems on the same layout, including throttles.

Throttles are an important aspect of any DCC system, and the CS-105 offers several ways to connect them. First is the yet-to-be-released, hard-wired TCS T-50 throttle. It will plug directly into one of the LCC sockets on the CS-105 or an expansion throttle network.

A second option is to use one of the TCS wireless Wi-Fi throttles, such as the UWT-50 or UWT-100. These can connect directly to the CS-105 via its built-in Wi-Fi interface.

A third option is to use the auxiliary network socket on the rear of the unit (see photo on opposite page) to connect throttles from NCE, Ramtraxx, SystemOne, Lenz, Roco, or ZTC.

Finally, should you wish to use one of the Wi-Fi apps such as WiThrottle or Engine Driver on a cell phone or tablet computer, that requires connecting through DecoderPro via a wireless router. [See this month's DCC Currents to learn more on that topic. – *Ed.*]

This last option requires some complicated setup, since you must access the CS-105 system settings. I used my UWT-100 throttle for that. Once in the system settings menu, you need to locate the internet address assigned to the CS-105

Facts & features

Price: $529.95

Manufacturer

Train Control Systems Inc.
P.O. Box 341
Blooming Glen, PA 18911
tcsdcc.com

Features

- Full feature DCC/LCC command station with integrated booster
- 12VDCC or 15VDCC 5 amp track power
- 12VDC or 15VDC 6 amp power supply
- Supports 2- and 4-digit decoder addresses; accessory decoder addresses 1-2,044; National Model Railroad Association (NMRA) functions 0-28; NMRA LCC and RailCom; JMRI (DecoderPro) and other computer programs via hard-wired and Wi-Fi interfaces; and smartphone and tablets using WiThrottle and EngineDriver apps using DecoderPro via built-in Wi-Fi interface
- Up to 300 ten-step macros; 260 simultaneous locomotives and consists; 4 LCC Wi-Fi throttles with internal Wi-Fi Access Point; 10 LCC Wi-Fi throttles with external Wi-Fi Access Point (wireless router); 250 LCC throttles wired or via aux Wi-Fi base stations; 62 wired throttles (NCE, Ramtraxx, SystemOne) via aux RJ11 socket; and 31 XpressNet wired throttles (Lenz, Roco, ZTC) via aux RJ11 socket

by your wireless router and enter that in the LCC preferences in DecoderPro. This complex process wasn't completely covered in the TCS documents, and I had to contact its tech support for assistance in finding the internet address. I hope TCS will provide more detailed instructions for this process either in a revised version of the manual or on its website.

One thing made clear from this process is that one of the TCS throttles is almost a necessity for using the CS-105. While you can connect to a computer using the internal Wi-Fi to access many of the CS-105's features, it's much easier using the menu-driven approach with the UWT-50 or UWT-100. Fortunately, TCS does offer special bundles on its website that include these throttles at a reduced price.

While the UWT-50 and UWT-100 throttles, B-106 booster, and BA-100 booster adapter are available, some other devices are still under development. The B-106 is an LCC-compatible, 5 amp

booster. The BA-100 makes it possible to use boosters from other manufacturers with the CS-105.

In addition, RR-CirKits makes a variety of LCC accessories that are compatible with the CS-105. These provide the ability to connect to a Digitrax LocoNet and use Digitrax throttles and other LCC equipment.

When it came to operating locomotives, I had no problems using either the TCS UWT-100, NCE ProCab, my cell phone with the WiThrottle app, or the virtual throttle in DecoderPro. Locomotive response was quick and functions operated without any delay. Consisting can be done using the usual basic and advanced methods, since that information is stored in the decoders. However, command station-assisted consisting is just a bit different with the CS-105 than with most DCC systems.

TCS allows you to store a roster of locomotives and assign various functions to each specifying how they operate alone or as part of a consist. In that respect, the TCS approach is similar to advanced consisting. The roster and consist information can be entered using a TCS throttle or a computer. Consists are then assembled using the throttle or computer. Both the roster and consists are stored in persistent memory in the command station. Once any locomotive is selected using a throttle, all the engines in that consist will respond.

The CS-105 is by far the most technologically advanced DCC/LCC system manufactured today. The extensive list of features and the wide variety of throttles supported should make it popular with clubs as well as power users who want the latest technology. However, be ready to do some reading as you climb the learning curve. For a video demonstration of the CS-105, visit my YouTube channel "The DCC Guy." – *Larry Puckett, contributing editor*

Atlas HO scale GE U28CG diesel locomotive

A General Electric U28CG diesel locomotive has joined the Master Line from Atlas Model Railroad Co. The newly tooled HO scale six-axle locomotive features railroad-specific details, etched-metal grills, and factory-installed and painted crew figures.

Atchison, Topeka & Santa Fe was the only road to order the steam generator-equipped U28CG. A mere 10 units were built between July and August 1966. The 2,800 hp dual-service units, numbered 350-359, were equipped with an FDL16 diesel engine and a split fuel tank for boiler water and diesel fuel.

In April and May 1970, the U28CGs were renumbered 7900 through 7909. After Amtrak began operations in May 1971, Santa Fe removed the steam generator equipment from the locomotives and reassigned the six-axle units to freight service. The U28CGs were repainted into Santa Fe's pre- and post-1972 blue-and-yellow freight schemes.

Santa Fe retired its fleet of U28CGs in September 1980. The units were used as trade-in credit on the railroad's order of GE B36-7 diesels. All 10 were scrapped.

The Atlas Master Line GE U28CG has an injection-molded plastic shell and die-cast metal body. The front and rear pilots have separate, factory-applied plastic m.u. hose clusters, a trainline hose, and an uncoupling lever. The plow on the front pilot has a different profile than those I saw in prototype photos.

Rooftop details include a three-chime air horn on the front edge of the cab; steam generator detail on the long hood; and molded hinge, lift ring, and door handle detail. The molded details are complemented with etched-metal intake and radiator screens.

Our sample is neatly painted in the red-and-silver warbonnet scheme. The lettering and stencil placement matches prototype photos.

Information on the Atlas website calls this the "as-delivered" scheme, but that's not entirely accurate. From the factory, the U28CGs had red pilots, black trucks, and a black fuel/water tank. In 1967 these areas were repainted aluminum and the vertical handrails were painted yellow. The bottom of the positionable drop step should also be yellow.

I compared the diesel to prototype drawings of a U28C in the July 2001 issue of *Model Railroader*. The model closely follows published dimensions.

The U28CG sample we received has a dual-mode ESU LokSound sound decoder. Atlas recommends using a variable-voltage power pack for direct-current operation. Similar to other locomotives equipped with a dual-mode decoder, the U28CG has a higher starting voltage and limited functions in DC.

To enjoy the full range of features, I tested the locomotive with an NCE PowerCab. The model moved at 2 scale mph at step 2, and achieved a top speed of 66 scale mph at step 28.

I then took the unit over to our Milwaukee, Racine & Troy for real-world testing. The unit pulled a passenger train across the layout without any issues. The U28CG was able to muscle 14 50-foot boxcars up the 3 percent grade between Bay Junction and Skyridge.

In addition to the U28CG, Atlas also offers the U28C in five paint schemes plus undecorated. Between the U28C and U28CG, only 81 prototypes were built. Most lasted from the mid-1960s through the 1980s, with a few holding on into the early 1990s.

If you're in the market for a new HO scale locomotive, you'll want to check out these six-axle General Electric units from Atlas. – *Cody Grivno, senior editor*

Facts & features

Price: Direct-current model with 21-pin plug and factory-installed speaker, $189.95; with dual-mode ESU LokSound sound decoder, $299.95

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

Era: 1967 to April-May 1970 (as decorated)

Road names: U28CG – Atchison, Topeka & Santa Fe (silver-and-red and blue-and-yellow warbonnet). U28C – Conrail, Louisville & Nashville, Pennsylvania RR, Southern Pacific, and Union Pacific. Three road numbers per paint scheme; also available undecorated (U28C, with and without nose headlight)

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A hot-air-type switch heater protects this switch-style derail from freezing up in winter. The combustion chamber, stack, and air handler are at left. Ducts in the gauge of the track route hot air against the side of the rails. M.R. Snell photo

The secret life of switch heaters

Q How do switch heaters work? And how can I model one?

Bob Kolankoski

A Over the years, railroads have tried many different methods to keep switch points from getting clogged with ice and compacted snow. One of the earliest was placing burning smudge pots between the rails. Later, more permanent switch heaters were invented.

One simple type was gas pipes routed to the outside of the rails and ignited, creating the spectacular sight of flames licking up alongside the track. You could model a switch heater like this fairly easily by bending and soldering together brass wire to represent the branching gas pipes. This method is still used in areas like yard throats, where tracks are too close together for the trackside hot-air switch heaters that are more common in remote locations.

Hot-air switch heaters use a gas burner or electric heating element to heat air that is then forced through ductwork under and between the rails to melt snow and ice. This distinctive piece of equipment is often accompanied by a trackside propane tank that supplies the fuel for the burner. Frequent *Model Railroader* contributor M.R. Snell wrote an article for our June 2021 issue about modeling this more modern kind of switch heater. Custom Finishing Models makes the cast-metal kit he used in his HO scale version (part no. 283). Another cast-metal hot-air switch heater kit is offered by Details West (part no. SH-924).

If you don't want to go that route, a trackside switch heater and its accompanying ductwork is typically blocky enough to be modeled easily in styrene strip and sheet.

Electric switch heaters are even easier to model. Do an online image search for "railroad switch heater" and you'll see, among the pictures of the two kinds I've described, electric heaters. These resemble wires secured by clips to the outside web of the rail. You could model a switch heater like this with brass wire, though in most modeling scales, it wouldn't be visible. A trackside cabinet for electrical equipment would help to identify the heater's location. If you model a snowscape, an area of dark (wet) ties and rail visible through a rectangular patch clear of snow would let the viewer know what was going on.

Q A fellow club member and I just started running the Walthers troop cars on the club layout. We are having problems with the troop sleeper cars derailing on the 36" curves. Can you suggest a solution to this problem?

Alan Cox

A If those are the only cars having derailing problems on those curves, the problem must be with the cars. The first thing you should check is if all the wheels roll smoothly, don't wobble, and aren't loose in the sideframes. Then check the gauge of both the wheels and the track with your National Model Railroad Association standards gauge.

Next, check that the trucks can pivot freely. The prototype they were modeled after never had to handle curves nearly as sharp as those considered broad on our layouts. So cars faithfully modeled on those prototypes sometimes have trouble with below-the-frame details. If you find that the vestibule steps, drop steps, center sills, screws, air lines, or other such items contact the trucks when they turn, take a jeweler's file to the parts that get hung up so the trucks can clear the obstructions.

Finally, check that the truck mounting screws let the trucks pivot as they should. One truck on each car should be tightened so that it rotates freely, but doesn't wobble. The other should be slightly looser so it can tilt to stay on uneven track.

Q I was recently given some older HO scale hopper cars that apparently had snap-on trucks. What method do you recommend to fill in the hole so I can replace snap-on trucks with the screw-on type? I gather I would use 2-56 screws?

Artie Krass

A What you use to fill in those holes in the underframe that the pins used to snap into depends on what the underframe is made of. If it's plastic, it's probably styrene or ABS. Drill out the hole using a 1/8" drill bit. Then glue a piece of 1/8" tubing into the hole using a glue that works on many different kinds of plastics, like Plastruct Plastic Weld.

Once the glue has cured, snip off the end and sand it flush with the bolster's

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

center plate. (Make sure you don't sand down the bearing surface of the center plate itself, or you'll end up lowering the car, possibly causing problems with uncoupling and derailing.)

According to styrene tube maker Evergreen Scale Models, the inside diameter of its 1/8" tubing is .069". Typically, you'd use a No. 50 tap drill prior to using a 2-56 tap. However, the hole in the tubing is wider than the bit. In this case, you can simply thread the tubing with a 2-56 tap in a pin vise or tap wrench. Work slowly and keep the tap perpendicular to the model.

If the hole the plastic pins snapped into is already larger than 1/8", you'll have to do the same sort of thing, but in two steps. Drill the hole out with a 3/16" bit, glue in a piece of 3/16" tubing, then glue a piece of 1/8" tubing inside of that. Then, drill (if needed) and tap as before.

If the underframe of your car is metal, though, you have a couple options. You can drill out and fill the hole with styrene tube as before, but you'll have to use gap-filling CA or

To replace snap-on trucks with screw-mounted ones, you may need to rebuild the car's truck bolsters with styrene tubing, tapped to accept 2-56 screws.
Andy Sperandeo photo

epoxy cement to secure it. The other option is to melt some solder into the hole and let it solidify. It might be difficult to drill out the exact center of the plug, though. And if it's not possible to temporarily remove or otherwise shield nearby plastic details from the soldering iron's heat, stick with plastic.

Q I have acquired a vintage Suydam "Purina Chows" feed mill kit. What would be contained in the silo part of the building (grain or feed) and how did those feed dealers receive grain? Dumping grain from a boxcar seems a bit messy, and covered hoppers were not in use until the mid-1950s. I model the transition era up to 1955. I don't think that individual sacks of product would be used to fill the silo. Was there a collection grate on the siding?

Tom Hiser, San Diego, Calif.

A The Suydam kit represents a fairly small feed and seed dealer, with a modest-sized grain bin. The bin might have been separated internally into individual compartments to hold different blends of grain for feeding poultry, cattle, sheep, etc., but with a bin that small, it could have just held a single product.

It's entirely plausible that such small feed dealers might not receive grain by rail at all, but rather from local farmers. But you're interested in a rail-served business, so let's look at the options.

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Montgomery Feed & Seed, a small feed mill on the Milwaukee, Racine & Troy, has no trackside unloading grate. It receives its wares in sacks. Steven Otte photo

Before covered hoppers became a popular way to ship grain in the 1960s, railroads hauled it in boxcars, either in sacks or in bulk with the grain held back by grain doors nailed over the door openings. So it wouldn't have been unusual for a smaller business like Suydam's Purina Chows to receive its wares in sacks and not have an unloading grate or chute.

Larger and busier industries received grain in bulk in boxcars fitted with grain doors. Made at first of reusable wood planks, then later of single-use paper and cardboard designs (all were used into the 1970s), grain doors were secured inside the openings of boxcar doors, covering them about ¾ of the way up. Loading chutes were then poked through the openings and the grain was poured inside. When these boxcars arrived at their destinations, the grain doors were removed, and the grain poured out.

How the grain got from the boxcars to the business' elevator varied. Some had an unloading grate next to the building, alongside the tracks. This grate would be protected from dirt, weather, and vermin with ground-level doors that would be closed when not in use. Since a spectator's view of the grate would be blocked when a car was spotted alongside, the grate itself need not be modeled, just the closed doors.

Other such businesses had different unloading methods. Sheller Feed Co., a prototype dealer that was the subject of an article in our August 2009 issue, had an unloading chute that folded down from the side of the building. When open, it extended under the doors of the boxcar to catch the grain. However, when it was closed, the chute just looked like a Y-shaped panel on the side of the building. Adding a piece of stripwood representing a closed unloading chute to your kit would be a simple matter. MR

By Cheryl Sassi

How to model white pines

As company arborist for the On30 Sandy River & Rangeley Lakes RR, I've been busy constructing trees over the past few years. In the April 2019 issue of *Model Railroader* magazine I described my techniques for building hardwoods. In the March 2020 issue, I shared my methods for modeling white birch trees. I recently decided to try my hand at white pines for a grove of trees on the outskirts of Kingfield, Maine.

The inspiration for this project came from Mike Confalone's HO scale white pines. Instead of using ground foam on his trees, Mike simulated pine needles with static grass flock. The finished trees were quite convincing.

I adapted Mike's techniques and made a grove of old and new growth white pines for the SR&RL. Though scratchbuilding trees is time consuming, the finished products are worth the effort.

Cheryl Sassi worked in the finance department for General Electric Co. in Schenectady, N.Y., for 32 years. She is the wife of Model Railroader *contributing editor Lou Sassi.*

Cheryl Sassi scratchbuilt white pines for the On30 layout she works on with her husband, Lou. Cheryl used static grass flock to simulate pine needles. Photos by Lou Sassi

STEP 1 WHAT YOU'LL NEED

The photo at right shows the various materials I used to model the white pines. I used peppergrass stems, Caspia, 18AWG wire, floral tape, wire cutters, and scissors to shape the trees. I found the peppergrass, also referred to as sesame bloom, that I used for hardwoods from Teresa's Plants & More (800-803-8056, teresamaekessler@gmail.com). I ordered the Caspia, used for evergreens, from Save on Crafts (800-928-6175, laura-c@list-companyinc.com).

Aerosol products used for the project include Rust-Oleum Painter's Touch 2X semi-gloss Hunter Green (262395) and Stops Rust satin Spruce Green (7737830), as well as Testor's Dullcote (1260).

In addition to spray paint, I used Mars Black, Raw Umber, and white tube acrylics and Model Master Earth, Engine Black, Reefer White, and Roof Brown. Testor Corp. discontinued the Model Master line in April 2020, but similar colors are available from Acrylicos Vallejo and Tamiya. Assorted brushes and a metal palette round out the paint products.

I used Heki No. 3362 Dark Green static grass flock for pine needles. I applied the fibers with a Noch GrasMaster.

Among the hand tools you'll need are a hobby knife with a No. 11 blade, a pin vise with a No. 68 bit, a plastic stylus, and a ruler. General purpose items include hair spray, facial tissue, wood glue, a block of foam, and water.

STEP 2 BUILDING TREES

I constructed the trunk on old growth trees by wrapping peppergrass stems and 18AWG wire with floral tape 1.

Then, using a scale rule, I established the heights of the trees. The tree shown above is 56 scale feet tall. The two large trees in the lead photo are a scale 52 and 48 feet. I left wire below the base for planting the tree in foam.

After randomly cutting slits in the trunk with a No. 11 blade in a hobby knife 2, I dipped the Caspia branches in wood glue and pushed them in place 3. Since I was modeling a White Pine, I made the top of the crown more rounded than a spruce or cedar.

Once I'd added more foliated Caspia branches around the top and middle of the trunk, I inserted assorted lengths of Caspia stems and other sticks to the lower trunk to represent dead branches that would have been shaded out and/or broken off 4.

STEP 3 ADDING TEXTURE AND COLOR

With all the branches in place, I used a brush to apply tube acrylics to thicken the trunk and the branches where they met the trunk 1. As the acrylics dried, I carved in bark texture with a scratch art plastic stylus 2. You can find the plastic stylus at well-stocked art and craft stores and through various online retailers.

I let the tube acrylics dry overnight. Then I used lengths of ripped up facial tissue to mask the trunk 3. Do this carefully so you don't break any of the Caspia branches.

I spray-painted the foliage with Rust-Oleum Hunter Green 4 (page 26), followed by an overcoat of the same company's Spruce Green 5.

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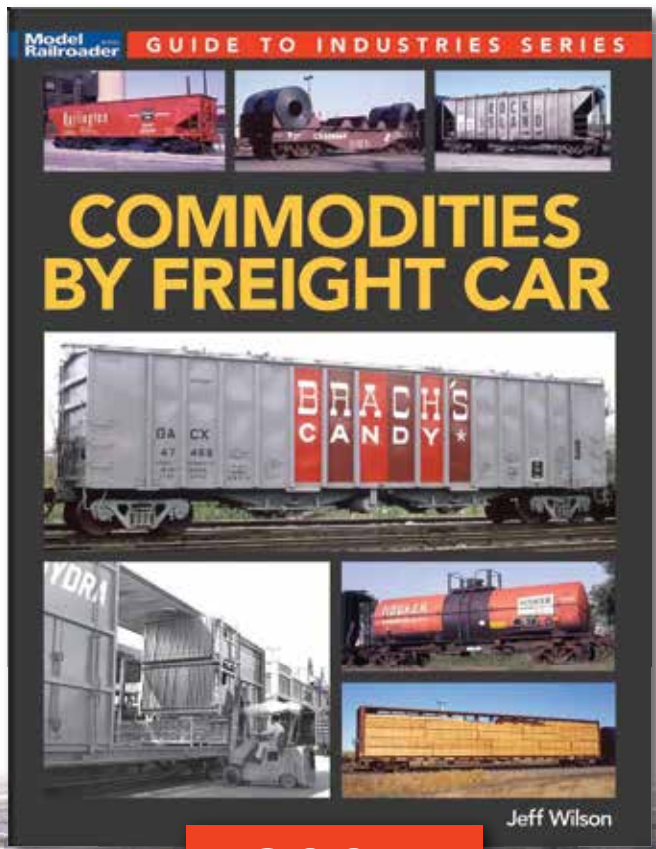

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STEP 3 ADDING TEXTURE AND COLOR (CONT'D)


4


5


6

After the spray paint had dried (5-9 hours for handling; 24 hours to fully dry), I gently removed the facial tissue. I then brush-painted the trunk and branches with a blend of Model Master Reefer White, Roof Brown, Earth, and Engine Black acrylics using a soft brush.

I wrapped up this phase of the tree-building project with some more brush work. I drybrushed black under the branches to create shadows. Then I alternated between light and dark brown, black, and earth to give the bark a realistic appearance 6.

STEP 4 FLOCKING AND FINAL TOUCHES


1


2


3


4


5

I reinstalled strips of facial tissue and sprayed the Caspia with hair spray 1. Then used a Noch GrasMaster to apply 2mm Heki dark green static grass flock to the branches 2. I used a small, stiff-bristle brush to remove any excess fibers from the trunk and branches 3. I misted the tree with Testor's Dullcote to help hold the remaining fibers in place and eliminate any sheen from the hair spray 4.

Other than using a No. 68 bit in a pin vise to drill holes for the branches in the trunk (5) and adding fewer dead branches, I used the same technique for the new growth pines. When building an HO scale pine, regardless of size, use a pin vise to make holes in the trunk instead of a No. 11 blade, as the trunk is smaller in diameter compared to those I built for our layout.

The president of the On30 Sandy River & Rangeley Lakes liked the white pines I built so much that he wants at least three dozen more for the wooded scenes around the layout. I'd better get back to the workbench! MR

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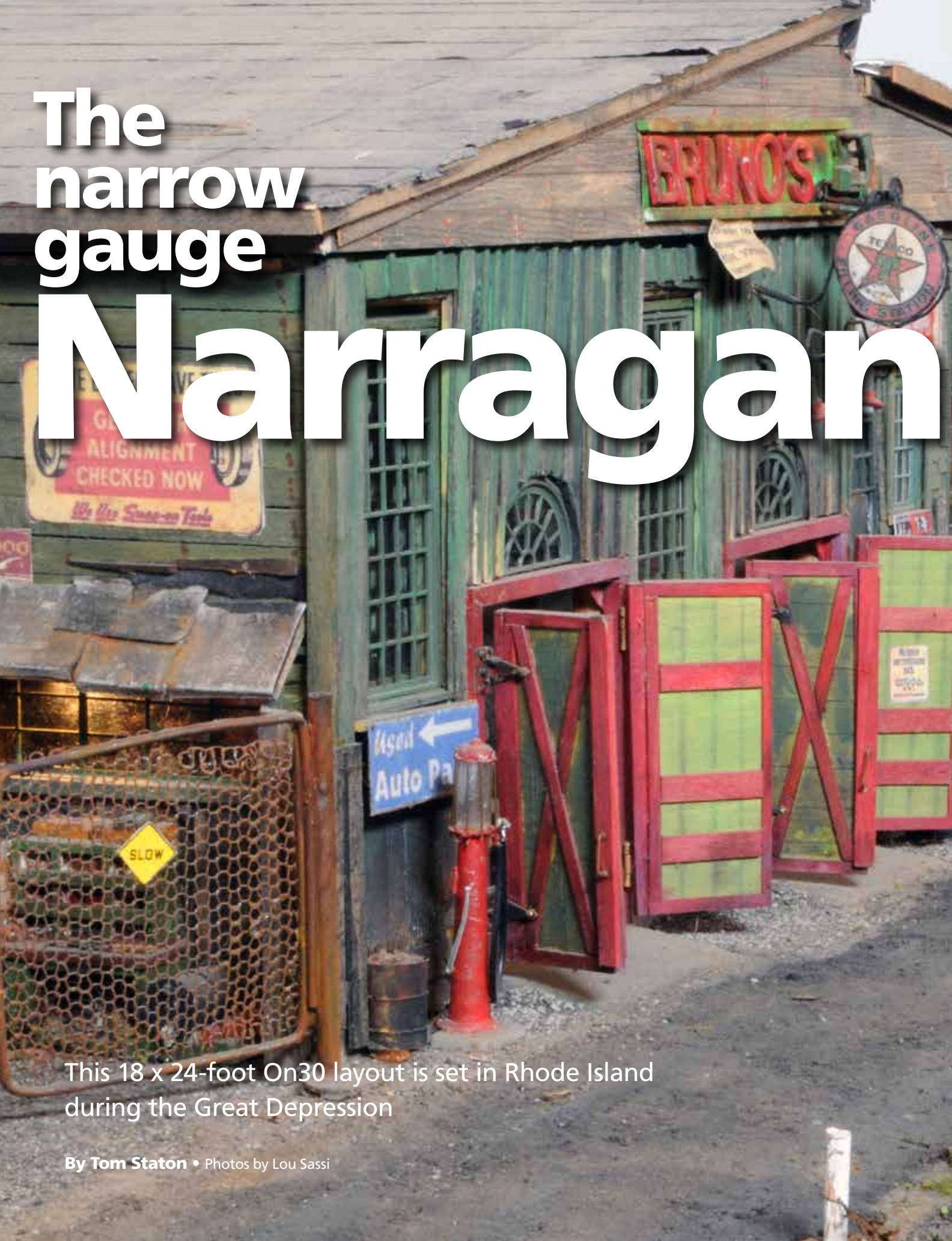
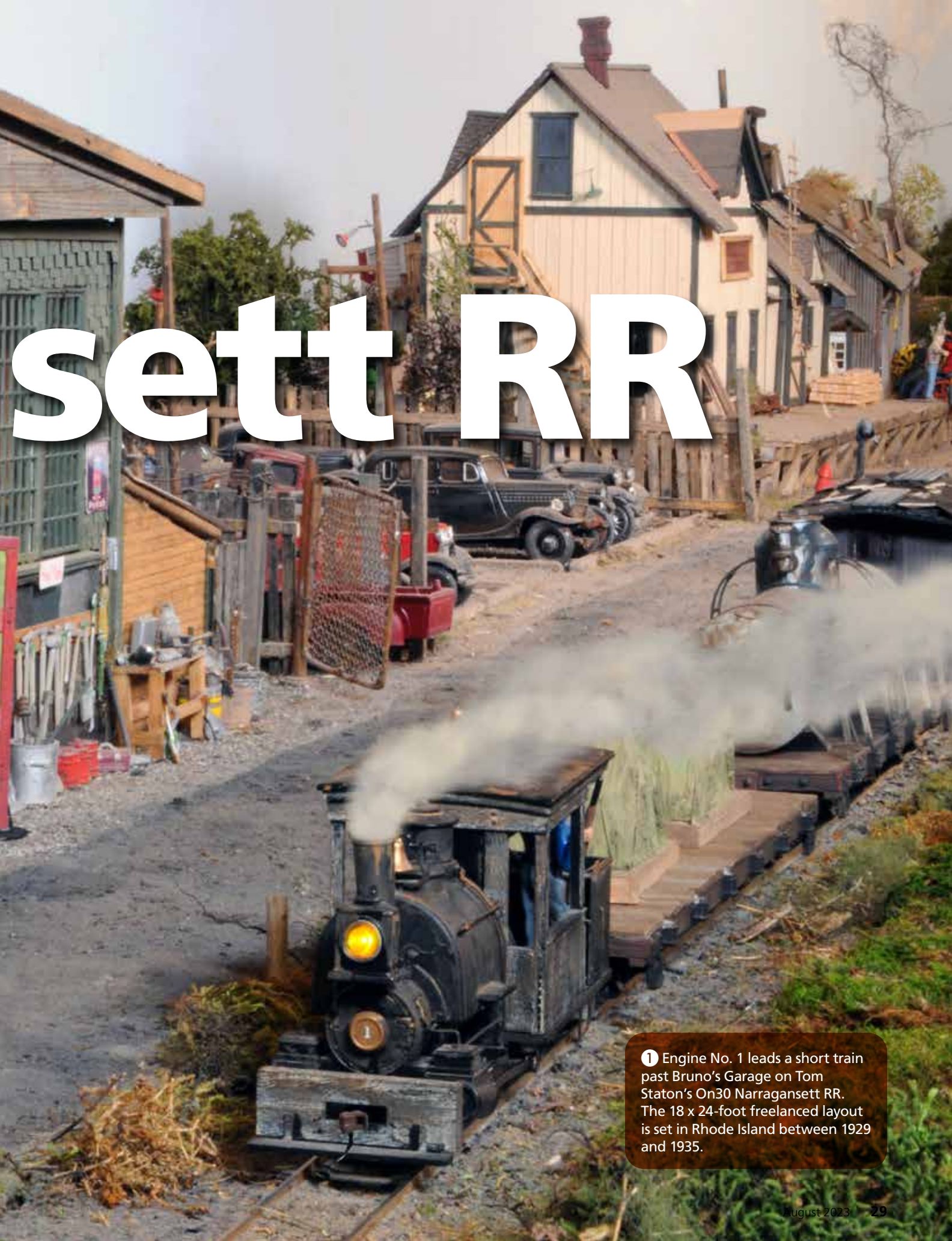
The narrow gauge Narragan



This 18 x 24-foot On30 layout is set in Rhode Island during the Great Depression

By Tom Staton • Photos by Lou Sassi

sett RR



❶ Engine No. 1 leads a short train past Bruno's Garage on Tom Staton's On30 Narragansett RR. The 18 x 24-foot freelanced layout is set in Rhode Island between 1929 and 1935.

2 Narragansett RR 0-4-2 No. 1 rumbles past the Salt City Locomotive Works. Tom uses the roots from weeds and other natural materials from his property to scenic the model railroad.

This is the story of an old model railroader and a broke and broken-down railroad, The Narragansett RR. The 18 x 24-foot On30 layout is set in Rhode Island between 1929 and 1935.

This is my seventh and final model railroad. I started off with N scale, then built two HO scale layouts. After that I moved onto On3, indoor G scale, a Gn15 diorama, and finally, On30.

Finding the fun

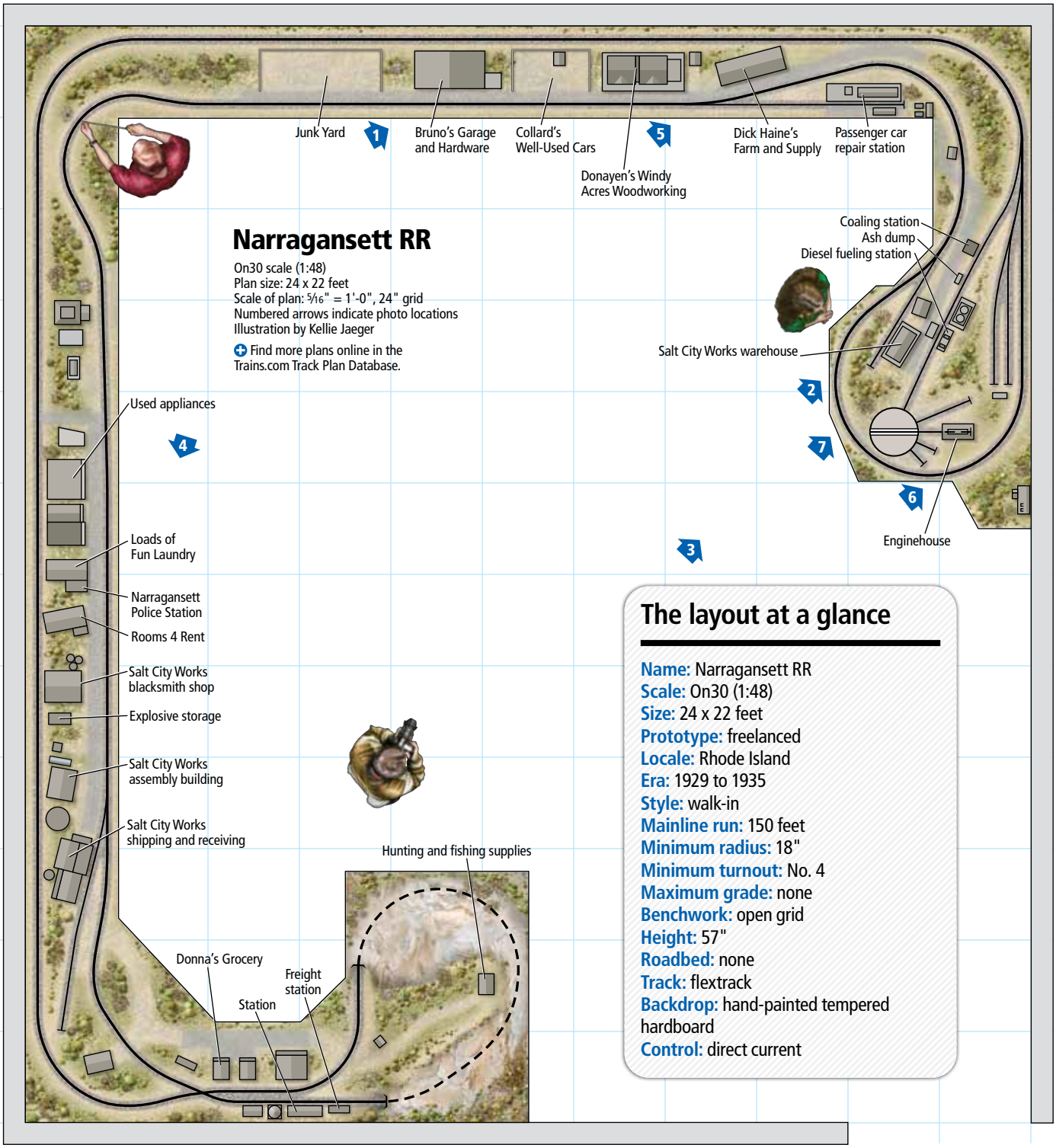
First, understand that I've never been much into operating layouts. I'm more interested in scenery. Without towns and such, there would be no need for a railroad to service empty space.

As construction progressed, my friend Dave and I started out wiring with all-new, easy-to-install switch machines and such. At first I thought that would be exciting. I was wrong. After spending three work sessions trying to get everything to work, I threw in the towel. This was not going to happen.

3 This overall view shows how Tom's model railroad fits in the layout room. His workbench and neatly organized stock of scratchbuilding supplies are on the left.

I took a step back and thought about the happiest time I had as a model railroader. The answer was easy. When I was about 7 years old, I saw what I thought was the biggest model railroad ever. My friend Don and his brothers arranged three 4 x 8 sheets of plywood in a U shape. That was just what I wanted.

What was holding me back? I had all the room to build a layout almost in the same U shape, only larger and in what is thought of as a dogbone. With only eight turnouts, half of which are in the engine yard and within arm's reach, why not use ground throws? The turntable could be manually operated, too.



The layout at a glance

Name: Narragansett RR
Scale: On30 (1:48)
Size: 24 x 22 feet
Prototype: freelanced
Locale: Rhode Island
Era: 1929 to 1935
Style: walk-in
Mainline run: 150 feet
Minimum radius: 18"
Minimum turnout: No. 4
Maximum grade: none
Benchwork: open grid
Height: 57"
Roadbed: none
Track: flextrack
Backdrop: hand-painted tempered hardboard
Control: direct current

The layout height is 57 inches tall, a little taller than most. I chose this for two reasons. First, I wanted to avoid viewing it from above and seeing 25 percent or more of the layout at one time. Second, I wanted to preserve the various superdetailed scenes around the layout. A side benefit of the height is that it gives forced perspective. This really makes the layout seem larger than just 24 x 22 feet.

Doing things differently

I must give credit to three people: Martin, Gary, and Dave.

Martin, Gary, and I started the "Syracuse Workshop" years ago along with our friend Brian, who has sadly since passed.

I've always tried to do things a little different and with a lot of humor.

I always try to avoid the "loop look," which every model railroad has no matter how big or small. My layout still goes from one end to the other. However, in order to do that, the track is laid close to the front edge, then loops around and runs behind the buildings, fences, and scenery on the back edge, thus making it seem larger than it really is. It also allows me to have a mainline run of 150 feet.

4 The Narragansett RR runs along the only street in Peace Dale. Tom's effective use of washes is visible on the various structures that line the dirt road through town.

Quick and easy weathering

The first thing to know is that I don't paint in the traditional sense of the word. However, I do spray any non-wood items with either a dull black or dull white. Then I apply multiple washes.

I start by dipping the tip of a brush in paint, then in water. Next, I dab the diluted paint on whatever I'm working on and let it flow. I repeat the process here and there. Then I go over the surface once more with a slightly less diluted paint.

Once satisfied with the appearance and the paint is dry, I apply a mild mix of black ink and alcohol. This simultaneously adds highlights and shadows. If I don't like the look, I use a toothbrush to remove the wash and try again. It takes a little practice.

You can use similar techniques with figures. A quick wash makes the details on painted figures stand out. – *Tom Staton*

5 A colorful lineup of tractors at Dick Haines Farm Supply & Service catches the attention of local residents. All of the structures on Tom's layout are scratchbuilt or kitbashed and everything is weathered.

All-natural scenery

One of my hobby strengths is realistic scenery. One motto I've followed is "nothing looks as real as real."

I'm frugal, to say the least. The main ground cover is real dirt sifted down to a powder. I then apply white glue and spread it unevenly. With the glue still wet, I sprinkle in the dirt.

Once the dirt is applied, I spray it with non-aerosol hair spray that I buy at a dollar store. After that's dry, I apply an India ink wash here and there.

If you live in an area that has damp or moist air and shade, go outside and find some green moss. You'll quickly notice that the moss is many different shades of green. It's not uniformly shaped, either. Grab it, tear it apart as needed, and glue it down. The moss doesn't need to be watered. To my best understanding, it gets moisture out the air. Should it ever dry out and turn brown, just stain it with a light green ink and alcohol.

In addition to dirt and moss, I also use wild shrubs and weeds. However, I don't use the parts that are visible above ground. Instead, I use their roots. The root structure, which is stiff, has a shape similar to trees. Most are shades from brown to gray. I spray the roots with aerosol glue and sprinkle on different shades of fine ground foam.

This technique yields realistic and affordable trees. Though plastic and other artificial products are OK, most have a uniform shape and color.

Don't forget that roots can represent dead trees, too. Leafless trees add interest to wooded scenes.

A run-down railroad

Looking at the photos, you might notice that most everything is broken down. The Narragansett RR is financed by the Salt City Locomotive Works. The company's president, Dave Wierowski, always seems to purchase secondhand junk. Examples include the coal loader that we didn't need and never got running, the sanding loader that just dumped sand on the ground, and the double water tank that leaked so badly it flooded the area.

The Climax locomotive that was going to save the railroad a lot of money lasted about a week. It did come in handy when the diesel generator that ran the electricity on the railroad and to some of the businesses in the area broke down. The workers in the area are still trying to figure out how to hook up the

6 Well-detailed scenes like this one draw visitors into Tom's On30 model railroad. The ground cover is sifted soil. Washes applied to the figures make facial details stand out and the trousers look dirty.

7 Many structures and pieces of equipment on the Narragansett RR were acquired secondhand. The 2-6-0 is missing its pilot truck, and the double water tank has a bad leak.

steam from the Climax to turn the electric generator. Good luck with that.

All of my structures are either scratchbuilt or kitbashed and aged with multiple washes [See "Quick and easy weathering" on the previous page. – *Ed.*] Everything is weathered, even the figures. The figures on the layout aren't posing for a magazine photo shoot after all (well, in this case they might be). I think scenery and structures should be detailed to the point that when people come to visit, they see the layout first and the trains second.

There are a lot of details to take in on the 18 x 24-foot model railroad, which I hope will bring a smile to your face. Please don't look for perfection, as it's not always there. But model railroading should be fun, and that's what the Narragansett RR all about. MR

Meet Tom Staton

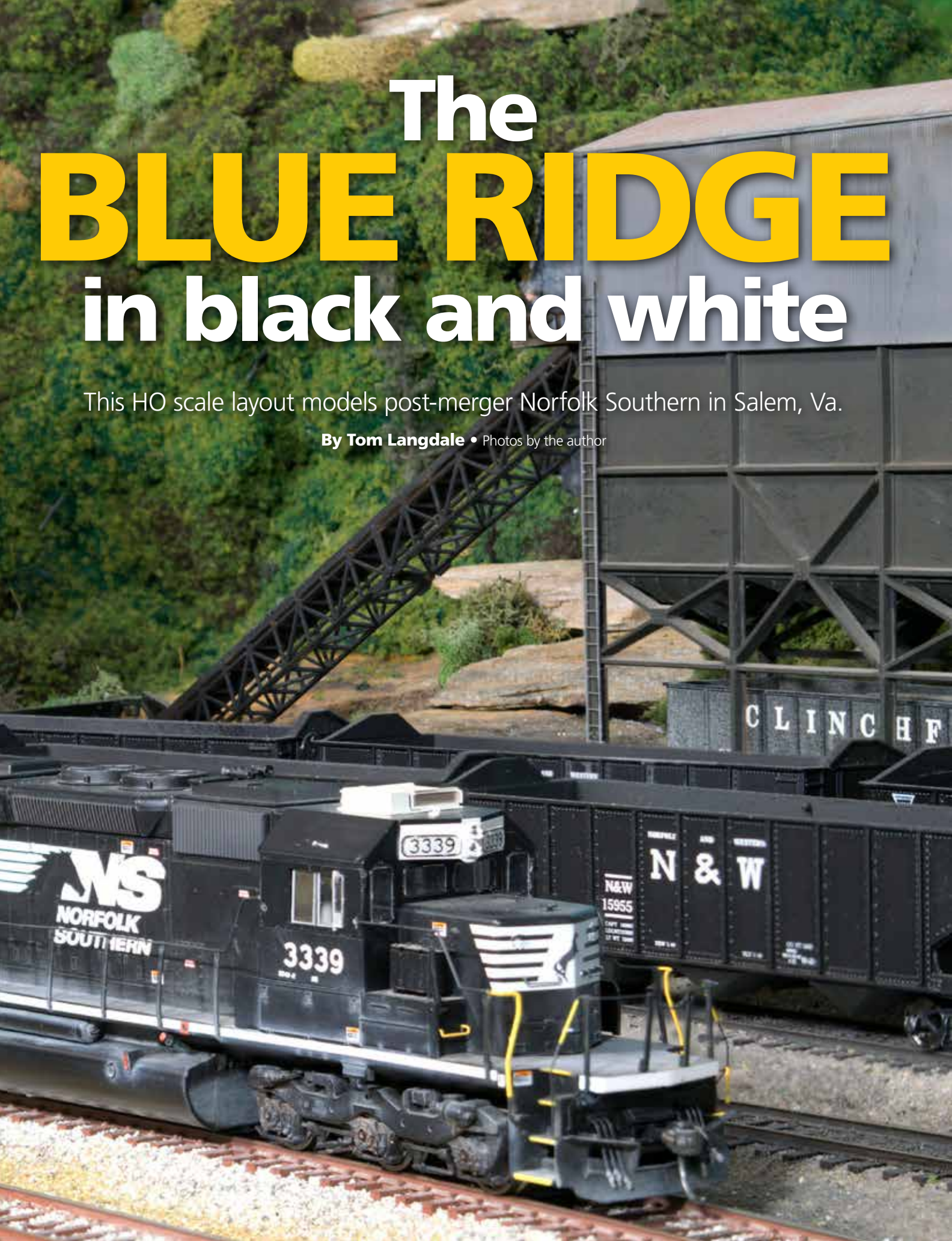
Tom Staton was born in Rhode Island in 1946. He lives with his wife, Donna, and their dog and cat in a log cabin in the Finger Lakes region of New York. Tom's previous On3 Narragansett RR appeared in the October 2015 issue of *Model Railroader*.

1 Norfolk Southern No. 3339 and 3375 lead their train past Hudson Coal Mine near Salem, Va., where Norfolk & Western-painted coal hoppers are still in use. Tom Langdale's HO scale Salem Division layout is set in 1991, shortly after the merger, but it rosters a wide variety of vintage and modern diesel power.

The BLUE RIDGE in black and white

This HO scale layout models post-merger Norfolk Southern in Salem, Va.

By Tom Langdale • Photos by the author



Many years ago, when I was 13 years old, my cousin's husband, Steve, introduced me to the world of model railroading. When I would visit him in Charleston, S.C., we would sit at the kitchen table long into the evening hours, he with his coffee and me with whatever a teenager drinks, constructing buildings from cardstock and toothpicks. This was when I caught the model railroading bug that has stuck with me for some 50-plus years.

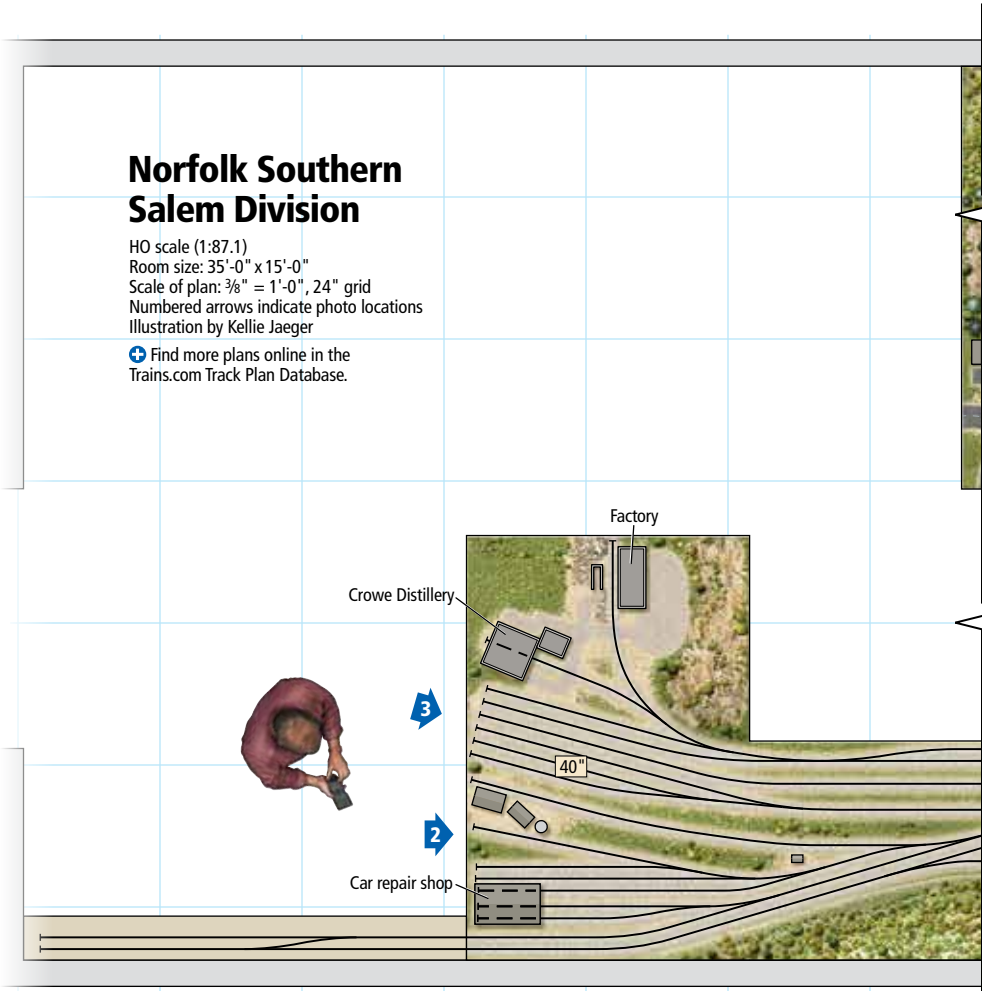
While riding the bus to school, I told one my friends about the trains and the hobby. As it turned out, his neighbor, Mr. Mooney, was also a model railroader. I spent many hours in Mr. Mooney's basement looking over his layout and dreaming about the model railroad I would someday build.

Mr. Mooney was nice enough to take the two of us along with him to the meetings of the model railroad club he belonged to in Richmond, Va. Since then, the model railroading bug has never left me.

Over the years I've built many layouts that were point-to-point operations. Some had reversing loops at both ends and others were around-the-room, multi-level affairs.

I designed my present layout, the Norfolk Southern Salem Division, as a simple double-track main line. The tracks are arranged in a folded dogbone for continuous operation, with a large

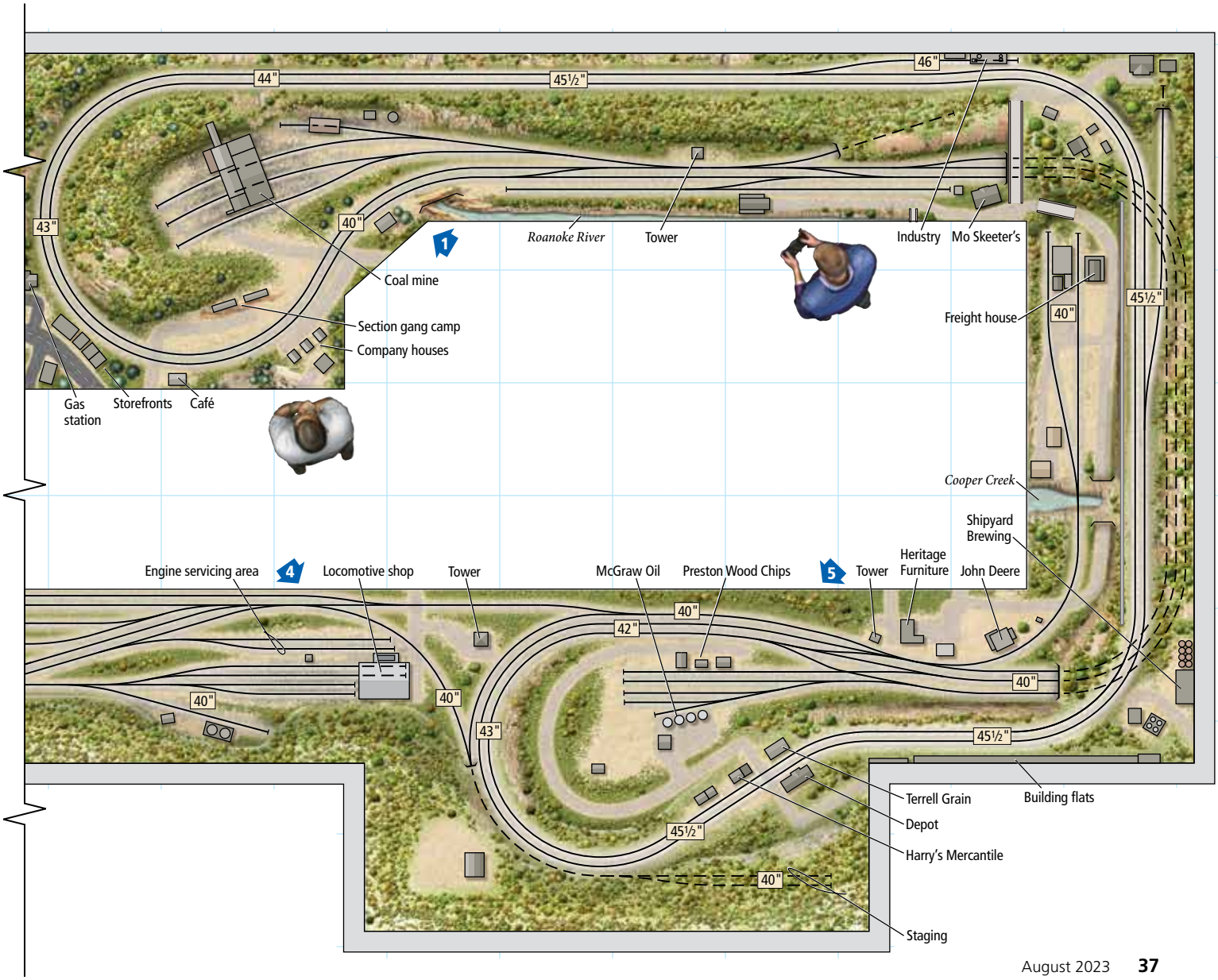
❷ Electro-Motive Division GP35 No. 3542, still wearing its blue Norfolk & Western paint, delivers a gondola to the Norfolk Southern car maintenance shop for repairs. Since the model railroad is set shortly after the merger of N&W and Southern Ry., not all equipment has yet been repainted in the NS black-and-white livery.



The layout at a glance

Name: Norfolk Southern Salem Division
Scale: HO (1:87.1)
Size: 15 x 34 feet
Prototype: Norfolk Southern
Locale: Salem, Va.
Era: summer 1991
Style: walkaround
Mainline run: 80 feet
Minimum radius: 22" (branch), 25" (main)
Minimum turnout: No. 6
Maximum grade: 1.5%
Benchwork: open grid
Height: 40" to 46"
Roadbed: cork
Track: Atlas code 83 flextrack with Peco and Shinohara turnouts
Scenery: extruded-foam insulation board and Woodland Scenics Shaper Sheet
Backdrop: painted tempered hardboard
Control: Digitrax DCS210

❸ This view from the left side of the layout shows the Crowe Distillery in the foreground and the engine servicing terminal at center. The main line extends around the walls to the left.



4 The work is hard on the Salem Division, and the motive power shows it despite being recently painted in NS livery. The crew at Salem's enginehouse are finishing their day, and all that's left is to return the engines to the ready track for tomorrow.

classification yard and engine servicing terminal attached to one loop by a wye. The railroad passes through just one modeled town.

Theme

My layout is set in June 1991, nine years after the Norfolk & Western and Southern Ry. merged to form the current Norfolk Southern (not to be confused with the 1942-1981 NS). There's still plenty of N&W and Southern rolling stock and motive power around to perform the daily activities.

The layout is set in the town of Salem, Va., which is situated at the foot of the Blue Ridge Mountains just west of Roanoke, Va., and east of the rich coal country of the Appalachians. Although Salem is an actual location, my model railroad is freelanced. Coal and pulpwood are the two main industries that keep the town alive. There are several smaller industries that require switching and can keep a conductor and engineer busy for the day.

MR. MOONEY WAS NICE ENOUGH TO TAKE US ALONG WITH HIM TO THE MEETINGS OF HIS MODEL RAILROAD CLUB IN RICHMOND, VA. SINCE THEN, THE MODEL RAILROADING BUG HAS NEVER LEFT ME. – TOM LANGDALE

Construction and scenery

Construction started in March 2020, and the railroad has started to really take on the look of a small town in the Blue Ridge mountains. The benchwork is an open grid of 1 x 4 pine boards attached to the perimeter walls. Legs are made of 2 x 4 lumber are attached 9" back from the front edge of the layout to not interfere with operators' feet.

The roadbed and subroadbed are constructed from ½" plywood elevated above the benchwork on risers and topped with commercial cork roadbed. Atlas code 83 flextrack was used throughout with a mix of Peco and Shinohara No. 6 and No. 8 turnouts. All mainline track was ballasted using Arizona Rock & Mineral crushed stone ballast, while sidings and yards were ballasted with sand and Woodland Scenics gray blend.

I dropped track feeder wires every four feet and attached them to the wiring bus, which is connected to a Digitrax Digital Command Control base station.

The terrain is extruded-foam insulation board, which was stacked, carved, and shaped. Woodland Scenics Shaper Sheets, a thick but flexible metal foil backed with felt, form the larger hills around the east and west ends of town. You simply crumple the foil to give it natural-looking ridges and crevices, attach it to your benchwork felt-side up, and trowel on plaster or other ground cover materials. Real rocks and cast-plaster ones were then applied. All exposed earth was painted with a brown latex paint and covered with various ground foam scenery products.

Puffball trees handmade from polyester fiber fill coated with ground foam foliage cover the mountains and hills. The foreground trees were handmade using Scenic Express SuperTrees stems and material unraveled from Coco Baskets, a hanging planter liner made from coconut husks. Detail items were then added to complete the scenery.

The riverbed was lined with Woodland Scenics Smooth-It painted with acrylic paints. The banks were lined with real rocks and details were added to the riverbed before gloss medium was poured in to model the water.

The backdrop was constructed by nailing 1 x 2 pine battens to the

❺ Leading a westbound mixed freight, Norfolk Southern No. 3234, an Electro-Motive Division SD40-2, awaits clearance to proceed while No. 3610 passes by on its way to pick up loaded hoppers from the Preston Wood Chip facility.

sheetrock wall and attaching ⅛" tempered hardboard to the battens. The hardboard was then hand-painted using a light blue latex paint for the sky. I then added clouds and distant and foreground mountains using acrylic paints. In addition, there is a photo backdrop attached to the hardboard behind the engine servicing facility.

Meet Tom Langdale

Tom retired after serving 21 years in the U.S. Air Force, Air Force Reserves, and Air National Guard. He then worked in the bank security industry until retiring again. He and his wife, Kim, then moved to the foothills of the Blue Ridge mountains, where he joined the Central Railway Model & Historical Association located in Central, S.C. Tom and Kim both enjoy golfing and exploring the mountains.

Structures

Presently the layout has about a 50-50 mix of structures built from plastic kits and laser-cut wood kits. Most of these buildings have been collected over the years and were salvaged after being used on my previous layouts. As time and money allow, I would like to start replacing some of the plastic kits with scratch-built structures.

There are two structures that will always be on my layout and never replaced. One is the only building my mother bought me when I was 13, and the other was my first attempt at scratch-building at the age of 14.

All buildings were weathered using India ink washes and PanPastel powders. Lighting for the interior and exterior of the buildings was accomplished using Woodland Scenics' Just Plug system.

Operations

Currently, three operators can stay busy at the same time – two running trains on the main lines and switching industries, and one in the yard making up and breaking down trains.

I don't use any formal car-card or switch list system to operate the railroad. Though it can be easily adapted to one of these methods in the future, at present, it's just an easy, laid-back operation.

Trains are operated using a Digitrax DCS210 Digital Command Control base station, DT500 and UT4 hand-held throttles, UP5 control points, DS52 stationary decoders, and a Digitrax LNWI Wi-Fi interface.

Several control panels on the fascia of the layout have Touch Toggles to control Tortoise by Circuitron switch motors to line turnouts in the yard, engine servicing facility, and industrial areas.

More to come

Most of the layout construction is complete, but there's still a lot of detailing that needs to be done. More trees, details, and scenes need to be added.

By no means is this layout built to hold hundreds of freight cars, take an army of people to operate, or have an elaborate operating signal system. Instead, it was built for one person (me) to view and operate two or three trains, or to allow my grandkids and other visitors the opportunity to run trains, enjoy, and learn about the hobby.

Enjoy the mountain view and fresh air! MR

Scratchbuilding a TRANSFER TABLE

Use a stepper motor and Arduino to move locomotives

By Robert Perry • Photos by the author

Using an Arduino Uno, Adafruit Motorshield, and stepper motor, Robert Perry solved his dilemma of having too many locomotives and not enough space for them.

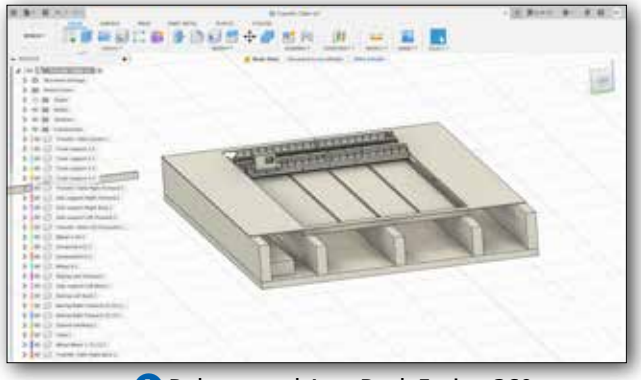
I have been a model railroader for 54 years, but like most of us, I enjoy some things about the hobby more than others. For me, I have always loved locomotives and electronics.

My HO scale layout fills a loft area above my garage. It is 13 x 24 feet and has no room to expand further. My growing fleet of locomotives was either taking up valuable yard and spur space or just sitting in display cabinets. I would have to move a locomotive out of the way to operate another one.

Since I use Java Model Railroad Interface (JMRI) for operations [See page 52. – *Ed.*], I like being able to cycle the use of the engines, which the program does automatically. Keeping locomotives in a display cabinet would mean constantly moving them back and forth by hand and updating the software when they were relocated – not an appealing thought. As such, since I model the modern era, I decided to investigate transfer tables.

Since Walthers had discontinued the production of its transfer table and I could find no working versions in the online second-hand market, I investigated European manufacturers. However, they were set up for European-style trackwork. I love electronics, programming, and 3-D printing, so I decided to build my own transfer table.

Since there was no unused space, I built my servicing facility above a short workbench storage area. I started out by building benchwork for an additional 30 x 60-inch expansion in the same



1 Robert used AutoDesk Fusion 360 to design the transfer table using prototypical references.

room. I then drew up plans to tie this into my existing main line, the transfer table, and associated tracks using AnyRail Track Design Software.

First steps

I started by analyzing the use of stepper motors and a slide rail that could be controlled via an Arduino to move the transfer bridge. I ordered a linear guide slide online on amazon.com. It came with a NEMA23 stepper motor, two limit switches, and 500mm travel. I also ordered a stepper motor driver to match, but upon arrival it didn't work. Since I already had an Adafruit MotorShield v2.3 and a NEMA17 stepper motor on hand, I decided to try that.

The mounting bracket for the slide rail easily accommodated the NEMA17, but I had to order a different shaft coupler to adapt the different size motor and slide rail shafts.

The MotorShield attaches to the top of an Arduino Uno microprocessor. It has a lower amperage capacity than the larger scale stepper drivers, but when I manually turned the slide rail, it seemed that there would be very little resistance to movement. As such, the motor would likely draw little current. I deemed it safe to proceed and hooked up the stepper to the Arduino/MotorShield combo. After loading a demonstration program from Adafruit, I was able to determine that the NEMA17 and MotorShield would work fine for my purposes.

Designing the transfer table

Now it was time to start the design of the transfer table itself. I use AutoDesk Fusion 360 for my 3-D designs. I searched for photos of prototype transfer tables online and found that there aren't too many out there. I did find a manufacturer of modern transfer tables called Macton and decided to try to copy one of its units.

Most modern transfer tables use fairly shallow pits, unlike older steam-era turntables. I didn't want the pit to infringe on the area below my benchwork, as I use this area as a workspace, so a shallow pit was perfect.

I designed the transfer bridge to mimic the Macton version as much as possible. In the absence of 360-degree photos, I took some liberty in the design. Since my longest diesel engine would easily fit on a 12" transfer bridge, I designed it for that length 1. I then printed and assembled the transfer bridge using my Creality CR-10S Pro with Ultimaker Cura Slicer software.

2 The stepper motor and slide rail mechanism that moves the transfer table is shown mounted to ½"-thick furniture-grade plywood.

The pit was designed to have five code 83 rails set perpendicular to the bridge, and the transfer table was designed to have wheels that would follow these rails across the pit. The outer set of wheels are double-flanged to prevent any deviation from perfect movement. The inner wheels are flat and designed to roll on the top surface of the rails to support the locomotive's weight on the prototype. In my case, I electrified the second and fourth rails to provide track power to the bridge. I installed electrical pickup wipers on the bottom of the bridge to contact those rails. I used a couple pieces of metal from automotive radiator hose clamps for the wipers, as these are easily bent and maintain their shape well.

A sturdy ½"-thick furniture-grade piece of plywood was cut to provide a solid and even base for the transfer pit. I made the base 22 x 28½ inches to fit exactly between the joists of the benchwork. Wood cleats were affixed to the base to provide a place to screw the unit to the benchwork when completed.

I attached the slide rail to the base using aluminum angle stock. I mounted a piece of flat ⅛"-thick aluminum stock to the top of the moving block on the slide rail. This piece is set to be 90 degrees from the slide rail and extends through the middle of the transfer bridge and a few inches beyond. The portion that extends beyond was attached to a 3-D printed roller bearing bracket. This bracket with attached bearing provides a support for the weight of the locomotive as it extends downward from the aluminum stock to the wooden base (a small strip of styrene on the base allows for smooth movement of the bearing.) This also ensures that there will be virtually no resistance to the lateral movement of the transfer bridge even though it extends outward perpendicularly from the slide rail 2.

Next, I lined the walls of the pit with .060" sheet styrene. Since the aluminum stock must run unobstructed through the length of travel of the bridge, the side of the pit wall can't extend all the way up to fully enclose the pit. I designed the edge of the surrounding terrain where the tracks are to camouflage this opening. Since the opening has no light behind it, it's virtually invisible with the transfer table installed (3 and 4).

3 Once the pieces of the table were printed, Robert assembled them along with the slide rail mechanism to make the transfer table module.

4 A top-down view shows the assembled module before the pit rails were installed. The stepper motor housing is visible at lower left.

I painted the base of the pit with a textured paint after masking off the attached rails. This gives the appearance of a gravel pit base, like the prototype. I didn't want to use ballast or other granular material in this area as it could potentially work its way into the slide rails or worm gear to foul its movement or increase physical resistance.

Installing the table

At this point, I asked a fellow modeler to help me lower the assembled transfer table into the benchwork while I fastened it in. This was a big help, as I couldn't be both under the layout to fasten the assembly and on top to hold it steady and lower it evenly.

From there, I started to lay out the adjacent locomotive storage tracks and lead track. I originally planned to use caulk to attach the tracks to the cork roadbed, but decided to use track nails instead. This would make it easier to remove the tracks in case I later needed to reposition them. The separation of the tracks was kept exactly uniform to facilitate Arduino indexing.

I then used .060" styrene to create a "concrete" pad on either side of the transfer table and between the rails. The paving is just below rail height to make track cleaning easier. Scribe marks were added to simulate expansion joints and holes were drilled in the styrene wherever a track nail was needed. I disguised these as drainage holes in the concrete.

Once the pieces of styrene were cut and their appearance deemed acceptable, they were numbered to represent their position and then brought to the garage for painting with concrete-colored spray paint. Once they were dry, I fixed them in position with Aleene's Tacky Glue. This provides a secure, but easily removable, attachment in case any service needs to be done on the area.

Two Pikestuff modern two-stall enginehouses were added along with a matching yard office. I left a small opening in the concrete over the stepper motor to prevent any overheating. This hole is covered by the yard office. Woodland Scenics' Just Plug lighting was used in the buildings and for spotlights. I added an inspection pit to one of the engine houses. One of the tracks extends through the enginehouse, as is done at CSX's Big Four Yard in Avon, Ind.

A Digitrax BDL168 monitors track occupancy and relays that info to the computer that runs JMRI on my railroad. A Digitrax DS74 runs the Tortoise by Circuitron switch motors that control the turnouts leading to the transfer table.

Arduino programming

Now came the Arduino setup and programming. A spare 12V computer power supply was used for the stepper motor and a 9V power supply for the Arduino. I attached the MotorShield and ran the associated wiring 5.

I have done many Arduino projects but had never dealt with stepper motor programming. I researched the possibility of programming the Arduino for an indexed movement from track to track. For a stepper motor to know where it is, a specific point of origin needs to be established via a "homing" sequence. Subsequent moves are then judged by the Arduino relative to that position. Given the extensive work that this would require in order to set up homing, calibration, and indexing, this is currently on the back burner. Since the operator of the transfer table will be right at the table, I decided for now to let the operator control the positioning.

I installed limit switches at both ends of travel of the transfer table. These will engage if the bridge moves too far beyond the lead track or the last track. The software will disengage the motor before the bridge could hit the end walls of the pit. I programmed an override to allow the bridge to be moved after the limit switch was engaged.

The stepper motor has 1.8 degrees of travel per energized step. This means 200 steps per revolution of the shaft. These motors allow for very precise movements as are needed in printers, CNC machines, and the like. I estimated an appropriate prototypical speed for the bridge movement based on an online video of real transfer bridge movements. I programmed this speed into the software and wired two normally open momentary push buttons to control forward and reverse movement.

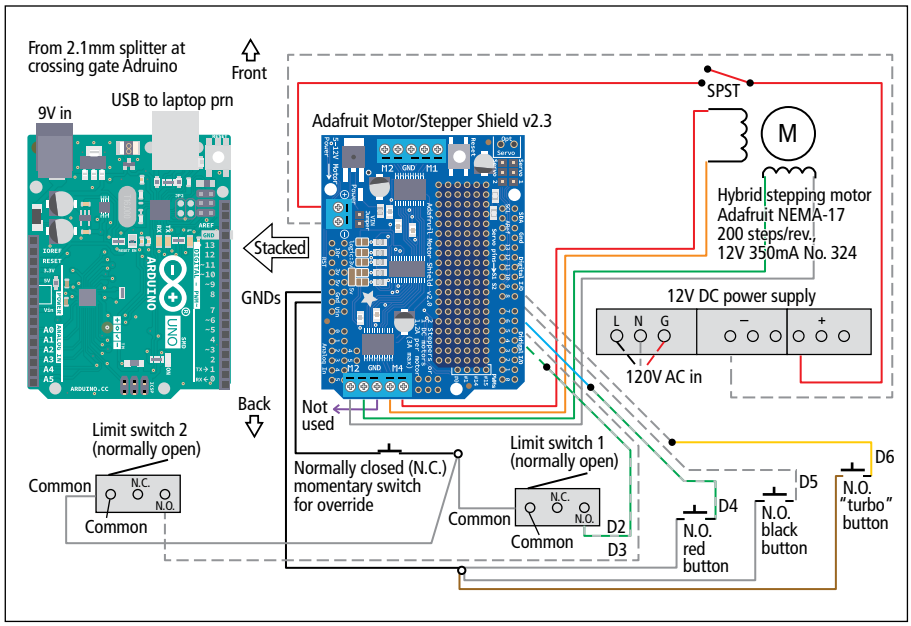
Since the prototypical speed seems a bit slow, I added a "turbo" button that doubles the speed if desired. Releasing the button brings the speed back down to normal to make alignment easier. These controls are grouped on a small control panel within easy view of the transfer table 6.

This level of programming expertise was within my "roundhouse" and suits my current needs. Software homing, calibration, and track indexing would be a nice feature, but for now, I'm content with the ease of control of the bridge.

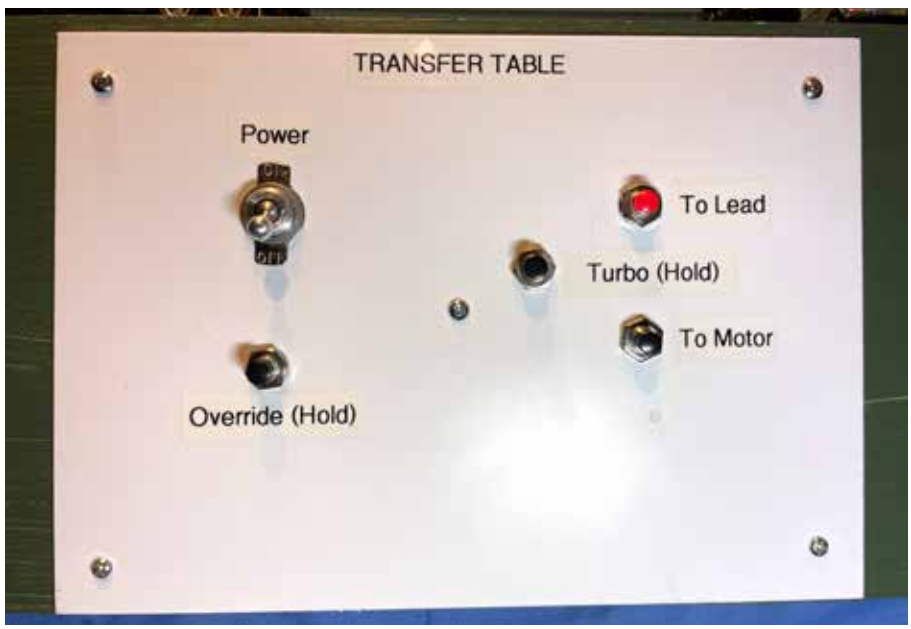
As I understand it, even with proper indexing, there can be an about .2mm error in movement. This error can be cumulative for each movement, especially when changing direction. It doesn't take much misalignment to derail an HO scale locomotive. This problem could be overcome by re-homing every so often, but I didn't want to deal with that, so I opted for the simpler method for now. Maybe someday if I get motivated, I will attempt to add indexing, but for now, the current method is simple and effective.

I hope this article will inspire others to investigate transfer tables as an effective way to house and display their modern locomotive roster in a smaller space than a yard or old-style turntable. MR

Richard Perry is a lifelong model railroader. He enjoys electronics, programming, and 3-D printing. He and his wife have fun camping and traveling.



5 This illustration shows how the Arduino Uno, Adafruit MotorShield, and stepper motor are connected to each other and the position of switches in the circuit.
Kellie Jaeger Illustration



6 The control panel gives operators several options when controlling the transfer table. The "turbo" option moves the table at double normal speed when the button is held down.

How to build a bevel tool

This homemade device makes it easy to get consistent 45-degree corners

By Bob Kingsnorth • Photos by the author

Bob Kingsnorth made this bevel tool to make consistent 45-degree corner joints for his various modeling projects. He built the device using wood and extruded aluminum available at most well-stocked lumberyards and home centers.

During my years in the hobby, I've often encountered 45-degree corners when scratchbuilding, kitbashing, and kit building. Examples include corner joints on structures and where the sides meet the ends on a freight car. Lacking power saws, routers, or laser cutters, I've long resorted to eyeballing a sanding block or using a hobby knife to create bevel joints, usually with less-than-satisfactory results. I needed to find a better way.

Inspired by the NorthWest Short Line (NWSL) True Sander and the Micro-Mark Sand-It, I built a bevel tool to make consistent 45-degree corners. The base is functionally similar to the commercial sanders, but I substituted an extruded aluminum angle for the sliding sandpaper holder. The extrusion slides on the two legs to make the 45-degree angle.

Getting started

I made the base for the bevel tool from a 12 x 12-inch piece of ¾" (or ½") birch veneer plywood. I fashioned the smaller work surface from an 8 x 9-inch piece of ½" birch plywood. To ensure a permanent bond, I secured the two pieces of wood with yellow carpenter's glue and 1" finishing nails 1.

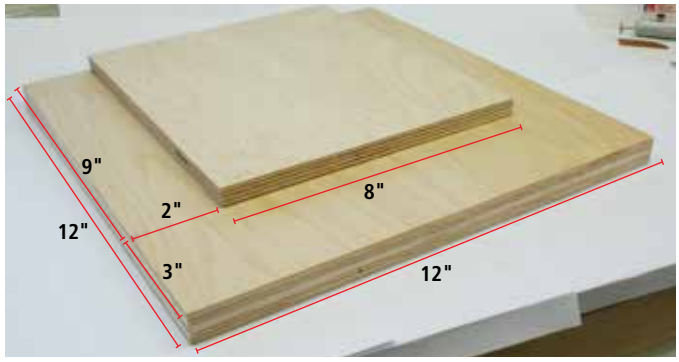
Adding the guard rail

Next, I installed a 1/16" x ½" x ½" extruded aluminum angle guide rail for the sanding slider. I drilled 7/64" pilot holes in the aluminum before securing the guide rail with three No. 4 x ½" sheet metal screws 2, opposite. I set the screws close to the edge of the angle to allow plenty of clearance for the aluminum slider to move along the inside corner of the extrusion. Leave a small gap between the guide rail and ½" plywood to allow some room for final positioning. I installed the center screw and one outside screw first.

I used a metal straightedge to ensure the guide rail was straight 3. Then I carefully installed the other outside screw and checked the final alignment of the aluminum. The screws should be tight, but not enough to create vertical waves along the length of the rail.

Installing the fences

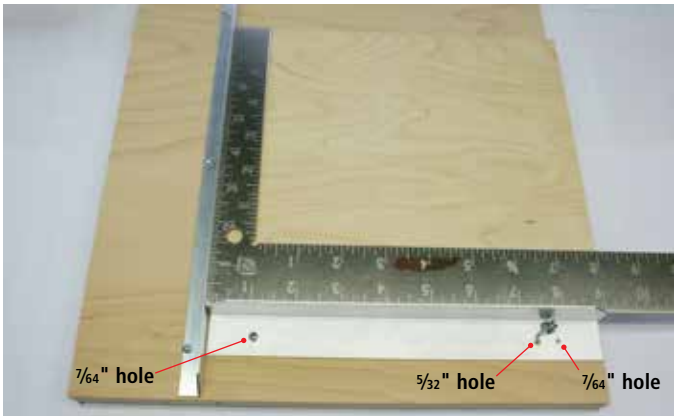
The side fences are 9" lengths of 1/16" x 1" x 1" aluminum extrusion with two 7/64" holes and one 5/32" hole 4. Using a



1 **Building the base.** Bob used a ¾"-thick piece of birch veneer plywood for the base on his bevel tool. The smaller work surface is ½"-thick birch plywood.

2 Taking shape. Next, Bob attached a 1/16" x 1/2" x 1/2" piece of extruded aluminum angle to the wood. He secured the metal, used as a guide rail for the sanding slider, with three No. 4 x 1/2" sheet metal screws.

3 Alignment check. A metal straightedge (in this case a scale rule) helped Bob confirm the alignment of the extruded aluminum angle. Once satisfied with the positioning, he carefully attached the third screw.



4 More metal. Bob used two 9" lengths of 1/16" x 1" x 1" aluminum extrusion for the side fences. He used a square to keep the fences at a right angle to the guide rail.

5 Cutting more wood. The top work surface is an 8" x 9 5/8" piece of 1/4"-thick birch veneer plywood. Bob cut a groove 9" in from the end on the bottom. The beveled edge is optional.

small carpenter's square, I positioned the fences at a right angle to the guide rail. Similar to the rail, I left a small clearance between the fences and bottom work surface.

I installed and tightened the No. 4 x 1/2" sheet metal screw closest to the guide rail first, maintaining a right angle between the pieces. Then I placed and tightened a screw and washer in the oversized 5/32" hole, making any final adjustments to maintain the right angle.

With the position confirmed, I installed and tightened the third screw. I installed the other fence on the other side using the same process.

Back to the wood

I made the top work surface from an 8" x 9 5/8" piece of 1/4" birch veneer plywood. The shallow groove is needed because the aluminum guide rail is 1/2" tall, while the bottom birch plywood work surface is thinner than 1/2". The groove allows the 1/4" plywood to sit firmly on the 1/2" plywood surface. I cut the groove 9" in from the edge 5.

The beveled edge is optional, but extends the top work surface closer to the sanding slider to support the work piece. If a square edge is used, the 9 5/8" length should be reduced to 9 1/8".

With the groove sitting over the vertical leg of the guide, I glued and nailed the work surfaces together 6, next page. Exact alignment with the other components isn't critical. However, the vertical distance between the top work surface and aluminum guide is very important. Variations will create unwanted waves in the work piece joint.

The slider

I cut a 4" piece of 1/16" x 1 1/2" x 1 1/2" aluminum extrusion for the sanding slider 7. The 4" length was comfortable to grip and slide along the aluminum guide.

With one leg of the slider raised by the 1/16"-thick guide, the bevel angle is approximately 43.5 degrees. I prefer this sharper bevel to ensure that the outside of the joint is tight. If you prefer a true 45-degree angle, add a 1/16" thick aluminum strip under the other leg of the slider.

I used removable double-sided cellophane tape to secure the sandpaper to the slider. The tape has enough tack to hold the sandpaper, yet it's easy to remove. If I have to remove a lot of material, I start with 60-grit sandpaper then switch to 100-grit or finer to finish the bevel.

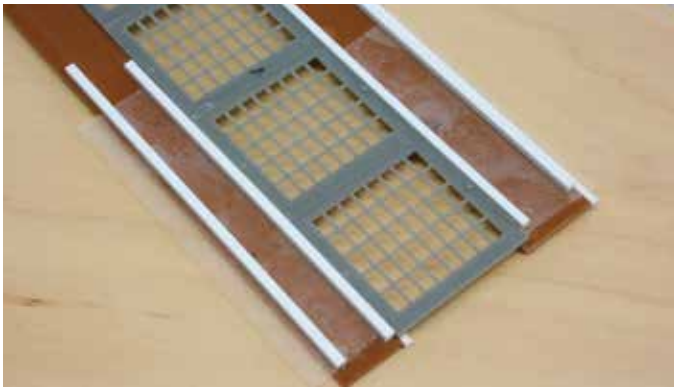
I used contact cement to add .080" x .080" styrene strip fences to the slider. The fences catch some (but not all) of the sandpaper grit and residue from the material being sanded. Debris that falls onto the guide makes it harder to move the slider. The sandpaper grit will also grind away the aluminum. I routinely switch the sandpaper from side to side to balance the wear on the slider.

When sanding, I use one hand and all fingers to press the work piece tight against the plywood surface and side fence. My other hand manipulates the sandpaper slider, holding it down and snug against the inside corner of the guide.

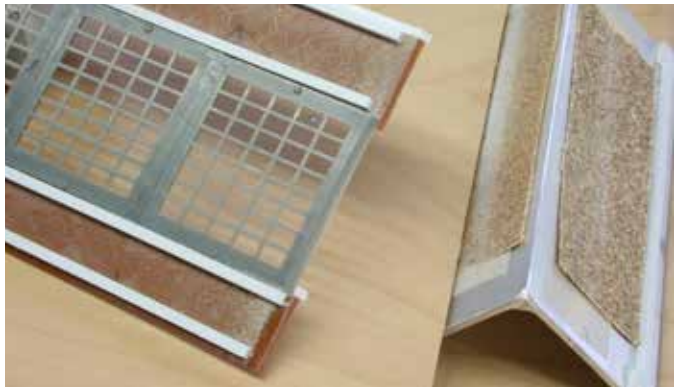
I make about a dozen passes on the work piece, then clean and inspect it to monitor progress. I also use a toothbrush to dust off the sandpaper and slider and to clean the guide.

6 **Making the connections.** Bob used yellow carpenter's glue and nails to secure the top work surface to the bottom. The groove should be seated over the vertical leg of the aluminum guide rail.

7 **Sanding slider.** Bob fashioned this part from a 4" piece of 1/16" x 1½" x 1½" aluminum extrusion. He used removable double-sided cellophane tape to attach the sandpaper. The .080" square styrene strip fences are used to catch debris.



8 **Preparing the parts.** Multi-layer walls like this one can be challenging to work with. To support the different layers while sanding, Bob attached .080" square styrene strips to the back of the wall with double-sided cellophane tape.



9 **The results.** Here's what the corner joint looked like after several passes over the sandpaper. Notice how Bob placed a fine-grit sandpaper on one side of the slider and a coarser grit on the other.

How to use the tool

A good bevel joint on a .040" thick piece of styrene sheet might require a dozen passes with 60-grit sandpaper plus a dozen passes with 100-grit sandpaper. Thicker walls with multiple layers will require more time and careful monitoring. Extra pressure against the work piece will force it up and off the work surface. That may be OK in the early stages of material removal, but not as you approach the final dimension.

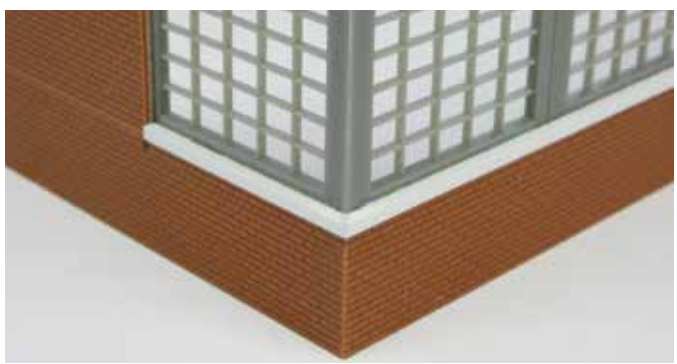
The wall in 8 has a thick window frame set behind the brick face. To ensure an even joint, the different layers must be held at the proper height on the work surface during the sanding process.

To support the layers, I attached four .080" x .080" styrene strips to the work piece with removable double-sided cellophane tape. The finished bevel will produce a good, straight joint 9.

My very first joint confirmed the accuracy of the tool. I wasn't attempting to match brick-for-brick, but the joint was better than anything I'd made before. As expected, the 43.5-degree bevel left a gap on the inside of the joint. But the outside of the joint was even and tight 10.

Build a beveling tool

Most of the work in this project involved building the base and guides. If you have a NWSL True Sander or Micro-Mark Sand-It, simply adapting the aluminum angle slider may put you in the business of creating 45-degree bevel joints.



10 **Spot on.** Though the 43.5-degree angle yields a slight gap on the inside of the joint, the outside is snug and flush. The bevel tool yielded a good, straight joint.

None of my dimensions are critical and can be altered to suit your scale and anticipated maximum wall height. However, the relationships between the guide, side fences, and work surface height are important.

My description of the construction may seem more involved than the actual effort. If you do a lot of scratchbuilding, kitbashing, or kit building, consider building one of these tools. MR

Robert "Bob" Kingsnorth of Central Point, Ore., was a regular contributor to Model Railroader *magazine. He passed away on October 8, 2018. His article "Installing ground throws in the foreground" appeared in the October 2018 issue.*

SCRATCHBUILD AN EARLY 1900s FLATCAR

Denver & Rio Grande Western flatcar 21004 is hauling a pair of surplus diesel engines destined for a power plant in southwest Colorado. Charles Goodrich shares the techniques he used to scratchbuild this O scale model.

This O scale model is based on a Denver & Rio Grande Western prototype

By Charles Goodrich • Photos by the author

While putting together a military train for my O scale layout, I found myself in need of many flatcars. During World War II, most new flatcars being built were 53-foot cars. Some railroads were even extending 42-foot cars into 53-footers by splicing a section in the center. In researching my military train, I also found many pictures of 40-foot cars. Railroads were refurbishing every car they could for use in transporting war materiel. The 40-foot cars are the subject of my modeling project.

There aren't many off-the-shelf options for O scale 40-foot flatcars. The only cars produced were the Red Caboose model with fish-belly side sills and the Berkshire Valley kit with straight side sills and fish-belly center sills. Both are out of production.

After building several kits I found on eBay, I realized that it would be fairly simple to scratchbuild a flatcar with straight sides and fish-belly center sills. I developed a method that's easy to assemble and builds into a nice-looking car.

Picking a prototype

I selected a Denver & Rio Grande Western (D&RGW) 40-foot flatcar for my project. The car is based on prototypes from the 21000 through 21249 series built in 1909. The flatcars served into the early 1950s when the K brake system was banned from interchange. It's possible cars from this series lasted longer in maintenance-of-way service.

I started by building the sub deck from .060" plain styrene sheet. I cut the sub deck to the length of the car minus the thickness of the end sills and the width of the car minus the thickness of the side sills.

The full-size flatcars had 12" sills. This conveniently works out to ¼" in O scale, so I used .100" x .250" styrene strip for the sides and ends. I cut the end sills to the same width as the sub deck and attached them with styrene cement. I cut the side sills slightly oversized before gluing them in place ❶, next page. I trimmed the sides flush with the ends after the glue had dried.

Bolsters and center sills

Next, I turned my attention to the flatcar's underbody. To speed up the assembly process, I used body bolsters from Precision Scale Co. The cast-Delrin bolsters have threaded brass inserts in the bolster block, so no drilling or tapping is required for the 4-40 screws.

I then cut two pieces of .060" plain styrene to the same dimensions as a Kadee draft-gear box. I used styrene cement to secure them between the end sill and body bolster. The pads will be used later in the project for mounting the draft-gear boxes.

❶ **Taking shape.** Charles used .060" plain styrene sheet for the sub deck and .100" x .250" styrene strip for the side and end sills. After the styrene cement dried, he cut the sides flush with the ends.

❷ **Center sills.** Charles used a black marker to color the .060" plain styrene sheet used to make the masters for the center sills. The scribed outlines are easier to see against the black background.

❸ **Building the mold.** Next, Charles glued the finished center sills to a piece of .100" plain styrene sheet. He made the walls for the model from pieces of ¼" square styrene strip.

Since the center sill is the most complicated part of the car and I needed several cars, I chose to make patterns and cast the parts. First, I applied black marker to the .060" styrene sheet. Then I scribed the outline for the sills ❷. This made the profile of the center sills easier to see. I used a Wondercutter to cut the center sills to shape. If you don't have this ultrasonic cutting tool, a No. 11 blade in a hobby knife will also work.

Next, I attached .080" styrene angle to the bottom edge of the center sills. Then I glued short pieces of angle where the fulcrum levers pass through the sills. I used Micro-Mark 3-D decals to add rivet detail to the styrene angle. With a bit in a pin vise, I drilled .0625" holes where the train line passes through the sills.

After I finished both patterns, I attached them to a piece of .100" plain styrene sheet. Then I built a wall around the patterns with ¼" square styrene strip ❸. I left a ¼" of space between the sills and walls.

I used Alumilite High Strength 3, a tin-based silicone rubber, to pour the one-piece mold. The product is designed for parts with negative space and deep undercuts, so it was ideal for the center sills. I let the rubber cure for 24 hours before removing the mold.

I cast the sills using Smooth-On Smooth-Cast 321 resin. Parts A and B are mixed 50:50, making it easy to get the correct ratio.

After combining the resin and hardener, I poured the mix into the mold until it was full. If you overfill the mold, use a flat stick to scrape off the excess. This eliminates flash and the need for extra clean-up after the parts are cured.

The resin set in about an hour. I removed the center sills from the mold and let them further cure overnight. After the castings were hard enough to work with, I filed the backs smooth. [Sand resin parts in a well-ventilated area and wear personal protective equipment. – *Ed.*]

Weights and details

I concealed Scale City Design weights between the cast-resin center sills. The castings were a bit rough, so I used a belt sander to smooth them. The set includes two weights; both need to be sanded to the same thickness.

I attached the cast-resin center sills to the weights with cyanoacrylate adhesive (CA). After the CA cured, I cut the sills to length and placed them between the bolsters ❹, opposite. I again used CA to attach the dissimilar materials.

Then I made crossmembers from .060" x .125" styrene strip. I installed six on each side of the center sills. If more were installed, they'd interfere with the motion of the truck.

Next, I worked on the Kadee draft-gear boxes. I started by removing the flange on the covers and filing them smooth. I carefully centered the coupler behind the end beam on both ends and marked the location.

I then notched the end beams to the height of the .060" coupler mounting pads. I placed the draft-gear boxes flush with the outside of the end beams and used a punch to mark the location of the center screw. I set the draft-gear boxes aside, then drilled and tapped the mounting holes for 2-56 screws ❺.

I placed a coupler in each draft-gear box and secured the assemblies with a screw through the center hole. Then I drilled and tapped the rear hole in both boxes and added the second screw.

Finally, I installed the Athearn Bettendorf trucks with InterMountain 33" metal wheelsets and checked the coupler height on both ends. It should be correct. If not, adjust as necessary. Use a file to remove any protrusions where the screw passes through the sub deck.

Hitting the brakes

Since the flatcar has straight side sills, most of the brake detail is visible. The D&RGW car has a K brake system.

First I worked on the train line, which I made from .040"-diameter brass rod. I placed a 45-degree bend ¼" in from one end. The angled end fits into the hole in the center sill. I cut the straight end to length so it passed under the slot in the body bolster. I attached the brass rod with CA. I made the other side of the line using the same techniques.

Next, I assembled a San Juan Details K brake cylinder. I cut a .060" styrene block the same size as the base of the brake cylinder and attached it with styrene cement. I mounted the cylinder on a piece of .020" x .250" styrene strip that spans the center two crossmembers.

I then glued the fulcrum lever from San Juan Details set No. 114 to the clevis at the end of the brake cylinder rod. Because of the weight, I had to cut the fulcrum lever where it enters the center sill. Then I attached it with CA ❻.

I drilled clevises from San Juan Model Co. to accept .020" wire. The brake rods were fashioned from brass rod. I attached the rod for the hand brake to the fulcrum just outside where the cylinder rod connects.

All brake rods opposite the end where the clevis attaches to the fulcrum were secured to the center sill near the bolster with CA. I attached them here to keep the rods from interfering with the swing of the trucks. At the other end of the car, on the opposite side, I added another partial fulcrum. I attached the rods in the same fashion.

Sides and ends

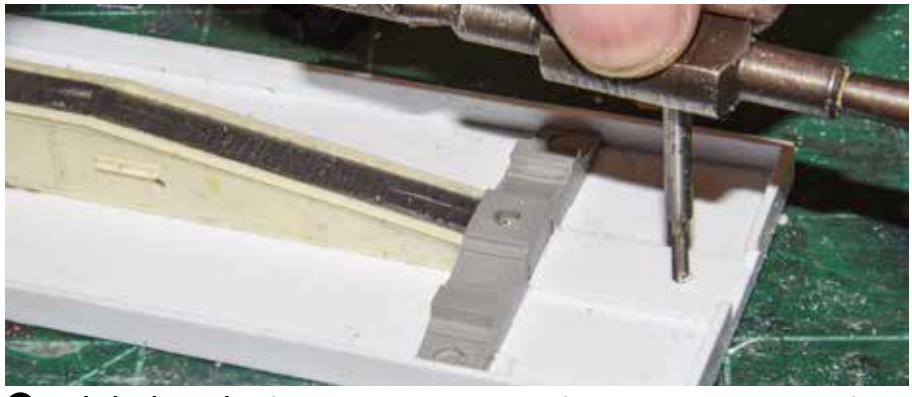
I next worked on the car sides. I started by adding the stake pockets. San Juan Details double-bolt stake pockets were a good match for the car.

The outermost pockets are set in 11/16" from the end of the car. This left sufficient room for the grab irons and stirrup steps. I used a fine-tip marker to indicate those locations.

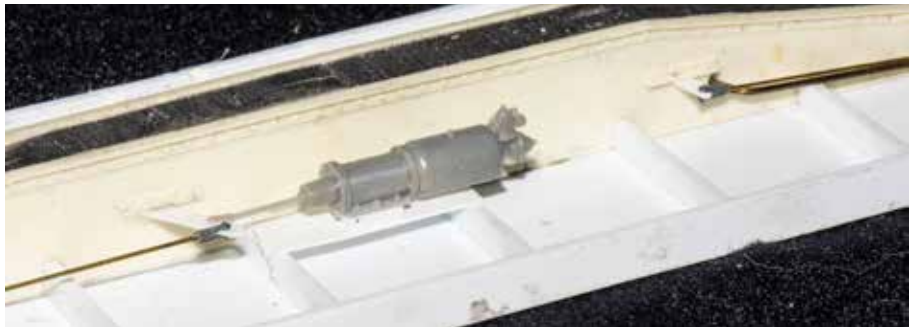
Then I used a divider to lay out the centerlines for the remainder of the pockets, which are evenly spaced. I transferred the stake pocket locations across the deck and to the car sides with a machinist's square and marker ❼.

The stake pocket castings have two mounting posts. To ensure they'd be installed at a consistent height on the sills, I made a drilling jig from a piece of

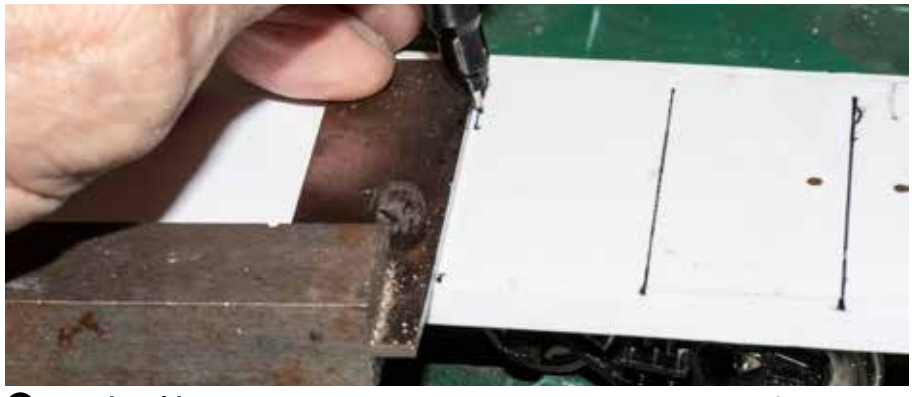
❹ **Attaching the sills.** Weights from Scale City Designs are concealed between the cast-resin center sills. Charles attached the resin sills to the metal weights with cyanoacrylate adhesive.



❺ **Underbody work.** After marking the location of the center hole in the draft-gear box with a punch, Charles drilled and tapped the styrene for 2-56 screws. He held the tap at a right angle to the body so the screw would seat properly.



❻ **Worth the effort.** The straight side sills on the flatcar make the brake details easy to see. Charles used commercial parts from San Juan Model Co. as well as scratchbuilt brass parts to re-create the K brake system.



❼ **Mapping things out.** Charles used a divider to mark the locations of the stake pockets on one side of the car. He used a square and fine-point marker to transfer those locations across the deck and to the car sides.

Parts list

Alumilite
High Strength 3 tin-based silicone rubber

Athearn
ATH90821 Bettendorf trucks

Evergreen Scale Models styrene
129 .020" x .250" strip
156 .060" x .125" strip
159 .060" x .250" strip
179 .100" x .250" strip
292 .080" angle
409 .250" x .250" strip
9060 .060" plain sheet
9100 .100" plain sheet

InterMountain Railway Co.
20050 33" metal wheelsets

Micro-Mark
84987 raised 3-D rivet decals

Mt. Albert Scale Lumber
ST-O-2x8-16 O scale 2 x 8

Kadee Quality Products Co.
740 couplers

Precision Scale Co.
349 bolster
4181 striker plate
40792 corner bracket with polling pocket

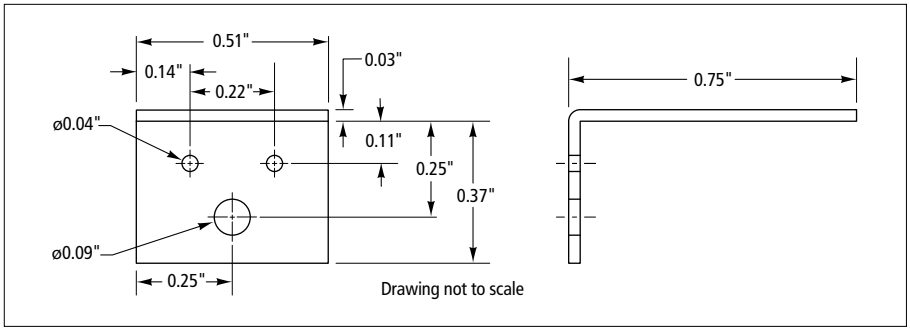
San Juan Details
33 brake ratchet and pawl
53 double-bolt stake pockets
83 stirrup steps
111 brake staff bracket
114 clevises, chain, and brake levers
138 NY air brake set

Scale City Designs
48-556 weight

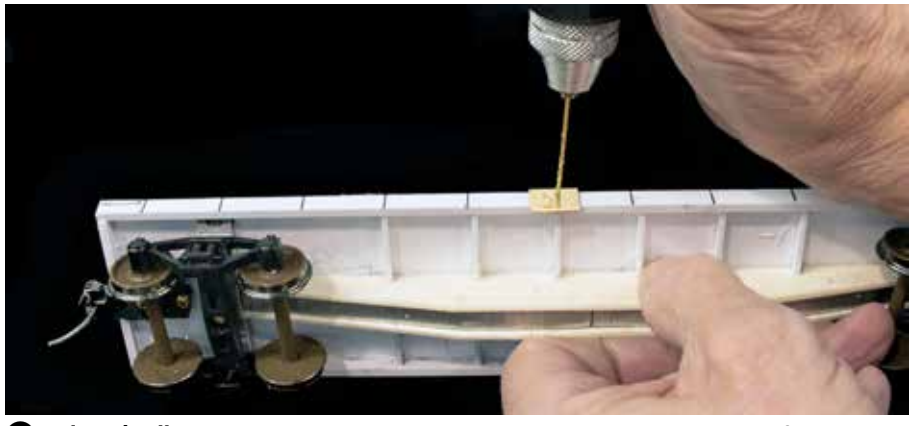
Smooth-On
Smooth-Cast 321 casting resin

Tamiya
TS-29 semi-gloss black
TS-80 flat clear

Miscellaneous
.020" brass wire
.040" brass rod
2-56 x .250" screws (4, coupler mounting)
4-40 x .380" screws (2, truck mounting)



8 Jig plans. Instead of drilling the holes for the stake pockets by eye, Charles made a jig from a piece of brass. The hole in the center is for aligning the jig on the centerlines marked on the car sides. Charles Goodrich illustration



9 Using the jig. Charles used a No. 58 bit in a pin vise to drill the holes for the stake pockets. You can see the holes he already drilled to the right of the jig.

brass 8. I used a No. 58 bit (.042" diameter) to make the holes in the brass. The larger hole was needed for aligning the jig on the centerlines.

Then I placed the jig on the car and used a No. 58 bit in a pin vise to make the holes 9. I double-checked the hole spacing to ensure the stake pockets would fit properly.

Next, I installed Precision Scale Co. poling pockets on the corners. I used CA to attach the brass parts to the styrene.

I then marked the locations for the grab irons on the sides and ends. I used a No. 72 bit to drill the holes for the grabs, which I bent from .020" wire.

The stirrup steps are San Juan Details plastic castings. After drilling holes for the mounting posts, I attached the details with CA.

I added striker plates, brake hoses, and uncoupling levers to the car's ends 10, opposite. The bottom cross pieces of the striker plates must be removed to clear the coupler. I also widened the pocket slightly to accommodate the swing of the Kadee coupler.

Hitting the deck

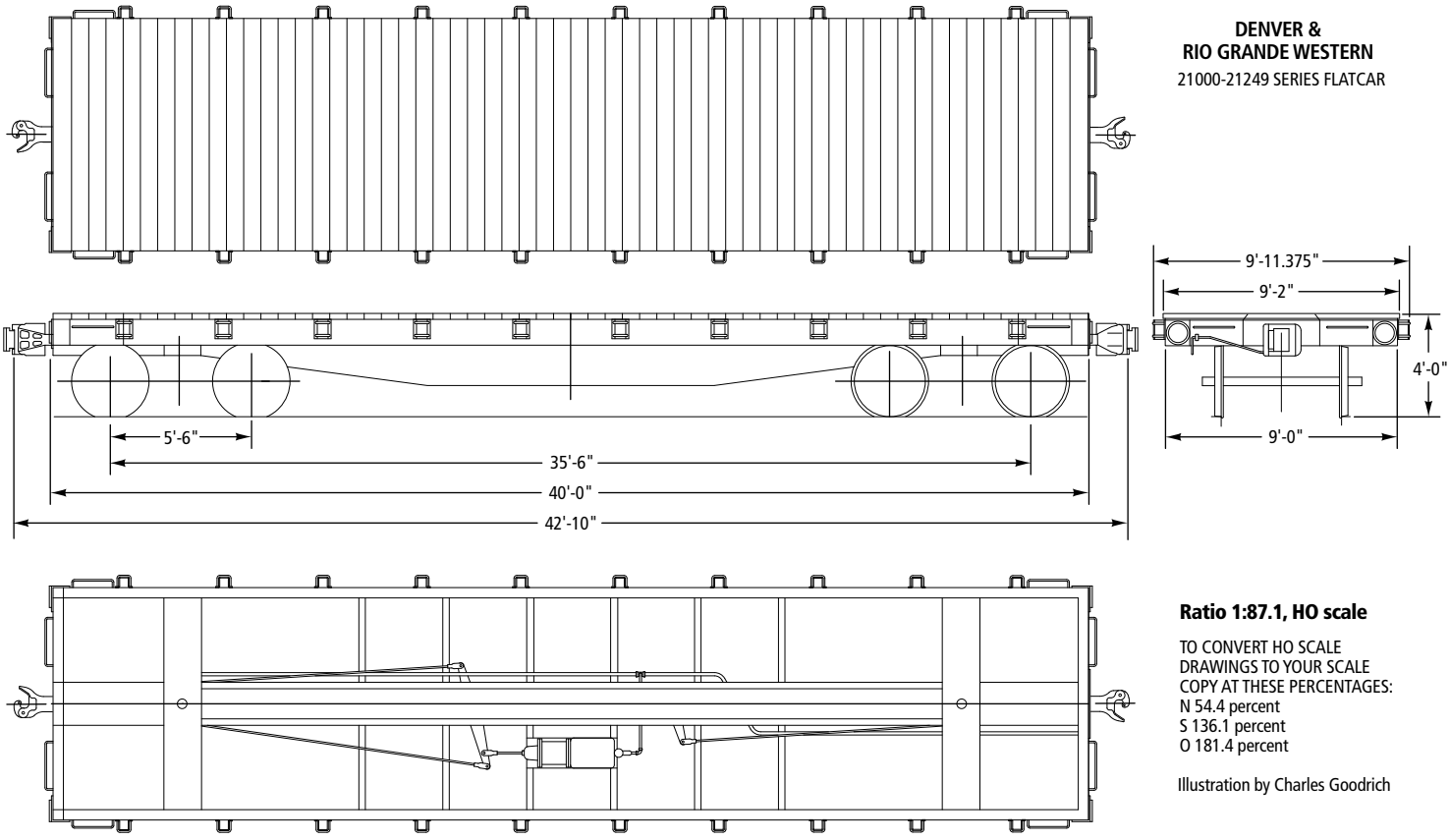
I spray-painted the car Tamiya TS-29 semi-gloss black. While the paint was drying, I began work on the deck, which I made using O scale 2 x 8s from Mt. Albert Scale Lumber. It took approximately six 24" pieces of scale lumber to cover the deck on the 40-foot car.

Before cutting the boards, I dragged a razor saw over them to enhance the wood grain and give them a weathered look 11. I distressed both sides to keep the boards from warping and to save time during assembly. I used a piece of fine steel wool to remove any fuzz. Then I cut the boards to a scale 9'-2".

Next, I stained the boards with an India ink wash (ink mixed with 90 percent rubbing alcohol). After dipping the boards in the wash, I put them on a piece of paper towel to absorb the excess alcohol. I then placed the wood in a large kitchen strainer and used a hair dryer to speed up the drying time.

Starting at one end of the car, I secured the boards to the deck with CA 12. I stopped about 3" from the opposite end. Then I worked from the opposite end toward the center. I did this in case a partial board was needed to complete the deck. I didn't want a narrow board at the end of the car.

I applied CA accelerator to set any glue that seeped out of the joints between the boards. A hair dryer quickly



⑩ Corner and end details. A mix of commercial and scratchbuilt details enhance the ends of the flatcar. The polling and coupler pockets are Precision Scale Co. parts and the stirrups are by San Juan Details. Charles bent the grab irons from .020" wire.

⑪ Weathering wood. Charles dragged a razor saw over both sides of the O scale 2 x 8s to enhance the woodgrain and give the wood a weathered look. After cutting the stripwood into scale 9'-2" lengths, he stained the boards with an India ink wash.

⑫ Board by board. After spray-painting the flatcar with Tamiya TS-29 semi-gloss black, Charles added the wood decking with cyanoacrylate adhesive. He later lettered the car with homemade decals, applied a flat coat, and weathered the model.

evaporated the accelerator. Then I ran fine steel wool over the deck, with the grain, to even out the color and remove any fuzz or wood splinters.

Finishing touches

I wrapped up the project by installing the brake wheel, ratchet pawl, and brake staff bracket – all San Juan Details parts – as well as scratchbuilt uncoupling levers. I painted the details with a fine-tipped brush.

Then I lettered the car with homemade decals printed on a Hewlett Packard Color LaserJet Pro Model M254dw, using a "ghost" cartridge to print white. I applied Tamiya TS-80 flat clear to hide the decal edges and give the model a dull finish.

I weathered the flatcar with a light spray of thinned white paint to make the black paint look sun-bleached and to simulate dirt and dust.

I followed that with a coat of thinned black. I applied the color heaviest in the places where grease would collect, like the journal boxes on the trucks. The thinned black also toned down the bright white graphics on the decals. I used weathering chalks to add dirt and rust. I sealed the powders with more Tamiya flat. I painted the faces, backs, and axles of the metal wheelsets brown.

After getting everything set up, I can build and paint a flatcar in about 8 hours. The visible brake gear and individual board decking add visual interest to the car. This style of flatcar would look right at home on a steam- or steam-to-diesel transition-era layout. MR

Charles Goodrich is a National Model Railroad Association Master Model Railroader who lives in McKinney, Texas.

Setting up smartphone Wi-Fi throttles

1 This month Allan Gartner explains how to get a Wi-Fi throttle, such as the Train Control Systems UWT 100, or smartphone app set up to control trains. Larry Puckett photo

Controlling trains with an app on a smartphone or tablet has become a popular way to run trains. These devices have fewer features than most top-of-the-line throttles, but many view that as a plus since they're less intimidating. Even apps that can control turnouts and functions have them on separate screens, making them more user friendly. If you have an unused smartphone, use it as a throttle!

Last month I covered setting up Java Model Railroad Interface (JMRI) on your computer. This month I'll give you some tips on setting up Wi-Fi throttles.

There are physical, non-phone Wi-Fi throttles if you don't want to drain your phone's battery during a long operating session. Train Control Systems (tcsdcc.com) makes two models, the UWT-100 and UWT-50 1.

For systems that let you control a train with your smartphone, you almost always use one of two ways of doing it. The first of these options is to buy an interface for your smartphone that communicates with your command station by attaching it to your system's control bus. Examples of this include Digitrax's LNWI and the WifiTrax WFD-31 or WFD-30 for use with NCE systems.

To install these, plug the LNWI into your LocoNet or plug the WFD-31 or WFD-30 into your NCE control bus. The WFD-31 even has jacks for plugging in NCE throttles.

The Digitrax LNWI plugs directly into Digitrax's LocoNet. Each module supports four Wi-Fi throttles, and you can have up to eight LNWIs. I had some trouble with the LNWI working properly when I plugged into the LocoNet bus. The cure was to simply plug it directly into my command station.

You can have one WFD-31 or WFD-30. Each supports four Wi-Fi throttles, or you can pair it up with your home Wi-Fi and support eight throttles. My club doesn't have Wi-Fi, so I couldn't test the eight-throttle capability. NCE throttles need to have an address, and the WFD-31/30 is no different.

They come set to a default address of 10, but it's easy to change. Out of the box they're designed to work with the PowerPro, but you can also use it with the PowerCab. Be sure to review the Quick Start instructions and configure your WFD-31/30 accordingly. Our club was able to get up and running quickly.

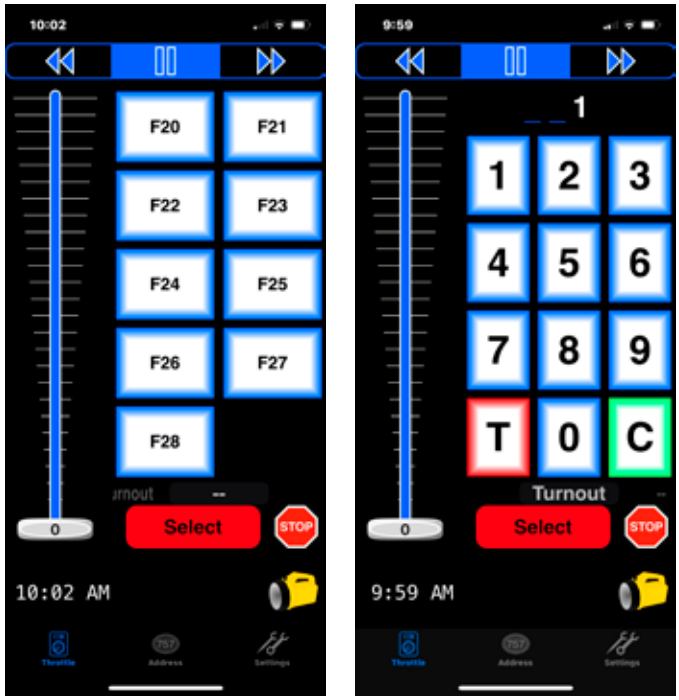
You'll need to install an application on your phone to use it as a throttle. Find the app designed for your phone. WiThrottle 2 or WiThrottle Lite are compatible with Apple's iPhone and iPad. Engine Driver 3 works with Android devices. Note that Engine Driver uses the WiThrottle protocol.

WiThrottle Lite is free, but for a modest fee, WiThrottle can also control turnouts, multiple locomotives, and track power. Either way, there's only one thing you need to set up your phone throttle and two steps to get it done regardless of which smartphone you're using.

Step one: Go into your smartphone's settings and look at your Wi-Fi settings 4. Look for the interface you just installed and connect with it. At this point, you'll lose your connection with your home Wi-Fi. (If you have the WFD-31/30 and use your home Wi-Fi, you won't need to do this.) When you're done running your trains, you'll need to come back here and restore your home Wi-Fi server connection.

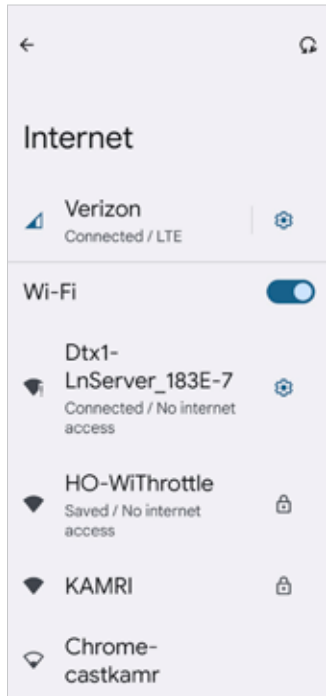
Step two: In WiThrottle or the Lite version, go into its Settings screen. You will be given the option of automatically selecting your railroad's server. Since you should have selected your server in your phone's settings, this should be straightforward 5. Select a locomotive address from the icon at the bottom of the main WiThrottle screen and enjoy. If using an Android, you'll mimic the same server selection process as the Apple product users do 6.

The other approach is to connect your phone to a computer running JMRI that's



2 The WiThrottle app is compatible with Apple's iPhone and iPad. The screenshot at left shows how to access the upper functions. The image at right shows how to access the locomotive address (bottom center icon and keypad). The settings icon at bottom right is used for initial setup.

3 The Engine Driver app is designed for Android devices. The throttle (left) and turnout (right) controls are shown in these screen shots. Engine Driver uses the WiThrottle protocol and can be used with any Wi-Fi throttle server.

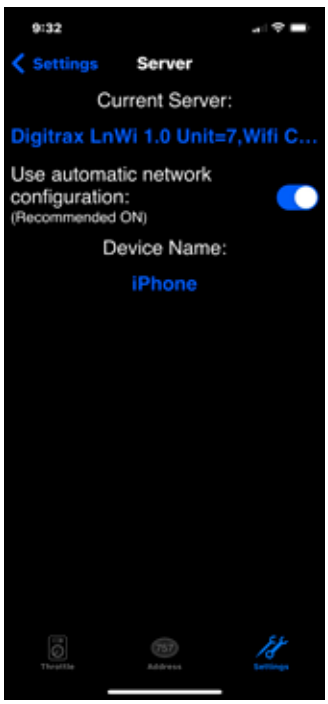


4 These screen shots show the Wi-Fi server selection for Apple products (left) and Android (right). Look for the model railroad server that you installed, in this case the Dtx1-LnServer_183E-7, and select it.

also connected to your layout. In this instance, you won't need to buy a LNWI or WFD-31/30 interface. You will need to set up JMRI on your computer, but it's free. See the July 2023 DCC Currents on setting up JMRI.

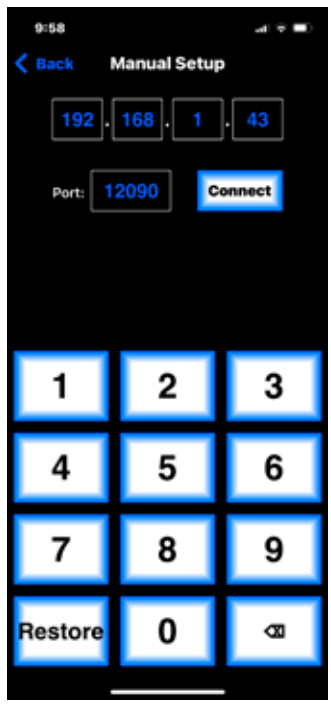
JMRI uses your home's Wi-Fi router 7. Since your phone is already connected with your home's Wi-Fi, all you have to do is launch PanelPro on your computer. Make sure you have your com port set up correctly as directed in last month's column. Then have your computer automatically start the WiThrottle server and then open the WiThrottle or Engine Driver app on your phone. You won't lose your Wi-Fi connection with your home. Though JMRI needs to be set up and your computer needs to be on, you might find it a bit easier to use.

There are several pros and cons of each approach. Decide which Wi-Fi throttle option is right for you. MR



5 When using WiThrottle, server selection will normally select the railroad server automatically. If it doesn't, slide the "Use automatic network configuration" button to the on position. It should always stay on.

6 When using a device with the Engine Driver app, you must select the railroad server from the "Discovered Servers" list and press Connect. This is all you need to do to run your trains with this phone.

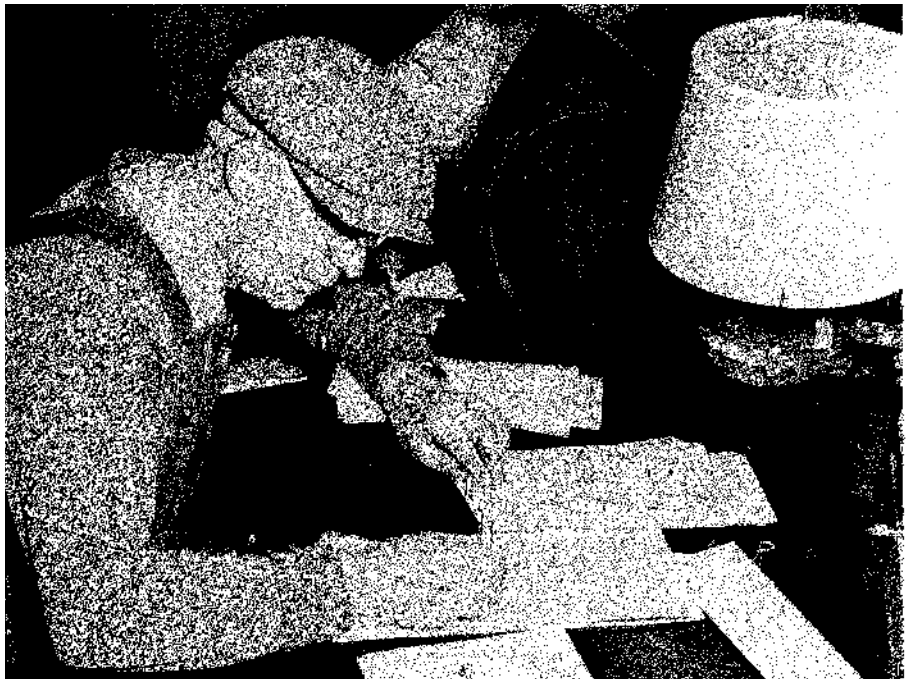


7 This is the setup screen for the WiThrottle used on Apple iOS smartphones and tablets. Manual setup is only needed when using the device with JMRI. From the main WiThrottle screen, select the settings icon.

By Jerry Dziedzic

Turning waybills into dollar bills

Walking around my layout, considering improvements inspired by a recent operations event, brought me to a surprising revelation. I realized that I saw loads, not freight cars, when I eyeballed a cut set out on a side track! Hominy feed headed to GLF in Sussex, gasoline to Decker & Simmons, and coal to the creamery in Slate Hill. I thought about the way veterans described the moves they made working these towns and my own crews placing their cars. I saw laborers shoveling coal out of the gondola. I could almost hear an agent's tires crunch on the gravel as he turned into the station's driveway. Railroads carry on commerce and the profit motive demands income. How did they turn waybills into dollar bills during the pencil-and-paper age?



Illinois Central conductor D.E. Price prepares his train's wheel report on Dec. 18, 1955, while another trainman completes a task beside him. Their work is part of the voluminous recordkeeping behind railroad transportation. Wayne Leeman photo

Eric Hiser writes "Transportation Function," a comprehensive treatment of the subject which has become a regular feature in both *The Dispatcher's Office*, the Operations Special Interest Group quarterly, and *The Warbonnet*, the Santa Fe Railway Historical & Modeling Society's magazine. The series first appeared in the January 2018 issue of *The Dispatcher's Office*. Its installments cover topics ranging from train consists to handling empties, describing the responsibilities of yardmasters, and car service employees in detail.

Yardmaster is a familiar role. It appeals because breaking down and making up trains relies on nimble problem-solving, assigning car destinations to classification tracks and organizing switching operations to meet train departures. Such switching is a real-time activity that's hard to keep up with when a fast clock times road freights, so preparing to receive inbound traffic and send outbound without delaying trains sets a demanding pace. Car service, on the other hand, is rarely found in operating sessions. It includes all the clerical work on which railroads depended, from checking freight rates to preparing waybills to routing empties. It depended on an army of clerks barracked in yard offices, local agencies, and headquarters.

The 10th issue in the series, April 2021, describes ways to model selected car service duties. One is appointing a yard clerk to assist the yardmaster by handling waybills, preparing switch lists, and helping to organize yard operation. A "system" agent is another role. Compare these positions, as they might exist, this way: the clerk does business with the yardmaster and the agent does business with customers. The agent roams the railroad, collecting information about empties needed for loading and leaving switching instructions for crews. The agent can also assist visitors and less-experienced crews. This resembles the position some railroads created when business in a smaller town didn't justify a full-time job. The agent covered several offices, with hours adjusted to allow for travel between the locations.

I've seen a steady interest in such clerical positions. Like operator jobs, they're not for everyone. Does this mean they're not for anyone? A similar job emerged from set-up nights on my layout when a handful of regulars help me with staging. One of my crew, Rich Wisneski, likes this back-office work. He goes from town to town, flips waybills, and visualizes the movements in the operating session we are preparing for. This readies him for a trainmaster role, assisting me during the session itself. Picture how a session can harry its host: one crew needs help acquiring a locomotive, another reports a turnout failure, and the dispatcher asks if a crew will be available for an upcoming train, all at once! Dividing these demands with Rich keeps the session moving and makes it more enjoyable.

I'VE SEEN A STEADY INTEREST IN SUCH CLERICAL POSITIONS. LIKE OPERATOR JOBS, THEY'RE NOT FOR EVERYONE. - JERRY

Eric illustrates "Transportation Function" with photos of car service employees on the job and examples of prototype documents. It's a comprehensive review of car service practices which railroads followed from the 1900s to the 1960s. Check out *The Dispatcher's Office* at opsig.org. Membership brings online access to back issues in which the series appeared. There's plenty of information to draw from, without adding legions of clerks to our crews. MR

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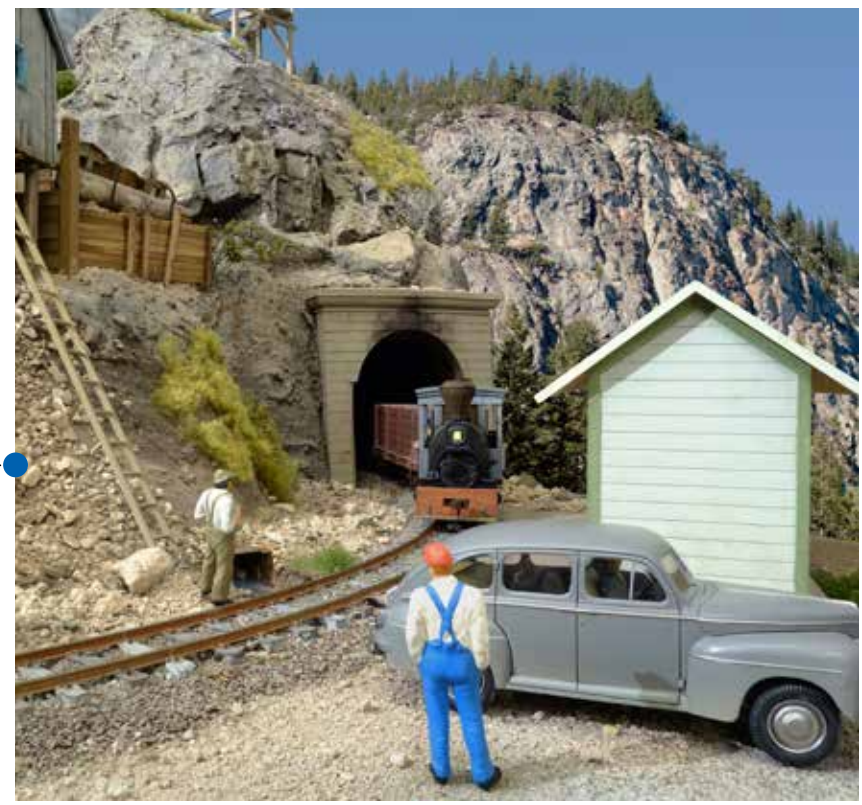
New York Central No. 2351, a 2-8-2 Mikado, leads a freight through 42nd Street. The scene takes place on the layout belonging to Mike Tricker, one of the few in the United Kingdom modeling the United States in S scale. The locomotive is a brass River Raisin Models import. The building to the left is a resin kit from Pine Canyon Scale Models. Cookse Inc. was scratchbuilt using Mike's train club's laser cutter.

Want to see your work in Trackside 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.

A pair of Baldwin Sharknoses, Delaware & Hudson Nos. 1216 and 1205, lead a local freight northward along the banks of Lake Champlain. One of the locomotives could handle the train, but the railroad runs them double-headed because of reliability issues. The action takes place on the HO scale Howe's Cave & Eastern belonging to Morgan Desmond of Novato, Calif. The locomotives are Bachmann models, refitted with DCC sound decoders. Jerrold Reilly shot the photo.

The noon whistle has blown at the D. Lee Coal Co. As the employees head for lunch, the mine's Alco RS27 locomotive also gets a break from its job shuffling loaded and empty hoppers under the tipple. Dale Ridgeway of Bishopville, Md., took the photo on his HO scale B&O Ridgley Division. The Alco is a Proto2000 model repainted for the mine company and weathered with chalks. The coal mine is scratchbuilt and the piles in the background are real crushed coal.



An ore train arrives with a string of empties to be loaded at the Black Bear Mountain Mine. Brian Rudko of New Westminster, B.C., photographed the scene on a 3-foot-square On30 "pizza box" micro-layout. The locomotive and gondola are both custom-painted Bachmann models. The figures are by Preiser and the auto is modified from a World War II staff car kit from Tamiya.

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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 Railroader* 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

AR, CONWAY: Central Arkansas Train & Hobby Show. Conway Expo Center, 2505 E. Oak Street, Conway, AR 72032. August 26-27, 9:00am - 4:00pm. Vendors, Layouts, Contests. Admission $5.00, 12 and under free. Contact RAIL & SPRUE Hobbies, 1200 John Harden Drive, Jacksonville, AR 72076. 501-982-6836, or railandsprue@aol.com

AZ, PRESCOTT: Beat the Heat Model Train Swap Meet and Show. Embry-Riddle Aeronautical University, 3700 Willow Creek Rd., Prescott, 86301. Saturday, July 29, 2023, 9am-1pm. Over 100 tables of vendors and sellers bringing model trains in most gauges, toys & railroad memorabilia. Cash door prizes and children's drawing. Admission: $5/adult, children 12 and under FREE. www.camrrc.com/bth

IA, DELMAR: Delmar Train Show & Swap Meet. October 7-8, 2023. Saturday 10am-4pm and Sunday 10am-2pm. Delwood School Gym, 311 Delmar Avenue, Delmar, IA 52037. Admission: Free Will Donation. Free tours of Delmar Railroad Museum. Vendor tables: $15 each (limit 10 tables per vendor). Food & drink available. Free parking/handicap accessible. Information: sjebsen@fbcom.net

IA, ELKADER: 11th Annual Elkader Model Train Show-Swap Meet. Sunday, August 20, 2023, 10:00am-3:30pm. Johnson's Reception Hall, 910 High Street. Adults $5, children 6-12 $2, under 5 FREE. Free parking, lunch stand available. Information: Larry Lerch, 563-880-2066 or 563-245-3345

IN, INDIANAPOLIS: Central Indiana Division/NMRA announces the Franklin Train Show. Johnson County Fairgrounds, 250 Fairground St., Franklin, IN 46131. August 5-6, 2023. Saturday 10am-4pm, Sunday 10am-3pm. Admission: $7/person, 16 and younger free w/adult. NMRA members (show membership card) $5/person. Demos, Displays, Operating Layouts, Door Prizes, Free Parking, Food available. Info/table rental: Michael Roderick, 317-833-3556, FranklinTrainShow@gmail.com or www.cidnmra.org

KS, TOPEKA: TMRR Club 2nd Annual Show. Great Overland Historic Station, 701 N. Kansas Ave., Topeka, KS 66608. September 30-October 1, 2023. Saturday 10am-5pm, Sunday 10am-3pm. Over 10,000 sq.ft. of operational layouts, displays, dioramas, railroad history and vendors. Admission: Adults $7, Children $5, under 6 free. Food on site, free parking. Contact info: philskow@yahoo.com or 785-221-2174

MI, BATTLE CREEK: Battle Creek Train Show & Swap Meet. Calhoun County Fairgrounds, 720 Fair St., Marshall, MI 49068. Saturday, September 16, 2023, 10am-3pm. Admission: $5 adults, under 12 free. Operating layouts, hands-on displays, door prizes. Refreshments available. Dealers welcome, $25.00 per table. For information: contact Andy Buck 269-268-0910, Shawn Rhoades 269-224-1142.

NC, FLETCHER: Autumn Rails 2023 Model Railroad Show. September 29-30, 2023. Friday noon-6pm, Saturday 10am-4pm. WNC Agricultural Center, Expo Building, 785 Boylston Hwy., Gate 5. Admission: $8 (covers both days), under 12/scouts in uniform FREE. Boy Scout Merit Badge clinic. Dozens of vendors, plus operating layouts. Dealer tables $35 (covers both days.) Free parking. Door prizes. www.fbemodelrr.org

NE, DESHLER: Train Show & Open House, July 8-9, 2023. Thayer County Activity Center, 4th & Race St. Hours: Saturday, 9:00am-5:00pm, Sunday 10:00am-4:00pm. Clinics, custom vendors, layouts, and manufacturers. Admission $6.00, under 12 FREE. Extended hours at Spring Creek Model Trains. 304 E. Bryson Ave., Deshler, NE 68340. Details: www.springcreekmodeltrains.com

OH, VAN WERT: Van Wert Railroad Heritage Weekend Model Railroad Show & Swap. Van Wert County Historical Society, Van Wert County Fairgrounds, 1055 S. Washington St., Van Wert, OH 45891. July 29-30, 2023. Saturday 10am-4pm & Sunday 10am-3pm. Adults $6.00. Scouts in Uniform and Children 12 & under FREE. Info: Chuck White, railcarman@frontier.com, 260-760-1666, www.vwrrhw.com

OK, STILLWATER: Summer Train Show. Saturday, July 29, 2023, 9am-3pm. Admission: $5.00, kids under 18 free with paid adult. Payne County Fairgrounds Expo Center. 4518 Expo Circle E., Stillwater, OK 74075. Buy/Sell/Trade. Operating layouts and door prizes. Concessions available. Sponsored by the TTOS Sooner Division. For further information visit: www.ttos-soonerdiv.org

TX, HOUSTON: Houston Area Model Train Show, November 18-19, 2023. Saturday 10am-5pm, Sunday 10am-4pm. Adults $7, 17 and under free. All scales, operating layouts, club/museum displays, table sales and more. Pearland Knights of Columbus Hall, 2320 Hatfield Rd., Pearland TX 77581. More information at http://houstontrak.org or by email info@houstontrak.org. Sponsored by Houston Area T-TRAK Association, Inc.

TX, TEMPLE: 41st Annual Temple Model Train & RPM Show by CentraMod Inc. Central Texas Area Model Railroaders. Frank W. Mayborn Convention Center, 3303 North 3rd St., Temple, TX 76501. September 16-17, 2023, Saturday 10am-5pm and Sunday 10am-4pm. Admission: $10, Seniors & Military w/ID $9, 12 and under free w/adult. FREE Parking! Additional information: 254-760-3761 or www.centramodrr.com

WI, LA CROSSE: Rail Fair, Copeland Park, Rose & Clinton Streets. Saturday, July 15, 2023, 10am-4pm. Admission $5.00, under 12 free with adult. Railroad Show–Flea Market–Swap Meet. BUY/SELL/TRADE. Model, Toy & Antique Trains & Memorabilia, Railroad Exhibits & Displays. Information: 4000 Foundation, PO Box 3411, La Crosse, WI 54602, 608-781-9383 or 608-498-9522. www.4000foundation.org

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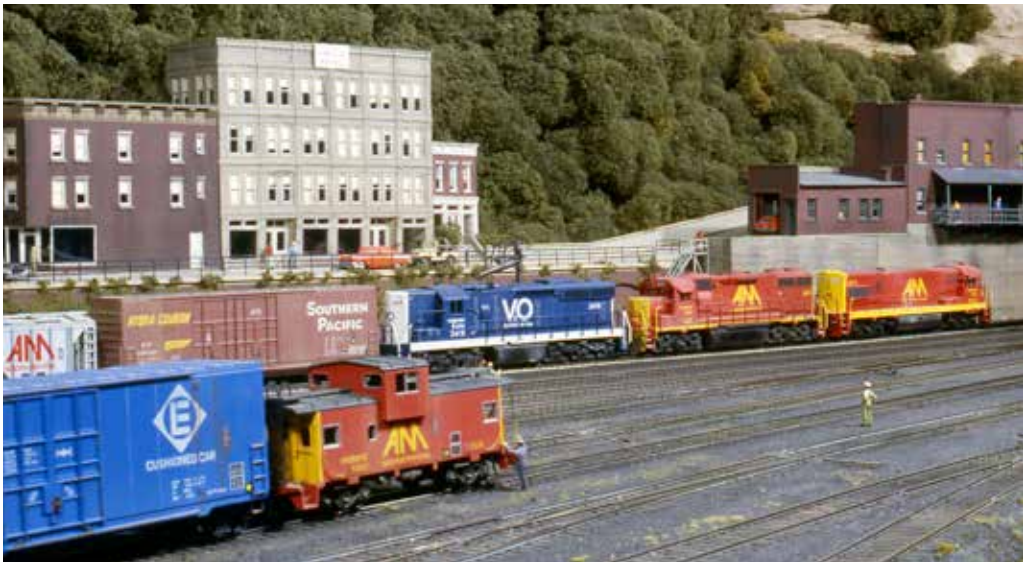
By Tony Koester

Between Perfection and Compromise



When creating a steam roster proved impractical prior to the early 1980s, "good enough" second-generation diesels filled the bill, including the Athearn U30B, Athearn GP38-2, and Atlas SD24 pulling this manifest freight. Tony Koester photo

Whether you're a prototype modeler or freelancer, I suspect you're actually building a railroad between two destinations: the one you started with called Perfection, and the one you end up with, called Compromise. None of us end up at Perfection. The key to a successful model railroad is what sort of shape we wind up in as we approach Compromise.

"Bright-eyed-and-bushy-tailed" might be a good description of us as we embark on our next model railroad planning and building project. That's as it should be, as we'll need some of that innate enthusiasm to carry us through the doldrums.

I remember a good friend telling me and another veteran modeler about his plans for his next model railroad in a spare bedroom. A small spare bedroom. A *very* small spare bedroom. By the time he finished the second sentence and grand sweep of his hand, we were asking for a tour of his house. Absolutely none of what he was envisioning was going to happen in that room, not in HO and not even in N.

Our goal, as I saw it, was to keep his spirits high as we chatted about alternatives. And soon enough we found one in another spare bedroom, recently remodeled to add two closets. They'd have to go, of course, but hey ...

I'm happy to report that his HO railroad has two decks, a ton of structures, and is close to operational status. He started out by seeing a model of Perfection and rather quickly boiled it down to something he could actually fit in a different, more reasonable area, featuring two unconnected decks. Novel, but workable. Compromise in location and objectives saved the day.

I've previously written about my former distaste for multi-deck railroads. That led me to draft a rather poor design for a sort-of multi-deck railroad. Only when Frank Hodina stepped in did an outstanding – and rather simple, actually – plan result.

Multi-deck plans have their faults. They quickly leave Perfection behind, as parts are usually too low, others too high. But, as Bill Darnaby, builder of the Maumee Route, aptly put it, "I like what they let me do." So do I. Only when I refocused on Compromise and followed Bill's lead and Frank's track plan did progress on my current layout rapidly ensue.

More compromises lay ahead. I discovered that some of the more interesting towns to model for operational reasons had changed dramatically over the decades, and that records of how they looked "down by the railroad tracks" in the 1950s were sketchy. Sanborn fire insurance maps and aerial photos have provided clues, but I'm still winging it with stand-ins. Compromise promotes progress.

MULTI-DECK PLANS HAVE THEIR FAULTS. BUT, AS BILL DARNABY PUT IT, "I LIKE WHAT THEY LET ME DO." SO DO I. – TONY

A few decades earlier, in the 1970s, my Allegheny Midland had started out with a perfectly clear plan in mind. All I had to do was built a railroad just like Allen McClelland's Virginian & Ohio!

Only mine would be a little different. It would be tied closely to a prototype parent, the Nickel Plate Road. So I searched the market for steam-era Nickel Plate-prototype equipment, which back then was pretty much only brass imports. Most of those didn't run very well, and a fleet of them was well beyond my budget.

It was time to reorient the railroad toward Compromise. Fortunately, as was so often the case in those days, a call from Allen solved the dilemma. "I think we better merge our railroads to compete with the Chessie System and Family lines," he said.

"The Appalachian Lines!" I blurted out.

So it was that Allen's V&O, Steve King's Virginia Midland, and my Allegheny Midland (a.k.a. the Midland Road) merged into the Appalachian Lines, complete with a new paint scheme and Avant Garde lettering. With Microscale's help, we soon had custom decals, and a fleet of sharp-looking second-generation hood units began to populate our rosters. My steam dreams were put on hold.

They later blossomed anew, and then segued to today's Nickel Plate layout. But Compromise proved to be the best destination all along. MR

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