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Model Railroad Hobbyist |

April 2024 | #170

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ISSN 2152-7423

V1.2 March 18

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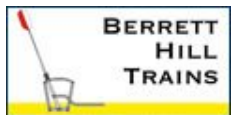
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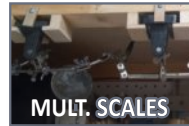
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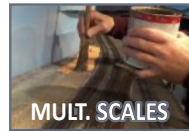


Publisher's Musings: 21st century layout design ...
JOE FUGATE



MULT. SCALES

MRH Website this month: Workspace idea: Store it overhead, ...
Compiled by JOE FUGATE



MULT. SCALES

What's Neat: Ken builds a layout module, ...
KEN PATTERSON



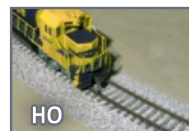
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Using servos for turnout control
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Neal Schorr's Pennsylvania Middle Division
JOE FUGATE



HO

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RICHARD BALE and JEFF SHULTZ

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PUBLISHER'S MUSINGS



Model Railroad Hobbyist | April 2024



**VIEW READER
COMMENTS**

**JOE FUGATE: THOUGHTS ON 21ST
CENTURY LAYOUT DESIGN BEST PRACTICES ...**

**WHEN YOU FIRST GET INTO THE HOBBY OF
MODEL RAILROADING, YOU GENERALLY THINK
THE BIGGER THE BETTER** when it comes to layout size. However, after almost 60 years in the hobby, I'm here to tell you layout satisfaction has little to do with size.

Let me back into this discussion rather than approach it head-on. First, let's talk about a modern layout design "best practice" that's intended to get more layout into your space: multi-decking.

The problem with multi-deck layouts

John Armstrong, famed model railroad designer from the 1950s through the 1990s, first suggested doing two benchwork decks as a way to get more layout into your space. The idea finally caught on in the 1980s, and multi-deck layouts can be seen frequently today.

Unfortunately, the traditional multideck layout design has many problems that make it less than ideal. I've been a proponent of the mushroom approach to multideck layout design, which puts the two decks facing opposite directions, and uses a raised floor on the upper deck side.

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In short, I am not a fan of traditional double-decked layouts and I detest a helix – the bigger the helix is the less I like it.

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PUBLISHER'S MUSINGS | 3

Siskiyou Line 2 will be a single decked design. I still will have 800 square feet to work with and that's going to be plenty and possibly even too much.

So if size isn't what makes a layout more satisfying, what does?

What makes a more satisfying layout?

I have a concept I present in my [Run like a Dream series](#) called "quality of run" and I contrast it with "quantity of run." Most modelers who are new in the hobby tend to think "quantity" is the key to greater hobby satisfaction, so the bigger layout the better.

But I maintain it's not how much run you have, it's how good the run you have is, in other words, it's the quality of that run that matters more.

The Run like a Dream series goes on to discuss how getting as close to flawless performance as you can get is a big part of quality of run. The series then delves into how to get near perfect performance with trackwork, with rolling stock, and (by the end of 2024) with locomotives.

Another part of upping the quality of the run is making running trains more engaging. This is where modelers differ as to their hobby goals. Let's talk about that next.

The engineer versus the railfan

Have you noticed how some modelers love serious operating sessions and others could care less about that and prefer to just watch the trains run?

Neal Schorr, this issue's cover story layout owner, is one of the latter – he has little interest in serious operations. He just likes to railfan the trains.

The Layout Design Special Interest Group (LDSIG) has done a study of this phenomenon and determined there's two basic

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groups of hobbyists: engineers and railfans. You may actually be a mix of the two, it's a continuum, but each person tends to lean one way or the other, but you're rarely completely just one or the other. You're a mix, but with a preference.

If you lean engineer, you tend to see yourself in the loco cab when you're running a train. If you lean railfan, you tend to see yourself standing beside the tracks watching the train run.

Those who lean engineer tend to love serious ops while the railfans tend to dislike serious ops. The railfans see all the procedures around serious operation as tedium and a distraction from the fun of just watching the trains run.

Regardless of which way you lean, railfan or engineer, you still want to see near flawless operation. Trains that don't run well kill the quality of run for both groups.

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Two types of ops

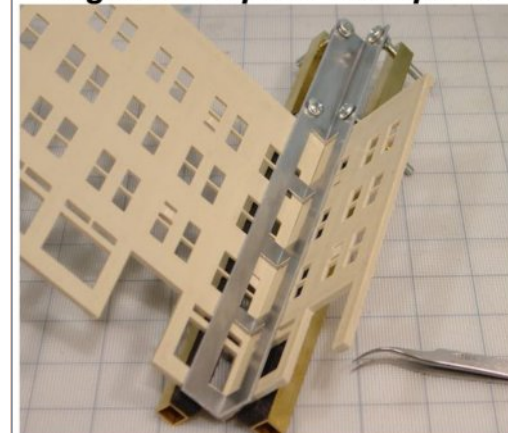
There's also two types of ops when it comes to making operation engaging. I call this "macro ops" and "micro ops."

When you focus on macro ops, it's like you're the big cheese of the overall railroad, and you think mostly about making sure the overall operation succeeds or fails. No one single railcar or a single train matters much. They're all simply pieces to the overall business of running the railroad.

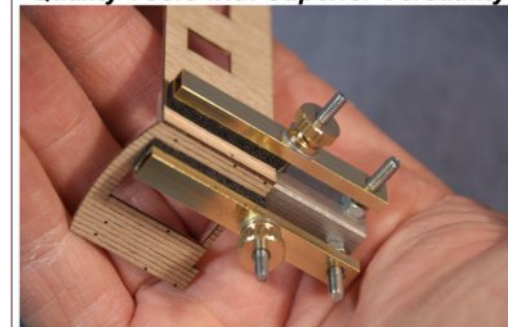
With micro ops, one single train is the focus. What does that train need to do, what moves does it make, and what are the cars in the train? What power is pulling the train, and in the era of cabooses, what's bringing up the rear?

Things like sound, momentum, and the ProtoThrottle is making micro ops more engaging than ever. The ProtoThrottle is for diesel locos, and the "Amigos" Steam Throttle begins to bring that level of

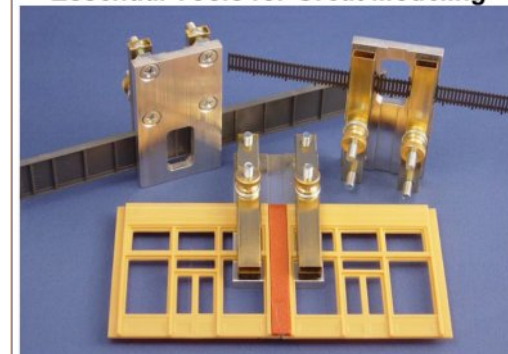
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detail to steam locomotive operation (see the May and June 2023 Running Extra issues for more).

I can tell you using the ProtoThrottle with a sound loco tuned properly to respond accurately to the settings is a game changer for micro ops. It's like a brand new, highly engaging hobby to me.

I demoed the ProtoThrottle at some past conventions on the TrainMasters TV TOMA layout and I never had so much fun running trains. Did I mention this TOMA layout was a whopping 13 feet down one leg, and 8 feet down the other leg?

Enter TOMA

If you're new around here, you may not know exactly what TOMA is. It stands for "The 'One Module' Approach." In its most basic form, the idea is to build a home layout a single piece at a time, roughly 2x6 feet, give or take.

The idea is to keep each section or "module" (and we use the term loosely here) small enough you can easily move it around from a work area to the layout area.

Having a special area where you can work carefully on the module section enables you to get comfortable and do your best work. You can easily turn the section over, and work on it from underneath to do wiring and install turnout control mechanisms. You can get the area messy with scenery work and that's a-okay.

Build the module section to completion making it fully scenicked and detailed. Then move it to the layout space, add on some flattop staging at each end, and run trains!

Need more layout? Then build another module section. And so on – build as much or as little layout as you like. This is how I'm planning to build Siskiyou Line 2, as a TOMA.

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And here's the irony and why I think a smaller layout size is the coming thing for the 21st century.

When I build the Siskiyou Line 2 as a TOMA, I will build a couple module sections, set up some staging, and run trains. Thanks to micro ops and the ProtoThrottle, I'm likely to be having a total blast – maybe even more fun than I had with Siskiyou Line 1.

I'm fully expecting I may not *want* to build a lot of layout if what I do build, thanks to TOMA, looks finished and is an absolute blast to operate. So what if I never get the 800 square feet filled with layout? The motivation for bigger just may not be there.

That's why I'm thinking times are changing, and smaller layouts may become more popular than ever, thanks to things like TOMA and micro-ops. ☑

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April issue ...

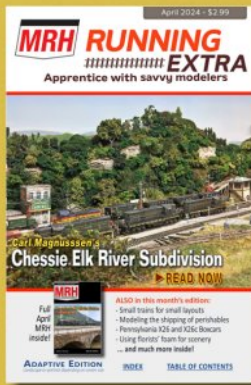








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Best of the
MRH FORUM
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THIS MONTH

Model Railroad Hobbyist | April 2024

Compiled by **JOE FUGATE**



Store it overhead!

MRH forum member **thewizard1** (Charles D.) posted this tool storage hack on a general workshop ideas MRH forum thread. Darn clever if you ask us. Storage space always seems to be at a premium for modelers, so this idea takes advantage of some otherwise unused space.

Get more such clever workshop and workbench ideas on this thread.



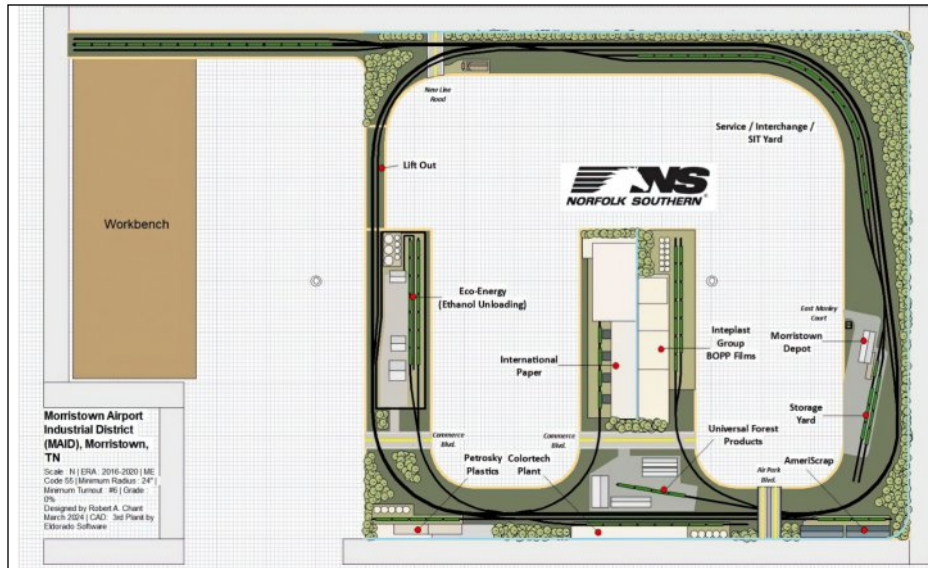
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► **MRH'S MONTHLY GREAT MODELER POSTS**

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1. *MRH* forum member **rjbokleman** (Ronald Bokleman) started a journal/blog for his new MAID layout he's building in N scale.

Morristown Airport Industrial District (MAID) in N

MRH forum member **rjbokleman** (Ronald Bokleman) kicked off a blog chronicling his new N scale Norfolk Southern layout. Ronald says,

This small Norfolk Southern branch is a great example of combining a Class I railroad branch to operate like a short line / last mile operation – because it is! I worked with Rob Chant of the Journal for Model Railroad Design for almost 60 days and finally landed on the plan shown [1]. I think I'll be very pleased with this plan and enjoy operating. it"

Follow Ronald's blog as the layout takes shape!

[View the full thread on the MRH website](#)

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2. *MRH* author dave1905 (David Husman) recently posted this iron furnace build project on the *MRH* forum.

Building the E&G Brooke iron furnace

MRH author **dave1905** (David Husman) posted this iron furnace structure project on the *MRH* forum.

“At Birdsboro on the Wilmington & Northern (W&N), one of the industries is the E&G Brooke Iron Furnace. It produced pig iron, a low quality iron that was used as a feed stock for foundries to make cast iron and wrought iron and for steel mills to make steel. The furnace had 3 sections, a cast house where the pigs were cast, the taller furnace building and a building for boilers and machinery (steam powered from the boilers).”

The photo above [2] shows the latest appearance of the furnace. Dave’s now finishing the painting and weathering.

Follow follow along as Dave brings this project to completion!

[View the full thread on the *MRH* website](#)

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3. *MRH* forum member **demented-tiger** kicked off a thread asking about how to build a good caboose fleet.

Building a caboose fleet

MRH forum member **demented-tiger** recently started a new thread on building a caboose fleet.

"I decided to anachronistically outfit my modern-dayish layout with a small fleet of working cabooses. I'm considering setting it in the Canadian Rockies with a Canadian Pacific prototype as a reference. My favorite Canadian model train manufacturer released a limited run of these in N-scale [3]. I could only afford to reserve just one. But once you graduate from toy to model, there's no going back. What's a fan of cabooses to do?"

Others have joined in and shared their thoughts on building a nice caboose fleet. Follow this thread *MRH* forum and see how to develop your own caboose fleet!

[View the full thread on the *MRH* website](#)

Weekly photo fun thread

Here's a couple definite "Yes, it's a model" candidates from recent forum photo fun threads. Enjoy!

[View photo fun threads on *MRH* website](#)

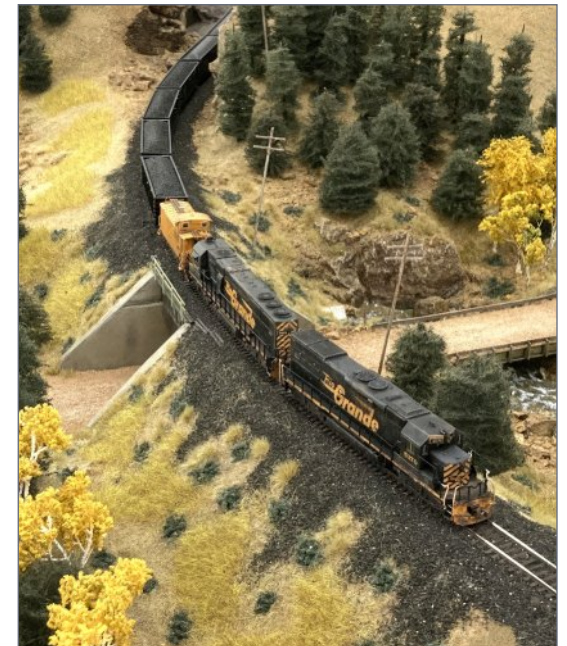


4. *MRH* author Neil Schofield seems to excel in scenes that look so typical of real railroading. Excellent modeling and photography.

5. *MRH* forum newcomer Rick Bacon 3 posted this photo of his N scale module of the D&RGW Moffat Line. Rick models ordinarily in O scale, but he's "scratching an itch" to model this scene on a Fremo N module. Nice!

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WHAT'S NEAT

column



Model Railroad Hobbyist | April 2024

KEN PATTERSON COVERS THIS MONTH:

- BLI: READING T-1 4-8-4 IN N SCALE
- KEN WORKS ON HIS LAYOUT
- NEW PRODUCTS FROM BACHMANN



THIS MONTH, Ken shows the new Broadway Limited N scale Reading T-1 locomotive. He also works on a long-delayed section of his layout, using foam to level the scenery, laying



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PHOTOS AND VIDEO OF SUPERB MODELS

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track, and modifying a Walthers kit to fit the location better. Doug Blaine joins Ken online to show some of the newest products coming from Bachmann.

N scale Reading T-1



1. Broadway Limited sent Ken one of the new N scale Reading T-1 4-8-4 locomotives, complete with Paragon 4 sound and smoke. In addition to the Reading paint scheme seen here, the model will be available in the Red, White, and Blue 1976 American Freedom Train (AFT) scheme, which it wore when it pulled the AFT in the Eastern United States.

Info: broadway-limited.com



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Working on Ken's layout in the basement



2. This month Ken is reworking a diorama that is part of his basement layout. First seen on "What's Neat" in January 2020 and May 2021, Ken frequently uses the largely completed front half of the diorama as a photo location.



3. A section in back that was originally going to be a road will now hold a spur into the center of the diorama. Ken uses Pro Foam to fill a depressed area on the diorama and saws it flat before sanding it down.



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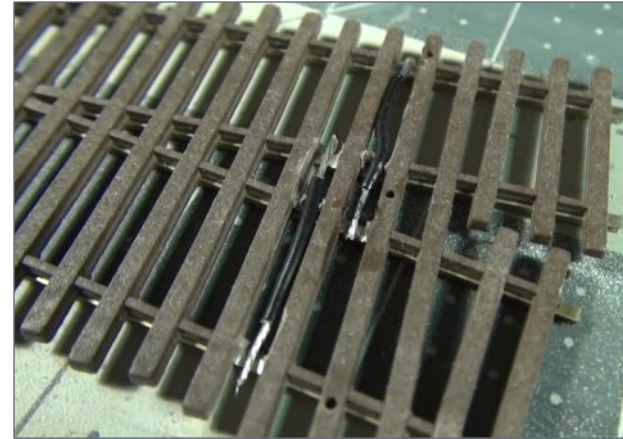
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4. The location of the new spur is roughed-in on the newly leveled section.



5. With the track removed, the foam is painted brown using ordinary latex house paint.



6. Before gluing the track to the foam, Ken prepares the track in several ways, including running jumpers from the outside rails to the opposite track inside rails on turnouts, eliminating the need for a feeder here.

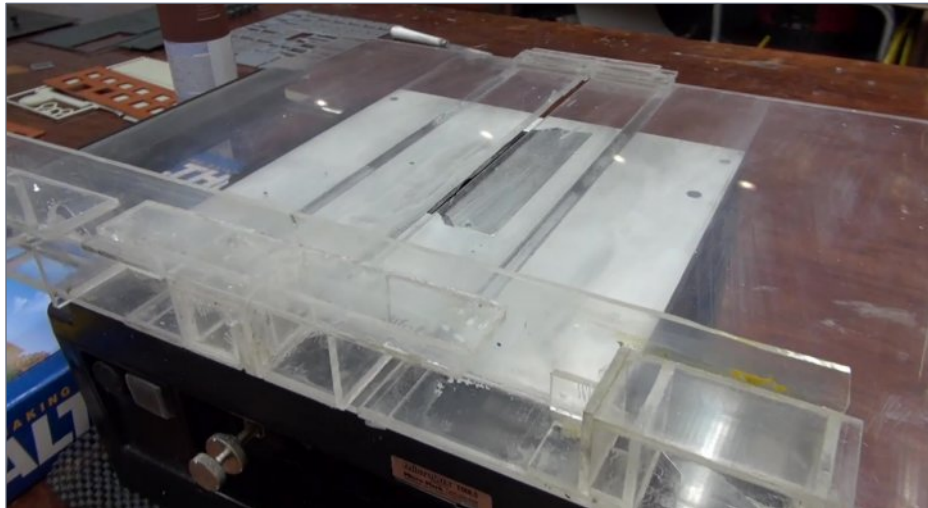


7. Also prior to installation, Ken paints the track with Rust-Oleum Camouflage Brown spray paint. Normally he would do this after the track was in place and glued down, but he reversed the steps this time to avoid damaging the completed scenery in the front portion of the diorama.





8. Ken has become quite fond of his Milwaukee M12 cordless soldering gun, using the chisel tip here to solder lengths of flex track together.



9. Ken built a Plexiglas sled for his Micro-Mark Microlux table saw. It keeps his fingers away from the saw as the material being cut passes smoothly through.



10. Ken's been using a Walthers machine shop building (right) as a stand-in on the diorama. He decided he wanted to change the footprint of the building as well as a few of the details. The modified building is under construction on the left.



11. Here Ken compares the shell of his incomplete narrowed building in the foreground with the original machine shop building built according to the directions. With the new footprint, there is room for a road between the building and the tracks.



New products from Bachmann



12. Doug Blaine stopped by virtually to show off some of the products arriving soon from Bachmann. Included in this is a new train set for next Christmas, the Scout Elf Express featuring a posable Elf on a Shelf in his own gondola.



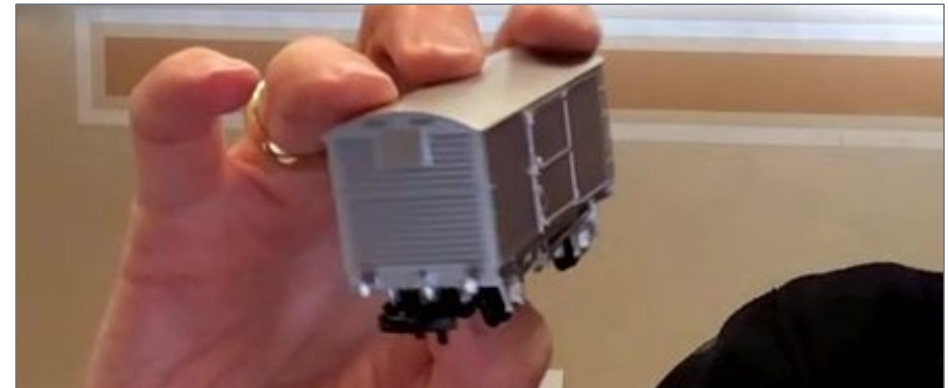
13. Doug showed off the new Ringling Bros. train set, which includes the caboose seen here.



14. In the classic HO scale Ringling Bros. collection, Bachmann is bringing out this new generator car.



15. In the world of Thomas and Friends, Doug had a few new models to show Ken, including the HO scale "American" 4-4-0 named Beau.



16. A new 12-ton van model in HO scale was shown in an early tooling sample.

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WHAT'S NEAT | 10



17. Finally, Emily is coming to the N scale Thomas collection, as seen with this nearly final painted sample.

Info: bachmanntrains.com

Click on the video link at the beginning of the article to learn more about the new N scale Reading T-1 from Broadway Limited, how Ken is finishing the back side of the diorama, and all of the new products coming from Bachmann. ☑



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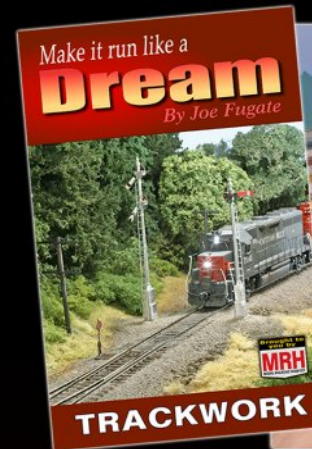
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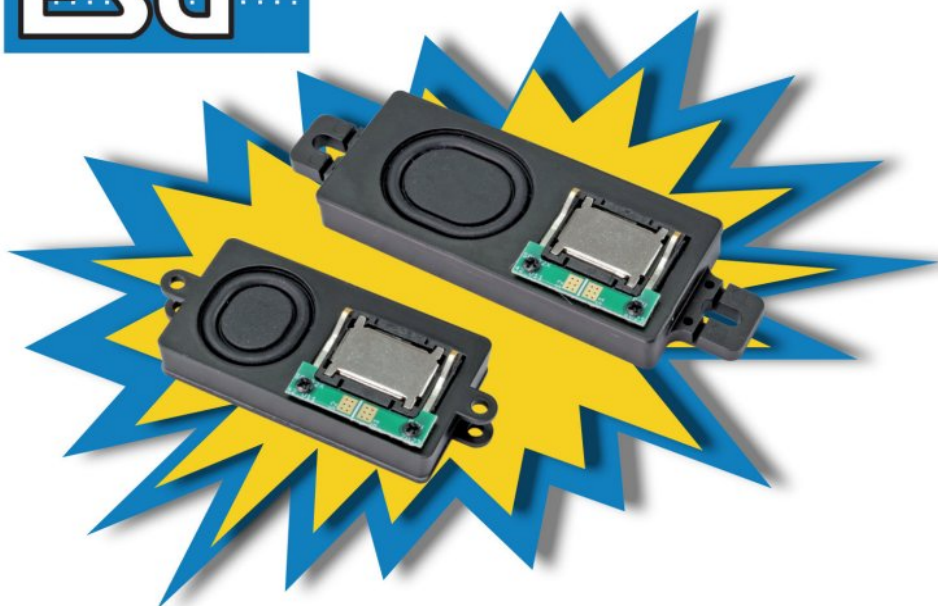
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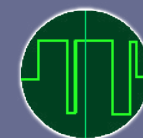
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USING SERVOS FOR TURNOUTS, PART 1



Electrical
Impulses

1. Here's a size comparison of a Tortoise to an SG90 servo. The combined cost of the servo, its mounting hardware, a microswitch for frog power, and an Arduino controller totals as little as 20% that of a Tortoise machine. The servo has plenty of torque, and takes up much less space. This two-part series shows the do-it-yourself steps.



Model Railroad Hobbyist | April 2024

JOE FUGATE SHOWS HOW TO SAVE UP TO 80% ON
THE COST OF TURNOUT CONTROL ...

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USING SERVOS FOR TURNOUTS, PART 1 | 2

THE CIRCUITRON TORTOISE HAS BEEN A TURNOUT THROW MECHANISM MAINSTAY for decades, and its reliability is legendary. These days, the Tortoise MSRP is circa \$25, with bulk pricing that can get the per-Tortoise cost down to just under \$20 each with shipping.

A modern digital pulse-width-modulation-driven servo like the SG90 has plenty of torque for throwing turnout points, and costs under \$2 each. Depending on which control board option you choose, you can save from 50-80% on the cost of equipping your turnouts with Tortoise machines.

My Siskiyou Line 1 had 120 turnouts, and I expect Siskiyou Line 2 to have a similar number. If I control all those turnouts with Tortoises, that would be over \$2000. On the other hand, if I use servos and one of the commercial servo driver board solutions, I can drop the price down to around \$1000, saving half.

If I'm willing to take a few hours and learn how to program an Arduino myself (with cookbook code I can easily edit for my layout specifics), I can get the total cost down to just over \$400 for the entire layout.

Those who have moved to servo turnout control generally report trouble-free reliability once the throw limits have been properly tuned to not overdrive the servos. I will cover how to properly set throw limits in this two-part series.

After I did the math, I became quite interested in learning how to save a bundle compared to Tortoises.



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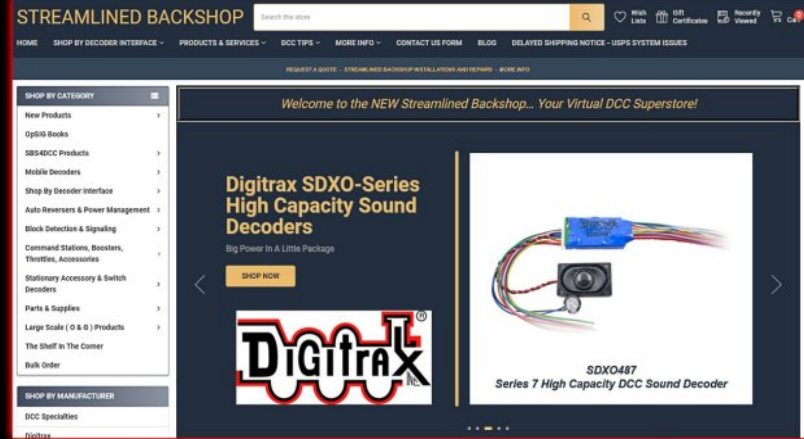
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USING SERVOS FOR TURNOUTS, PART 1 | 3



J. Fugate

MORE ROBUST SERVOS

If you're at all concerned about the tiny plastic gears in the SG90 servos and their reliability, MG90s servos have all-metal gears, resulting in a more durable servo. The all-metal gear servos cost about 40 cents more per servo. I list both kinds of servos in the shopping list for this article.

For the record, the Tortoise uses plastic gears, so plastic gears may not be a liability.

Plastic gears



SG90 servo

Metal gears



MG90s servo

2. SG90 and MG90 servos. They're essentially identical except the MG90 has all-metal gears.

INTRODUCTION TO SERVOS

Hobbyists in robotics and radio-controlled airplanes, cars, and boats have become quite familiar with pulse-modulated servos, and have been using them for decades.

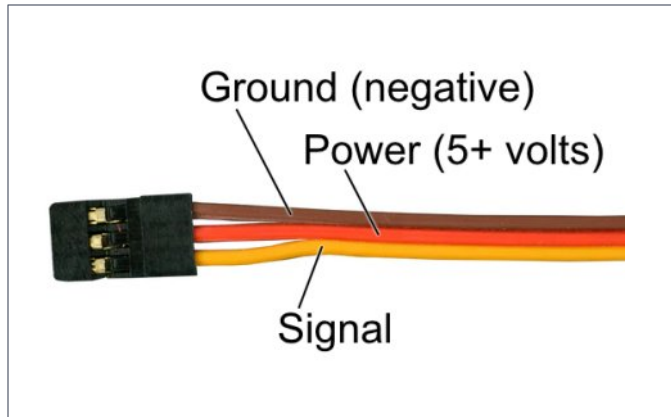
Servos can be digitally controlled, and provide precise, programmable movement. They are small, lightweight, and have high torque, making them ideal for hobby projects.

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USING SERVOS FOR TURNOUTS, PART 1 | 4



3. Servos have three wires: brown for ground, red for power, and yellow for the pulse-width modulated (PWM) signal.

They come in three sizes: micro, standard, and jumbo/giant servos. For our purposes, we're using micro servos, specifically the SG90/MG90 servos.

Servos have three wires: power (+5 volts), ground (negative), and control signal [3]. A stream of pulses at 50-60 Hz on the signal wire controls the servo rotation. The servo responds by rotating to a specific position based on the width of the pulses.

Servos come in two types: 180-degree rotation and continuous rotation. 180-degree servos provide precise positioning, while there is only speed and direction with continuous-rotation servos. We are using the 180-degree rotation servos.

Each SG90/MG90 servo draws 100-250mA of current, with a maximum stall current of 360mA. The total current needs of any servo project depend on how many servos you'll be actuating simultaneously. For just a single turnout, throwing a single servo is no big deal with a servo driver board.

But if you want to throw multiple turnouts at once, such as two turnouts in a crossover, four turnouts in a double crossover, or any number of turnouts in a yard ladder, the total current needs must be computed and provided by the power supply to the servo driver board. More on this later.

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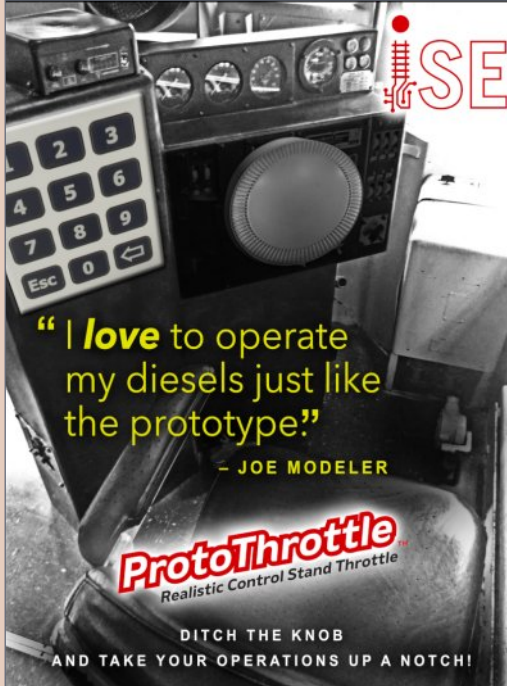


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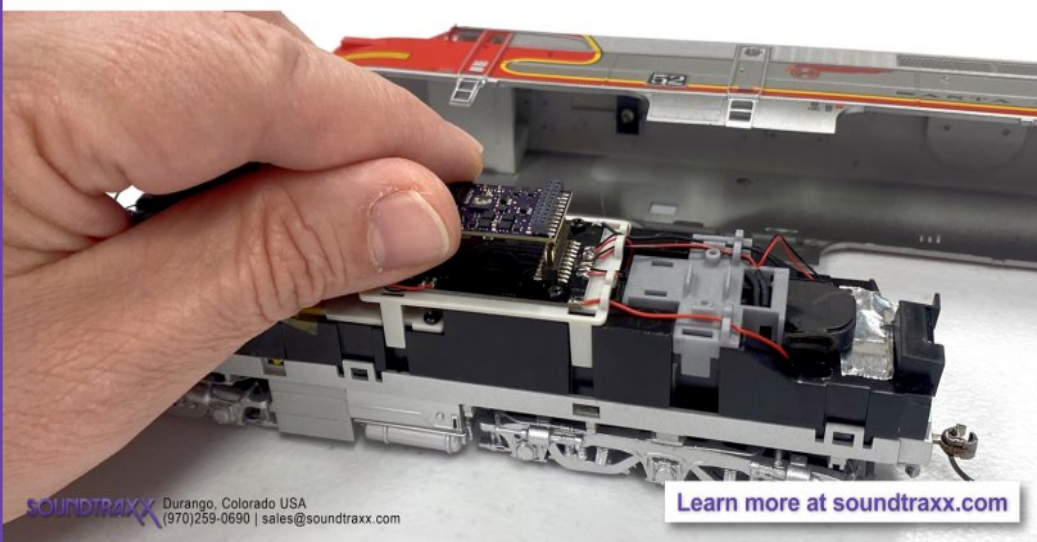
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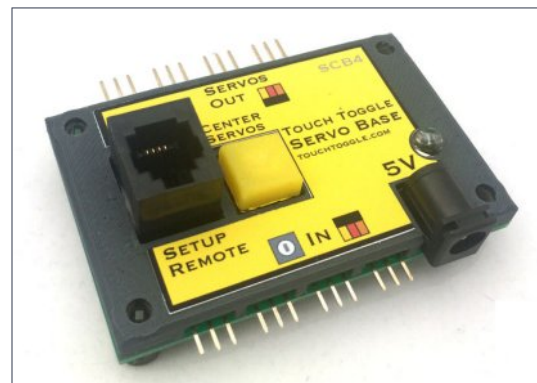
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USING SERVOS FOR TURNOUTS, PART 1 | 5**COMMERCIAL SERVO CONTROL OPTIONS**

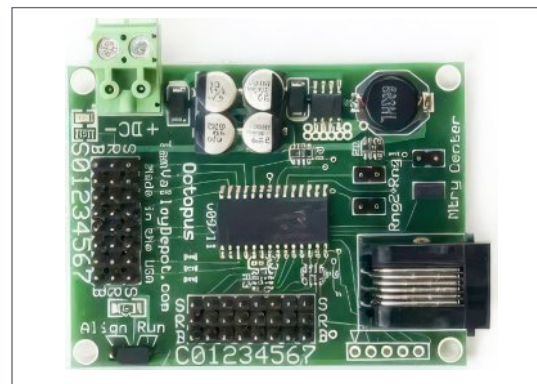
You can buy commercial servo control boards made specifically for turnout. Here are the most commonly available boards (listing *MRH* Sponsors first):

- Berrett Hill [4a] **MRH* Sponsor link: go.mrhmag.net/berrethill
- TAM Valley [4b] **MRH* Sponsor link: go.mrhmag.net/tamvalley
- MegaPoints [4c]

Other vendors also provide boards, but these tend to come and go, and may not always be available. The listed vendors tend to keep boards in stock.



4a. *MRH* Sponsor Berrett Hill's SCB4 drives up to four servos (\$8.90 per servo). See: go.mrhmag.net/berrethill



4b. *MRH* Sponsor TAM Valley's Octopus III drives up to eight servos (\$6.25 per servo). See: go.mrhmag.net/tamvalley



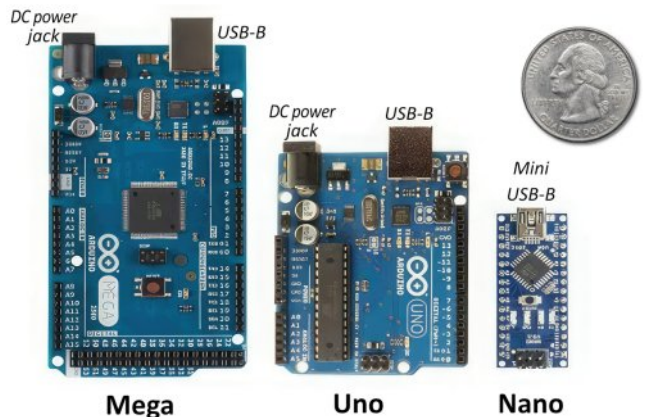
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These commercial solutions have the advantages that you don't need to do any coding, plus they include step-by-step instructions for setup, wiring, and servo throw adjustment. They run about 50% less costly than using Tortoises. They're almost plug-and-play, but that does come at a price compared to total do-it-yourself.

If you want big savings, then the do-it-yourself option using an Arduino is the way to go. I'm dedicating the rest of this article to the DIY Arduino option.



4c. The Megapoints Servo Controller 12 drives up to a dozen servos (\$8.80 per servo). See: megapointscontrollers.co.uk/product/servo-controller-12



5. You can get Arduino boards in various form factors; here are three of the most common. All the form factors use the same pin configuration, which allows swapping the program code between boards. The Mega offers

the most I/O pins, and the Uno is considered the most generic Arduino board. The Nano operates similarly to the Uno, but saves considerable space when that's needed.

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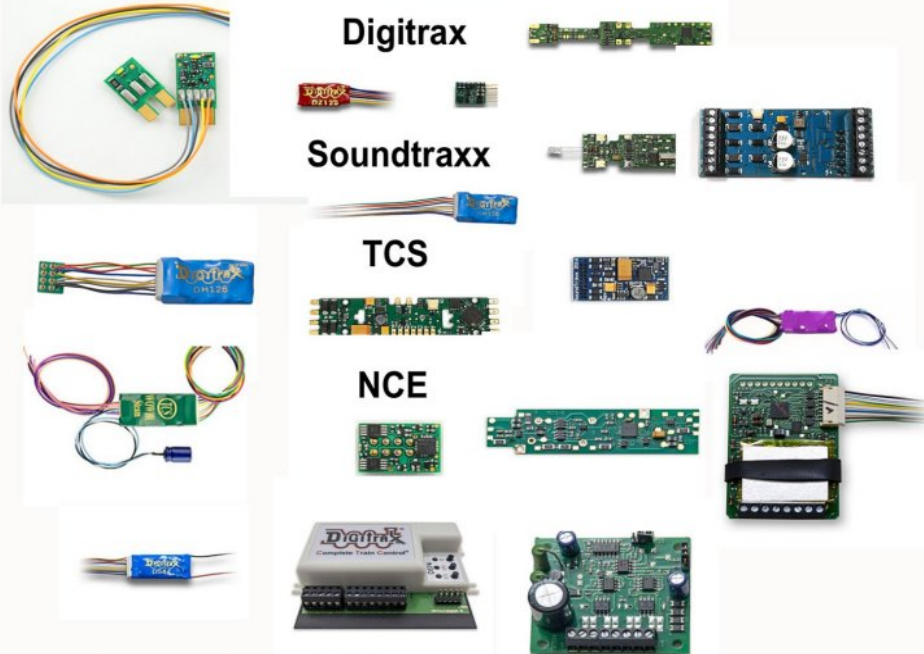
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CONTROLLING TURNOUT SERVOS WITH AN ARDUINO

Using an Arduino to control turnout servos is not that difficult if you're willing to learn some simple coding. I take you by the hand and provide cookbook coding examples in these two articles, so you can start with those and customize as needed for your specific case. I also deliberately work to make the code examples easily configurable – basically, just change a few values and you should be off-and-running.

There's a side benefit to learning to use an Arduino for turnout control. You will likely think of other things you can do with an Arduino, such as driving signals, driving a turntable, adding layout animation, or automating things like structure lighting.

The Arduino began in 2005 as an electronics board for students at the Interaction Design Institute in Ivrea, Italy. The idea was to provide a low-cost, easy way for novices and professionals to create easily programmable devices that interact with their environment using sensors and actuators. Today, you can buy an Arduino board for as little as \$10, making them very affordable for hobbyist projects.

There are several versions of the Arduino available [5], most commonly the Uno, Mega, and Nano. The Uno is considered the most general-purpose Arduino board, with 14 digital I/O pins and six analog pins. The Mega has 54 digital I/O pins and 16 analog pins. The Nano has 14 digital I/O pins, eight analog pins, and is the most useful when space is limited. Typical Amazon prices are \$10 for the Uno, \$21 for the Mega, and \$18 for the Nano.

How do you decide which board to use? It largely depends on how many turnouts you want to control with a single Arduino board.

The Uno, which we're going to use in the rest of this article, permits controlling up to 10 turnout servos with a toggle switch when paired with a PCA9685 servo driver board (more on this in a moment). If you want to use push buttons, one for each throw

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direction (two push buttons total per turnout), then you can control five turnouts with an Uno.

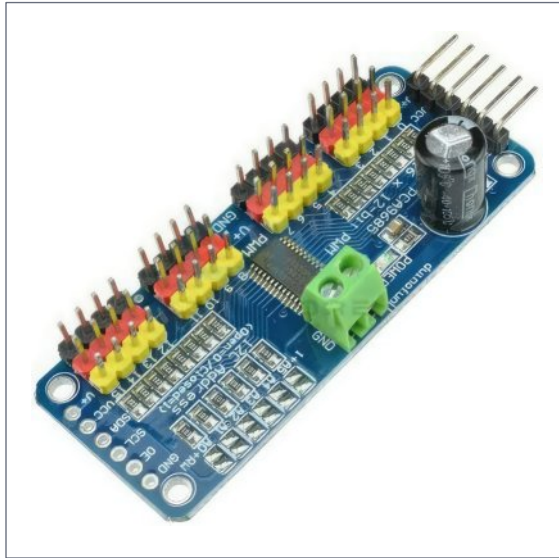
If you move to a Mega, then you can control up to 50 turnouts with a toggle switch, or 25 turnouts with two push buttons per turnout.

Servos require pulse-width-modulation (PWM) as the driving signal, and the Arduino Uno only has five PWM output pins, marked with a wavy line. The Mega has 15 PWM pins. However, the Arduino pins can only drive a max of 40mA per pin, and 200mA total per board. The SG90/MG90 servos need 100-250mA to operate properly, so we need a way to safely drive the high current micro servos without burning out the Arduino board.

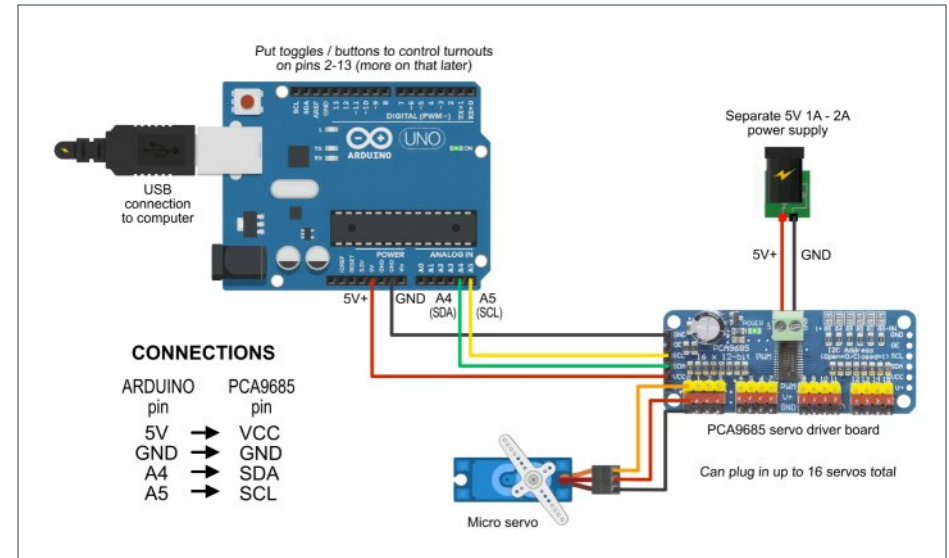
That's where the PCA9685 servo driver board comes in.

PCA9685 SERVO DRIVER BOARD

The PCA9685 servo driver board, when connected to an Arduino, allows safely driving up to 16 servos without overloading



6. The PCA9685 servo driver board.



7. Just connect the Uno, servo driver board, and a single servo as shown and you're ready to write some simple code to drive the servo. Next month, we will show how to control the servo with a toggle switch or pushbuttons.

the Arduino. This board sells for around \$7, and can be had for less than \$5 in sets of three or more. Connecting the 9685 board to an Arduino Uno is simple, just run wires as shown in diagram [7]. Add on a 5V servo driver power supply on the green servo feeder terminals and you're ready to drive up to 16 servos.

Since each SG90/MG90 servo has a stall current of 360mA, you need to use a power supply that can supply 360mA times the number of servos you plan to drive all at the same time. For example, with a crossover, driving two servos at once will take 720mA max. If you're driving a six-turnout yard ladder set of servos all at once with route selection, then you'll need just over 2 amps.

Unless you plan to drive a lot of servos at once, a 5V, 1A power supply should be fine. If you have 16 servos connected, but only

throw turnout one at a time, then a 1A supply is plenty. Throwing a single servo at a time only takes 360mA max. Any other servos connected to the driver board not being thrown draw 0 amps.

Use jumper wires (see the shopping list) to connect the Uno to the servo driver board. Plug in a servo to socket zero (first set of pins on the left), making sure the brown wire goes to the GND pin and the yellow-orange wire goes to the PWM pin. The red middle wire goes to the V+ pin.

Connect a 5V power supply to the green terminal block, with V+ going to the left socket and the black negative/ground going to the right GND socket.

Once you have the circuit in [7] set up, we're ready to write some code. You'll need a desktop computer or a laptop to run the Arduino development app for writing the code.

Let's install the Arduino development app

Go to this URL in your browser [8] and download the Arduino IDE (Integrated Development Environment) to your computer: www.arduino.cc/en/software

When you download the IDE, it asks if you want to donate to the Arduino project. Donating is up to you, but I suggest giving them a few dollars – after all, once you get this working, they'll have saved you up to 80% on the cost of controlling your turnouts.

Once the IDE has downloaded, double click it to install it. It may tell you it has to download some other software – just say yes to everything.

Once the IDE has installed, go ahead and start it up – upon startup, it may download further bits of software; just say yes when prompted. Plug in the Arduino USB cable to your computer and you should hear the familiar blip indicating your computer has found a new USB device.

Here's a step-by-step video done by YouTuber **AL AMIN** showing the IDE installation on a Windows computer: youtu.be/5vBXvIQtmOM?si=3gCpqQe1mSpaLc-p



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PCA9685 BOARD POSSIBILITIES

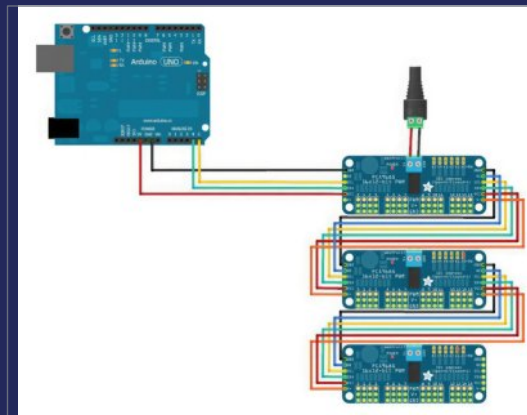
You can daisy-chain [7a] up to 62 of the PCA9685 boards, each able to drive 16 servos, giving a maximum of 992 servos in total that can be driven by a single Arduino. The practical limit is the toggle/pushbutton control pins, and for this article we're assuming a single SPDT toggle or two push buttons per turnout.

For the Uno, you can control up to 10 turnouts with toggles, or five turnouts with push buttons. With the Arduino Mega, you can control up to 50 turnouts with toggles or 25 turnouts with push buttons.

To go beyond this number of turnouts, you can always use more than one Arduino. That means there's no limit to the number of servo-driven turnouts you can control.

Also, the 9685 board can drive LEDs as well, which can be handy for indicating turnout position on a control panel. We'll explore using LEDs with the 9685 board in Part 2.

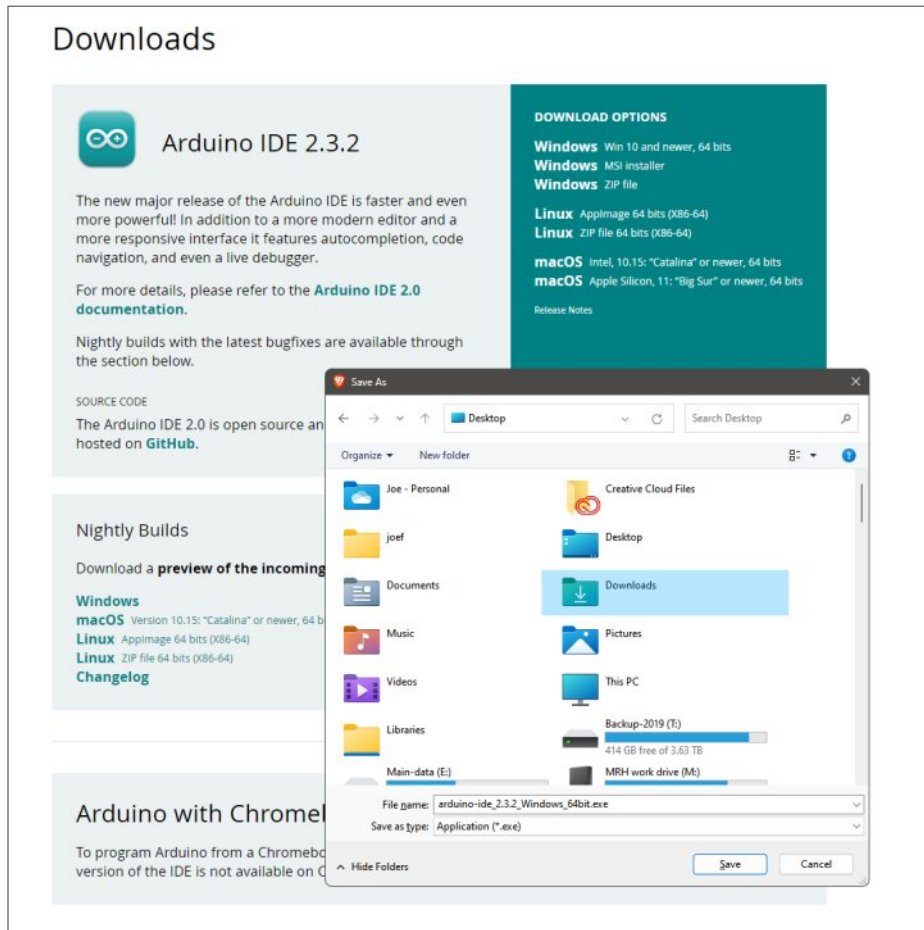
You can think of the PCA9685 board as way to add digital PWM pins to an Arduino, with the ability to provide up to several amps of current when driving devices off those pins.



7a. The PCA9685 board can be daisy-chained off a single Arduino up to a maximum of 62 boards. With this 9685 daisy-chaining, a theoretical maximum of 992 servos can be driven with a single Arduino.

GETTING STARTED WITH THE IDE

Once you get the IDE installed, let's do a simple program to shake-down the setup and make sure the Arduino's connected okay and working properly. With this simple example, we will blink the built-in LED on the Uno board wired to pin 13.



8. Go to this URL: www.arduino.cc/en/software and download the Arduino IDE. Then install it on your computer and say yes to all the prompts.

An Arduino program is called a sketch, and the code has two sections, one called setup and the other called loop. The setup code runs once right at the start and then never runs again. The loop code runs endlessly after the setup has completed.

The first thing we want to do is to initialize the LED_BUILTIN pin as an output pin in the setup section, so type this in:

```
pinMode(LED_BUILTIN, OUTPUT);
```

Commands you write in the Arduino IDE end with a semicolon (with a few exceptions, which we will point out). The pinMode statement tells the Arduino we're talking to the built-in LED pin and we're using it as an output pin to control the onboard LED.

In the main loop, we turn on the LED on with this line:

```
digitalWrite(LED_BUILTIN, HIGH);
```

HIGH says to send 5 volts to the built-in LED pin to light it up. Then to turn off the LED, use the line:

```
digitalWrite(LED_BUILTIN, LOW);
```

This sets the LED_BUILTIN pin back to 0 volts, which turns off the LED. The Arduino runs code very fast (in a thousandth of a second) meaning the LED will be blinking on and off so fast we can't tell, so it will just look like it's not doing anything (look dark).

To be able to see the on/off change, we need to introduce a delay after the first digital write by telling it how many milliseconds to wait and do nothing. Let's make it 1000 milliseconds (one second):

```
delay(1000);
```

And we also introduce another delay after the second digital write of another second by coding a thousand milliseconds:

```
delay(1000);
```

The complete sketch code looks like this:


```

/* BLINK BUILT-IN UNO LED
   Beginner example
*/
void setup() {
  // put your setup code here, to run once:
  pinMode(LED_BUILTIN, OUTPUT);
}

void loop() {
  // put your main code here, to run repeatedly:
  digitalWrite(LED_BUILTIN, HIGH);
  delay(1000);
  digitalWrite(LED_BUILTIN, LOW);
  delay(1000);
}

```

This code includes comments, which the IDE just ignores. A single-line comment begins with `//` and a comment block starts with `/*` and ends with `*/`.

To run this code, we need to compile it and send it to the Uno board. To do that, press the right-hand arrow button up at the top of the screen and wait a few moments for the code to compile and get uploaded. If you made a typo anywhere, the compile-and-upload will tell you.

Once you have no errors in the code, watch the Uno board and after a few moments, you should see the TX/RX LEDs settle down and the board LED L should begin blinking on/off endlessly every second [9]. Congratulations, you have written your first Arduino program – go ahead and select Save to save your program to your computer drive. Name it whatever you want, like **blink-led** for instance.

To see a video demonstrating the process of putting this the example code into the IDE and sending it to the board, watch this

YouTube video by **Quad Store**:

youtu.be/BoB-3JHLjS8?si=WXHQRLtm_MvWgJr

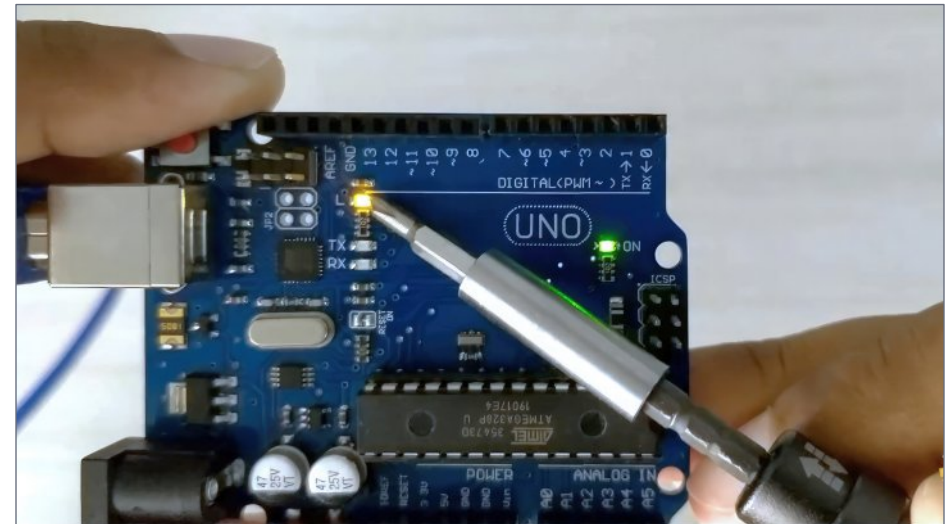
Once you've gotten this to work, go back into the code and experiment with different values for the delay.

For example, if you change to 500 milliseconds on both delay commands, the LED will blink on and off every half-second instead of every second.

You don't need to put the same value in both delay lines. You can make one 1500 and the other 500, for example. Or you can try 300/700, or any other combination. You may notice if you make the delay too short (under 100 milliseconds) on either line, the blinking will get so fast you won't see it.

Experiment and have fun – get comfortable making the Arduino do stuff with program code – see how easy it is?

If you've made it this far and did this first LED blink example, then you've shaken down your Arduino setup and proven you can write code and make the Uno do something. Time now to write some code to move that servo back and forth.



9. The simple coding example in the text makes the Uno's built-in LED blink on and off every second.

MAKING THE SERVO MOVE

At this point, we're assuming you have the wiring set up in [7] with the PCA9685 board and a servo attached. First, you need to add the Adafruit PCA9685 code library to the IDE. This YouTube video by **Michael Klements** shows how to add the PCA9685 code library to the IDE:

youtu.be/mQK3Scp3Qls?t=297

Stop the video once you've seen how to install the code library – the video continues on into more advanced topics that you can just ignore for now. Once you have the servo driver board code library installed, let's get coding!

Type in the code shown below (or copy and paste it):

```
#include <Wire.h>
#include <Adafruit_PWMServoDriver.h>

Adafruit_PWMServoDriver pwm = Adafruit_PWMServoDriver();

void setup() {
  // put your setup code here, to run once:
  Serial.begin(9600);

  pwm.begin();

  pwm.setPWMFreq(60);
  pwm.setPWM(0, 0, 375); //servo pin, min
  pulse, max pulse (servo position)
}

void loop() {
  // put your main code here, to run repeatedly:
  char inChar = (char)Serial.read();
```

```
if (inChar == 'q') {
  pwm.setPWM(0, 0, 625);
  Serial.println("Set servo left position");
}

if (inChar == 'w') {
  pwm.setPWM(0, 0, 375);
  Serial.println("Set servo center position");
}

if (inChar == 'e') {
  pwm.setPWM(0, 0, 125);
  Serial.println("Set servo right position");
}
}
```

Okay, let me walk you through this code so you understand how it works.

To use the PCA9685, we need to include some code libraries:

```
#include <Wire.h>
#include <Adafruit_PWMServoDriver.h>
```

The #include is a compiler load directive and not Arduino program code per se, so it doesn't need a semicolon at the end.

Next, we need to create an instance of the driver board in the code so we can talk to it with the Arduino. Let's call it pwm:

```
Adafruit_PWMServoDriver pwm = Adafruit_PWMServoDriver();
```

In the setup loop, let's initialize everything. First, we set the serial baud rate to 9600 (standard value). The serial interface lets us read from the computer keyboard and write to the serial window on the computer screen. In other words, this is a simple way we can send a command to the Arduino and display some text describing what's happening.

Next we initialize the pwm board (begin), establish its servo pulse frequency (60Hz is typical), and set the initial position of the servo on pwm board pin zero to center:

```
Serial.begin(9600);
pwm.begin();
pwm.setPWMFreq(60);
pwm.setPWM(0, 0, 375); //servo pin, min
pulse, max pulse (servo position)
```

The `setPWM` method takes these values: servo pin number, servo min pulse (always zero), and servo max pulse, which is the position to which you want to move the servo. As general guideline, the min-max position values for far left to far right are 650 – 150, but you need to test each servo batch and adjust up/down from those starting values to determine a good value range for 0 to 180 degrees with your servos.

With my servos, I found 625 and 125 to be a perfect left zero degrees position and a perfect right 180 degrees position. You may need to adjust the position in which you attach the servo arm (called a “horn”) to get these positions with these values (or something close to them).

We’re setting the servo arm position to straight up 90 degrees (called center position) to start with. How did I come up with 375 for the center position? Knowing the left and right values, 625 and 125, just add them together and divide by two to get the center position.

We will set up the sketch loop to take some keyboard keys to position the servo using `Serial.read`. Let’s use Q, W, and E (upper left keyboard keys). We will make Q the leftmost position (zero degrees), W the center position (90 degrees), and E the rightmost position (180 degrees). Here’s the code:

```
void loop() {
  // put your main code here, to run repeatedly:
  char inChar = (char)Serial.read();

  if (inChar == 'q') {
    pwm.setPWM(0, 0, 625);
    Serial.println("Set servo left position");
  }

  if (inChar == 'w') {
    pwm.setPWM(0, 0, 375);
    Serial.println("Set servo center position");
  }

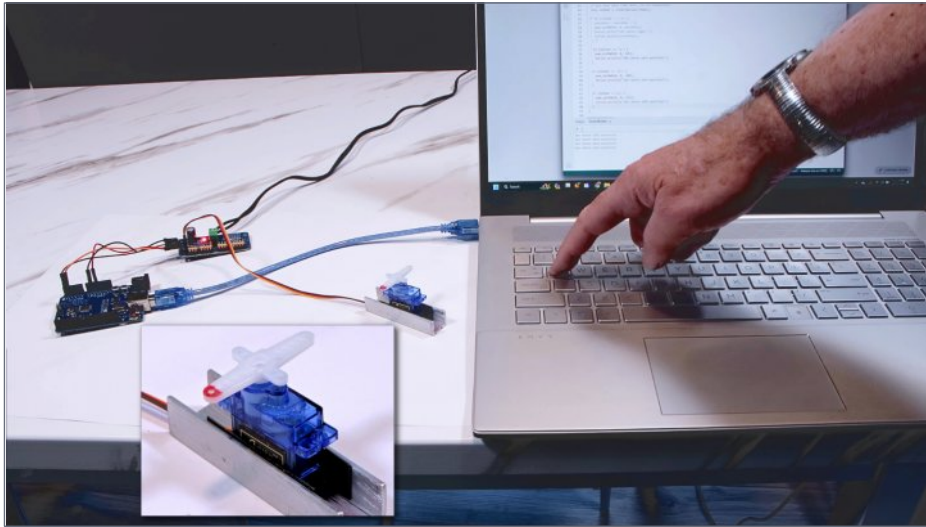
  if (inChar == 'e') {
    pwm.setPWM(0, 0, 125);
    Serial.println("Set servo right position");
  }
}
```

Press the right arrow at the top of the IDE window to compile and upload the code. If you made a mistake somewhere, the compiler will find it and let you know. Most often it’s a missing semicolon or the wrong case on something – yes, upper and lowercase matters with Arduino code.

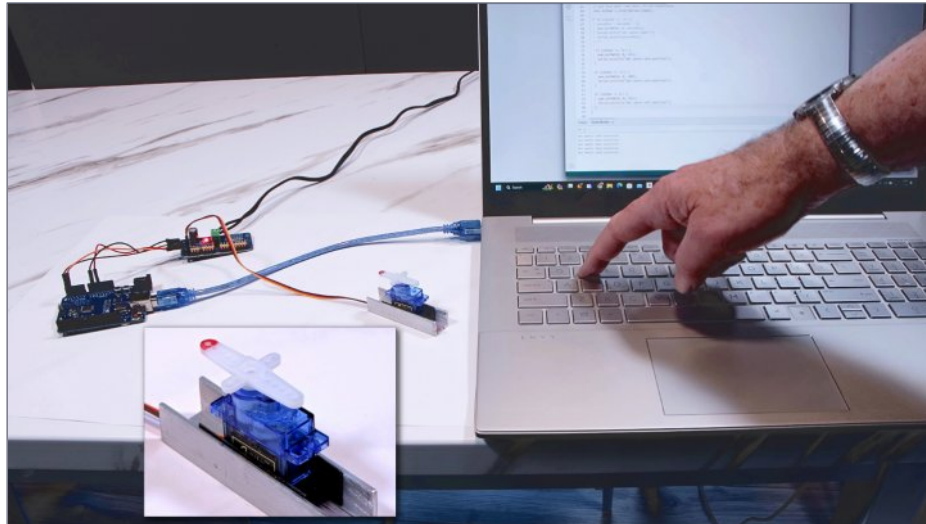
Once you get a successful compile and upload, open the serial window using the magnifier at the upper right.

Now type a small q and press Enter. You should see the servo move to zero degrees left and the text “Set servo left position” should appear in the serial window [10a]. Type a w and press Enter – the servo should move to center vertical position and display the text “Set servo center position” [10b].

Finally type e and press Enter. The servo should move to 180 degrees right and the text “Set servo right position” should dis-



10a. Once I've compiled and loaded the servo position sketch, I press Q + Enter and the servo moves to the left zero degrees position. Also see [10b, 10c].



10b. I press W + Enter and the servo moves to the center 90-degree position.

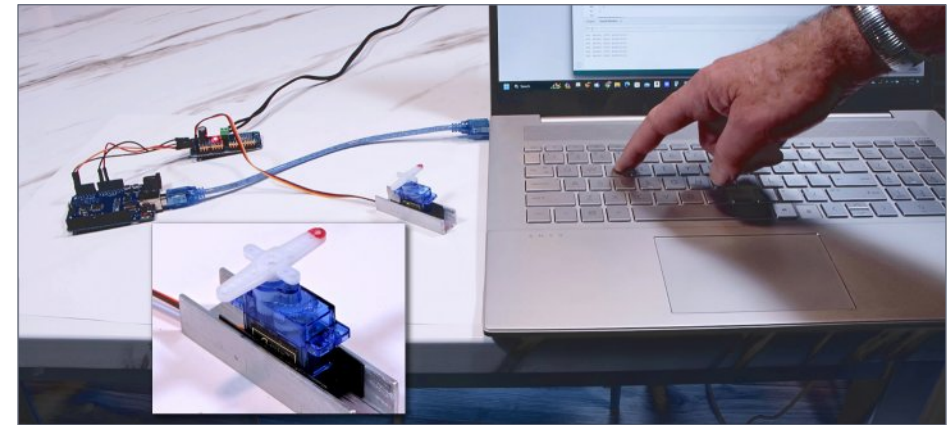
play in the serial window [10c]. You can type any of the three letters, q, w, or e to move the servo any direction to any of the three positions.

Once you get your servo to do this, you've now learned the basics of moving a servo to any position with an Arduino and PCA9685 board. Doing this with any of your turnout simply builds on these fundamentals!

That's it for this month. Next month, I will show how to determine the 0-180 value range for your specific batch of servos, then we'll move on to controlling a servo with a toggle switch, or with two push buttons, and how to add LED position indicators.

Then I will show you a final sketch you can adapt to your layout and be able to control as many turnout servos as you want using toggles, and LED position indicators.

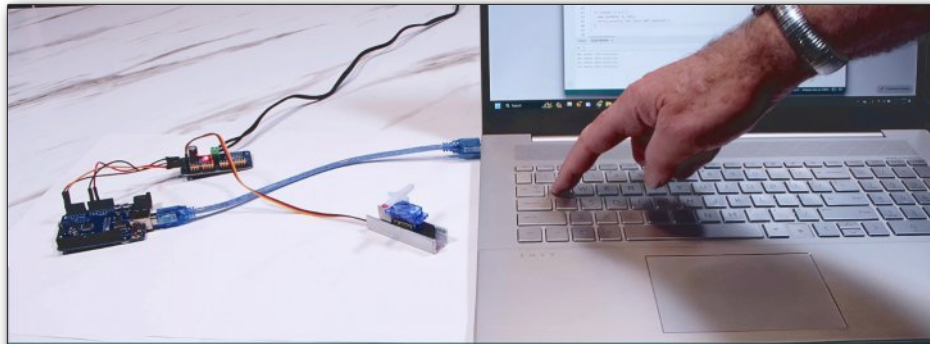
Finally, I'll show you a good way to mount the servo under a turnout and how to add a microswitch for frog power routing – all for about \$3.50 total per turnout. See you next month! ☑



10c. I press E + Enter and the servo moves to the right 180-degree position.

The article continues on the next page ...

USING SERVOS FOR TURNOUTS, PART 1 | 22



Demo: Control servos w/Arduino
April 2024 MRH companion video



11. Watch this video to see this article's final servo sketch in operation.

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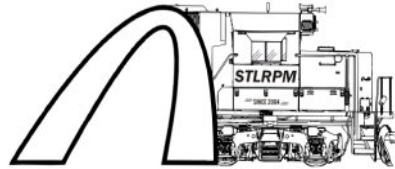
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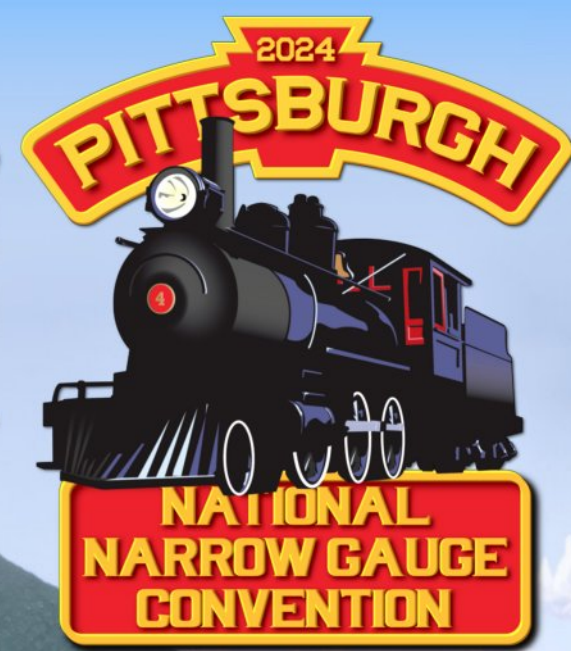
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This layout can be viewed at the
**2024 Pittsburgh National
Narrow Gauge Convention**
September 11-14, 2024



The Pennsylvania Middle Division

**JOE FUGATE VISITS NEAL SCHORR'S O SCALE
LAYOUT ...**

1. A couple of Pennsy L1 Mikados slowly pull this heavy coal train across Sherman's Creek near View tower, which represents the 1930s era. The smoke in this photo is real – Neal has locos with smoke generators on them and he put smoke fluid in them for this shot.



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NEAL SCHORR HAS AN O SCALE THREE-RAIL

LAYOUT IN the greater Pittsburgh area that will be open for tours during September 2024 as part of the 2024 National Narrow-Gauge Convention. To learn more about this convention / to register, please visit this website: 44nngc.com.

I visited Neal and toured the layout, taking photos and video. Don't let the three-rail aspect of this layout fool you, this layout is every bit as realistic as the best two-rail layout we've seen. And the heft of O scale makes it an even better treat!

MRH: Neal, how did you first get started in the hobby?



Neal Schorr

Neal Schorr: I've been involved in this hobby actively since I was 16 years old. I got a Lionel Train set as a young child of four years old back in 1960. I got into other hobbies as I grew up, but around 1973 I discovered that Lionel had gone back into business after they had shut down. I found a hobby shop here in Pittsburgh, and they had a nice O scale three-rail train set that was prototypically accurate.

I got really excited and purchased it – that's what launched me back into the hobby. I had been with O scale three rail trains for many years, but as time went on, I started to see their shortcomings – they were too toy-like. So I switched to HO Trains around 1987, had an HO layout for about 10 years.

During that time period, Lionel started making far more realistic trains, as did their competitors such as Mike's Train House (MTH). There were others, like K-Line and Atlas.



2. A steam-powered freight in the foreground leaves Enola heading west. In the distance, the L1 double-headed coal train in [1] approaches Enola.



3. The freight train in [2] rolls through Duncannon. Neal modeled the town to be circa 1944 and the end of the World War II era.

When I built my current home and moved into it in 1997, I decided to switch back to the three-rail trains, because they were now much more realistic.

MRH: How did your hobby interests progress from there?

Neal: I've always been interested in highways and civil engineering. My old HO layout represented the South Pennsylvania Railroad, which was started in the 1880s but never finished – and eventually purchased by the Commonwealth of Pennsylvania.

They built the Pennsylvania turnpike on the roadbed, and I thought that's what I would do when I built my new house. Then in 1975, I was looking at a Pennsylvania road map and I



4. (Left) East Altoona represents the 1950s, with lots of late era steam locos visible.

5. (Top) An early diesel era PA set with the iconic Pennsy long roof antenna blasts through Port Royal with a hot passenger train in tow.



saw a new expressway being built in the middle of Pennsylvania – US Route 22 and 322. So I drove out there to take a look.

It wasn't the road that got me, it was the scenery. It was the most beautiful place I had ever seen on the face of the earth. I continued to go out there year after year, so I decided to model that area. The Pennsylvania Railroad ran through this area on its journey between Harrisburg and Pittsburgh. When I designed and build my new house, I decided to go back to O Scale trains and to model the middle division of the Pennsylvania Railroad across central Pennsylvania.



MRH: How do non-modelers react when they see your layout?

Neal: I have friends and family who know of my model railroad and tell me they'd like to see it. I often don't tell them much about it, because I like to see the look of surprise in their face. I think they're expecting a four by eight sheet of plywood having a circle of track with a train running merry-go-round style and featuring something like Bozo the clown.

Instead, they see a museum-quality model of central Pennsylvania, and they are shocked! I like watching their reaction and seeing the look on their face when they step in here.

MRH: How did you arrive at this particular layout setting?

Neal: I based my era on my decision to model this area from my initial trip out to central Pennsylvania in 1975 – I had just finished my freshman year of college.

I had no idea what was out there – but I found out – lots of rural scenery. As a kid, I always liked farmland, barns, and scenery outside the city. I didn't want to model a lot of big industries and factories.

6. A transition-era RS-11 lashup rumbles across the Juniata River on its way toward Port Royal.

I wanted to capture that beautiful rural scenery that defined the Pennsylvania Railroad in western Pennsylvania. Although, by the time I got out there in the mid-seventies, it was near the end of the Penn Central and soon to be Conrail.

But that's why I model this area and this railroad.

MRH: So what era are you modeling?

Neal: I started designing my house around 1990, and I didn't start building it until 1996, so I had a long time to think about the design of my railroad. I was active in the National Model Railroad Association, and I really wasn't interested in operation, I was interested in scenery.



I couldn't decide on one era, so I decided to take a novel approach. I aged the layout as went from east to west, so I start out back to the steam era around 1930 or so. I made the eastern-most town Enola represent the 1930s.

The next town, which is Duncannon, models the World War II years. It's 1944 and you can see that by the crowds on the passenger platforms. As you have shot the layout here today, we started the same way – we started

7. (Left) The Works area has a diesel enginehouse with 1960s era diesels on view.

8. (Top) Here's another view of the Works diesel enginehouse.

with steam engines at Enola [2], and shot another steam engine at Duncannon [3].

Moving further west, I represent the railroad where it hangs onto the banks of the Juniata River – with a mountain on one side and the river on the other. And as we proceed further west, we get to the town of Port Royal and one of my favorite scenes in the layout [5, 6]. Port Royal represents the end of the steam era. The old Pennsylvania railroad still had four tracks at that time.

They're about ready to rip out track number three, but there you see early diesel units mixed with later era diesel freights. Then we move further to the west to Mifflin, Pennsylvania [3]. It's late Pennsy, moving into Penn Central. That's the first time we vary from Pennsylvania Railroad engines to something else – in this case Pennsy mixed with Penn Central.

Then we reach Longfellow [23]. Longfellow to me is classic central Pennsylvania. People view this scene [16] and they say, "that looks just like the mountains of Pennsylvania" and I love it. Further west, we have the rural grade crossing at Anderson Road



9. A lashup of three RS11s pulls a mixed freight through Mifflin, PA.



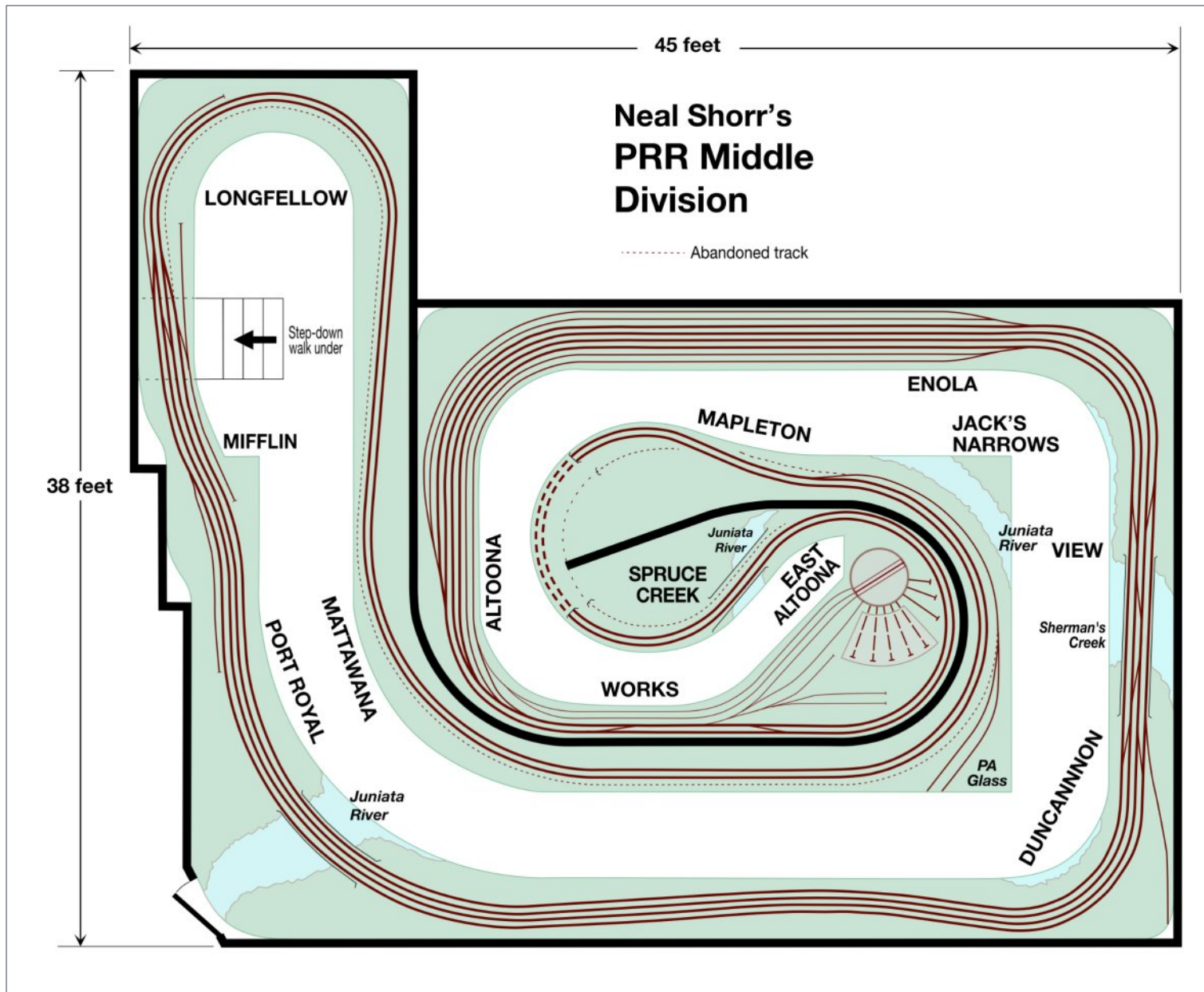
10. Neal designed this house himself and deliberately added basement features to accommodate his layout.

[17], which is about five miles west of Lewistown, PA. There you shot more Penn Central equipment.

Next, we get to one of my favorite scenes, which is Mattawana, with working crossing gates [18]. There we're into the early Conrail era – and we reach my time. I went out there many times with my kids while doing research.

Moving further west we reach an area of woodlands, and that's now pure Conrail. On the track plan [7], there's just two tracks left. You can see the right of way where tracks three and four were previously, but one was taken out by the Pennsy and then Conrail removed a second track.

Next, we come around past Jack's Narrows, which is a gap in the mountains and a real favorite of mine. Then comes the town of Mapleton [13], the one scene on the layout that's not done.



11. Track plan of Neal Shorr's Pennsylvania Railroad Middle Division.

Finally comes Spruce Creek, Pennsylvania, which is contemporary, like 2010. It involves Norfolk Southern [25], which my son who loves trains wanted included on the layout.

I've modeled Altoona on the layout too, as well as an engine servicing area at Works [4, 7, 8] but that drops back again into the 1950s to early 1960s.

MRH: How did you develop the track plan?

Neal: I developed my track plan along with my house. I knew the type of house I wanted, and although I live in Pittsburgh, my house looks more like what you might see in eastern Pennsylvania [10]. I wanted the house to have a long floor plan and a big basement.

Ever since I was a kid, it was always my goal to design and build my own house. So I had the privilege of not only designing my house but to design the layout going into the basement at the same time.

I was able to design in features that enhanced the layout. The biggest thing I did



was run a steel girder the length of the house. While it did need support columns, the contractor told me I could space the support posts up to 24 feet apart because I used an extra heavy girder.

I knew right where the backdrop would be on my layout design. I designed it so the two support posts would fit right into the backdrop.

As they began building the house, I noticed the footer for one of one of the posts was off four feet, which would put a support post *right in the middle of the aisleway*. I talked to the contractor, and he moved it.

I also put an extra course of blocks in the basement so I wouldn't have a real low ceiling in here. Since I didn't want to duck under, designed a stair pit which drops you down about four steps some 36 inches below the floor level. You walk underneath the layout without having to bend over, and then you just come back up those four steps and pop into the middle of the layout [12]. It just saves so much aggravation.

An additional feature I put into the house was a specialized HVAC. The contractor who worked on the house had done a railroad museum here in Pittsburgh, and he told me the correct way to do it was to have the fresh air vent for the heated and the cooled air be at the far end of the basement, and have the return air vent on the near end of the basement closest to the furnace.

That way all the air would be coming across the room and would go into the return and back to the furnace. It's worked extremely well. I can heat or cool this room to an ideal temperature within five minutes.

I knew from studying track plans and reading about model railroad planning, the most efficient way is to build an around-the-wall layout and to have a center peninsula. In this way, all of your aisleways do double duty. They have layout on both sides, so you're getting maximum efficiency and you're getting the most layout per square foot.



12. Since Neal designed this house and basement, he had the contractor build this step-down walk-under specifically with the layout in mind.



13. The town of Mapleton is currently the only unfinished part of the layout left. Note the way Neal runs all the wiring along the front of the layout for easy access. Saves from having to crawl under the benchwork to run feeders to the track.

I believe the main line is 360 feet long. I don't have a large number of turnouts because I wanted to keep it simple. My guess is there's maybe 25 or 30 turnouts, which is plenty. My minimum radius is 60 inches.

I had two curves where I had to drop down to 54 inches. One's buried in a tunnel. The other is behind the roundhouse, so you don't really see them. I've tried to put in large radius curves where I could.

My largest curve is 156 inches, which is huge in either two or three rail, and the trains just look wonderful going around that. I have another one of 120 inch radius, another broad curve. I do have a few reverse curves, but I've tried to stick to prototype railroad track geometry practices to avoid any toy-like look.

MRH: When did you start construction?

Neal: The layout has been under construction for 26 and a half years. I moved into the house in February of 1997. I needed about six months to settle into the house. I started layout construction on September 13th, 1997. I made the first cut in the wood and I started the benchwork.

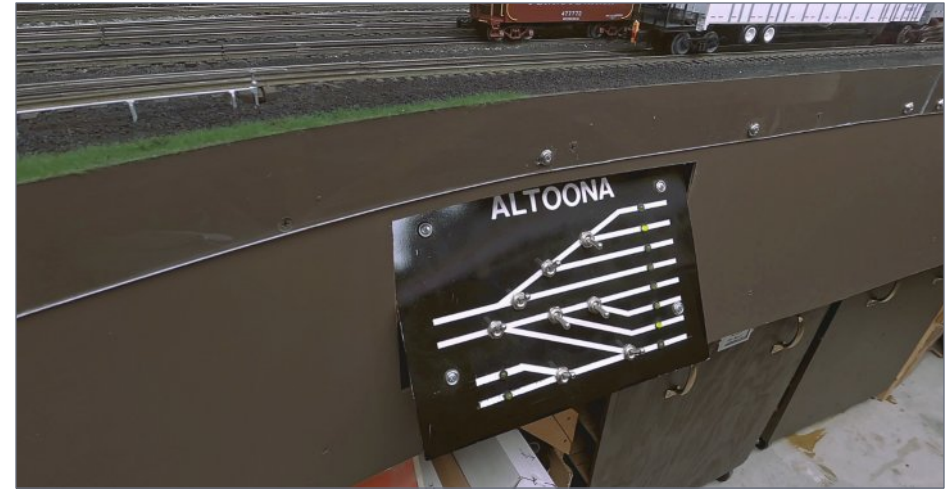
I had trains running within about three years.

MRH: How did construction go? Did it go like you expected, and did it progress as fast as you anticipated?

Neal: The layout has progressed pretty much as I had anticipated. I built it in three phases.

Phase one was just a U near the entrance to get some trains up and running. For the second phase, I made the complete loop around the room. By 2004 I had the center peninsula up and running.

Once the whole main line was in, I finished all the wiring and started scenery construction a couple of years later. My initial guess was the scenery would take about 20 years to get done. Well, I've taken a little longer.



14. Each town on Neal's layout has a nice mini-panel for controlling the turnouts like this one at Altoona.



15. A Conrail freight rumbles around the curve at the rural PA Glass plant.

I've been working on it 26 and a half years and as of today it's 95% done. I did most of it myself. My friend Mark Vinsky did the engine servicing area and my son Steven did a lot of the scenery around Duncannon.

MRH: Did you encounter any unexpected challenges with this layout?

Neal: The greatest challenge in building this layout is managing all the junk I have to accumulate to build it. There's all kinds of junk under the layout.

Now that the layout is nearing completion, I swear when it's done I will get a dumpster and get rid of all of that junk. I want this layout room to look really nice.



While the construction process has been very pleasurable, my favorite part is backdrop painting.

I would say the ceiling and the original lighting, it was not good. I had a suspended ceiling has been aggravating. I just put the two by four light fixtures over where the aisles would be. I didn't think it looked good, so I eventually replaced it with panel lighting.

I did have a pinhole leak develop in a pipe in the ceiling, and I never really thought about access, so that was disconcerting. I worry that it may happen again, so that's probably been my biggest concern with the layout.

Oh, one more thing – I didn't have a clear understanding of perspective, so I painted a few structures in the town of

Duncannon, and they didn't look right, so I painted them again properly. I do have a couple other areas where I would have dropped the distant farm land a little bit lower. Those are the main things.

In hindsight, I would have made the house a foot deeper and a few feet longer – my aisles are mostly a very wide four feet [19], but I have a couple pinch points in the

16. Neal loves this iconic rural Pennsylvania scene at Longfellow. He says people see this scene and immediately remark how it's so typical of western Pennsylvania.

center, and I wish I had given consideration to that. Making the house a bit larger would have eliminated those pinch points.

When I built this thing, I didn't have the fascia on it yet. The risers hold the subroadbed up about eight inches above the base benchwork, so I can wire it all from the front. I just sat in a store chair and wired it up.

Now if I have to fix it, I must crawl underneath. But without that fascia, it was a piece of cake to wire [13].

I drilled one and a half inch holes on all the risers, an upper hole and a lower hole. The upper one's all the track power, the lower one has signal controls and other stuff.

I sat there and threaded the wires through the risers. It was a piece of cake, for whatever that's worth.

MRH: Why three rail track? Isn't that extra center rail something of an eyesore?

Neal: People often ask me why I went with three rail and that's actually a very easy question to answer. If they were still making three-rail trains like they did when I was in high school, I would never have done it. They look like toys. But today, they're scale models, but meant to operate on three-rail track.

The biggest single reason I went three rail is the signals. I love signals and I've been modeling signals since I was in high school. By having that extra rail, my signals operate just like the prototype. I ground the two outer rails and it activates a relay controlling the signals just like what the prototype does.

I don't have to deal with current sensing units, and I don't have to deal with resistance wheel sets. When I was an HO, doing signaling was a big pain in the neck.

In HO, I might have one short block with trains that were longer than a block. This extra long train had a lighted caboose and a powered engine. So the middle of train was on the short block – but the engine and the caboose weren't, so the train wasn't detected. Three rail makes it so much easier.



17. A Penn Central train blows the rural grade crossing at Anderson Road. The crossbucks are fully animated with lights and sound.



18. The crossing gates at Mattawana are fully animated with sound, lights, and motion. Neal has modeled this scene to represent the early Conrail era of the late 1970s.

The second reason for three rail is the Lionel command control system. I think now the two rail DCC ones have progressed and they're easy to use, but back in the day they weren't. In that day, the Lionel command control was a piece of cake. You can hook it up in 90 seconds, and the thing works flawlessly.

My last reason is something a scale modeler won't understand. It's just love the look of the trains on three rail track. Like so many people, I got a three rail Lionel train when I was a kid, and I really enjoyed them.

But the single biggest reason is those signals are super simple and they work flawlessly.



Most of my track is Atlas three rail flex track. There was a fellow at Atlas who loves three rail but he was also a scale guy, so Atlas came out with very realistic three rail track, which looked better than anything else that was available in the market.

When the new Atlas three rail track first came out, I got the first run, but turnouts weren't available. For my initial turnouts, I used Ross custom switches, which are similar to GarGraves track. The ties are a little too wide, but the turnout quality is perfect. They're reasonably prototypical looking.

I used number sixes and eights. Then over the next year or two, Atlas did come out with scale turnouts, and I started using those in their place. I used the Ross custom switches as they came out with wide radius curve turnouts. I used them in the throat to my main yard and was able to extend it, adding another 25 car capacity to it.

MRH: How did you determine your layout height?

Neal: I selected my layout height based on prior experience with model railroads. When I was a kid, I

19. One thing we really liked is Neal's generous four-foot aisles. That's View and Sherman's Creek on the left, and almost to Jack's Narrows at the far right edge. In the distance is a rural glass plant that's between Jack's Narrows and Mattawana.

used to build them 18 inches off the floor and they were no fun to wire. I had to lay flat on my back, but I was 17 years old. What did I know?

When I switched to my first HO layout around 1985, I made it a lot higher. The railhead was probably about four feet off the floor. As I visited more layouts and got more experience, I finally decided to set the railhead to about 53 inches off the floor, which is great.

I wired the layout from the front. If I have to crawl underneath, there's lots of space plus that extra height gives more storage space.



MRH: What is your ruling grade?

Neal: My ruling grade is zero. I purposely chose the Middle Division because the thing is almost flat. It follows the Juniata River. I had grades on my old HO layout and I just didn't want to deal with them. I like to watch the trains run and not worry about turning the throttle up or down.

I suppose nowadays with Lionel cruise control it's not necessary, but when I designed my layout, that wasn't available. Now there are some grades on the real Middle Division, with the steepest one being half of 1%, but for the most part it's flat. So I've done what the prototype did.

MRH: You have a lot of deep scenes on this layout, and the fact your layout is O scale means accessing everything must be a challenge. How have you managed that?

Neal: I have several approaches to accessing deep areas of the layout where I can't just reach in. In the early areas I scenicked, I made all my scenery out of layered pink foam.

I built them in my workshop, including all the buildings, and

20. Neal has areas where the O scale benchwork gets rather deep. For access, he has several powered hatches where he just throws a switch and the hatch raises itself, such as this hatch at Port Royal.

I made them with little hooks on the bottom. With the assistance of my children, I dropped them into place and I used bungee cords to anchor them down.

In several other locations, I have hatches so I can get access, but I didn't want to lift them out, so I added a motor drive. The motor pushes them up, and I can come up through them and work on the surrounding scenery [20].

I also have two large square corners (PA Glass [15] and Jack's Narrows) that I wanted to have scenery. But when you do that, you can't reach back to the track. So I built the corners and I framed



them out of wood in a triangular shape, and added a piano hinge on one end so I can actually swing them out of the way.

I have storage underneath the layout [21], and in most areas I can easily access the track from the aisle.

I only have one tunnel. It's Spruce Creek tunnel, and I'm currently working on the scenery above Spruce Creek tunnel. The scenery is just about finished.

To access the track in the tunnel, I put in two hinged doors. All I have to do is pull open the doors, and I can access the track in the tunnel [22]. I need to finish the fascia by adding some one eighth inch Masonite so the fascia that matches the rest of the layout.

MRH: Tell us how you control the trains – it's not DCC, is it?

Neal: The Lionel command control came out 20-25 years ago. When it first came out, it was called Odyssey and was pretty basic. The engines didn't necessarily lash up well and it didn't have a whole lot of features, but they continuously improved it.

After it had been out, maybe six to eight years, they revised it to what they call the Legacy System, which is much better.

21. For storing all his equipment, Neal built these boxes with slots in the shelves at track gauge. He added rollers to make them easy to roll under the layout here below Enola yard.

It now has cruise control, so you can lash up the engines together. Everything runs well together and it has many more features. They came out with a more advanced handheld, and they did make the loco electronics available in the aftermarket so you can retrofit older engines.

There are locos coming out now that have the Lionel command control installed, so there's not that much need unless you have an older engine you want to upgrade. I have upgraded my older engines to Lionel command control.

Lionel command control uses a handheld throttle, which is wireless. You don't have to plug it in anywhere. The first one, which



was called Cab one, did have an antenna, some found it bothersome and kept breaking them off.

Then they came out with the Legacy System with a CAB 2 and a CAB 1L, which was like the initial handheld. The more advanced one was complicated, and people didn't like it, so they no longer make it.

The new Legacy 1 looks like the original Odyssey 1, but it has more features built into it. It doesn't have any external antenna either. I don't think the range is quite as good. I have one area of the room that's a little dead, but overall it works very well.

The Lionel command control system also has sound, and the sounds have gotten better and better. The new sounds are tremendous because it's O scale the speakers are big.

For the most part, they go out and record accurate sounds. The sound is not perfect, but it's really good and has improved over the years.

MRH: What's your least favorite part of doing this layout?

22. For tunnel access, Neal built sections of the fascia between Mapleton and Spruce Creek into little walls on hinges, with a supporting wheel at the other end. He plans to add fascia paneling to the front of these hinged doors, giving them a finished look.

Neal: I suppose my least favorite part of doing a layout is airbrushing the track. It's not that I don't like airbrushing, but my airbrush clogs frequently and it just frustrates me. My friend Mark Vinsky will do it for me, so that's the one part I'm happy not to do.

Compared to most layouts, my layout is pretty big, and sometimes I think it's too big. I certainly would not want it any bigger than this.

I would tell others that unless you know you're going to be in the same place for a long time and you're a driven person who will go down and work on that layout a lot, you don't build a real big layout. You'll never get it done.



I knew that as a physician, I didn't have to leave Pittsburgh. I would live here my whole life. I love Pittsburgh and I designed my own house and I wanted to stay here. I am driven, and I do come down here and work on the layout regularly.

But if you're not sure that you're going to stay in a place long, or you don't have sufficient time available, I would not build a real big layout.

MRH: Tell us about the locomotives and rolling stock you run on this layout.

Neal: If it ever ran on the Pennsy, I will run it here. Basically that includes steam engines from about the 1920s on and then going to the Penn Central era, the Conrail era, and the contemporary Norfolk Southern.

My favorites are GP40-2s and GP38s. That's what I saw when I started railfanning as a teenager. I think those are the ones I like the best.

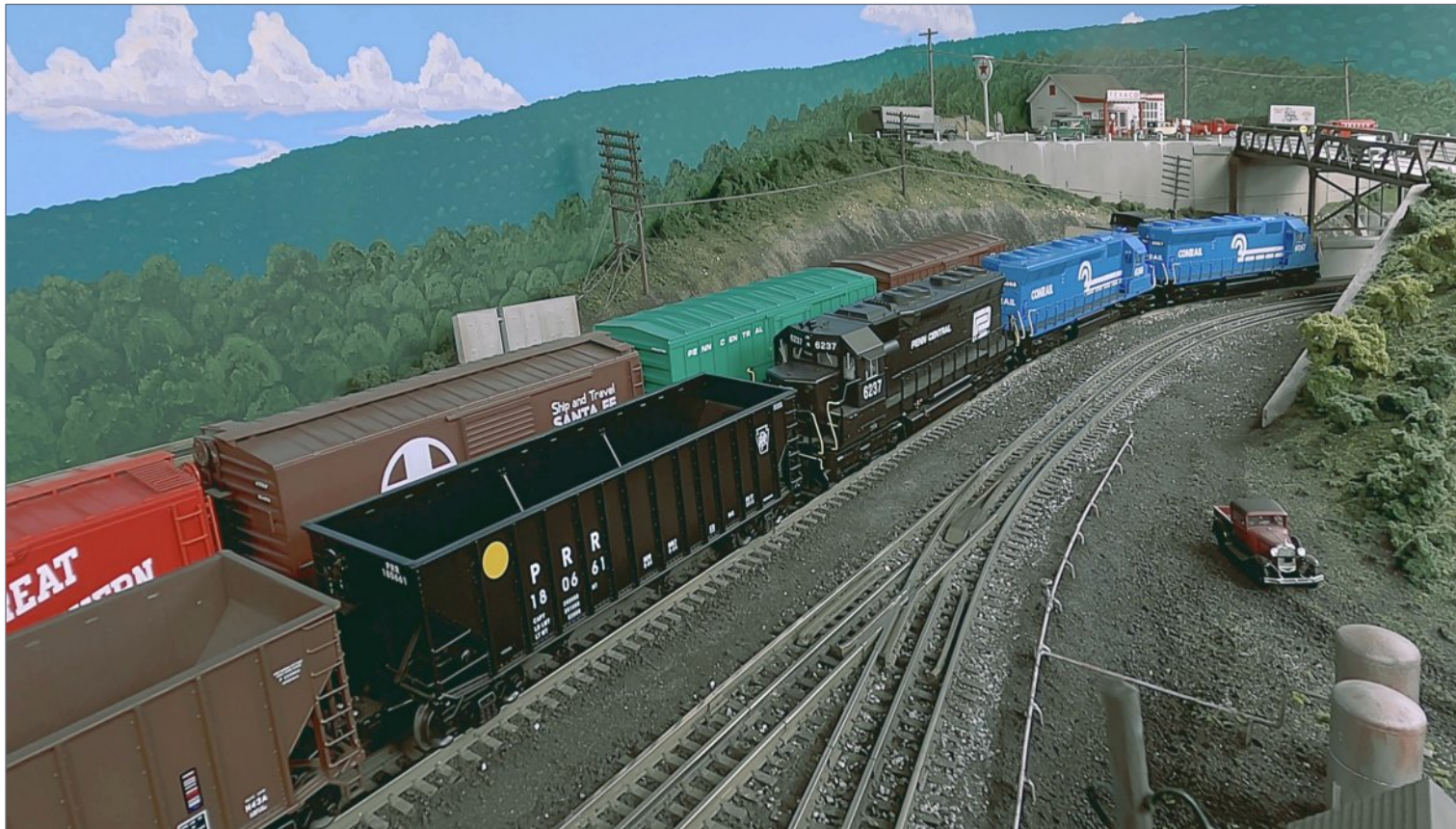
As the years have gone by, the fidelity of the train models improve. So I get rid of the older ones, and I get

23. Neal runs a first-generation RS11 lashup (with sound) through Longfellow pulling a mixed freight consist behind. Note the wireless Lionel command control throttle in his hand.

the new ones, which have road specific details and very accurate graphics, very much like HO and the other scales.

There are many loco brands available in three rail. Mike's Train House (MTH) was the manufacturer that really pushed the movement to scale type trains starting late 1980s and early 1990s. I got to know Mike well, he's actually been over to the house, but he's now retired.

This brought other manufacturers into making scale models, there was K-Line and Weaver models who I worked with. Eventually Lionel themselves got the message and they started making high-end scale trains.



Because I use the Lionel command control system, their command control system (MTH DCS) was incompatible with mine.

My rolling stock has to be realistic. I don't want fake paint schemes on realistically molded plastic rolling stock. I buy rolling stock that will fit any era. I run steam era trains with the Pennsylvania Road steam engines and then with the Norfolk Southern engines I will run stack trains.

My son Steven upgrades the well cars so they're extremely accurate, including the paint schemes. He drops the height on the trucks so they look more realistic.

But in general, I will only go with things that are realistic. Fake paint schemes, I'm not interested in. I don't do toy trains. I assure you there will not be any exploding box cars on this layout!

My favorite brand of rolling stock is probably Atlas. They make extremely accurate models. The paint schemes are accurate, and the tooling is accurate. I think Atlas sort of forced the other

24. An early Conrail-era freight rolls west out of Enola yard. Neal's era changes as you walk around the layout, which enables him to run anything from 1930s Pennsylvania Railroad steam to modern-day Norfolk Southern diesels, and everything in between.

manufacturers to up their game. I'd say in the last few years it's been more Lionel driving more accurate models in the O scale three rail market.

I have a lot of trains here because I run many eras, so I need a lot of storage capacity. Keeping them in boxes is not the way to do it, because the need to unpack them is a huge disincentive. So I came up with the idea of building a train storage rack [21].

Each rack, if it's double-sided, can actually hold 120 trains. If they're single-sided for long cars, such as passenger cars, a storage rack can hold 60, which is still a lot. Every summer, Steven and I build one or two of them and we're up to about 15 now.



operations and I'm not into rivet counting, but my scenery had better look like central Pennsylvania.

I think the most important part is a backdrop. Not everyone is artistic. I was blessed with some artistic ability. I used to go out to central Pennsylvania all the time and take pictures.

I've been doing backdrops for years and it's my absolute favorite thing to do.

25. A modern Norfolk Southern freight pulled by ES44s in the legacy paint scheme rolls across the Juniata River at Spruce Creek.

My total storage capacity is about a thousand cars. We just store the trains in these racks underneath the layout and it's very easy to swap out trains – my son has kind of taken charge of that. He's reorganized, everything so he knows where everything is.

I intend to keep building more storage racks, and eventually get all the trains stored in boxes out from under layout and have nothing but the custom storage racks in here.

MRH: How have you done the scenery on this layout?

Neal: My favorite part of the hobby is scenery, as you can probably tell from looking at the layout. I'm not into

I also like modeling properly shaped terrain. I make mine all out pink foam. This way I can rough-cut it, and then shape it with a rasp to get accurate land forms.

I don't have little pits and dimples like when you get when you crumple up newspapers and then put the hydrocal soaked paper towels on it. All those little dimples would all be little ponds.

The other thing I like to do is stick to proper civil engineering practices. My cuts and fills are all accurate, and that adds to the realism of the layout.

I am modeling late spring, early summer. I like the vegetation green. I don't want it just sprouting out of the ground, but I don't want it to be starting to dry up either. I also painted everything so it's around 11 o'clock in the morning, and the sun is coming over my left shoulder. I tried to keep all the shadows consistent and to keep all the lighting consistent throughout the layout.

My water is simple – I just use a two-part resin. I don't buy the stuff intended for model railroad use. I just go to the craft store and buy it. It's a two-part epoxy, you just mix it together and pour it in. I add some ripples in it. I also bury rocks along the banks of the streams and waterways as well.

MRH: What about the structures on this layout?

Neal: I have lots of structures on here, and as far as buildings go, I have a variety. Some of them are a craftsman kit, some are scratchbuilt, others are commercial models but significantly upgraded. I'll tear them apart, repaint them, and add details. I'm what you would call a frustrated civil engineer.

Civil engineering is a favorite interest area, so I scratchbuild all my bridges. I aim to make my bridges to be highly accurate.

My railroad bridges are all stone arch bridges, which is what the Pennsy used. I don't have any wooden trestles. I don't have any giant steel arch bridges because Pennsy didn't have them.

I also love highway engineering. I used to work for the Pennsylvania Department of Transportation in the summers, even when I was in medical school.

For my bridges, I've gone out and photographed them, and measured them. Probably none is more accurate than my Route 35 overpass at Mifflin. I got tons of pictures for reference. I went out there with my kids and we measured them.

In recent years, when I did the last stone arch bridge, my son Steven, now a conductor for the Reading and Northern, went out with me. We took tape measures, and we did measurements. I strive to make my bridges extremely accurate.



26. Neal's son Steven grew up loving trains and now works for a railroad. He remains an avid model railroader, still coming over to help his dad with his layout.

MRH: Do you host regular operating sessions?

Neal: A lot of scale model railroaders are into operating but that's one area that never really got my attention. Being in the NMRA made it easy to find layouts to operate on, but I never found it interesting.

I did design this layout, however, so it really could be run by operators. I have towers scattered along the length of the main line and I've set it up so that every tower would have a tower man sitting there flipping the turnouts. And there could be a dispatcher in the other room giving him instructions. Then the engineers could walk along with their train and follow it the whole way.

Even today when I run a train, the layout's so big I can't see the whole thing. On the first run around, I walk with the train and I make sure all the switches are set correctly. Furthermore, the signal system tells me that the route is clear, so I can just look at the signals and that's all I need to know. I can see the route is clear.

So this layout *could* host formal op sessions. But I normally just like to railfan it and watch the trains run.

MRH: Would you ever consider doing a layout in a different scale or gauge?

Neal: I made a firm decision to go with the O Scale three-rail trains back in the mid-1990s, and I've never regretted the decision. They work reliably, they're easy to use, the signals work great, the command control works great, and this is the way I want to get pleasure out of the hobby.

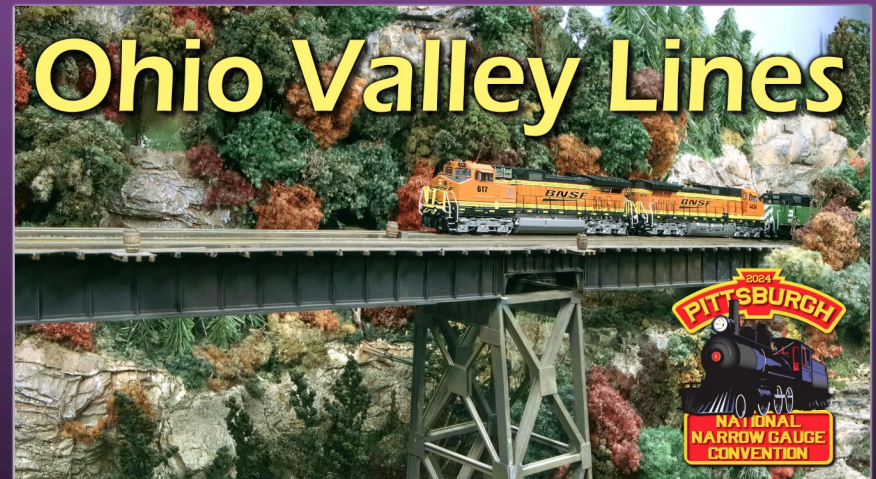
I don't want to be using computers to run the train. Computers are not my hobby, so I would stick with what I have here. They're simple, they work reliably, and I've been quite satisfied with them. ☑

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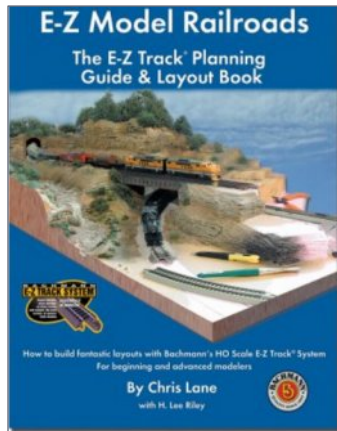
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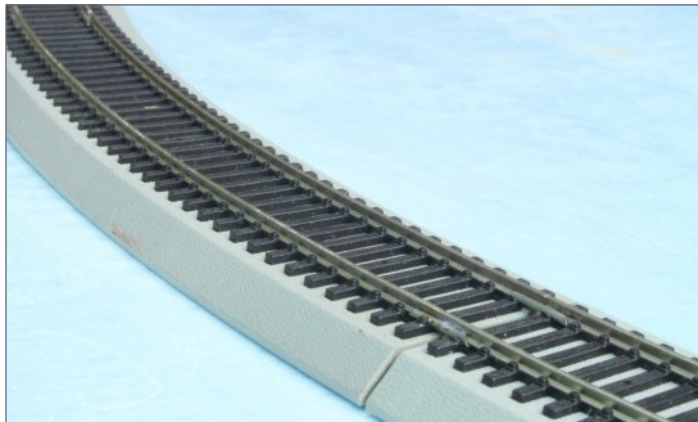
DETAILING BACHMANN E-Z TRACK | 2

radii that range from 15 inches to 35-1/2 inches, #4, #5 and #6 turnouts, two #6 crossovers and several crossings. Bachmann even offers a book of E-Z Track plans that range from beginning to serious modeling skill levels [1].

The advantage of E-Z Track is obvious. Simply lay it on the table top, snap the pieces together, and it's ready to run [2]. More serious enthusiasts can carry that a step further to make E-Z Track a match for any of the flexible track and turnout brands.



1. Bachmann offers this book, *E-Z Model Railroads: The E-Z Track Planning Guide and Layout Book*. Compiled by Chris Lane, it offers layout plans and design ideas suitable for anyone from beginners to advanced modelers.



2. A length of Bachmann E-Z Track laid on an extruded blue Styrofoam layout surface.

DETAILING BACHMANN E-Z TRACK | 3

The only drawback to E-Z Track for a permanent model railroad is that it relies on spring-loaded plastic clips to hold the pieces together. If those clips are loosened when something or someone hits the edge of the track, the rail can be dislocated enough to cause a kink that can derail the trains.

In the article, "E-Z Track for Track Planning" in the October 2023 issue of MRH (online.fliphtml5.com/buups/agyb/index.html#p=87), I discussed some techniques to overcome the alignment issues, and recommend following them.

With proper alignment measures, E-Z Track is excellent for staging tracks (article coming next month). It is also a wise choice for visible tracks, and with ballast, painting, and weathering, it looks as realistic as code 100 rail from most other manufacturers [3, 4].

The steps for detailing E-Z Track are essentially the same as for detailing any brand. E-Z Track has that gray built-in ballast that serves as the support base for the track, so it can be snapped-together for



3. The same length of E-Z Track on the same surface as [2], but upgraded with ballast and the same painting and weathering techniques used for any brand of track.



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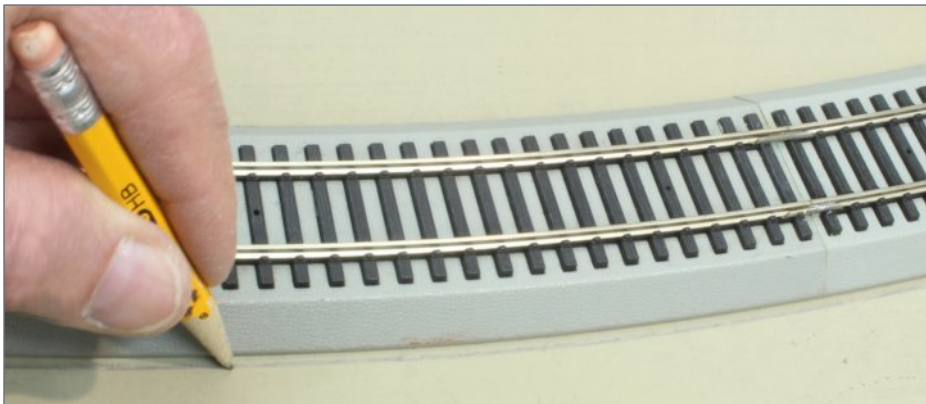
DETAILING BACHMANN E-Z TRACK | 4

reliable operation. Cement the E-Z Track down on a tabletop like you would any other brand and proceed.



4. I used this piece of real railroad track as a guide for upgrading the E-Z Track. This curve is on a reverse loop on the north edge of BNSF's freight yard in La Junta, Colorado.

LAYING THE TRACK



5. The E-Z Track should be cemented to the tabletop or sub-roadbed like any other type of track. Use a pencil to mark the edges of the ballast on the tabletop.

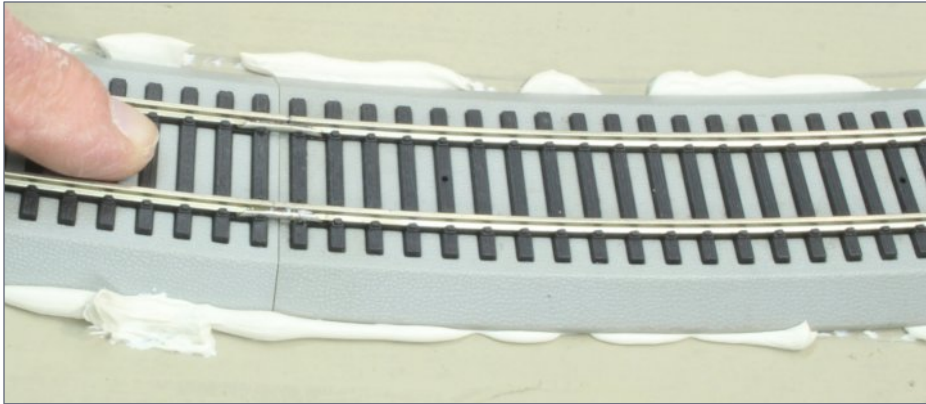
DETAILING BACHMANN E-Z TRACK | 5



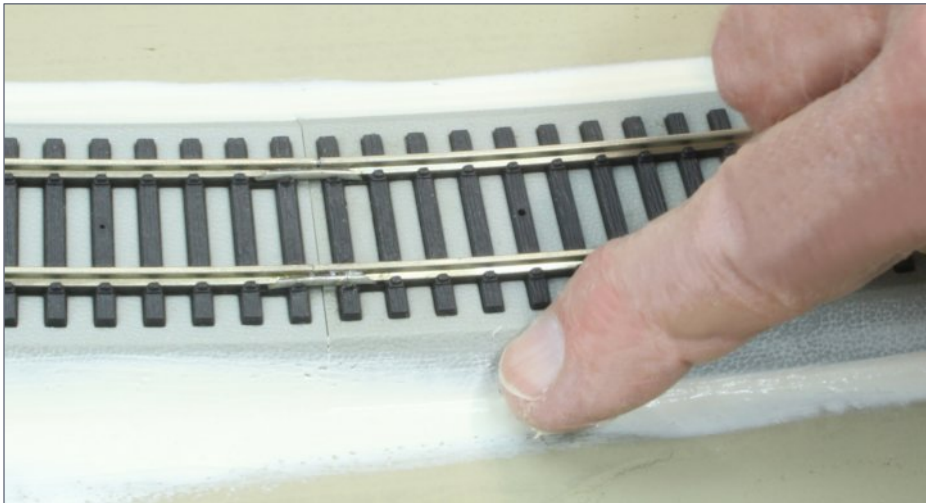
6. I used Liquid Nails "Projects" adhesive because it does not soften or dissolve Styrofoam. Run a bead about 1/8-inch wide down the pencil line.



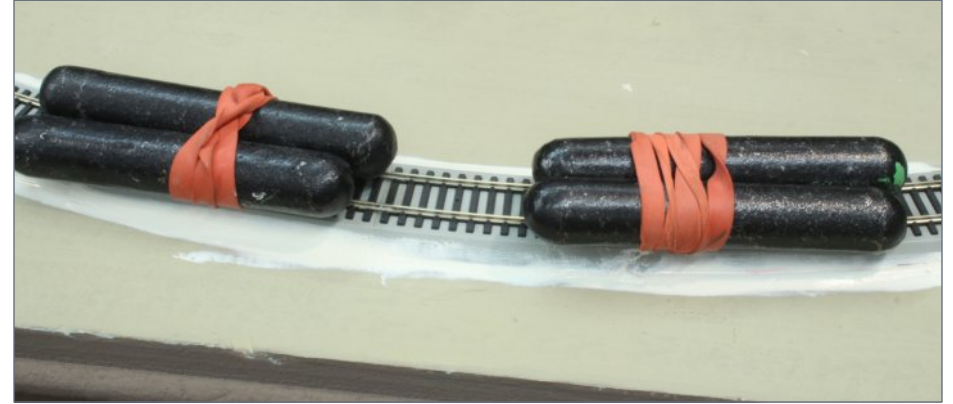
7. Run a second bead down the second pencil line. The adhesive takes several hours to dry, but I worked for just an hour at a time to complete one stretch of track before starting another.



8. Press the E-Z Track into the beads of adhesive and wiggle the track slightly to spread the adhesive.



9. The ballast shoulders on the E-Z Track are too steep to be prototypical. The bottom edges must be built-up about 1/8 inch to create a gentler slope for the loose ballast. Run a second bead of adhesive down both edges of the ballast, and smooth it lightly so most of the adhesive remains as thick as possible. The idea is to create a dam for ballasting the track later.

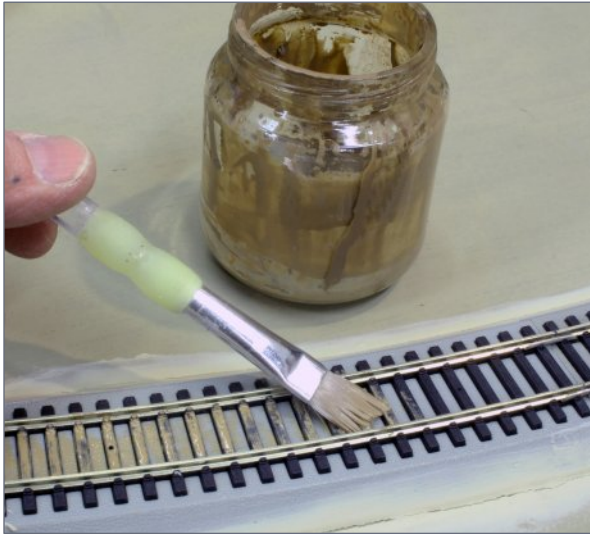


10. Use weights to press the E-Z Track into the adhesive. I had some "leftover" exercise weights, but you can use cans of paint, bricks, or heavy tools.



11. Use a level to be sure that the track is level side-to-side. If the track leans you can use strips of cardboard or paper between one edge of the roadbed and the tabletop to level the track. Apply a bit more adhesive to secure the strips. Let the adhesive dry for 24 hours before moving on to the next section of track.

INITIAL WEATHERING



12. Use the same painting techniques for E-Z Track that you would with any other brand. The tracks on the prototype railroads are dark "black" only for few months before they begin to weather.



13. Start the "weathering" process by using dark beige paint on the full length of every tie from the ends through the middle. I used acrylic "craft" paint from Michaels: Folk Art Acrylic #939 Butter Pecan mixed half/half with Americana DecoArt Acrylic DA313 Oyster Beige. Try to keep the paint from the base of the rails.

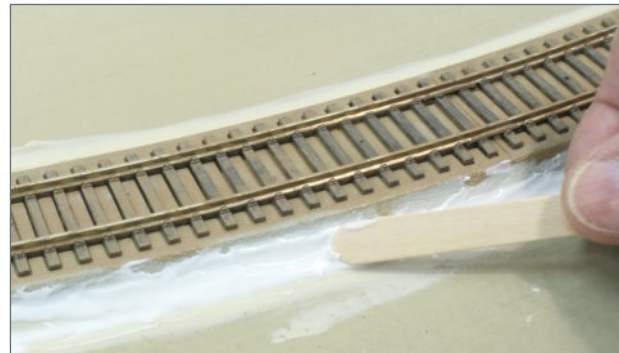
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APPLYING BALLAST



14. The slick plastic ballast shoulders do not retain the loose ballast granules. I built-up the bottom of the ballast shoulders to a gentler slope with Aleene's Super Tacky Glue. The glue dries quickly, so work with only about six to nine inches of track at time, moving on to

the next section once ballast is in place.



15. Smooth the surface of the glue with a Popsicle stick.



16. Apply a thick bead of Super Tacky glue to the opposite ballast shoulder and smooth it with the Popsicle stick.



17. I used Woodland Scenics fine gray ballast. While “fine” is typically used for N scale, I found it closer to HO than “medium.” I used a metal measuring spoon to spread the ballast, tilting and lightly tapping the spoon to direct the granules where I wanted them.



18. Use your fingertip to gently push the ballast into the glue. Let it dry overnight.



19. The ballast usually does not adhere to the sharp top edges of the roadbed. Run a bead of glue along just the edge. Apply more loose ballast and gently press it into the glue.



wash the granules down the slope.

20. While the glue is still wet, mix a few drops of dishwashing detergent into a spray bottle filled with water. The detergent breaks down the surface tension, so this “wet” water flows easily into the loose ballast. Spray lightly over the ballast, enough to soak it, but not enough to



21. Thin some matte medium or Woodland Scenics cement with three parts water to one part cement. Add a few drops of dishwashing detergent to the mix, and apply it to the wet ballast with an eyedropper. Allow it to dry for a day or two.



22. Use a stiff wire brush to remove any loose ballast granules from the tops of the ties.





23. Use a soft brush to spread the ballast granules between the outer ends of the ties.



24. The space between the ties will be filled with loose ballast. It takes only a few dozen grains, so work slowly and, if you apply too much, vacuum it up and try again.



25. Gently spray the loose ballast with the “wet” water and apply the mix of diluted matte medium to the ballast with an eye dropper.



fall into the can to be used again.

26. You can vacuum up loose ballast between any of these steps. Wrap a scrap of nylon pantyhose over the end of the vacuum nozzle to catch the ballast. Hold the nozzle over an empty can with the vacuum still on, turn off the vacuum, and shake the hose so the granules can

FINAL RAIL WEATHERING



27. Use an old kitchen knife to scrape the paint from the sides of the rails. The tops of the rail will be cleaned later.



28. The center of the ties on older track is usually bleached to a medium gray. Use an airbrush to apply a very dilute gray wash. Vary the strength of the paint application over the length of the track to give the ties a random weathered appearance.





29. The final detail is to hide the shiny silver sides of the rail. If you are an experienced model painter, you may be able to use an airbrush to apply the paint in a pencil-thin line. I searched for a paint pen that would have the dark reddish-brown color of aged steel. The Uni Posca-brand PC-3M Fine Bullet Tip Paint Marker was close enough. Empty paint pens are also available if you want to mix your own color.



30. Simply drag the pen down both sides of the rails. Try to keep the paint from the tops of rails but any that is splashed will be removed later.

CLEANUP



31. Use a fine-grit emery board to clean the matte medium and paint from the tops and inner edges of the rails.



32. Polish the tops and inner edges of the rails with a track-cleaning eraser.



CONCLUSION

With the same weathering and ballasting techniques used with track from most manufactures, Bachmann E-Z Track comes out favorably. It looks realistic enough that it compares well to a prototype photo [33, 34]. I hope I have shown that Bachmann E-Z Track can and should be considered seriously for realistic layout construction. ☑



33. These two prototype tracks are on the Burlington Northern in Loveland, Colorado. The track with the dark ballast is the mainline and the lower track is a seldom-used siding that probably has not been touched by a maintenance crew in at least a decade.



34. You can use different colors of ballast and paint to match either track.

ROBERT SCHLEICHER



Robert was editor of *Railmodel Journal* for 19 years and, prior to that, editor of *Model Railroading* magazine. He has also authored over a dozen model railroad books including the *Tyco Model Railroad Big Book Of Model Railroad Track Plans* and three books for Lionel. Bob has been a consultant to several manufacturers and helped to kick-start the Railroad Prototype Modelers concept. He is modeling the standard gauge Colorado & Southern in northern Colorado circa 1959 in HO scale. ■



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Model Railroad Hobbyist | April 2024



Make some great looking control panels

YouTuber **MFRailroad** shows step-by-step how to make these really nice looking control panels for your layout. All you need is some acrylic panel and an inkjet printer.

VIEW READER COMMENTS

He poo-poops his choice of tools, but frankly, his every man tools work great for folks on a budget. You can cut acrylic on a table saw too – protect the cuts with blue tape as he does, and use the steps here: mrhmag.com/magazine/url/cutting-acrylic. ☑

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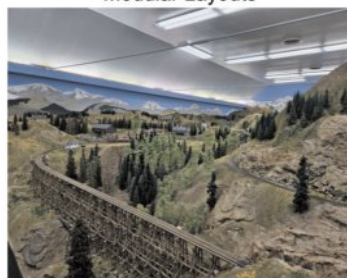
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Modular Layouts



APRIL NEWS

column



Model Railroad Hobbyist | April 2024

RICHARD BALE AND JEFF SHULTZ
REPORT THE LATEST HOBBY
INDUSTRY NEWS ...



INDUSTRY NEWS

M.B. Klein/Model Train Stuff to Reopen

In March, Factory Direct Hobbies reported that M. B. Klein, also known as Model Train Stuff, would soon reopen as part of the Factory Direct Hobbies family-owned business. Initial plans include reestablishing Model Train Stuff's customer rewards program including restoring previously earned points.

Factory Direct Hobbies was established in 2006 in North Carolina as a model railroad hobby store that has since expanded into a large retailer of a variety of hobby products. M.B. Klein was found in 1913 in Baltimore, Maryland as a hardware store. Over the past 110 years it evolved into a major outlet of model railroad products. M. B. Klein was purchased in 2023 by Hattons Model Railways, a UK-based supplier of model railroad equipment. Less than a year later Hattons announced it was closing.

NEW CLUB CARS

The **Amarillo Railroad Museum** is selling a triple-bay coal hopper with offset sides decorated with Colorado & Southern

THE LATEST MODEL RAILROAD PRODUCTS, NEWS & EVENTS



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reporting marks, a subsidiary of the Chicago Burlington & Quincy Railroad. The HO scale ready-to-run model is based on a group of C&S hoppers built

in 1961 at the CB&Q Havelock, Nebraska shops. The ready-to-run model is available in six road numbers. The Chinese Red cars have wire grab irons and separate brake line and brake hoses. They are equipped with Kadee-compatible knuckle couplers and Timken roller-bearing trucks. Each car comes with a removable ABS plastic coal load. The model is produced for the Amarillo Museum by Broadway Limited.

Info: www.amarillorailmuseum.com

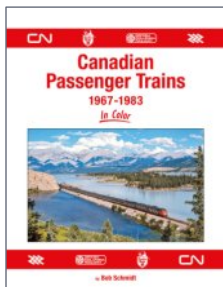


Division 6/MCR/NMRA is offering a 41' gondola lettered for Buckeye Steel Castings. The HO scale model is

produced for the division by Accurail, using a 3700-series steel gondola. Buckeye Steel was located in Columbus, OH and produced various railroad component castings, including Buckeye trucks.

Info: [div6-mcr-nmra.org/StoreFold/StoreCarFold/BuckeyeCastCar\(RO\).html](http://div6-mcr-nmra.org/StoreFold/StoreCarFold/BuckeyeCastCar(RO).html)

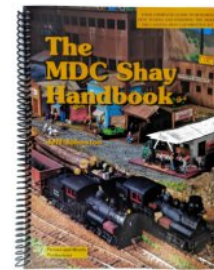
NEW PRODUCTS FOR ALL SCALES



Morning Sun Books' newly released *Canadian Passenger Trains* features color photos of CN and CP equipment in operation from 1967 through 1983. Coverage extends from Newfoundland to Vancouver Island with an emphasis on transcontinental trains in corridor service. Author Bob Schmidt includes local and mixed trains from Labrador to remote

Manitoba in the 128 page all-color book.

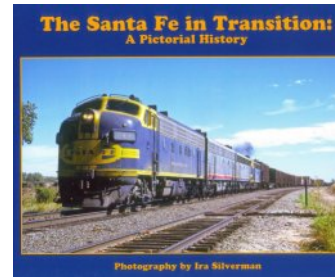
Info: www.morningsunbooks.com



Pictures-and-Words Productions has released the third printing of *The MDC Shay Handbook* by Jeff Johnston. Updated from the first printing in 1997 with a buyers guide of aftermarket Shay detail and performance parts, the 96 page spiral-bound book includes over 200 photos and figures showing how to improve both the looks and performance of the

2- and 3-truck HO scale Shay kits produced by MDC starting in the 1990s.

Info: thesugarpineshop.bigcartel.com



The Santa Fe Railway Historical & Modeling Society has published *Santa Fe in Transition: A Pictorial History*, by Ira Silverman. The book documents the competitive challenge the Santa Fe faced from the interstate highway system and jet travel from the late 1960s to the mid-1970s. Santa Fe responded with intermodal service, the nation's fastest

freight train, more powerful locomotives, and new signal and telecommunications systems – all while maintaining its hallmark passenger service. The 72-page softbound book includes more than 100 color photos.

Info: sfrhms.org

HO SCALE PRODUCT NEWS



New economy priced HO scale freight car kits available from **Accurail** include this 40' riveted steel boxcar decorated for the

Chicago & Eastern Illinois Railroad.

Kits for these three reefers are available individually and in three-car sets with different road numbers. The model



represents a steel car built in the early 1950s with 6' plug doors. Decorating schemes include Oscar Mayer (URTX -Union Refrigerator Transit), ADM Milling (DANX) and Milwaukee Road (DSDX-Dairy Shippers Despatch).



Accurail has released a kit for this Southern Pacific/Texas & New Orleans open hopper car. The HO scale model is

based on a 70-ton triple-bay hopper with offset sides built in late 1953. All Accurail HO scale car kits in this report come with appropriate trucks with Delrin wheelsets and Accurail knuckle couplers.

Info: www.accurail.com



R. Bale

EMD SD60M AND SD70M DIESEL LOCOMOTIVES

In 1984 EMD introduced the 3,800hp turbocharged SD60 road switcher. It became a winning design for EMD with 537 being sold. EMD began offering the SD60 with a wide-nose North American safety cab with a three-piece high-visibility windshield in 1989. Units with the safety cab and "Tri-Clops" windshield were identified as SD60M. Continuing on the successful SD60-series, EMD launched the next step in locomotive evolution with the 4,000hp SD70-series high-horsepower road engine in 1992. While the shape and location of a few appurtenances such as traction motor blower housings, radiator intake grilles and walkways were juggled around, the general appearance of the SD60 and SD70 were similar. The major difference between the two locomotives was internal, with the SD70 getting a new 4,000hp prime mover, a new alternator, and new traction motors – all controlled by microprocessors. Another significant change was upgrading the standard HT-C high-traction trucks to the revolutionary HTC-R high-traction self-steering radial truck.

Athearn's production schedule for August 2025 includes four new diesel locomotive models including three versions of F units. The production list begins with a Genesis series EMD SD70M locomotive in eight paint schemes.



SD70Ms decorated for Union Pacific will have front ditch lights mounted

on the snow plow style pilot. Union Pacific units in faded paint share several details with newer equipment including K3LA 3-chime horns and PTC antennas.



Road specific details on SD70M diesel locomotives decorated for Caterpillar's Progress Rail Services subsidiary include a flared four-panel radiator, ditch



lights, a small snow plow pilot and a spare coupler knuckle on the rear deck.



Athearn HO scale SD70M diesel units decorated for RJ Corman and Indiana Rail

Road also have a flared four-panel radiator plus front and rear ditch lights and a K5LA air horn. Two of the four RJ Corman road numbers in this release will wear the 50th anniversary paint scheme.



Indiana Rail Road acquired several SD70M units from Norfolk Southern in 2023.



EMD SD70M models decorated for Western Pacific and Arizona &

California have a flat radiator, sunshades on the cab windows, a freight style brake wheel and front ditch lights with rounded tops.



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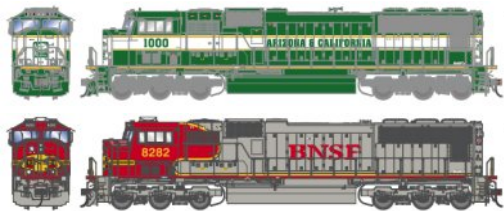
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An EMD SD75I (an SD75M with an isolated cab and horsepower boosted from 4,000 to 4,300) decorated for Burlington Northern Santa Fe will be

included in Athearn's August 2025 release. Spotting details include a front snow plow pilot, ditch lights mounted on the front deck, a K3LA three-chime horn and a spare coupler knuckle on the rear deck.



Athearn has included three variations of classic first generation

F unit A and B sets in its August 2025 production schedule. Units decorated in Great Northern's green and orange Empire Builder scheme represent F3 Phase II production with as-built skirting and a passenger style pilot below the familiar bulldog nose. Additional features include ladder rest grab irons and a pair of single-note air horns on the cab roof.



F7A/F7B sets decorated for Colorado & Southern

represent F7 Phase I production with a passenger style pilot on the A unit, both clear and red Gyalights and dynamic brakes with a 36" fans.



Athearn's Denver & Rio Grande Western F set represent F7 Phase

II production with dynamic brakes and 48" fans. The A unit has a freight style pilot, a three-chime horn and a nail antenna. The B unit has a single chime hostler back up horn.

Athearn's F units feature a Genesis driveline with 5-pole skew wound motor, machined flywheels, all-wheel drive and all-wheel electrical pickup. Additional features include uncoupling levers,

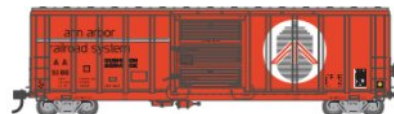
trainline and MU hoses, windshield wipers, lift rings, wire grab irons, sanding lines, LED directional lighting, a detailed fuel tank with fuel fillers, gauges, breather pipes and retention tanks; see-through cab windows with interior detail, etched metal fan grilles and McHenry knuckle couplers.



Athearn has included four Genesis series GE Dash 9-44CW locomotives

decorated for the Arizona & California Railroad in its August 2025 production schedule. Road numbers 4401 and 4402 will feature Operation Lifesaver heralds, skate-style antennas and large antenna domes. Locomotives numbered 4400 and 4403 are former BNSF units with large dome antennas and no A&C herald.

All Athearn DCC locomotives in this report come with a factory installed DCC decoder with SoundTraxx Tsunami sound. DCC-ready models operate on standard DC and come with a QuickPlug 21-pin NEM connector for installation of an aftermarket decoder.



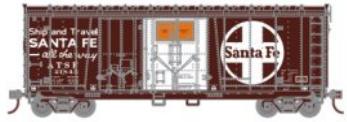
This Athearn 50' PS 5344 cu. ft. boxcar will be available decorated for Ann Arbor, Chicago & North Western, Arkansas Louisiana &

Mississippi, Corinth & Counce, Lenawee County, and Upper Merion & Plymouth Railway. The HO scale model is based on prototype per diem boxcars built by Pullman Standard in the 1970s with exterior posts and non-terminating ends.



Insulated boxcars began to appear early 1950's. They featured tight sealing plug doors that helped keep the interior within a few degrees of

the original temperature over several days. Athearn has included a 50' boxcar with a Youngstown plug door in its August 2025 production schedule. Road names will be Union Pacific, Burlington Northern, Milwaukee Road, Denver & Rio Grande Western, Boston & Maine, and Fruit Growers Express.



Before the development and proliferation of covered hopper cars, grain was shipped in boxcars with doors modified with hatches high on the door to facilitate loading and inspection. Athearn's August 2025 production schedule includes a 40' boxcar fitted with double plug doors. One of the doors on each side has a grain hatch. Road names on this release will be Santa Fe, Union Pacific, Northern Pacific, Great Northern, Canadian Pacific, Soo Line

All Athearn models mentioned in this report come with McHenry automatic couplers and appropriate trucks with machined metal wheels. Info: www.athearn.com



R. Bale

4-4-0 AMERICAN STEAM LOCOMOTIVE

The 4-4-0 wheel arrangement, also known as the American or American Standard, was a popular steam locomotive type widely used in North America throughout the 1800's. More than 25,000 were built. The 4-4-0 was stable, uncomplicated, easy to service and capable of handling both freight and passenger service. The design utilized a narrow firebox positioned between the driving wheels which provided stability but limited its steam generating capacity. The widespread application of air brakes in the 1880s spelled the end of the 4-4-0. Air brakes made it possible to run longer and heavier trains which created a demand for bigger locomotives with increased steam generating capability. As heavier motive power appeared, railroads assigned their 4-4-0 locomotives to light freight and passenger service, often on branch lines.



Mate Mark II couplers on the front and rear.



The distinctively decorated models come with factory installed SoundTraxx Economi DCC.



Locomotives with wood loads in the tender and balloon exhaust stacks are available for Virginia & Truckee, Old Colony Railway and Northern Central Railroad.



Spike Ceremony at Promontory Point in 1869.



Also new from Bachmann is a select group of USRA 2-8-2 light Mikado steam locomotives. The HO scale model has a heavy die cast chassis, an operating headlight and E-Z Mate Mark II couplers. The DC model is DCC-ready with a factory installed 21-pin plug for installation of an aftermarket decoder.



Road names available in this release include Union Pacific, Seaboard and Nickel Plate Road. Info: www.bachmanntrains.com



R. Bale

SHAY LOCOMOTIVES

The Shay locomotive is a geared steam locomotive patented by Ephraim Shay in 1881. Analogous to a powerful, slow moving tractor, Shay locomotives are able to operate on steep, poor quality track with sharp curves, making them well-suited to logging, mining and industrial operations. The distinguishing feature of the Shay is the boiler off-center to the left to balance the weight of the cylinders, crankshaft, gearing and longitudinal drive shaft on the right side. The drive shaft powered all wheels through universal joints and square sliding joints to accommodate the swiveling trucks. Each axle was driven by a separate bevel gear. Four classes of Shay locomotives were available from Lima Locomotive Works: Class A (two cylinders, two trucks), Class B (three cylinders, two trucks), Class C (three cylinders, three trucks) and Class D (three cylinders, four trucks).

Broadway Limited is preparing a group of Class D four-truck 150-ton Shay locomotives with delivery planned for winter 2024.



BLI's HO scale Shays will have die cast locomotive and tender bodies.



The first production run will be available decorated for Western Maryland, Norfolk & Western, Carolina & Northwestern, Mower Lumber, Red River Lumber, Greenbrier, Cheat and Elks; and two schemes each for Chesapeake & Ohio and Southern Railway.



Stealth (no sound) versions of the Shay will be available along with models factory equipped with Paragon4 Sound/DC/DCC sound system with smoke and integral GoPack capacitors.



Broadway Limited has announced plans to produce a second production run of its HO scale EMD GP30 and GP35 diesel locomotives. EMD developed the 2,250p GP30 to compete with GE's 2,500hp U25B. The GP30 was in production from 1961 through 1963. EMD introduced the 2,500hp GP35 in 1963 with production continuing through 1966.



BLI's GP30 and GP35 share similar features including front and rear headlights, illuminated number boards, classification lights and an interior cab light. Road specific lights include a Mars light, rotary beacon and ditch lights. Both models will feature BLI's Paragon4 Sound/DC/DCC control system with Rolling Thunder and GoPack capacitor packs.



Additional road specific details include Alco or Blomberg truck side frames, a dynamic brake

hatch, roof fan arrangement, bell location, horn type and location, antenna type and location and MU receptacle arrangement.



Reading Lines, Southern Pacific and a fantasy U.S. Air Force scheme.



GP30s will be available decorated for Santa Fe, Burlington, Chesapeake & Ohio (blue and yellow scheme), Milwaukee Road,

A special US Army fantasy scheme will only be available from TrainWorld. (www.trainworld.com/broadway-limited-9144-ho-

emd-gp30-us-army-shark-trainworld-exclusive-299-fantasy-paragon4-sound-dc-dcc.html).



BLI's GP35 diesel units will be available decorated for Santa Fe, Conway Scenic, Canadian Pacific, Chicago & North Western and two schemes each for Chessie System-B&O and Great Northern.



A GP35 decorated for Tuscola & Saginaw Bay Railroad will only be available from Smokebox Graphics (smokeboxgraphics.com).



Broadway Limited has expanded its forthcoming selection of HO scale heavyweight passenger equipment with the addition of a PB70 coach-baggage combine and a Z74D business car. Both cars are planned for release this fall.



Notable features include detailed interiors with lights, full underbody

details, operating sprung diaphragms, wire handrails and Pullman 2411 six-wheel trucks.



Road names on this release include Santa Fe, Chesapeake & Ohio,

Canadian National, Norfolk & Western, Northern Pacific, New York Central, Southern Pacific and Union Pacific. Special decorating schemes include CSX, Merry Christmas and painted in Pullman green but unlettered.



In addition to individual cars, special five car sets will also be available.

Each set consists of a combine, three coaches and a business car. Road names will be available for C&O, CN, NP, and a Christmas holiday scheme.

Info: www.broadway-limited.com



Dauphin Limited, of Chiba Shi, Japan, is selling an HO scale model of a GE box cab electric locomotive. The painted but unlettered ready-to-run model comes with LED directional headlights. This is a DC model with a DCC-ready 21-pin socket for installation of an aftermarket decoder.

Info: dauphin-mtp.myshopify.com



InterMountain is booking advance orders for a new production run of HO scale ACF 4650 cu. ft. triple-bay covered hopper cars.



Decorating schemes include Cotton Belt and Far Mar Co. Both road names will come with three elongated loading hatches.

Models decorated for CSX and BNSF will have fiberglass trough loading hatches.



Soo Line and Burlington Northern cars will have corrugated trough loading hatches.



Completing this release is an ACFX-Dry Branch Kaolin car with a Gypsum walkway and round loading hatches. All InterMountain

4650 covered hoppers in this release will feature etched metal roof walkways, metal knuckle couplers and appropriate trucks with 36" machined metal wheelsets. The order deadline is May 31, 2024. Delivery is TBA.

Info: www.intermountain-railway.com



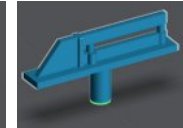
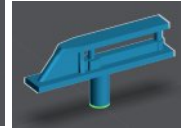
Kadee has released a 40 PS-1 boxcar decorated for the Copper Range Railroad, a regional line that operated from 1899 to 1972 in Michigan's Upper Peninsula.

Spotting details on Kadee's HO scale ready-to-run model include 6' seven-panel Superior doors, full height ladders, an Apex running board and Bettendorf-type plain-bearing trucks. The boxcar red sides are accented by a black roof and ends.



The newest HO scale Whisker coupler from Kadee is an SBE Bottom Shelf coupler with a medium (9/32") centerset shank. Identified as item #120, the new metal Shelf Coupler comes with a #242 snap together gearbox or it can be mounted directly into most manufacturer's molded-on gearboxes.

Info: www.kadee.com



Maple Leaf Trains continues to expand its selection of laser-cut and 3D printed building, structures and detail parts. The latest additions

include an Electrical Cabinet Air Filter Box (ECAFB) for EMD locomotives, and two types of cab-mounted radio antennas.

Info: www.mapleleaftrains.com



Rapido is developing an HO scale model of a Canadian National Hawker-Siddeley van (caboose). The model replicates the 150 modern steel prototypes H-S delivered to CN in 1967. Crew comforts included a pair of oil stoves, a refrigerator, hot plate, Waugh full-cushion underframes, electric lighting and power via an axle-driven generator, and roller-bearing caboose trucks.

The most notable changes to the H-S vans over their 30-year service life were the paint schemes. Some were modified for international service with FRA-compliant window glass with orange side sills and end striping to denote that service.



Rapido's HO scale version will feature a detailed underbody including all separate air and brake piping, operating markers, track and step lights, interior cabin lights, and a separately controlled cupola light. Additional details include multi-colored interior, interior handrails in the cupola, see-through etched metal end platforms and steps. The Barber Bettendorf-type caboose trucks will have all-wheel electrical pickup.



Paint schemes on the initial release will include Canadian National (As-delivered with red/orange steps), CN (Late with black steps), CN

(International service), and DEVCO Railway. A July 15, 2024 order deadline has been announced with delivery TBA.



R. Bale

PFE R-40-27 AND R-40-28 REEFERS

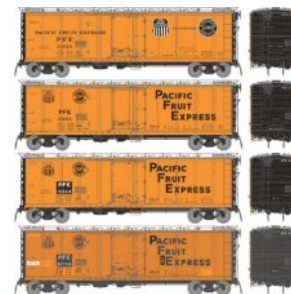
Pacific Fruit Express added a total of 1700 class R-40-27 refrigerator cars to its roster in 1957. Numbered PFE 10001-11700, the R-40-27 reefers were equipped with a 4' wide Youngstown plug door that opened to the left. On the right side of the plug door was a 2' wide hinged door. Together they provided a 6' wide opening for loading. The smaller swing door could be opened for inspection purposes while retaining the cool interior temperature. Toward the end of the production run 100 of the reefers had the 4' sliding plug door replaced with a 6' plug door. The 2' hinged inspection door was retained. The modified cars, numbered PFE 11701-11800, were designated class R-40-28. Both cars were cooled with ice, and included overhead electric fans to circulate the cool air while underway. The R40-27 and R-40-28 refrigerator cars were the last ice-cooled reefers built by PFE. Subsequent PFE reefers utilized mechanical cooling. Pacific Fruit Express was established in 1906 as a joint venture between the Union Pacific and Southern Pacific railroads. It peaked in 1930 with over 40,000 reefers on its roster.



Rapido is completing production including all-new tooling for HO scale PFE class R-40-27 and R-40-28 steel refrigerator cars. The models are being scaled from a combination of prototype blue-

prints and field measurements.

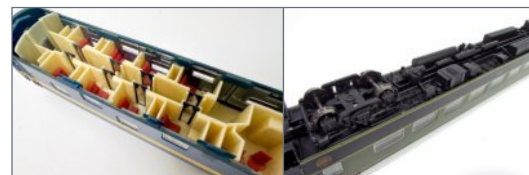
Details on Rapido's latest freight car include separate wire grab irons, correct running boards and brake wheels, accurate cooling fan housings, positionable roof ice hatches, metal knuckle couplers and appropriate trucks with machined metal wheels.



Rapido's PFE R-40-27 reefer will be available in four decorating schemes: 1957, 1961, 1966 and a 1970s TIV (Top Ice Ventilator) Service. Paint and lettering schemes for the R-40-28 reefer include 1957, 1961 and 1966. Each decorating scheme will be available in multiple road numbers. An order deadline and delivery date are TBA.



Rapido is getting ready to reissue its HO scale Super Continental Line of light-weight passenger cars. The models feature extensive underbody details and multi-color interiors.



The new production run will have several upgrades including improved track-powered interior lighting, improved body design

and assembly to prevent warping, new couplers designed for increased reliability in both push and pull operation, and redesigned trucks. Coaches and Duplex Sleepers feature new Trane air conditioner details. This release will include three

car types: a lightweight coach, an 8-4-4 Duplex sleeper (4-8-4 in Canada) and a 10-5 sleeper.



Road names and paint schemes for the lightweight coach will be VIA Rail Canada, CNR (1954 scheme), Canadian National (Wet noodle) BC Rail, CP - Royal Canadian Pacific, Amtrak (Phase I), Central of New Jersey, Delaware & Hudson, Erie-Lackawanna, GTW (two schemes), Long Island Railroad and Missouri Pacific.



The Duplex sleeper will be available for Great Northern, VIA Rail Canada, CNR (1954 scheme), Canadian National (Wet noodle), CP - Royal Canadian Pacific, Amtrak (Phase I), and Milwaukee Road (Hiawatha and 1955 yellow schemes).



Road names and paint schemes for the 10-5 sleeper include CSX (Michael J. Ward), Conrail 11, Erie, Erie-Lackawanna and Missouri Pacific. The order deadline and delivery date are pending.



In addition to the production run summarized above, Rapido plans to celebrate its 20th anniversary with a special run of the lightweight coach in a paint scheme inspired by Southern Pacific's popular passenger train: The Lark. The anniversary car is only available direct from Rapido.

Info: www.rapidotrains.com



Tangent has released several versions of a 60' Greenville 6,000 cu. ft. auto parts boxcar with double plug doors. Prototype cars built from 1963-1964 had the

trucks mounted on a narrow wheelbase of 41' 3". Cars produced by Greenville during 1965-1966 had a wider

wheelbase with trucks centered 46' 3" apart. Tangent's HO scale versions replicate the distinctive truck spacing along with multiple road specific variations in construction and appurtenance details.



Models decorated for Conrail and Milwaukee Road have 41' 3" truck centers, no running boards and low ladders. Conrail cars have auxiliary top crank arms on the plug doors and are equipped with Tangent's new 100-ton Barber S-2 plain-bearing trucks that have been refitted with Timken roller bearings.



Canadian Pacific and Erie-Lackawanna models represent prototypes delivered in 1966 with 46' 3" truck centers. Both road names have Apex power brakes. The CN car has full height ladders and an Apex running board. The running board has been removed from the Erie-Lackawanna car and the ladders have been shortened.



The E-L cars come with Tangent's new 100-ton Barber S-2 plain-bearing trucks that have been refitted with Timken roller bearings.



The Wabash model is based on a prototype delivered in 1963 with trucks on 41' 3" centers. Details include an Apex running board, high ladders, a Morton brake step and Peacock power brake.

Details on all of the models in this release include an accurately-rendered diagonal panel roof, Stanray ends, prototypical brake piping, Hydra-Cushion center-of-car underframe and Kadee metal couplers. In addition to ready-to-run models with road-

name specific details, Tangent is offering five different undecorated kit versions of the Greenville 6,000 cu. ft. auto parts boxcar.



Also new from Tangent are 100-ton Barber S-2 plain-bearing trucks with 36" machined metal wheels. Modelers have the option of removing the journal box lids to represent plain-

bearing trucks that have been refitted with Timken roller bearings inside the journal box. Truck-mounted brake beam parts are included. The trucks are available with .110" (RP-25) or .088" wheel treads.

Info: www.tangentscalemodels.com



Walthers HO scale Trinity 57' 4750 cu. ft. triple-bay covered hopper cars are scheduled for release this spring. The Mainline series model is based

on a prototype introduced by Trinity in 1990. Road names on this release will be SL-SF Frisco, BNSF, Chicago & North Western, GACX, Illinois Central Gulf, Norfolk Southern, Southern Railway and Union Pacific. An undecorated model will be included in this release.



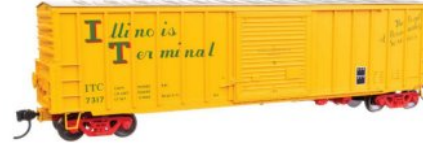
The ready-to-run model features well-detailed hopper gates with vibrator brackets and outlets and Trinity-style jacking pads. The model comes

with appropriate 100-ton roller-bearing trucks with 36" machined metal wheelsets.



Coming this summer from Walthers is a 50' ACF exterior post Plate B boxcar. The newly tooled HO scale model features Dreadnaught ends and a Stanray diagonal panel roof.

Road names scheduled for this Mainline series model include Burlington Northern, Illinois Terminal, Canadian National, Penn Central, Chicago & North Western, Rock Island, SL-SF-Frisco, Southern Railway and undecorated.



Both of the Walthers Mainline ready-to-run models mentioned in this report will come with Proto MAX metal knuckle couplers.

Info: www.walthers.com

N SCALE PRODUCT NEWS



R. Bale

BAY WINDOW CABOOSE

As more and more freight cars exceeded Plate C dimensions, the caboose cupola became ineffective for watching over a train. The development of bay-windows provided better train visibility and were more comfortable to ride in than a cupola. Union Pacific acquired 100 class CA-11 bay-window cabooses from the International Car Company in 1979. They featured large protected end porches, oil-fired heat, hydraulic coupler cushioning and swing motion caboose trucks. Several were later modified with the porch supports being enclosed to reduce injuries. Extra grab irons were added around the doors and the walkway lights were shielded to protect night-vision from the bay-windows. Union Pacific modified two CA-11 cabooses to shuttle road crews to remote locations during difficult weather conditions. Called Snowbuses, they were equipped with MU and signal hoses and both ends porches were fully enclosed.





Athearn is developing an all-new Genesis N scale class CA-11 caboose for release in

August 2025. As-delivered models will be available featuring L-angle porch supports, two window screen options and National swing-motion trucks.



CA-11 cabooses modified by the UP had their porches boxed in, additional door-side grab

irons were installed, the steps were lowered and the walkway lights were shielded.



Included in the August 2025 release is a specialized UP caboose named the Madera

Flyer. The name comes from a long reverse maneuver near Fresno, CA that encountered many dangerous road crossings requiring the Madera Flyer to be equipped with a headlight, air horn, and roof-mounted bell.



Additional unique CA-11 cabooses are UP numbers 25809 and 25872 that were

nicknamed Snowbuses. Their porches were fully enclosed and they were equipped with MU and signal hoses so they could be positioned between back-to-back locomotives.



Completing this release of N scale CA-11 cabooses is an ex-UP car decorated for Idaho Northern & Pacific.

All of Athearn's Genesis series CA-11 N scale cabooses will feature interior details with a conductor's desk, stove, sink, bathroom and a radio stand. Additional details include see-through end platforms and steps, etched metal window screens on doors and selected side windows, formed wire grab irons, underframe details including an air brake reservoir, control

valve, and brake cylinder with plumbing and brake rod details. The model comes with appropriate roller-bearing trucks with axle generator details and body-mounted McHenry knuckle-spring couplers.

Info: www.athearn.com



Bachmann has introduced four N scale versions of a New York Central J3a 4-6-4

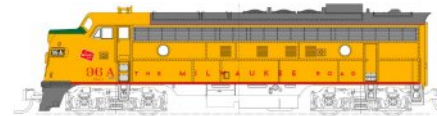
Hudson steam locomotive. Locomotives numbered 5407 and 5426 will have Roman lettering on the cab and tender. Locomotives 5405 and 5445 have Gothic lettering.



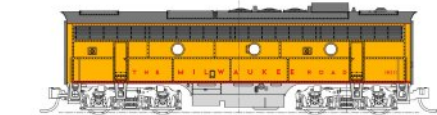
The J3a Hudson represents the epitome of high-speed power on NYC's water level route

during the 1920s and '30s. The models will be equipped with a TCS WOWSound CD-quality 16-bit 44,100Hz decoder with Audio Assist. Additional features include directional headlights, blackened metal side rods, E-Z Mate Mark II couplers, and Keep-Alive that keeps the engine running during power interruptions due to dirty track or loss of electrical contact.

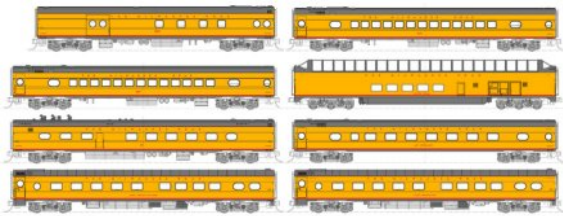
Info: www.bachmanntrains.com/home-usa



Coming this fall from **Kato USA** is an N scale edition of The Milwaukee Road Olympian name train decorated in the post 1955 scheme.



Single FP7A and FP7A/FP7B sets will be available along with a nine-car set of Olympian passenger cars including the



distinctive multi-paned round-end observation car designed by Otto Kuhler.



All Locomotives will be available with Preinstalled DCC and DCC + Sound.

Info: www.katousa.com



New N scale models recently issued by **Micro-Trains Line** include this Southern Pacific 65' mill gondola. The model comes with a scrap load.



This 50' steel boxcar with Superior six-panel sliding doors represents a Delaware & Hudson car that has had its running board removed and ladders shortened.



Micro-Trains new model of a 40' North America Despatch double-sheathed wood reefer leased to Bradbury Produce is based on a prototype built by the Pressed Steel Car Co. in 1928. Like the full sized car, M-Ts N scale version rides on Bettendorf-type plain-bearing trucks.



BNSF acquired this 100-ton triple-bay coal hopper in its merger with the Santa Fe Railroad in the mid-1990s. Micro-Trains N scale model comes with a removable coal load.
Info: Contact a dealer.

STRUCTURES & SCENIC SUPPLIES



Frenchman River Model Works has released an HO scale craftsman kit for Earl's Service Station. The stucco structure represents gas stations found across American

from the 1920s through the 1960s. The kit consists of numerous cast resin parts including the walls and roof, tar paper and corrugated metal roofing material, decal signage and laser-cut window glazing material. The assembled model has a footprint of 4.125" by 5.25". Painting and assembly are required.

An O scale version is also available with dimensions of approximately 7.5" by 9.75".

Info: www.frenchmanriver.com



Central & Western HomaRoad Supply has recently added curvable roadbed with a 30 degree shoulder to its lineup of N scale Homasote products.

The company supplies a variety of Homasote roadbed and turnout pads in all popular scales.

Info: www.cwhomaroad.com

Showcase Miniatures has an HO scale kit for a B & O Signal Tower Mast Assembly. The kit contains brass tubing, stainless steel photo-etching and resin parts. The signal head mast assembly is scheduled for an early release. Showcase Miniatures N scale grade crossing signal can be fitted with 402 LEDs. The kit now includes parts to make the arm operate. The kit include stainless photo-etch details, brass tubing, pewter

STRUCTURES & SCENIC SUPPLIES | 26



and resin parts. The kit can be built with or without the arm and comes with options for three different arm lengths. A video at www.youtube.com/watch?v=gwSJYoT5ILO shows the arm actuating. The movement of the arm in the video is done manually.

Modelers can make the signal function automatically with the addition of a separate controller.

Info: www.showcaseminiatures.net

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! BRIEFLY NOTED AT PRESS TIME ...

Bachmann has released an HO scale 40' quadruple-bay coal hopper car decorated for N&W, Sou, C&O, RI, NKP and a special Boy Scouts of America Merit Badge scheme ...

Berkshire Valley Models (BVM) has acquired the masters, instructions and CAD drawings of **American Model Builders** and its **LaserKit** line of kits. Actual production of kits will take some times as AMB's unique CAD data must be converted for use on existing BVM equipment ...

Maple Leaf Trains latest release is a set of five unique 3D sculptured HO scale unpainted locomotive engineers in sitting positions ...

New HO scale items coming from **Walthers** this summer include a 40' steel refrigerator car with running boards, full height ladders and Dreadnaught ends; a 36' 10,000 gallon tank car with a bolted-on jacket, and a plastic structure kit for an Art Deco Bowling Alley. An 85' former-GN full-length dome car decorated in four Amtrak schemes is scheduled for release next winter ■

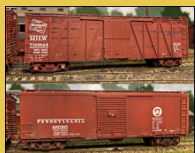
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Ongoing 2024

ONLINE, Zoom, dates vary, see website. Operation Special Interest Group Meetups – limited attendance available.

Info: www.opsig.org/Virtual

Archive: www.opsig.org/Virtual/Past

ONLINE, Zoom & YouTube, Wednesday & Saturday, see Facebook page. "New Tracks" Meetup, hosted by Jim Kellow, MMR.

Info: newtracksmodeling.com

YouTube: www.youtube.com/channel/UCMA_VhPb5pjdkAYTdXLceJA

ONLINE, Facebook & YouTube, dates vary, see Facebook page. "NMRax" organized by Gordy Robinson, Martyn Jenkins, Gert Muller, Jordan Kramer.

Info: www.facebook.com/groups/nmragroup

ONLINE, YouTube, every other Saturday. 4th Division, Pacific Northwest Region, NMRA hosts online layout tours and clinics.

Archive: www.youtube.com/c/4DPNRMovies



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ONLINE, Zoom, Second Tuesdays, 8pm Eastern. “Off the Beaten Track” featuring Narrow Gauge layouts, clinics, and manufacturers.

Info: groups.io/g/NNG

AROUND THE USA, IN-PERSON, Various dates. ScaleTrains.com Road Trip.

Info: www.scaletrains.com/roadtrip

April - May 2024

CANADA, ALBERTA, CALGARY, April 20-21, 2024. SUPERTRAIN. Genesis Centre, 7555 Falconridge Blvd NE.

Info: www.supertrain.ca

CANADA, BRITISH COLUMBIA, SURREY, May 22-26, 2024. Surrey Excursion, NMRA PNR 2024 Convention. Sheraton Vancouver, Guildford Hotel, 15269 104th Avenue.

Info: www.pnr2024.7divpnr.ca

NEW ZEALAND, MOSGIEL, May 4-5, 2024. Dunedin Model Train Show. 12 Wickliffe Street.

Info: www.facebook.com/groups/159812677415713

ARIZONA, GLENDALE, May 11, 2024. Arizona Railroad Historical Society Swap Meet. Glendale Christian Church, 9661 N 59th Ave.

Info: Craig Ferris 623-340-3529

ARIZONA, MESA, May 2-4, 2024. 2024 Sn3 Symposium. Sheraton Mesa Hotel at Wrigleyville West, 860 North Riverview.

Info: sn3symposium.com

CALIFORNIA, MILPITAS, April 24-28, 2024. The Tech Line, PCR Convention 2024. Sonesta Hotel, 777 Bellew Drive.

Info: www.pcrnmra.net/conv2024

CALIFORNIA, SANTA CLARA, May 24-26, 2024. O Scale – S Scale – Narrow Gauge West Meet. Hyatt Regency Santa Clara, 5101 Great America Pkwy.

Info: oscalewest.com

INDIANA, INDIANAPOLIS, April 26-28, 2024. New York Central System Historical Society 2024 Convention. Indianapolis Airport Crowne Plaza, 2501 S High School Rd.

Info: www.nycshs.net/NYCSHS-Convention-2024--Indianapolis-IN-April-26--28-2024_c_23.html

INDIANA, SOUTH BEND, May 2-4, 2024. Around The Bend, Midwest Regional Convention. The Century Center, 120 Doctor M.L.K. Jr Blvd.

Info: www.mwr-nmra.org/aroundthebend.html

KANSAS, HERINGTON, April 27-28, 2024. Herington Kansas Railroad Days Model Railroading and Railroad Memorabilia Show. Herington Community Building, 810 S. Broadway.

Info: heringtonhistory.org/heringtonrailroaddays

MICHIGAN, MUSKEGON, April 27, 2024. Model Railroad and Hobby Expo, by the Muskegon RR Historical Society. Cardinal Elementary School, 2310 Marquette Ave

Info: mrhsonline.org

OHIO, MIDDLEBURG HEIGHTS (Cleveland), May 16-19, 2024. North Coast Limited, Mid-Central Region 2024 Convention. Crowne Plaza Hotel, 7230 Engle Rd.

Info: northcoastlimited2024.org

PENNSYLVANIA, ALTOONA, May 8-11, 2024. Pennsylvania Railroad Technical & Historical Society 2024 Annual Meeting. Blair County Convention Center, 1 Convention Center Drive.

Info: prtrhs.org

Future 2024 by location

NEW ZEALAND, ASHBURTON, July 6-7, 2024. Ashburton Model Train Show. Tinwald Memorial Hall, Graham Street, Tinwald.

Info: ashburtontrainshow.co.nz

ALABAMA, DECATUR, June 20-23, 2024. River Rails 2024, SER Convention. Doubletree by Hilton Hotel Decatur Riverfront, 1101 6th Ave NE.

Info: midsouthnmra.org/Convention.html



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CALIFORNIA, CROCKETT, June 22-23, August 24-25, September 14, October 26-27, December 7-8, 2024. Carquinez Model Railroad Society Open House. 645 Loring Avenue.

Info: cmrstrainclub.org

CALIFORNIA, LONG BEACH, August 4-11, 2024. Surfliner 2024 NMRA National Convention & National Train Show. Westin Long Beach, 333 East Ocean Blvd.

Info: surfliner2024.org

COLORADO, PUEBLO, October 10-13, 2024. Rio Grande Modeling & Historical Society joint convention with Missouri Pacific Historical Society. Pueblo Convention Center, 320 Central Main Street.

Info: www.eventbrite.com/e/2024-mphs-rgmhs-joint-convention-tickets-794966836207

ILLINOIS, COLLINSVILLE, July 19-20, 2024. St. Louis RPM. The Gateway Center, 1 Gateway Center Drive.

Info: stlrpm.com

ILLINOIS, NAPERVILLE, October 10-12, 2024. RPM Chicagoland 2024.

Info: www.rpmconference.com

INDIANA, FRANKLIN, August 3-4, 2024. Franklin Train Show, sponsored by the Central Indiana Division NMRA. Johnson County Fairgrounds, 250 Fairground St.

Info: www.cidnmra.org

MARYLAND, BALTIMORE, September 6-8, 2024. Mid-Atlantic RPM. DoubleTree by Hilton BWI.

Info: www.marpm.org

NEVADA, SPARKS, October 16-19, 2024. San Francisco Overland, 2024 SPH&TS Convention. Nugget Casino Resort, 1100 Nugget Avenue.

Info: sphts.org/convention

NORTH CAROLINA, DURHAM, October 17-20, 2024. Piedmont Junction 2024, Mid-Eastern Region NMRA Convention. Raleigh-Durham Marriott.

Info: piedmontjunction.cpd13.org

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OHIO, CAMBRIDGE, October 27, 2024. Sixth Annual Buckeye Division Train Show. Pritchard Laughlin Center, 7033 Glenn Hwy. Info: div6-mcr-nmra.org/trainshow.html

OHIO, MARION, October 10-12, 2024. Central Ohio RPM. Marion Union Station.

Info: centralohiorpm.wordpress.com

OREGON, PORTLAND, June 15, 2024. 21st Annual Garden Railways Tour, sponsored by the Rose City Garden Railway Society.

Info: rosecitygardenrailwaysociety.wildapricot.org

OREGON, PORTLAND, October 5, 2024. Bridgetown RPM Meet. Shilo Inn Portland Airport, 11707 NE Airport Way.

Info: www.brppmm.com

PENNSYLVANIA, BETHLEHEM, June 18-23, 2024. 2024 National N Scale Convention. Wind Creek Bethlehem, 77 Wind Creek Blvd.

Info: www.nationalscaleconvention.com

PENNSYLVANIA, HARRISBURG, September 21-22, 2024. Anthracite Railroad Modelers Meet XII. Reading Railroad Heritage Museum, 500 South 3rd Street.

Info: readingrrmm.com

PENNSYLVANIA, PITTSBURGH, September 11-14, 2024. 44th National Narrow Gauge Convention. Doubletree by Hilton Hotel Pittsburgh – Green Tree, 500 Mansfield Avenue.

Info: www.44nngc.com

TEXAS, FOREST HILL, June 24, 2024. Red River RPM Event. Forest Hill Civic Center, 6901 Wichita Street.

Info: redriverrpm.org

WISCONSIN, MILWAUKEE, November 23-24, 2024. Trainfest – America's Largest Operating Model Railroad Show. Baird Center, 400 W Wisconsin Ave.

Info: www.train-fest.com

WYOMING, EVANSTON, July 24-28, 2024. N-Scale Evanston 2024. Historic Roundhouse and Machine Shop, 1500 Main St.

Info: nscalemeet.info ■



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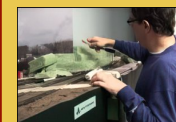
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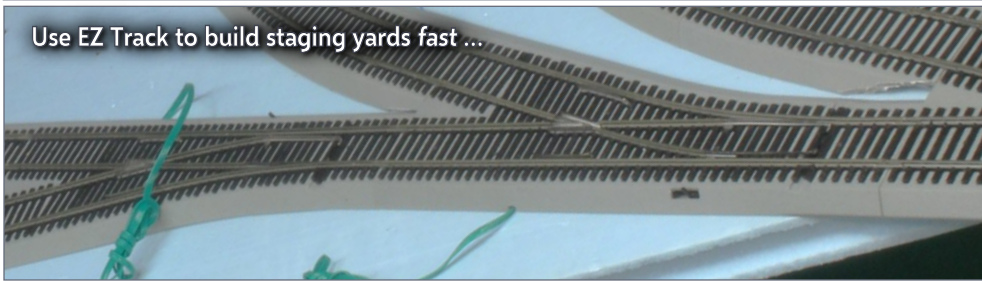
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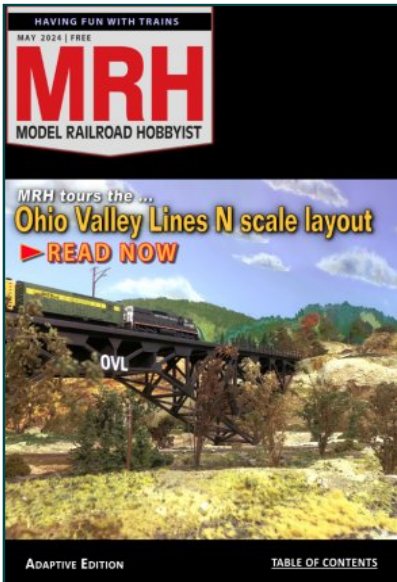
Use EZ Track to build staging yards fast ...



Using servos to control turnouts, part 2



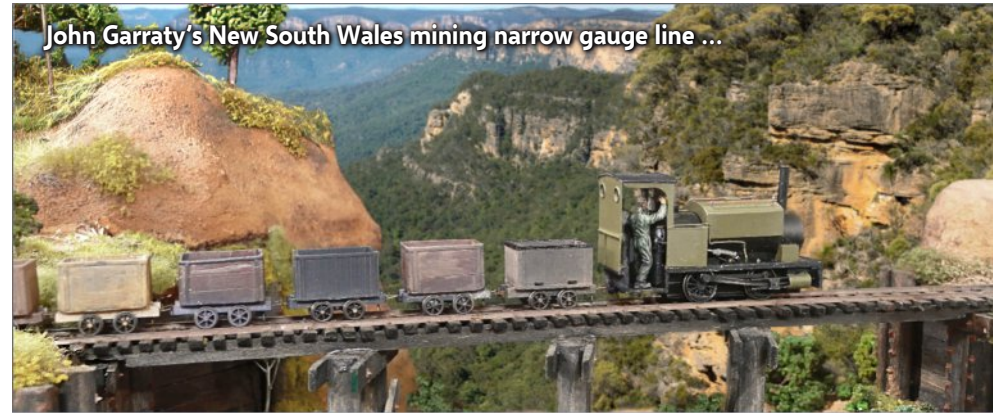
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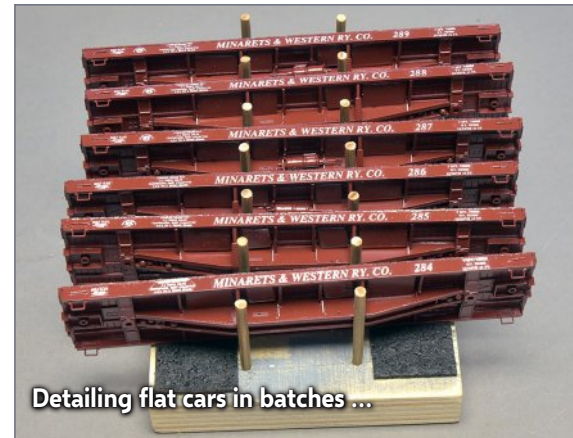
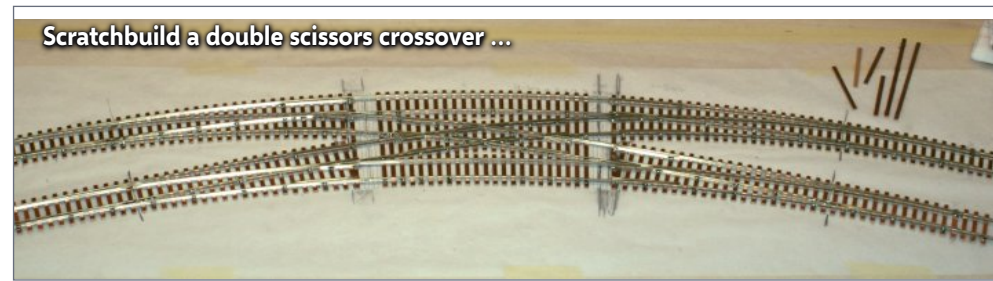
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