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MRH

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[INDEX](#)

[TABLE OF CONTENTS](#)

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Model Railroad Hobbyist | July 2022 | #149

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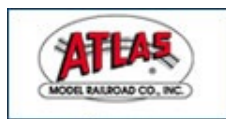
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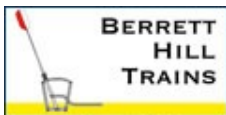
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[INDEX](#)

[TABLE OF CONTENTS](#)

MRH SPONSORS | 2

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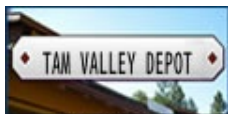
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[INDEX](#)

[TABLE OF CONTENTS](#)



Publisher's Musings: Unexpected benefits of SL2 ...

JOE FUGATE



MRH Website this month: Bare minimum layout, ...

Compiled by JOE FUGATE



What's Neat: Awesome moss mat scenery, ...

KEN PATTERSON



Quad servo decoder monitor, part 2

DR. TERRY CHAMBERLAIN



Scratchbuild a branch line turntable

MICHAEL ANTEAU



A beginner's guide to railroad signals

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[INDEX](#)[TABLE OF CONTENTS](#)

PUBLISHER'S MUSINGS



Model Railroad Hobbyist | July 2022

JOE FUGATE: UNEXPECTED BENEFITS OF STARTING OVER WITH SISKIYOU LINE 2



SOME HAVE ASKED ME HOW I FEEL ABOUT TEARING OUT SISKIYOU LINE 1. They ask me if I'm sad to see the old layout go?

The short answer? No, not really.

I received 26 years of satisfying enjoyment out of the old layout. Dozens of great operating sessions and many hours of enjoyable modeling, especially doing the finished scenes like I documented on the [Ten Mile Creek scenery video series](#).

Unless you've had your own large model railroad, you may not be aware of the flip side of owning a large layout: the maintenance burden.

Maintenance is a two-edged sword. It's not fun to do and it takes time. The time part can really bite you if you're on a deadline to get ready for an operating session or a layout tour.

Adding to the maintenance load is another related issue: the temptation to cut corners as you build the layout.

In the early days, you're sorely tempted to build things "fast and dirty" just to get to the fun stuff – running trains. That can be especially true if you're like me where operations is why you do the hobby.

The problem with being ops-centric

For me, all the other parts of the hobby are a means to the end I'm after: realistic operation.

Put another way, all the other parts of the hobby are a necessary evil to get to the fun part – running the trains realistically in a delightful social event we call an operating session.

Benchwork is not too bad because it goes fast. Building roadbed and laying track also can be kind of fun because the layout is starting to materialize. Making jig-built turnouts *is a requirement* if I want spot-on to spec flawless turnouts, but I'm not particularly fond of the task.

I absolutely hate wiring. Oh, I can do it just fine, but it's tedious and extremely boring. But without power, the trains don't run. A close second that I also hate is putting decoders in locomotives.

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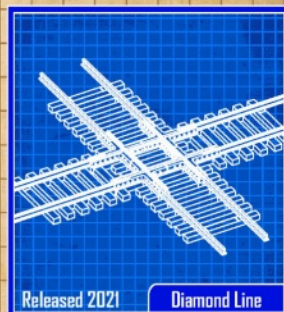
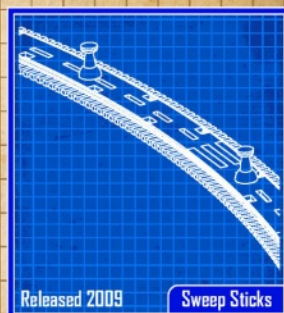
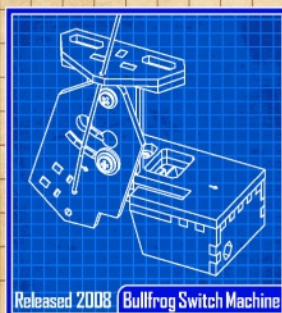
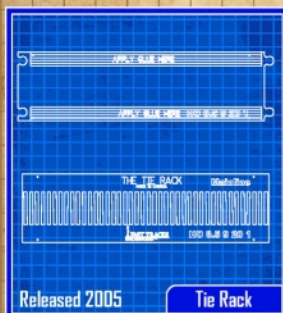
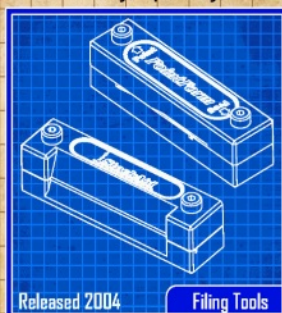
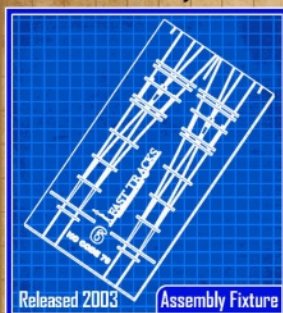
[INDEX](#)

[TABLE OF CONTENTS](#)

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PUBLISHER'S MUSINGS | 3

Yuck ... what a pain. It's even worse now with sound and lights and stay alive. Wires and stuff everywhere that I'm trying to cram into the shell. And don't tell me batteries would make it easier because that's just one more thing to cram into the shell!

At least with wiring, it's a one-time pain and then it's done. Battery powered locos all would need recharging before an op session and the Siskiyou Line 1 had 60 locomotives in service. Can you imagine charging 60 cell phones before each operating session? What an ongoing pain that I don't need. No thanks.

Anyhow, I digress.

The one part of layout construction I enjoy the most is doing scenery. The scenery really makes that miniature world come alive. It's easy to imagine my tiny railfanning alter ego walking the tracks as a new layout scene takes shape. I do enjoy that part.



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[INDEX](#)

[TABLE OF CONTENTS](#)

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[INDEX](#)

[TABLE OF CONTENTS](#)

Projects everywhere!

Sometimes walking into the layout room could be a real downer. If I was in a fastidious mood, all I could see when walking into the Siskiyou Line 1 layout room was projects that needed done everywhere I looked.

How depressing.

I would just walk back out of the layout room and go do something else to take my mind off the layout albatross in the basement.

I'm just being totally honest here. Yes, the SL1 layout could be a lot of fun, but it could also be a burden at times, too. I know some who think a large layout would be a dream come true. But as they say, be careful what you wish for!

Deferred maintenance and poor ops

After struggling with issues during operating sessions on Siskiyou Line 1, I was on the lookout for how to make things better. In my heart of hearts, I knew many of the problems we had during operating sessions were because I cut corners.

I would quickly add Kadee couplers to new cars and rush them into service. I fell off the wagon as to jig-built turnouts and slapped down some commercial turnouts instead because it was faster. I would likewise take locos straight out of the box and put them on the layout if they had so-called Kadee compatible couplers.

The result was a mish-mash of equipment and trackwork with what amounted to deferred maintenance everywhere. Every op session would have issues. Almost no train would complete its run without a derailment somewhere. Trains would break apart because of mismatched coupler height issues.

Because of these disappointing issues, I started to develop my "quality of run" philosophy. See my editorial in the [November 2015 MRH, "The layout supsize fallacy"](#) for more on quality of run vs quantity of run.



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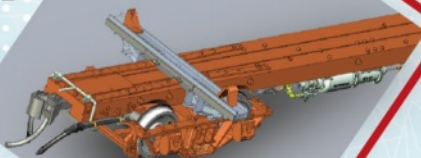
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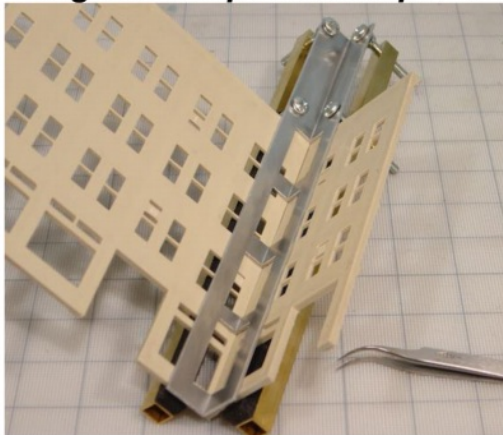
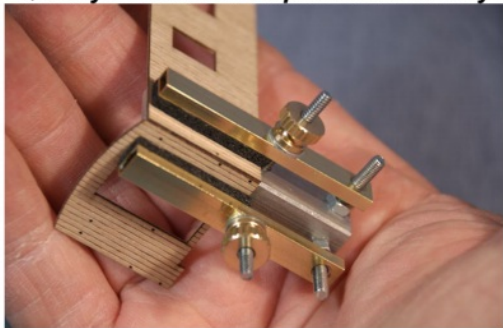
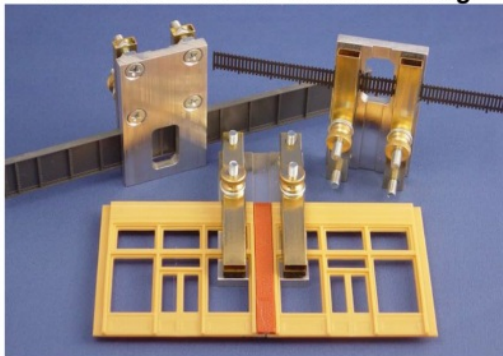
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Back in 2013 or so, I visited Mike Confalone and shot an Ops Live video of an Allagash operating session.

Mike's op session ran for 6 hours and the only mishaps were operator caused, and they were very few thanks to the experienced Allagash operating crew.

The Allagash ran flawlessly!

I asked Mike what he did to get such a flawless operating session. The answer I got really didn't surprise me.

Mike said, "Flawless ops doesn't happen by accident. You need to take preventative measures so some things never happen, and then you need to tune everything to get it to run at its best."

That became the genesis of my [Run like a Dream series](#).

I now have what I'm calling my "RLAD standard" for trackwork, rolling stock, and locomotives. Nothing goes on the layout without passing these standards first.

The other piece to my new approach to doing a layout is TOMA.



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[INDEX](#)**[TABLE OF CONTENTS](#)**



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The “One Module” Approach (TOMA)

Remember I said I could get depressed going into the layout room and seeing projects everywhere on my large Siskiyou Line 1 layout?

Now that I'm doing Siskiyou Line 2 using TOMA, I'm loving the bite-sized approach to doing a layout this time. For more detail on TOMA, [see our TOMA topic index](#).

TOMA automatically makes me keep the scope small with just one, two, or maybe three layout sections at a time. The TOMA discipline says I need to complete the layout section sub-project I'm building *first* before I move on to building more layout.

This gives me a small enough layout building project that I measure the timeline to completion in terms of months, not years. I also can take a much smaller bite out of my pocketbook at a time.

As an aside, yes, I don't get the benefit of bulk buys this when I break up the buys, but hey, it's a hobby. If bulk buys were how we should do the hobby, then we should figure out all the locos we need and buy them all at once, right? But who wants to do the hobby that way? It's more fun to shop for locos as something interesting comes along, bit by bit, right?

Once I get one-to-three TOMA modules done, it's time to hang some temp staging off the end and run trains!

So I just take my rolling stock and loco collection, upgrade a few pieces to my new Run-Like-A-Dream (RLAD) standard, and run some trains. I love the bit-by-bit approach – I feel far less pressure to deal with a massive maintenance load.

I can tell you once I've applied my RLAD standard to the track, rolling stock, and one of my locos, the flawless operation is truly a dream-come-true. I have taken some of my SL2 test modules to some train shows, along with some locos and rolling stock that's been upgraded and things just run and run and run without a hiccup for the entire show. Nice!



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[INDEX](#)

[TABLE OF CONTENTS](#)

As an ops guy, I've also fallen in love with Iowa Scaled Engineering's ProtoThrottle. It makes me slow down and engage a lot more when I run trains. It's a total blast, and it doesn't take a lot of layout for the ops to be off-the-charts fun.

Yep, I've never been more excited about the hobby as a result of tearing down Siskiyou Line 1. The opportunity to take all these years of learnings and apply them to SL2 has me more enthused and energized than I've been in decades! ☑

in the **JULY 2021 MRH RUNNING EXTRA!**

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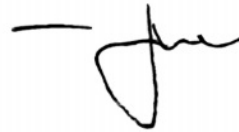
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[INDEX](#)

[TABLE OF CONTENTS](#)



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- 1st** Siskiyou Line 1 retrospective
- 2nd** First Look: Make it run like a Dream-Trackwork
- 3rd** Publisher's Musings: Learning from others' mistakes

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TABLE OF CONTENTS | RUNNING EXTRA

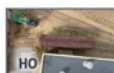
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[INDEX](#)
[TABLE OF CONTENTS](#)

Best of the

MRH WEBSITE



THIS MONTH

Model Railroad Hobbyist | July 2022

Compiled by **JOE FUGATE**



Bare minimum layout?

MRH forum member **usmcnewdog** (Mike S.) is wondering about how to best do a small layout: *"I have acquired space in a spare bedroom ... was originally thinking of painting the walls a generic sky blue and adding track lighting ... maybe something like the attached picture. What do you think?"*

Check out Mike's thread for the answers!



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

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



1. MRH forum member **LyndonS** shows examples of how he models pavement using 2mm EVA foam board.

Modeling realistic pavement

MRH forum member **LyndonS** describes how he uses 2mm EVA foam board to model realistic looking pavement:

“Cut the foam and push it down between the rails, just slightly below the top of the rails. Even my pre-RP25 wheels work.”

Lyndon tells how he paints and weathers the foam, starting with white foam for pavement or black foam for asphalt:

“I stripe my roads using a paint pen and then weather with acrylic craft paints applied with a sponge. Thanks to Rick Sutton and Kathy Millatt for the inspiration!”

Check out the full post (and thread) for more.

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



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[INDEX](#)

[TABLE OF CONTENTS](#)

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2. MRH forum member **blshoop** posted this photo of his PRR X31C boxcar that he runs on his late 1960s to early 70s layout.

PRR X31A boxcar

MRH forum member **Deemiorgos** asked if the PRR X31A boxcar with circle logo could be seen in 1956. Several posted insights on how long this car likely ran on the prototype.

"The Circle Keystone was replaced by the Shadow Keystone in 1954 so cars painted in early 1954 would only be a couple of years old. I would check the rebuild date and base your weathering on that. If the rebuild date was 1940s then the weathering would be heavier."

And another ... *"I've seen photos of the X31a cars in circle keystone into the early 60's in various publications."*

Read the full thread for more ...

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



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[INDEX](#)

[TABLE OF CONTENTS](#)

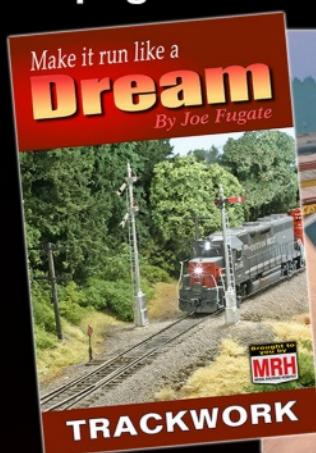
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3. *MRH* forum member **Monkeybucket** maintains a blog chronicling the build on his layout modeling a plywood industrial area. What makes this blog unique is he's using YouTube videos as his blog entries.

HO switching layout build as YouTube videos

MRH forum member **Monkeybucket** (Chris D.) maintains a blog documenting the progress on his switching layout build. Chris is modeling an old plywood industrial area.

His latest blog entry #11 demonstrates how he weathered a timber trestle:

"Finally I have found the time to complete a model I started so long ago. The timber trestle bridge that has now found a home on the layout extension gets a weathered finish. This has taken me all my courage and a fair bit of research on different techniques but I am happy with the results on the relatively simple method I ended up using. I hope this entertains as much as it informs ..."

Check out Chris' blog for many more video blog posts.

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



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[INDEX](#)

[TABLE OF CONTENTS](#)

Prototype photos threads

The MRH Forum also plays host to an annual prototype photos thread. Check out the thread for 2022 ...

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

4. *MRH* forum member [amsnick](#) (Nick S.) says, “I usually see these tank cars in the VTR yard in Burlington, VT. It was a pleasant surprise to see them in Lumberton, TX today on the BNSF Beaumont sub.”



5. We also get some great vintage phtoos on this thread. *MRH* forum member [edalsie](#) posted this vintage photo on the thread, saying, “Here is a Delaware & Hudson paint scheme I'll bet few, if any, remember. Taken in Lanesboro, PA in June, 1972.”



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WHAT'S NEAT

column



Model Railroad Hobbyist | July 2022



KEN PATTERSON COVERS:

- **VIC SMITH'S THE CITY EDGE LAYOUT**
- **MOSS MAT SCENERY WITH JASON THOMAS**
- **NEW PRODUCTS FROM BACHMANN**



click to play video

PHOTOS AND VIDEO OF SUPERB MODELS

THIS MONTH KEN INTERVIEWS VIC SMITH ABOUT HIS HO SCALE City Edge layout, Jason Thomas shows us how he uses moss mat and other scenic materials to create a diorama quickly, and Larry Harrington shows off the latest from Bachmann in HO and N scales.



1. Ken interviews Vic on his modeling philosophies, methods, and techniques in building the City Edge layout.

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2. The City Edge layout features both street running below and an elevated railroad built on Micro-Engineering bridge girders.



3. The City Edge layout is fully illuminated for night scenes with over 500 light bulbs. Vic's building painting technique involves many layers of different color paints sprayed and misted on, with sanding in-between.



4. Staging on the City Edge consists of two yards laid on cork with polyurethane applied for quiet operation.



5. The City Edge layout is full of small vignettes and scenes, many illuminated, including this one that you might recognize.



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[INDEX](#)

[TABLE OF CONTENTS](#)



6. Also featured are three Overland Brass truss bridges, in their own indented niche. The scene was inspired by the three-truss MacArthur Bridge in St. Louis.



7. Jason Thomas dropped by Ken's basement to demonstrate how he uses moss mat material on model dioramas.



8. The moss mat comes in rolls from retailers like Hobby Lobby, Scenic Express, and Noch. To prepare it for use, the material on the bottom needs to be removed.



9. To secure it, Jason uses Woodland Scenics foam glue, which he brushes into a smooth layer on the foam.



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[INDEX](#)

[TABLE OF CONTENTS](#)



10. The moss mat is secured to the foam by T-pins for a couple of hours while the glue dries.



11. Jason finishes up the basic ground cover for the diorama with Woodland Scenics ballast and ground foam products.



12. Larry Harrington of Bachmann Trains shows off the upcoming N scale SC-44 Charger, seen here in the Washington DOT "Cascades" scheme.



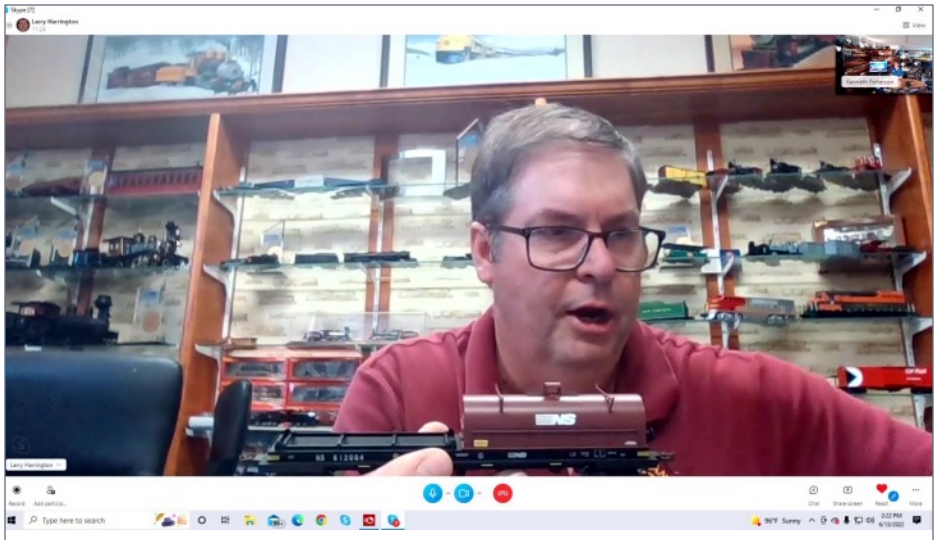
13. Here Larry compares the HO scale SC-44 to the N scale model, both in the Amtrak Midwest paint scheme.



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[INDEX](#)

[TABLE OF CONTENTS](#)



14. Also on hand were Bachmann's upcoming HO scale coil cars, with examples in BNSF, UP, NS, and CSX. The two coil hoods are removable, and the models come with a load of six steel coils.

To see full City Edge layout and interview, all the steps in using moss mat as a scenery material, and all the models Larry Harrington shared with Ken, check out the video linked at the beginning of this article. ☒

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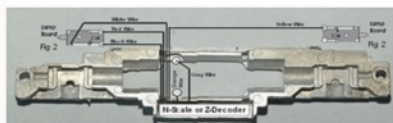


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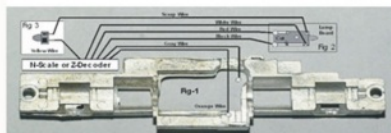
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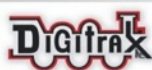
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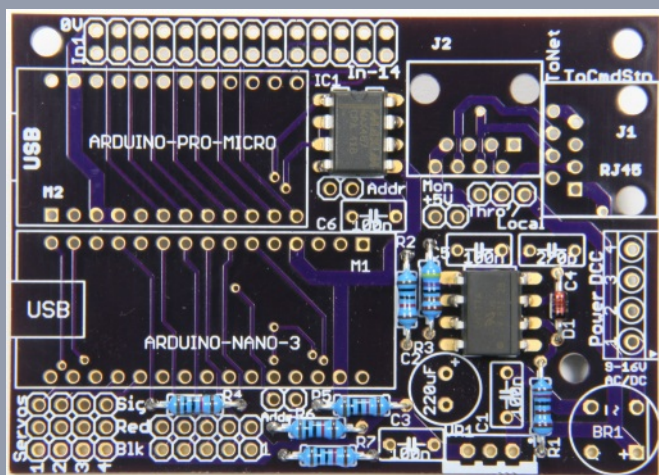


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[INDEX](#)

[TABLE OF CONTENTS](#)

Quad Servo Decoder-Monitor Part 2



Electrical
Impulses

Model Railroad Hobbyist | July 2022

1. Partially assembled Quad Servo
Decoder-Monitor board.



DR. TERRY CHAMBERLAIN SHOWS US HOW HE MADE
A **DCC** ACCESSORY DECODER WITH FEEDBACK ...

IF BUILDING A QUAD SERVO DECODER-MONITOR (QSDM) SPARKED YOUR interest in Part 1, you may have acquired the set of printed circuit boards and accompanying components in the parts lists, ready for assembly.

The position and reference number of each component is printed on the top surface of each PCB. Most resistors and capacitors also have their value shown, but refer to the component tables in Part 1 Bonus Downloads to make sure you fit the correct component in each position.

BUILDING THE QUAD SERVO DECODER-MONITOR

Install diode D1 and resistors R1-R7, as shown in [1]. Then install the 6N137 opto-isolator and the MAX487 transceiver.

The next step is to fit the Arduino Nano-3 and Pro-Micro modules to the QSDM PCB. But first, connect each module to one of your computer's USB ports to confirm each module powers up. You do not need any Arduino software installed on your computer to perform this test.

For the Nano-3, you will normally see two LEDs lit – one constant and one flashing. The Pro-Micro module should behave similarly, with the LED next to the USB connector constantly lit, and the LED at the other end flashing briefly. If everything is in order, fit them to the PCB.

If you purchased the Nano-3 and Pro-Micro modules “unsoldered,” you will need to attach the supplied pin header strips [2], to the modules before fitting them to the PCB.

To ensure the header strips are fitted square and flush, hold the QSDM PCB horizontally above your bench, either in a vise or a “third-hand” jig, and insert the long side of the header pins into the PCB holes so that each header strip sits squarely on the PCB. Now drop each module onto its set of short header pins and solder the pins to the module solder pads.

With the Nano-3, be sure each pin is in a solder pad – not a corner hole [3].

Fit and solder the Nano-3 and Pro-Micro modules onto the QSDM board, making sure both modules' USB connectors are toward the edge of the PCB. Follow with the smaller capacitors (C1, C3-C6), bridge rectifier (BR1), and terminal block. The flat edge of the bridge rectifier should be next to the shorter edge of the PCB, lower-right in [4].



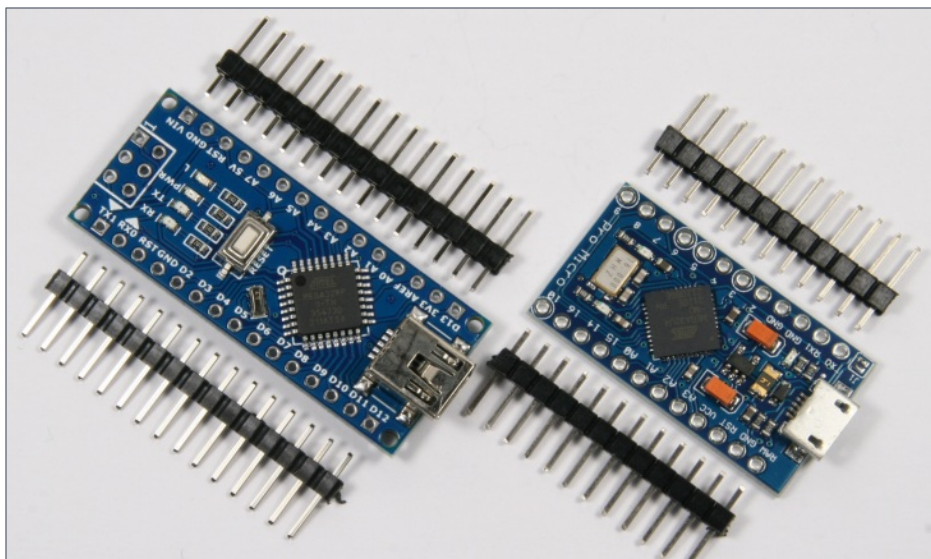


M. Dodd

HOW TO BUILD YOUR PCBs

To avoid repetition in the assembly instructions, here are guidelines for installing electronic components on PCBs.

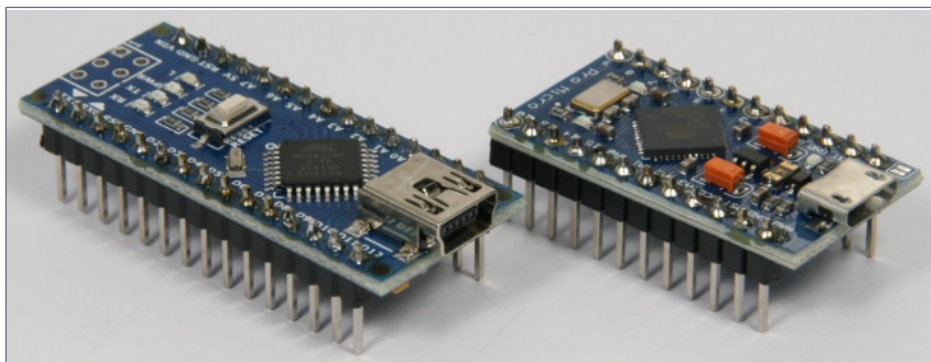
- Install shortest components first.
- After inserting a component's leads through PCB holes, bend their leads outward slightly to hold the component flat against the PCB. Solder one lead. If the component is not flat, re-heat the joint and push it flat, then solder the remaining leads.
- Once soldered, clip excess lead wires flush with the solder. Do this only where excess wire is long; it's not necessary with short pins on integrated circuits or pin headers.
- Orientation of resistors doesn't matter.
- A polarized capacitor has a vertical stripe printed next to the *negative* lead. The *positive* lead is unmarked, but the wire is longer than the negative lead. However, usually the PCB outline marks the *positive* lead with a + symbol. Don't be confused: Install a polarized capacitor with the longest lead (on the unmarked side) into the PCB hole with the + symbol.
- Orientation of capacitors with no polarity markings doesn't matter.
- The band on one end of a diode must match the line printed on the PCB outline.
- The notch or dimple on one end of an integrated circuit or other multi-pin device must match the notch or dot printed on the PCB outline.
- Pin headers can be tricky to solder perpendicular to the PCB. Solder just one pin, then check. If not right, melt the solder and rock the pin header slightly, trying to feel when the plastic base sits flat on the PCB. Remove the soldering iron and hold the header steady until the solder cools. Then solder the remaining pins.
- Be sure to make your solder joints hot and quick. Many of the electrical components, especially LEDs, diodes, and header strips are heat sensitive, so you don't want to heat them up for too long.



2. Header pin strips supplied with the Arduino Nano-3 and Pro-Micro.

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3. Header pin strips soldered to the Arduino modules. The 6-hole pattern at the far end of the Nano-3 module (left) is unused in this application.



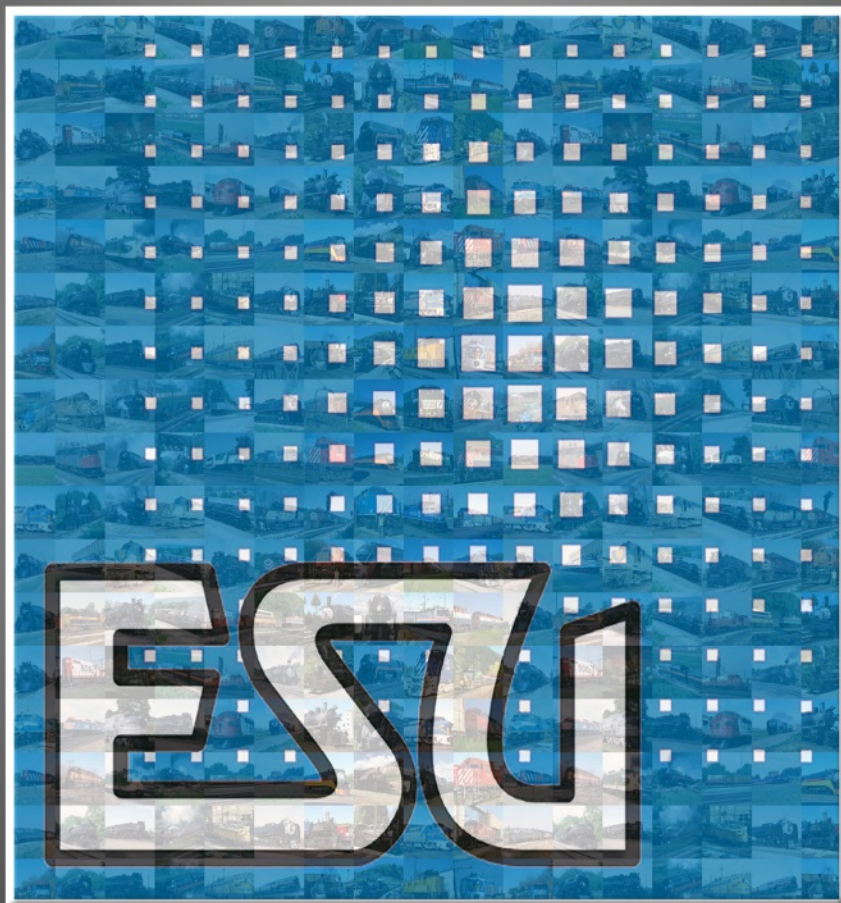
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[INDEX](#)

[TABLE OF CONTENTS](#)

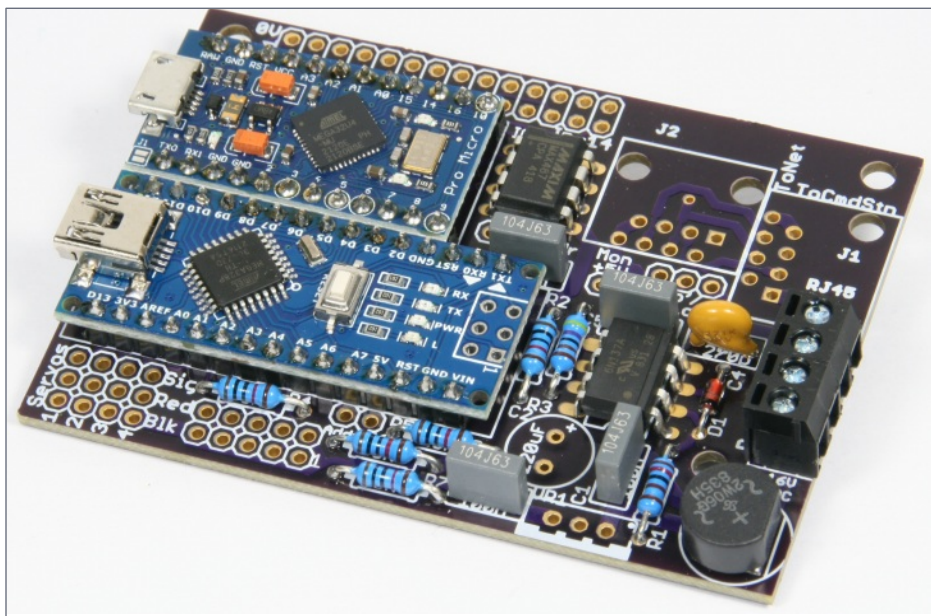
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4. Continuing assembly of the QSDM board.

Now fit the pin headers. If you purchased long strips, cut them into the required lengths with wire cutters. Place and solder each group of pins in place separately, ensuring that they are flush to the PCB, with the pins perpendicular [5].

Fit the tallest components, the 220uF capacitor (C2) and the two RJ45 connectors last. Ensure that C2's polarity is correct, as described in the sidebar.

The RJ45 jacks have two mounting pegs that fit into holes in the PCB. Place the eight pins at the rear of each connector in their holes before you press the mounting pegs into place. Install J1 (labeled "ToCmdStn") first so there's space to tilt each connector to ensure the pins are positioned correctly.

Finally, install the voltage regulator vertically with the metal tab facing outward. Attach a heat sink to the voltage regulator to keep

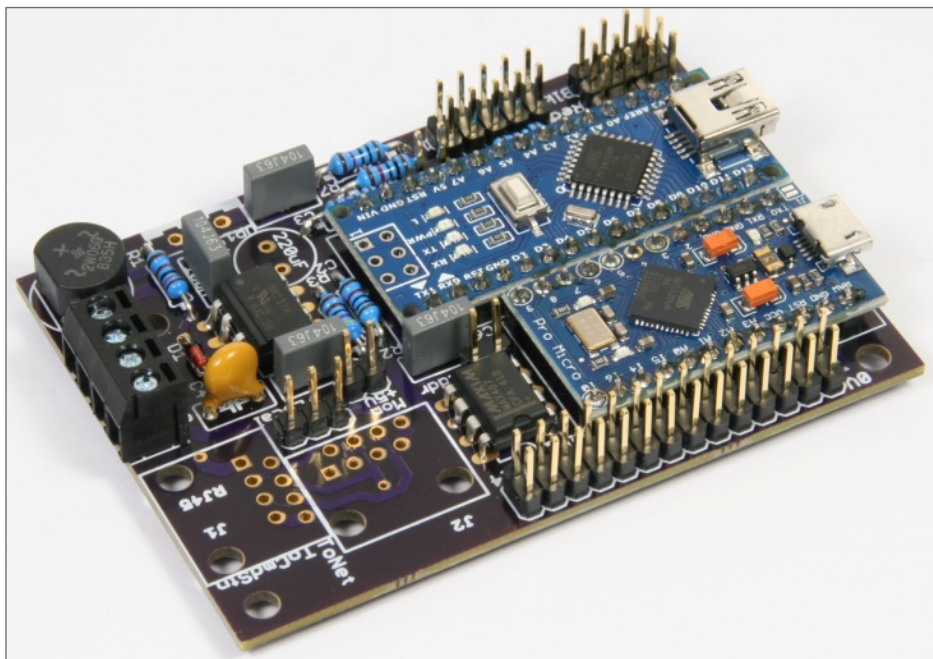


its operating temperature within limits. The fins should face inward, but carefully straighten the bottom fin (don't break it) to clear the adjacent component [6].

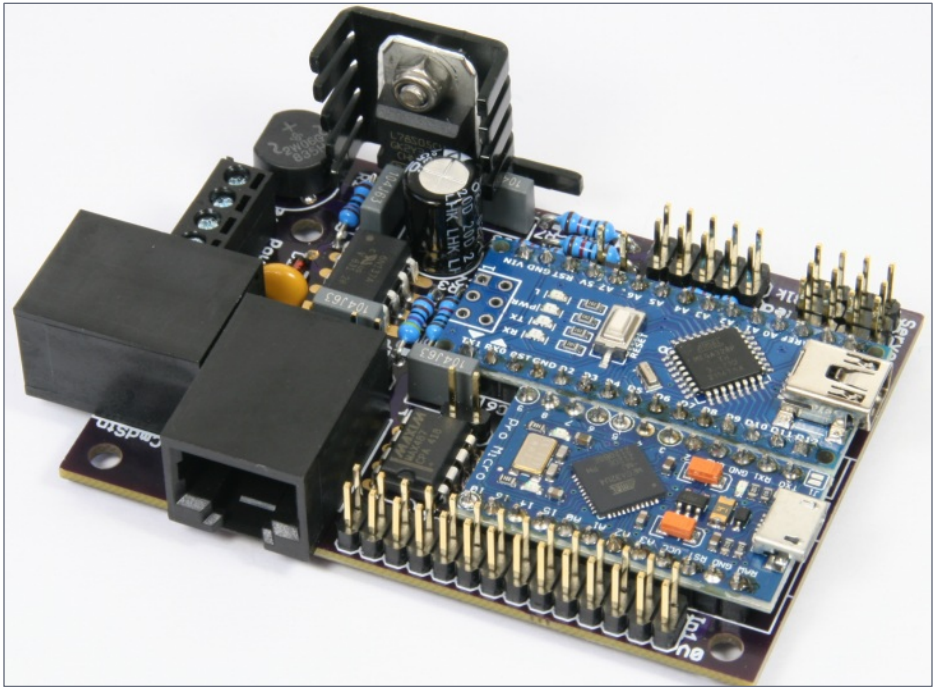
BUILDING THE SUBSIDIARY UNITS

A keypad and extension cable are required to set up the servos that will eventually be attached to the decoder section of the QSDM. If you do not already have a keypad, then please refer to the original February 2020 *MRH* article (online.fliphtml5.com/buups/wpwb/index.html#p=49) for full assembly details.

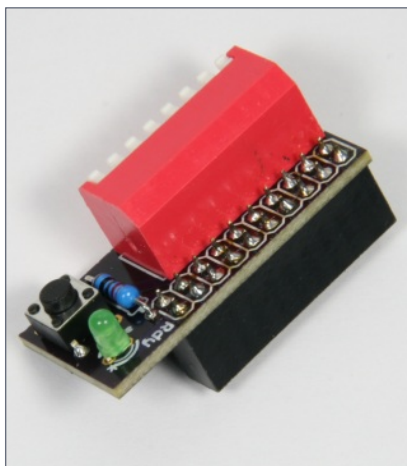
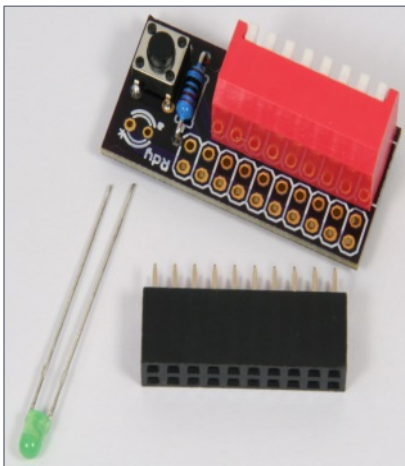
Assemble a Set Address module by soldering resistor R1, pushbutton S1, and the 8-position DIP switch S2. Solder the LED with its longest lead in the hole marked “a” as shown [7].



5. All pin headers in place.



6. Assembled Quad Servo Decoder-Monitor.



7. Set Address module assembly.



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[INDEX](#)

[TABLE OF CONTENTS](#)

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Lastly, solder the 2 x 10 socket header on the underside of the board.

As an option you can also build a Status View unit with five resistors and five LEDs [8].

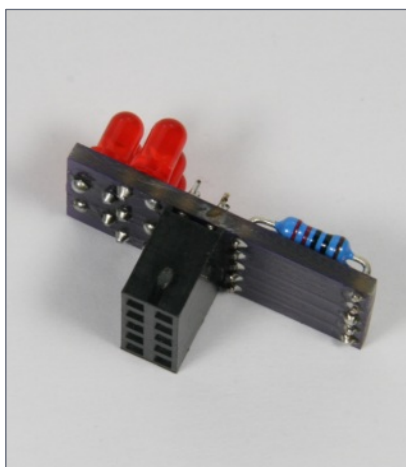
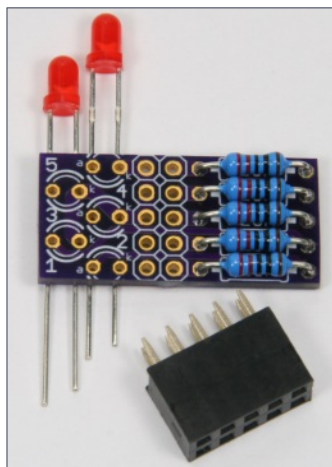
Again, the 2 x 5 socket header goes on the underside of the board.

Inspect each of the completed boards to verify all solder joints are bright and shiny, and that the solder has flowed through the holes to the component side. Make sure there are no solder bridges between copper pads or component pins anywhere on either side of each PCB. A magnifying glass or jeweler's loupe helps with this inspection.

UPLOADING ARDUINO SOFTWARE

Assuming you have installed the Arduino IDE on your computer (Part 1) and downloaded the two sketches for the Nano-3 and Pro-Micro, upload the code to the Arduino modules.

Start the Arduino IDE by double-clicking on the sketch for the Nano-3 (QuadServo_DCC-Decoder_5-3.ino). Check that the Board,



8. Assembled Status View module.



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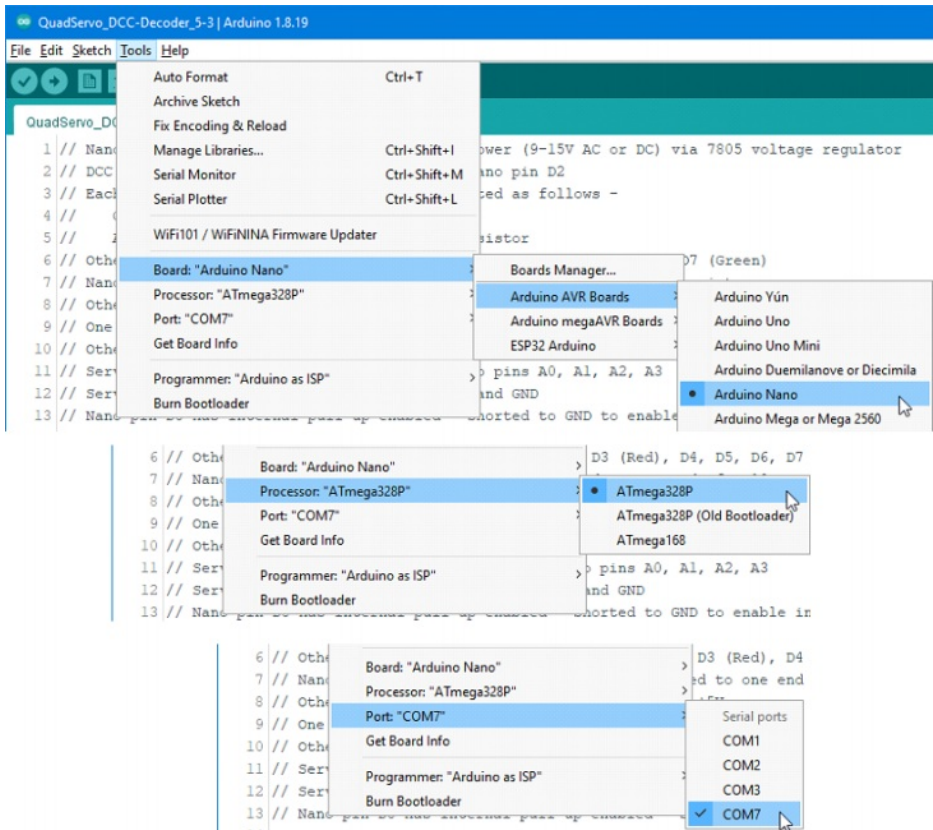
[INDEX](#)

[TABLE OF CONTENTS](#)

Processor, and Port settings on the Tools menu are set appropriately [9].

Connect a mini-B USB cable from your computer to the Nano-3, then click the Upload (📤) button to transfer the compiled sketch to the module. You should see the Tx and Rx LEDs on the Nano-3 light for varying lengths of time as the transfer proceeds.

If you have difficulty finding the right port, disconnect the USB cable and look at the list of available ports displayed when you click “Port” on the Tools menu. Close the Tools menu, plug the



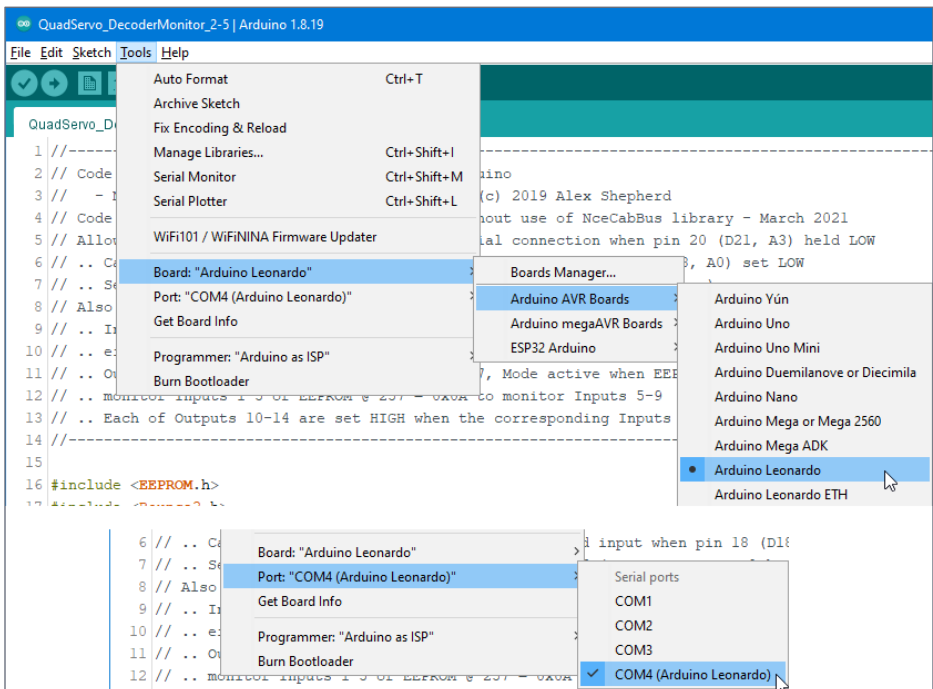
9. Arduino IDE setup for Nano-3 module.

USB cable in, and look at the Port list again. There should be one extra port shown, which is the one to use.

Once the sketch has been uploaded, the Nano-3 will retain the code even when switched off, so you can simply remove the USB cable, and close the Arduino IDE.

Restart the Arduino IDE by double-clicking on the Pro-Micro sketch (QuadServo_DecoderMonitor_2-5.ino). In the Tools menu, set the Board and Port settings to "Arduino Leonardo." The port will almost certainly be different from that used by the Nano-3, but is usually clearly identified [10].

Connect your Pro-Micro to your computer with the micro-B USB cable and click the Upload (📤) button to transfer the compiled sketch to the module. The Tx and Rx LEDs on the



10. Arduino IDE setup for Pro-Micro module.



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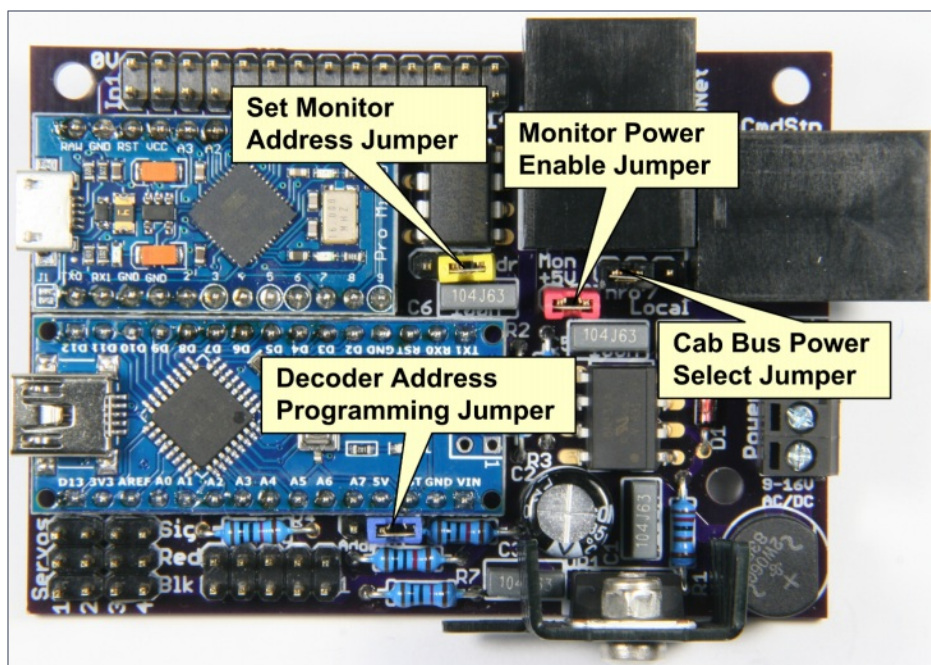
module will light as the transfer proceeds. When complete, remove the USB cable and close the Arduino IDE window.

READY FOR SETUP

Before proceeding to the next stage of QSDM setup, add four jumper links to the various pin headers shown in [11]. Color doesn't matter, though I use different colors to help differentiate.

The Monitor Power Enable jumper (red) connects the Monitor section of the QSDM to the onboard 5-volt supply from the voltage regulator. It should always be fitted to the header, except when accessing the Decoder section configuration variables using JMRI Decoder Pro or my own A-Track application.

The Cab Bus Power Select jumper (black) is normally fitted to the two leftmost pins of the 3-pin header. It allows the 12-



11. QSDM jumper link positions.



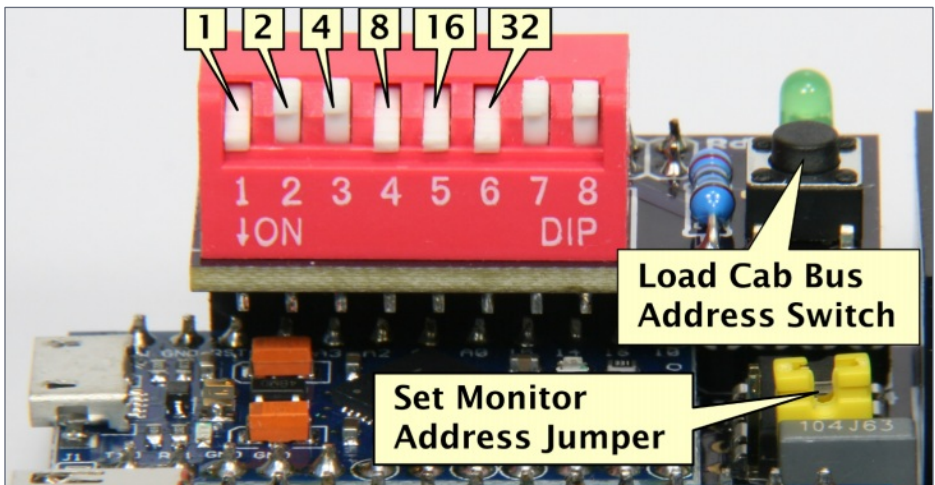
volt supply carried by the NCE Cab Bus to pass through the RJ45 sockets.

Fitting this jumper on the rightmost pair of pins allows the QSDM to supply power to the downstream section of the Cab Bus, but this would only be necessary for a very large, extended layout. It would also require the QSDM to be powered from a 13.5-volt supply.

The other two jumpers, Set Monitor Address (yellow) and Decoder Address Programming (blue), are fitted only during setup, and will normally simply be “parked” on one of the relevant pair of header pins.

QSDM DECODER SECTION SETUP

After connecting the QSDM to the track DCC and to its own power source (9 volts recommended), and connecting up to four servos to the appropriate 3-pin headers, the setup of the QSDM Decoder section is identical to that described for the



12. Setting QSDM Cab Bus address.

Quad Servo DCC Decoder in Part 2 of the original article in MRH, March 2020 (online.fliphtml5.com/buups/hfkwx/index.html#p=51), or as found on the A-Train Systems website (www.a-train-systems.co.uk/download.htm#Projects). I won't repeat all the steps here.


QSDM MONITOR SECTION SETUP

Setting up the Monitor section only requires setting a Cab Bus address for the QSDM. Use the switch block fitted to the Set Address unit. Block switches 1 to 6 set the required Cab Bus address, by being set ON or OFF with a small screwdriver or your fingernail. They are assigned the numerical values shown in [12].

Select the Cab Bus address by adding the values of switches 1 to 6 which are ON, so the address set in [12] will be 57 (1+8+16+32). Switches 7 and 8 control how the optional Status View module operates, as described later in this article.

The Cab Bus address when using the NCE Power Pro can have any value between 2 and 63, although NCE recommends using addresses 41 or higher. With the NCE Power Cab, only addresses 2 to 10 are available, with some restrictions (see the NCE website at ncedcc.zendesk.com/hc/en-us/articles/201802345-Cab-Ids-101 for more details).

Apply power to the QSDM Monitor section by connecting the Pro-Micro to a USB port on your PC. Do not make any other connections to the QSDM at this point.

Open the Arduino sketch for the QSDM Decoder section (QuadServo_DecoderMonitor_2-5.ino) and click the icon () in the top-right corner of the Arduino window to start the Arduino Serial Monitor. The speed of the serial link should be set to 115200 baud, selected from the drop-down list located at the bottom-right corner of the Serial Monitor window.

Set the Set Address unit switches to the required Cab Bus address, then carefully plug the unit onto the first 10 pairs of the 14x2 pin header of the QSDM Monitor section, with the switch block overlapping the Arduino Pro-Micro [13].



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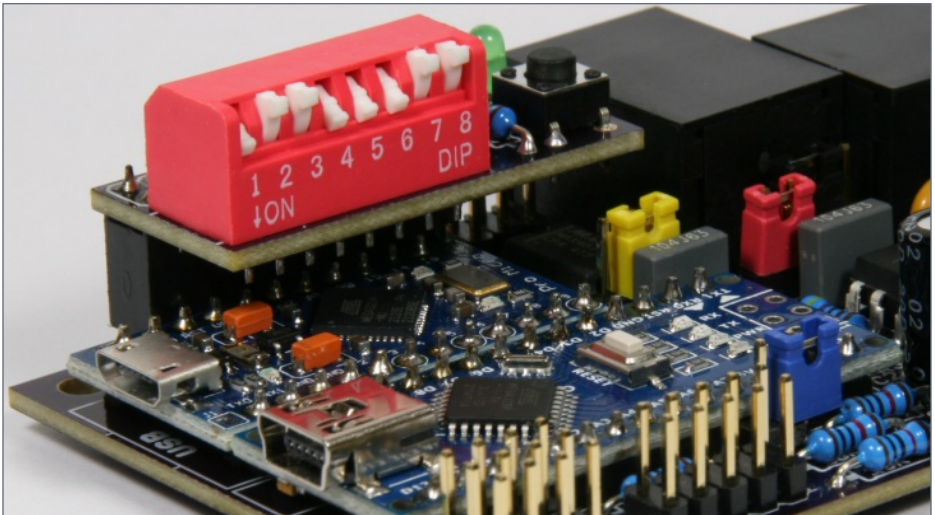


The Serial Monitor window will display a few messages showing that the state of some of the QSDM Input pins has changed (depending on how the Set Address switches have been set) [14].

Now, use a small pair of pliers to fit the jumper link to the 2-pin header next to the Pro-Micro (the yellow jumper labeled “Set Monitor Address Jumper” in [11]) – the jumper is normally “parked” on one of the header pins.

This action should light the green LED on the Set Address unit and display a further message in the Serial Monitor window, as in [15] below, which shows you the currently stored Address and Output Mode.

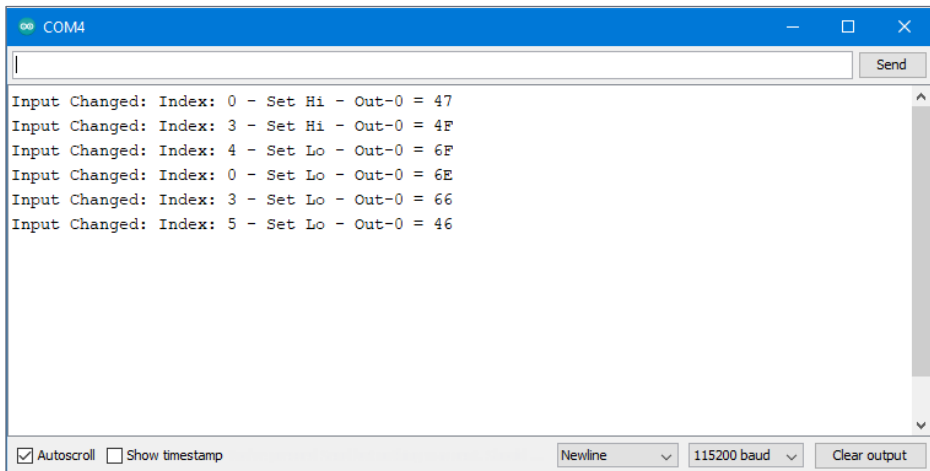
If you do not manage to fit the jumper solidly on the first attempt, you may see some further messages in the Serial Monitor window, indicating that Address Programming has been stopped and restarted. This is not a problem. Just keep trying to fit the jumper.



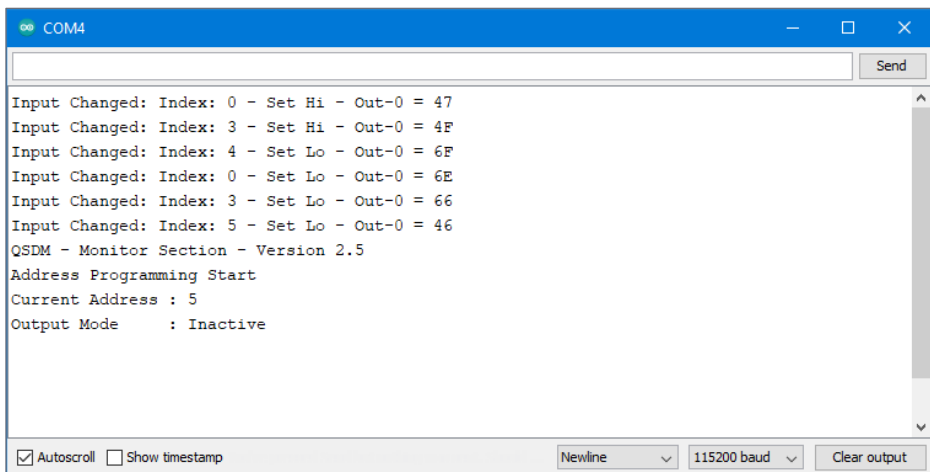
13. Set Address module fitted to QSDM Monitor header.



Once the jumper is firmly in place, press the pushbutton on the Set Address unit. This will extinguish the LED and produce a set of messages in the Serial Monitor window [16], confirming that the Set Address (57 in this case) plus the Output Mode



14. Serial Monitor window – initial state.



15. Serial Monitor window – programming started.

status (as set by switch 7 or 8) has been saved in the Pro-Micro memory (EEPROM). These values will be retained when the QSDM is powered off.

Remove the Set Monitor Address jumper and “park” it on one of the 2-pin header pins for safekeeping. A final confirmation message “Address Programming Completed” will be displayed in the Serial Monitor window, and you can unplug the Set Address unit from the QSDM. If the Serial Monitor window is still open, you will see a few more Input Changed messages reporting the resultant changes in the Pro-Micro inputs – these can be ignored.

Remove the USB connection to the Pro-Micro. Connect the QSDM to its intended position in the layout control network, using standard Cat5/6 Ethernet cables (as shown in the example network [5] in Part 1).

The QSDM must be powered off after programming (and removal of the Set Monitor Address unit) because the newly entered values will not become effective until the QSDM is restarted.

It's not necessary to keep the Arduino Serial Monitor window open when setting up the address of the QSDM Monitor section. Its only purpose is to provide confirmation of the switch settings. The Arduino IDE takes no part in the data-entry operation.

STATUS VIEW MODULE SETUP

I have divided the 14 inputs (header pin pairs) to the QSDM Monitor into three groups: A, B and C [17].

During programming of the Cab Bus address, with the Set Address module plugged onto the QSDM 14x2 pin header, you can set the pins of Group C as outputs (Output Mode) to drive the LEDs of the Status View module.

To enable the LEDs to display the states of the Group A inputs, set switch 8 ON. Or, to enable the display of the Group B input



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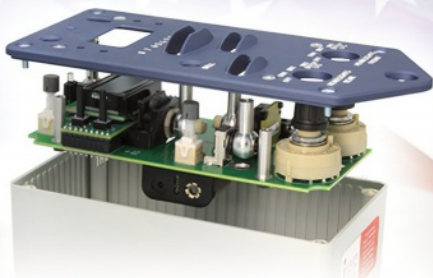
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[INDEX](#)

[TABLE OF CONTENTS](#)

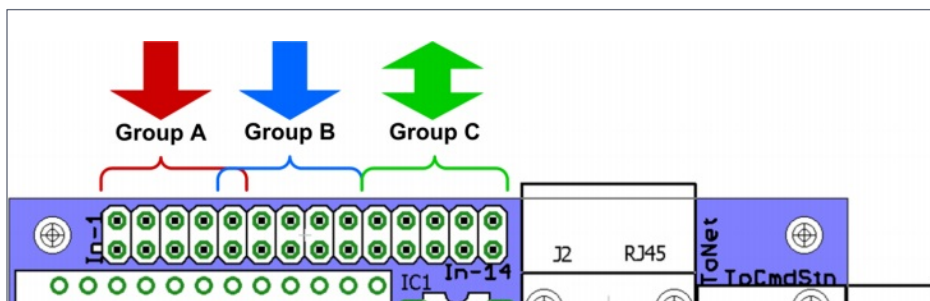
states, set switch 7 ON and 8 OFF. Setting both Switches 7 and 8 ON will only enable display of the Group A input states. To disable Output Mode, and allow the Group C pins to be used as inputs, set both switches 7 and 8 to OFF.

If, for example, switch 8 previously was set to ON during the programming of the Cab Bus address, the Arduino Serial Monitor will display the additional message shown in [18], to

```
COM4
Input Changed: Index: 0 - Set Hi - Out-0 = 47
Input Changed: Index: 3 - Set Hi - Out-0 = 4F
Input Changed: Index: 4 - Set Lo - Out-0 = 6F
Input Changed: Index: 0 - Set Lo - Out-0 = 6E
Input Changed: Index: 3 - Set Lo - Out-0 = 66
Input Changed: Index: 5 - Set Lo - Out-0 = 46
QSDM - Monitor Section - Version 2.5
Address Programming Start
Current Address : 5
Output Mode      : Inactive
Address Entered
Address Stored   : 57
Output Mode      : Inactive

☒ Autoscroll ☐ Show timestamp Newline 115200 baud Clear output
```

16. Serial Monitor window – address stored.



17. Group A consists of inputs 1-5, Group B has inputs 5-9 (overlapping with Group A), and Group C has the remaining inputs 10-14.

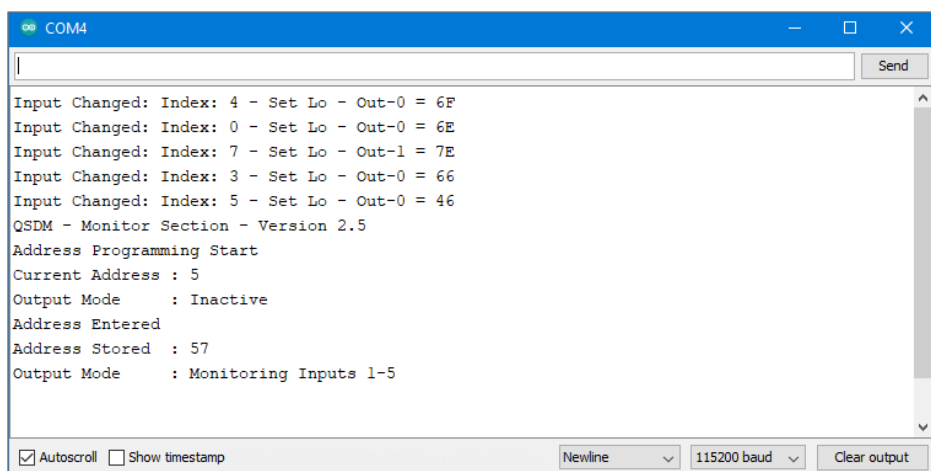
indicate that the Status View module, when plugged onto the Group C header pins, will display the state of the Group A pins.

Alternatively, if switch 7 is set ON prior to programming (with switch 8 set OFF) the states of the Group B inner pins will be shown on the Status View module when it is plugged onto the Group C pins, i.e., Output Mode will be shown as Monitoring Inputs 5-9.

Assuming we have set switch 8 as part of Cab Bus address programming, when a sensor such as a microswitch or an occupancy detector is connected to one of the QSDM Monitor Group A inputs, the state of that sensor will be indicated by the LED attached to the corresponding Group C output.

Once you are sure all your sensor connections are sound, you can unplug the Status View module, ready for use during your next QSDM setup.

However, if you want to use the pins of Group C as inputs from other sensors, you must remove all the connections from the QSDM 14x2 pin header. Note what they are and how their connection is oriented. You can then reprogram the Cab Bus



18. Serial Monitor window – input monitoring enabled.



address into the QSDM, with switches 7 and 8 set OFF on the Set Address module. Finally, reconnect the sensor inputs you removed before adding additional sensors to the Group C pins.

USING THE QSDM

After all parts of setup are complete, power the QSDM from a separate 9-volt AC or DC supply capable of providing up to 2 amps. This allows simultaneous operation of several servos while keeping the heat sink reasonably cool. Unlike the NCE AIU, the Monitor is not powered from the Cab Bus 12-volt line, so you must switch the QSDM on before powering-up the NCE Command Station.

Supply power to the QSDM and hence the attached servos, through terminals 1 and 2 of the 4-position terminal block. Connect the DCC supply to terminals 3 and 4 of the terminal block. This connection provides DCC commands to the Servo Decoder section of the QSDM.

The Monitor section of the QSDM is connected to the Command Station Cab Bus with an Ethernet cable via the RJ45 socket J1 (labeled "ToCmdStn"). The Cab Bus is continued in daisy-chain fashion to the next QSDM (or AIU or other NCE device) from J2 (labeled "ToNet").

The Cab Bus daisy chain can be extended to incorporate up to 62 devices, each with a unique address, and can stretch as far as 1000 feet. For cable runs beyond 40-50 feet, connect 12V DC auxiliary power units to the Cab Bus (as shown in diagram [5] in Part 1) to keep handheld controllers at this distance operational.

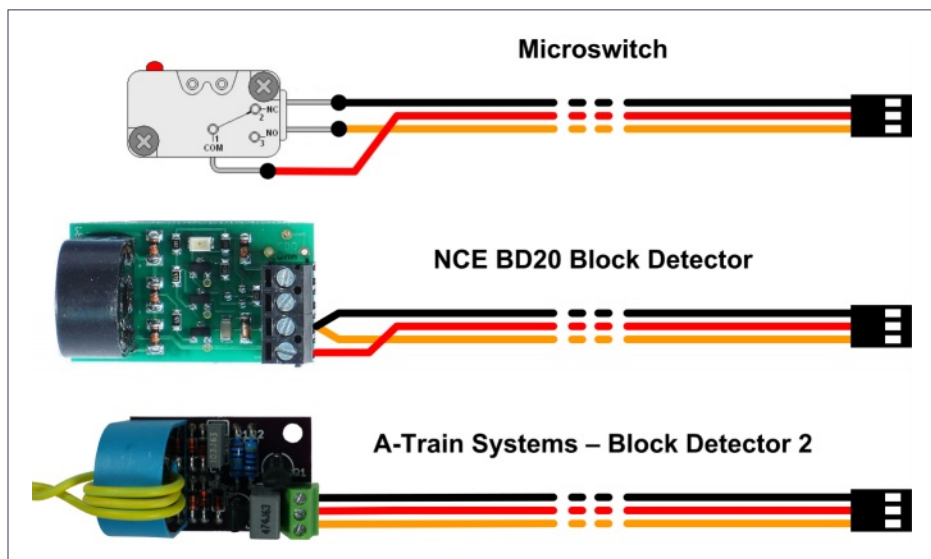
You can attach any type of sensor to one of the 14 Monitor inputs via the 14x2 header pins. Each of the outer row of pins are all connected to ground (0 volts), and an input is regarded as active when the sensor connects the corresponding inner pin to ground. Typical sensors are microswitches attached to turnout motors, and block occupancy detectors such as the NCE BD20, or my own DIY detector design (www.a-train-systems.co.uk/projects.htm#BlockDet).

To link sensors to the QSDM, I use 3-wire servo extender cables. For microswitches and block occupancy detectors the connections are as shown in [19].

The center (red) wire makes the ground connection. This ensures that the ground connection is always correct, whichever way the connector is plugged onto the two pins of a Monitor input.

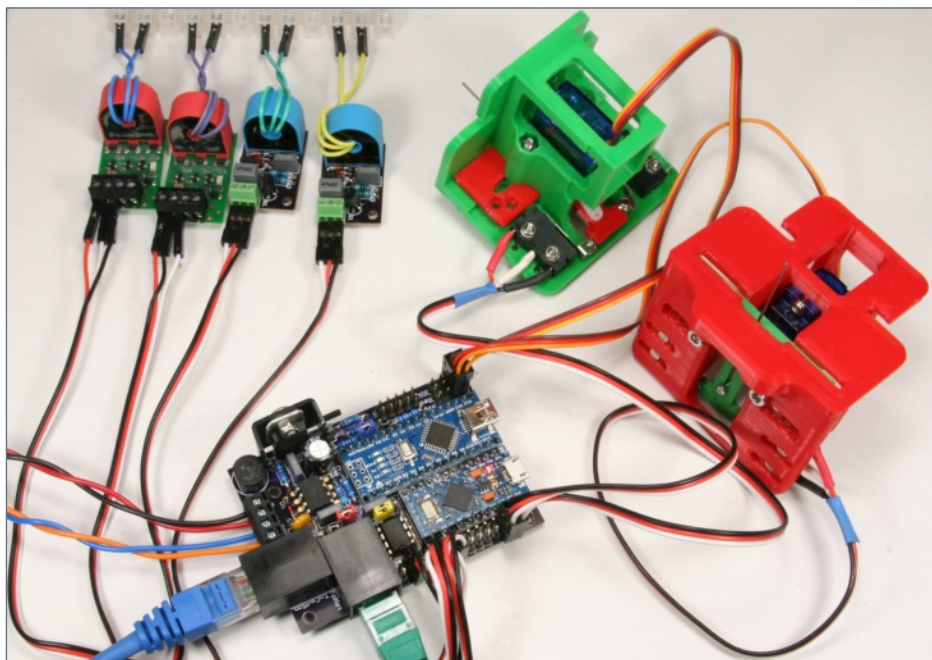
For the NCE BD20, the outer two wires of the cable are both connected to the device's Logic output [19], whereas my own AT Block Detector 2 already has the required dual output connections at its terminal block.

Since microswitches are generally attached to the servo (or other) turnout motor before the assembly is mounted to the turnout, it is common to find that the sensed state of the turnout is opposite to what is required. With the cable connection shown in [19] you can fix the problem by reversing the connector on the relevant pair of pins of the 14x2 header.



19. Sensor connections to QSDM inputs.





20. Typical connections to the Quad Servo Decoder-Monitor.

An example of how the QSDM would be connected in a typical system is shown in [20].

The two servos attached to the Decoder section are in the (red and green) mounts designed and 3-D printed by my brother Derek. Each servo drives a horizontal slider, with connections for either a vertical (shown) or horizontal actuating rod. This also operates one or two attached microswitches. One microswitch connects to a Monitor section input [19], while the other changes the turnout frog polarity.

Four block-occupancy detectors are connected to other inputs of the Monitor section 14x2 header – two NCE BD20 detectors on the left and two of my own AT Block Detectors.

A computer application (JMRI Panel Pro or my A-Track software) will read the state of all QSDM Monitor inputs from

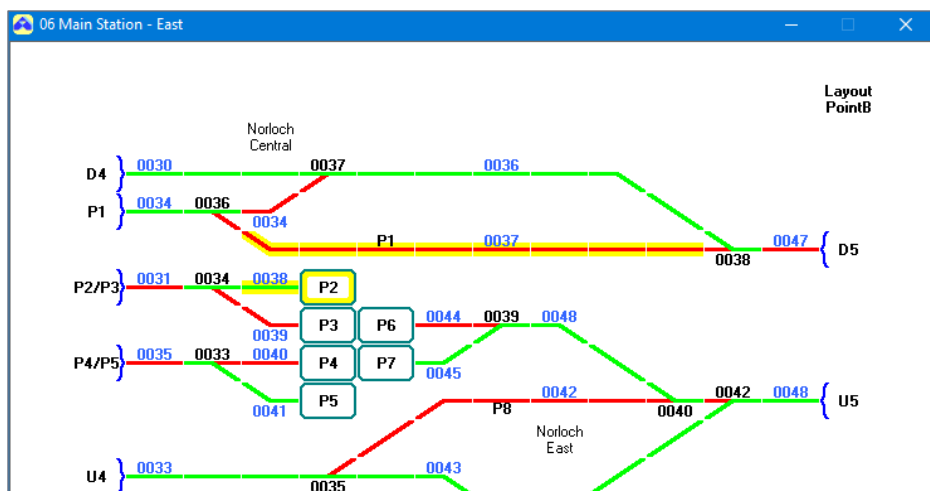
the NCE system at regular intervals. A layout panel or mimic diagram will display the results on screen [21].

TECHNICAL DETAILS

The circuit schematics of the QSDM and the subsidiary units can be found on my A-Train Systems website (www.a-train-systems.co.uk/qsdm-download). ✓

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21. An example mimic diagram using A-Track. Turnout addresses are shown in black text, with the green track indicating the current turnout direction. Track block addresses are shown in blue text, with currently occupied blocks highlighted in yellow, such as block 0037 and block 0038 leading to terminal platform P2.



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[INDEX](#)

[TABLE OF CONTENTS](#)

DR TERRY CHAMBERLAIN



Terry Chamberlain got into model railroading almost by accident in the 1990s when he responded to a request from some modelers in California to build a DCC system based around an Atari personal computer – and he had to build a simple layout to prove that it all worked.

Eventually the project evolved into A-Track, a Windows application to provide full computer support for the complete range of NCE DCC systems, with facilities like JMRI's Decoder Pro and Panel Pro.

Terry is a professional electronics engineer and spent most of his career in the UK defense industry designing, and managing the development of, large real-time computer systems for the Royal Navy. Now that he is fully retired, he is beginning to make progress building the small logging and mining layout he has been planning for many years (after several visits to Colorado) . But he keeps getting distracted by new computer and electronics projects for model railroading. ■

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[TABLE OF CONTENTS](#)



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INDEX

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[INDEX](#)

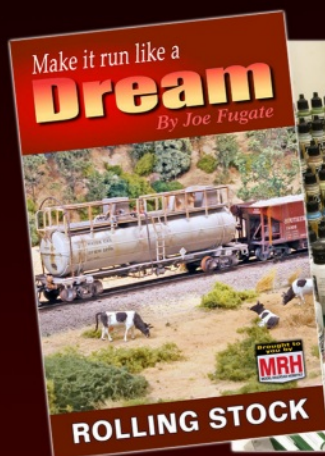
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[INDEX](#)

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MICHAEL ANTEAU BUILDS A HAND-OPERATED
TURNTABLE BASED ON A **BOB HAYDEN** CLASSIC ...



MANY YEARS AGO, I read an article by Bob Hayden: “An Inexpensive, easy-to-build turntable,” from Kalmbach’s *Model Railroad Handbook No. 40: HO Trackside Structures You Can Build*.

Bob described building a narrow-gauge turntable for Dave Frary’s layout. Using a 1/4” phono plug as the pivot, spare parts from an Atlas girder bridge, “spit, and bailing wire,” he built the project for about \$10. I just had to try building my own!

Several decades later, and after the accumulation of my own spare parts box, I finally built my version for the Two Hats Lumber Company, a logging subsidiary of my HO Scale Nicholas & Ashley Creek Ry.

PLANNING THE BRIDGE

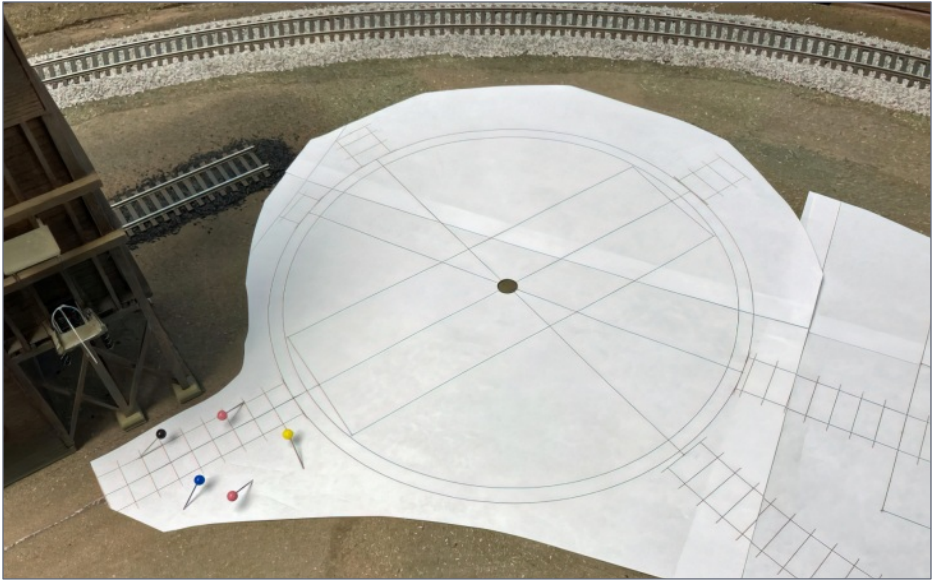
Many turntables on logging lines were hand-operated, with grab irons on the ends of the table and a walkway around the pit. After positioning the locomotive on the table for precise balance, the crew would climb down into the pit to shove the turntable around into position. Some turntables, such as the prototype I chose, had only a partial pit wall [lead photo].

Bob’s turntable was 44’ long. I made mine 56’ to accommodate my standard-gauge Shay, Heisler, and 2-6-0 locomotives. At 56’, the table could even handle a first-generation diesel, should the Nicholas & Ashley Creek Ry. ever acquire one.

BUILDING THE BRIDGE BASE

Prototype railroads built such turntables as timber structures initially, but rebuilt them over the years to accommodate

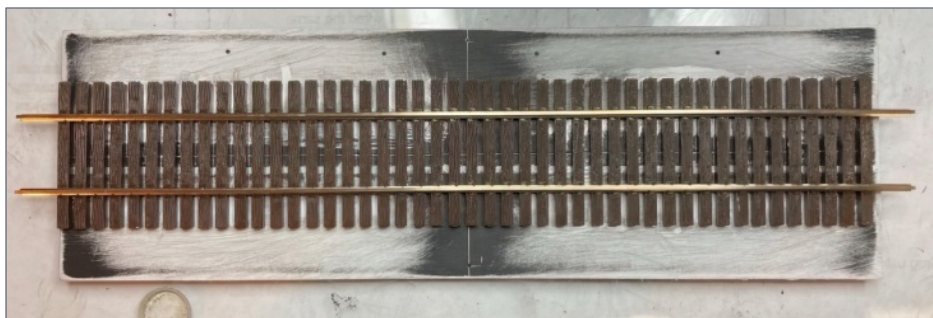




1. I started the project by drawing the turntable with CADRail and printing it full-size. I used the print as a template to test-fit the turntable.



2. I had painted my old bridge black, so I scribed crosshairs into the paint on the bridge base to mark the exact center on both sides. I drilled small holes at the center and edges to make sure they matched.

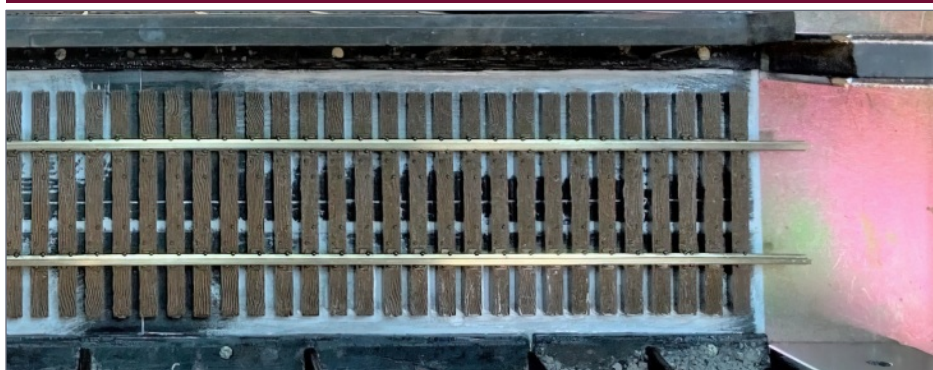


3. I used the markings and calipers to center Micro Engineering bridge track cut to size so the rails overhung the ends for later trimming. I secured the track to the base with CA.

increasingly heavy locomotives. As on my model, some even used reclaimed bridge girders on the sides for added strength.

I scratchbuilt a through-girder bridge years ago using Atlas bridge girders that were detailed on both sides, and a base of thick styrene. I disassembled that bridge and had the basic components for my new turntable.

ADDING THE BRIDGE GIRDERS: TRACING THE BRIDGE



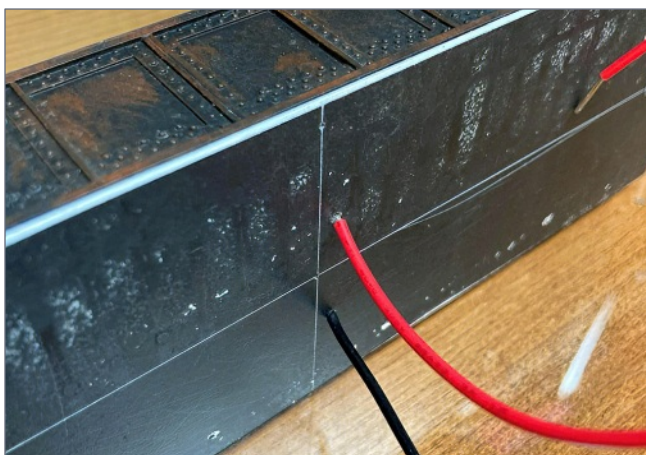
4. I cut two Atlas girders to size in a miter box to form each side of the turntable. I glued them together back-to-back in a butt joint. I then glued the girders to the sides of the bridge, using a Micro-Mark jig to hold it all together as the glue set.



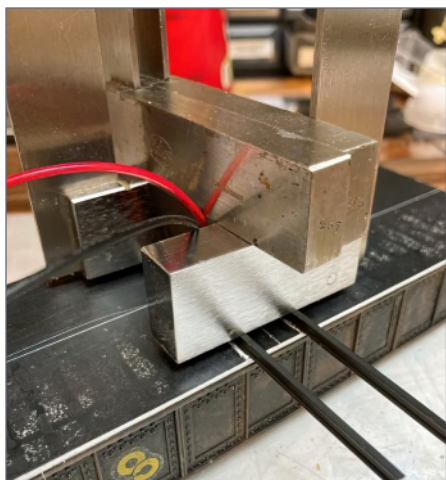


5. I used leftover parts from a Micro Engineering trestle to hide the seams of the butt joint. I didn't think to use my NMRA gauge ahead of time, and my bridge opening turned out to be slightly narrower than the NMRA minimum. However, I liked the looks of it, and all my locomotives fit, so it worked out.

BRIDGE WIRING AND I-BEAMS



6. I drilled two holes through the bridge base and wired up the track. I soldered the leads to the outside of the bridge rails with enough slack in the wire to connect it to the 1/4" phono plug.

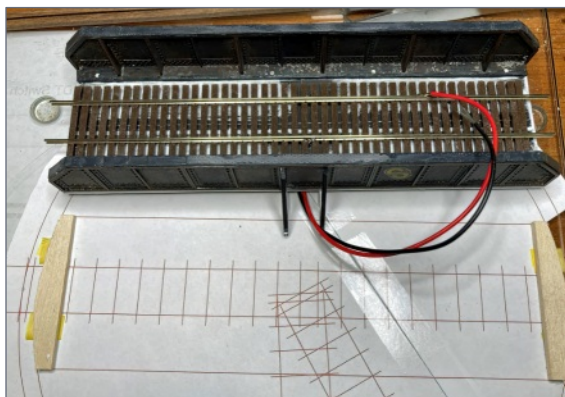


7. I glued two I-beams to the bottom of the bridge for the center supports, spaced so the plug would fit between them. Then I cut angled brace girders in my miter box and added them on the side.

BOTTOM

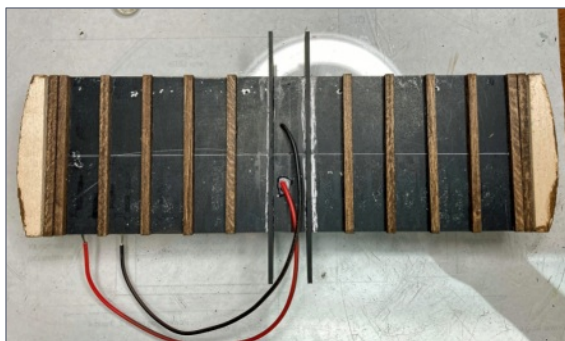
The prototype bridge had wooden beams supporting the bottom. The ends of the beams were curved to match the pit and rested on wooden abutments when the bridge was aligned with the lead tracks.

I made the supports using $\frac{1}{4}$ " stained stripwood, and glued them to the bottom of the bridge with canopy glue. I love working with canopy glue as it goes on thin, but sets up quickly and bonds to most surfaces.

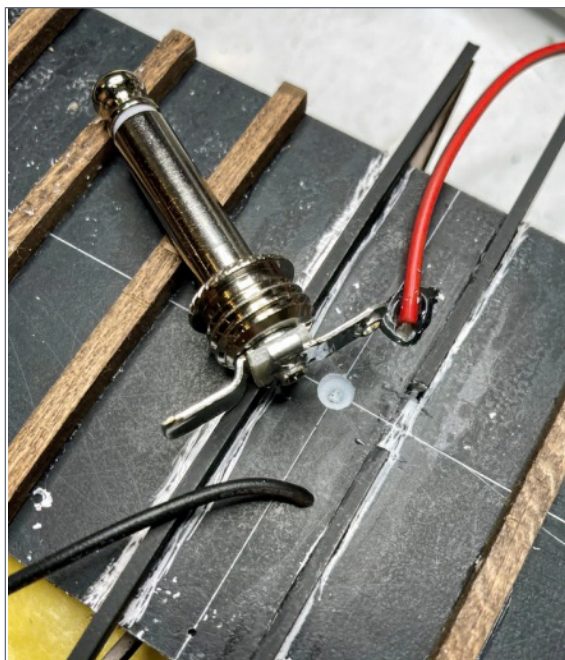


8. To round the edge braces, I printed a 1:1 copy of the turntable pit from CADRail. I then cut and sanded the stripwood ends to match the pit curve and taped them to the plan with double-sided tape.





9. Then I glued the bridge to the ends with canopy glue and weighted the assembly overnight to dry.



10. To prepare the plug, I bent the leads perpendicular and trimmed them short, leaving enough material for a solder joint. I drilled a small recess in the bottom of the bridge at my center line to accommodate the rivet on the base of plug base, taking care not to drill all the way through. I also cut slots in the girders to accommodate the plug wires.

INSTALL THE PHONO PLUG

Probably the most challenging, nerve-wracking part of this project was installing the phono plug on the bridge. The plug must be centered perfectly, and at exactly 90 degrees. If any of these measurements are off, the bridge rails won't align properly with the approach rails, and the bridge may rub on the pit.



11. I planned to use machinist's angles to hold the plug vertically so I could glue it in place with 5-minute epoxy. This proved difficult since the metal plug slipped easily off the angles. I used a spare print roller – with 1/4" center – as a bushing to help hold the plug so I could apply just enough epoxy to secure it in place.



12. With the wires soldered in place, I built an octagon around the plug with stained stripwood. In addition to improving the turntable's appearance, it also provided a reservoir for epoxy. I used my angles and some clamps to support the plug at 90 degrees, then filled the octagon with 5-minute epoxy.

My plan worked to a point. Caliper measurements showed the plug to be centered, but it had tilted a little as the epoxy set. Though the plug was secure, it still had enough play that I could correct the angle.

Before correcting the angle, I soldered the track wires to the plug leads. The polarity didn't matter since I switch the track voltage polarity with a PSX-AR auto-reverser.

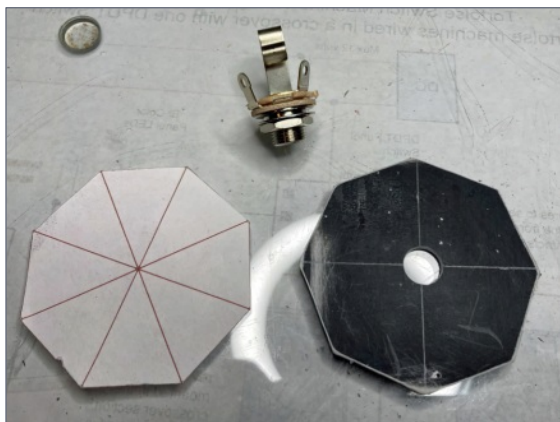




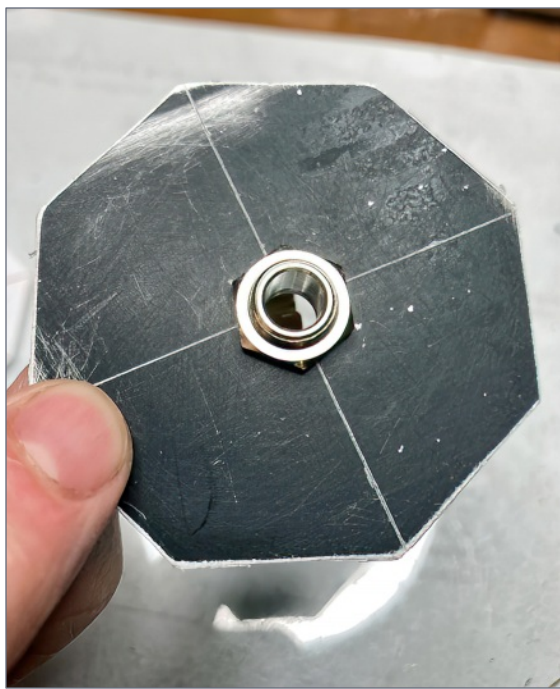
13. After letting it set overnight, the phono plug was secure at its proper angle.



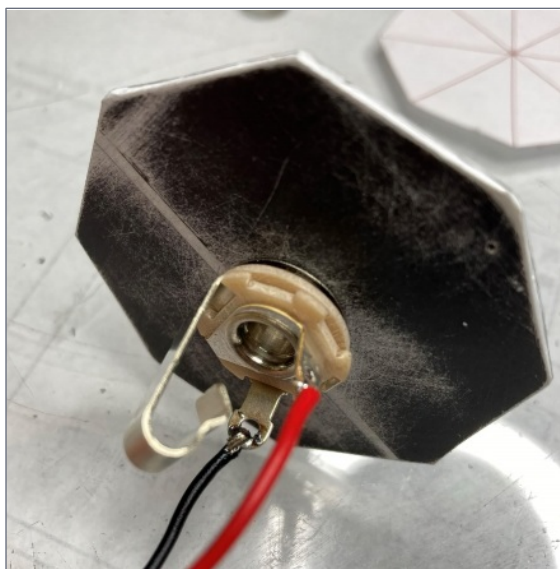
INSTALLING THE PHONO JACK TURNTABLE BASE



14. With the plug done I turned to the phono jack base. Bob mounted his base in a piece of heavy plastic, so I decided to do the same. I drew an octagon in CAD, traced it to a scrap of styrene from my old bridge, and cut it out with the score-and-snap method.



15. I marked the center, then I used a succession of drills to make a hole to mount the jack.



16. I soldered wires to the jack for later connection to my PSX-AR polarity reverser.



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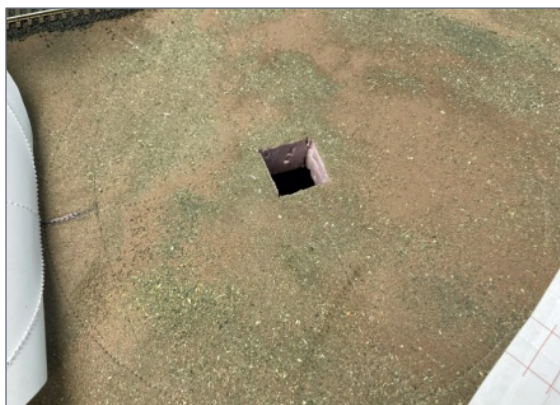
[INDEX](#)

[TABLE OF CONTENTS](#)

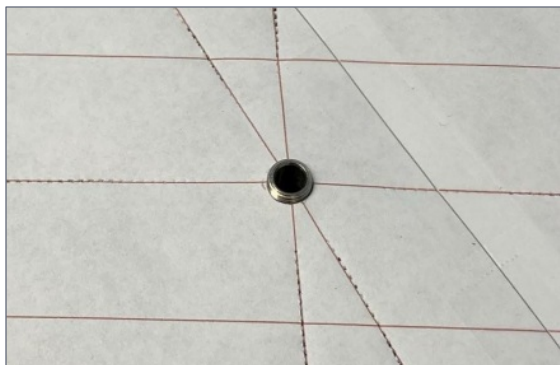
I considered a few different methods for mounting the turntable jack/base, then settled on a solution like the one in Bob's article. I was confident my jack was at a 90-degree angle to my base, and I knew the bridge plug was perpendicular. Logic told me that since my approach tracks were on a flat, level surface, I could just attach the base on top of that surface.

From there, I would simply adjust the mount left and right to align with the approach track, cut out the pit circle, lower the pit until the turntable tracks were even with the approach and roundhouse tracks, and fasten it in place. It seemed simple enough, but it only worked with a lot of fussing around.

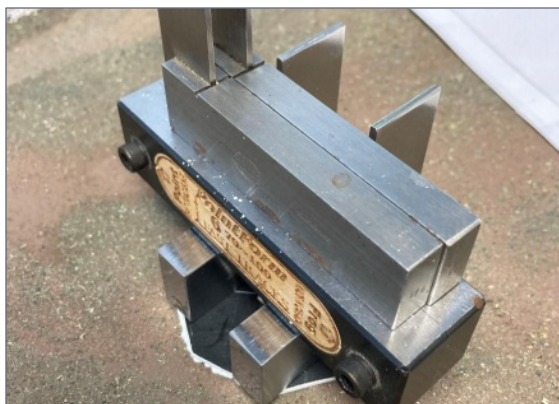
To align the base, I first printed a 1:1 CAD drawing of the turntable and pit, with the phono jack circle carefully cut out. I aligned this with the approach tracks and pinned it down [1].



17. I marked the center in the pit floor, then peeled back the template and cut an opening for the wiring and the clip on the bottom of the base. I gave it some left-right wiggle room.



18. I covered the bottom of the base with canopy glue, dropped it in the hole, and used the center hole of the CAD printout to align it.



19. I removed the drawing, weighted the base, and let it dry overnight.



LOWERING THE PIT (TROUBLE, RIGHT HERE IN RIVER CITY!)



20. With the glue set on the base, I replaced the CAD drawing and carefully cut out the turntable pit.



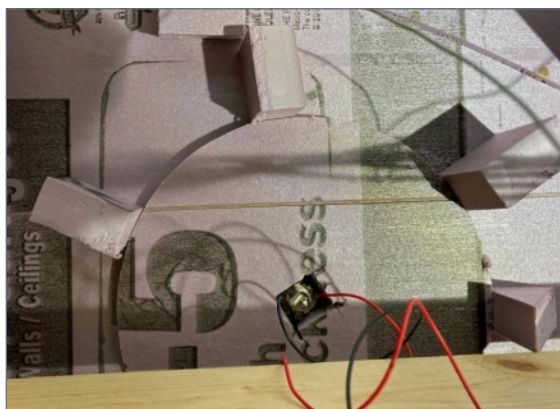
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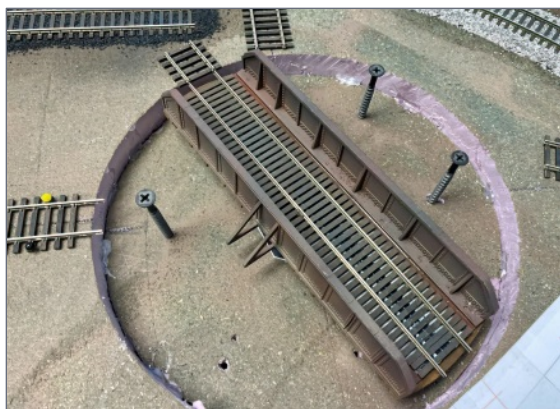
[TABLE OF CONTENTS](#)



21. I counted on my foam base to provide friction to hold the cut pit in place. I snapped-in the turntable, pinned down the approach and engine house tracks, and proceeded to lower the pit a little at a time to bring the bridge in line with the approach tracks.



22. I ran into some difficulty as I found I had to lower the pit almost exactly one inch, and my foam is one inch thick. I hot-glued some foam supports below the turntable to allow for more friction points as I lowered the pit.



23. These didn't hold as well as the original circle, and made it difficult to lower the pit accurately. I had to drive some drywall screws into the base to serve as temporary handles to level the whole thing.

I thought this process would take 15 minutes or so, but I worked for about two hours, gave up when my wife came home, then spent another hour the next day.

Finally, I got the pit leveled to within about 0.01 inch, and the tracks aligned well, with only one high spot in one orientation. Good enough. I glued the pit in place and braced it securely from below.

In retrospect, I think there's enough variance in the mounting of the post, mounting of the jack, play in the jack itself, and mounting of the pit, that "good enough" is the best I could expect, at least with this method.

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24. My CAD drawing allowed for a pit wall made from a Chooch Random Stone wall. I cut out a strip of this product the height of the pit (about 0.7 inches) and glued it in place.



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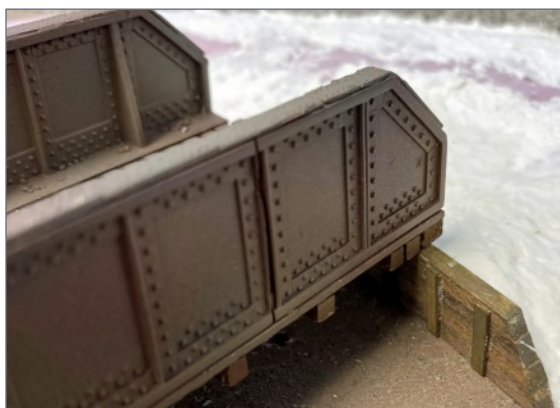
[TABLE OF CONTENTS](#)



25. Since the folks working in the engine house would be rotating the turntable by hand, they needed a way into the pit. I extended my pit wall only around 3/4 of the pit, and cut away the foam ground on the other side for a sloped access.



26. The prototype used wooden bents to support the ends of the turntable as locomotives were driven on and off. I added these on both ends of the table for each track. As on the prototype, they support the table, and serve as final alignment to correct the slight level irregularities from my pit design and installation.



27. I used my caliper to measure the distance from the pit floor to the wooden braces at the ends of the bridge, then stacked and glued stained stripwood so the bents were slightly larger than needed. When dry, I sanded them until they guided the

bridge into place and held it securely. I can rotate the bridge with a finger on each end, just like the prototype bridge pushers.



28. I wanted to disguise the plug jack in the base so it would look like it was set in concrete. I used a razor saw to cut a slice from the same print roller I had used as a bushing to mount the 1/4" plug, and glued it to the jack base.





29. When the glue had set, I painted the whole thing concrete color.

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PIT CONSTRUCTION AND DETAILING

Because my turntable is manually operated, I wanted it to look plausible that HO scale people could push it in a circle. I tested the height of the installed table with some scale figures and found the pit floor was a little too deep.

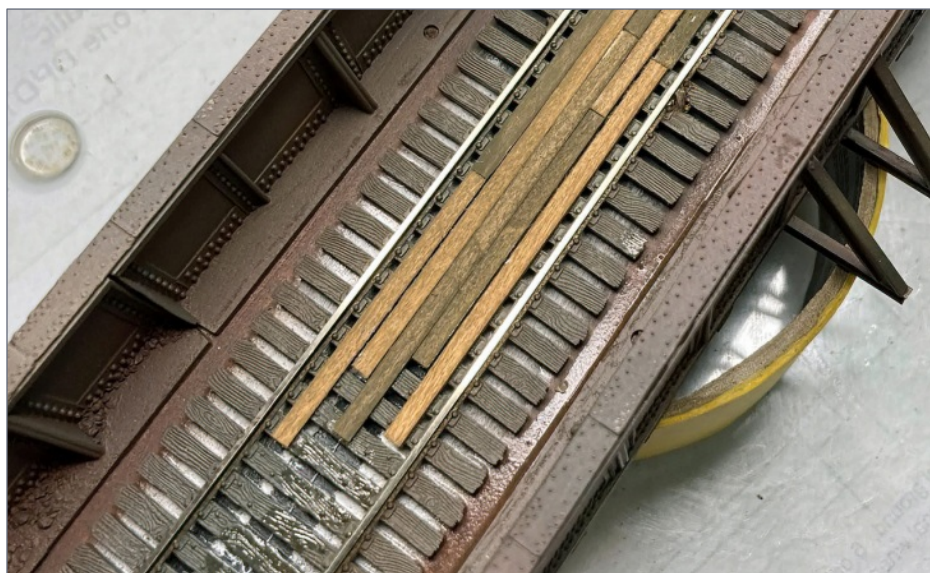


30. I used sculptamold to build up the pit floor. I also formed a walking path on the pit floor, and built up the surrounding slopes. Alas, I also covered up that fancy octagon I worked so hard on!



31. I painted the whole thing and added ground foam, static grass weeds, and debris like broken couplers and boards.

FINAL BRIDGE DETAILING



32. I airbrushed the finished bridge a light gray color followed by rust. I added 2x6 decking boards to the bridge between and around the rails, and stained them with Floquil paint markers. I cut them to various lengths so the deck would look cobbled together.





33. I also added push boards along the bottom of the bridge for the workmen to push from the pit. I airbrushed the bridge again with rust, mud, dirt, and dust, and dry-brushed the rivet details with more rust and white. Finally, I added a wheel and some chain to one end

of the bridge to “balance” the bridge when empty.

WIRING AND OPERATION

I connected the two leads from the ¼” phono jack to the DCC Specialties PSX-AR polarity reverser, and the PSX-AR to track power. The PSX-AR flips the bridge track polarity to match the lead track with no pause in sound or motion.

See this video where the loco reverses direction seamlessly:



click to play video

Scratchbuilding my turntable was an enjoyable project. It's fun to rotate the turntable by hand, like they did on the prototype. I didn't meet Bob's \$10 price tag from the 1990s, but I came close. The phono plug was less than \$10 on Amazon, the rest was scrap and materials I had on hand, but the PSX-AR cost around \$50. Still a very good price for a smooth working, fun-to-build turntable. ☑

MICHAEL ANTEAU



Michael comes from a railroading family. His grandfather was an engineer for the C&O, and his father was an engineer for CSX.

Michael was first bitten by the model railroad bug watching his dad's Lionel trains, and he built his first 4x8 layout at the age of ten.

Michael is now working on his "dream" layout, a prototype-freelanced coal hauling railroad set in transition-era West Virginia.

Michael lives in Northwest Ohio and works in Information Technology. He is married and has two grown children.

When he is not working on the Nicholas & Ashley Creek RY, Michael enjoys playing piano, biking, hiking, and traveling. ■

in the **JULY 2021 MRH RUNNING EXTRA!**

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Floquil/PollyScale stash running out?



MRH has mapped the old familiar colors
to readily-available acrylic paints.



MIR®'s Floq® / Poly/Slate Paint Equivalents Conversion Chart - 1

Floq®	Floq® Color	Color Name	Model Name	MIR® Model	MIR® Color	Notes
Primer Gray				MIR 4763	MIR 71-026	10-12
Engine Gray				MIR 4886	MIR 71-020 MIR 71-211	10-01
Steel Bone Black				MIR 4795	MIR 71-027	10-08
City Gray				MIR 4767	MIR 71-021	10-04*
Weathered (Charcoal) Black				MIR 4760	MIR 71-022 MIR 71-024	10-05
Reef-Gray				MIR 4884*	MIR 71-041	10-04
Reef-White				MIR 4873	MIR 71-030 MIR 71-031	10-02
Crimson Red				MIR 4187	MIR 71-002 MIR 71-025	10-03
Galaxy Red				MIR 4182*	MIR 71-002 MIR 71-003	10-08

*Indicates a color that may occur in nature. MIR 4800/026 is a sampling floq. MIR 4800/020 is the Miroton and Miroton Red floqs that are used in the 10-000 series. 2 Sampling floqs. Miroton Red is the Miroton and Miroton Red floqs that are used in the 10-000 series. 2 Sampling floqs. Color 4800/026 is a sampling floq. Color 4800/020 is the Miroton and Miroton Red floqs that are used in the 10-000 series. 2 Sampling floqs.

MIR®'s Floq® / Poly/Slate Paint Equivalents Conversion Chart - 2

Floq®	Floq® Color	Color Name	Model Name	MIR® Model	MIR® Color	Notes
Taupe				MIR 4800*	MIR 71-026	10-15
Reefter-Darjeeling				MIR 4800*	MIR 71-023	10-09
Reefter-Yellow				MIR 4819	MIR 71-018	10-10
Reef-Brown				MIR 4888*	MIR 71-249	10-108
Reef-Light Beige				MIR 4885	MIR 71-029	10-051 Charcoal match - see 10-04
Rail-Brown				MIR 4830*	MIR 71-020	10-015
Reef				MIR 4875	MIR 71-027	10-02
Concretes				MIR 4816	MIR 71-040*	10-17
Angel-Concretes				MIR 4875*	MIR 71-042	10-04*

*Indicates a color that may occur in nature. MIR 4800/026 is a sampling floq. MIR 4800/020 is the Miroton and Miroton Red floqs that are used in the 10-000 series. 2 Sampling floqs. Miroton Red is the Miroton and Miroton Red floqs that are used in the 10-000 series. 2 Sampling floqs. Color 4800/026 is a sampling floq. Color 4800/020 is the Miroton and Miroton Red floqs that are used in the 10-000 series. 2 Sampling floqs.

Page 14 MIR® Guide to acrylic painting

Page 15 Chapter 3 Paint conversion chart

TABLE OF CONTENTS

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INDEX

TABLE OF CONTENTS

SIGNALS

A beginner's walkthrough



Adding signals to your layout can take its looks and operation to a whole new level. Photo posted on the MRH forum by John Purbrick

Model Railroad Hobbyist | July 2022



JASON MILLER WALKS US THROUGH PLANNING FOR MODEL SIGNAL OPERATION ...

I ALWAYS WANTED TO INCLUDE A FORM OF SIGNALING ON my layout to control train movement. When I first investigated what this required, I was a little shocked and overwhelmed. There is a huge amount of information to assimilate.

What type of signal system do I want to use? Do I follow prototypical North American systems like CTC, APB, ABS? Do I use prototypical signal heads and aspects? The amount of information I had to digest disillusioned me even before I thought about the

hardware or software I was going to use, let alone type of signal head or brand.

Deciding on a signal system, mast type, hardware, and software could each make articles. Here I explain what kind of signaling I chose and why.

My system is not completely prototypical for the area or era I model, but then, my layout isn't prototypical, either. Mine is a proto-freelanced layout, with a prototypical railroad but freelanced era, towns, and history.

PLANNING THE SIGNALING SYSTEM

I decided to use a centralized traffic control (CTC) System as the main signaling for operating sessions on my JL&T Railroad. This involves a dispatcher to control the movement of trains through control points (interlockings), and an automatic block system between.

When I am operating on my own, or without enough operators to need a dedicated dispatcher, CTC is impractical. I decided to use a secondary automatic permissive block (APB) signaling system.

To permit this, I am designing two separate systems in JMRI. Effectively, this means I am creating two JMRI panels, one for APB and the other for CTC. I can then choose which panel to use when operating.

I will not delve into the complexities of JMRI here – I'm just helping you know a bit of the context behind my signal planning. You can find definitions and diagrams for CTC at:

www.lundsten.dk/us_signaling/signalbasics and for APB at: www.lundsten.dk/us_signaling/abs_apb/index.html.

I have used these links to educate myself about the various signal systems, and recommend them to anyone wanting to add signaling to their layout. They explain the different systems very well and have good diagrams to illustrate operation.



SIGNAL INDICATIONS

Next, I needed to decide what type of signal head I wanted. The Reading Lines and eventually Conrail used a wide variety of signal heads across the system. They included searchlights, triangular color lights, position lights, and color position lights.

For the JL&T, I chose single-head searchlight signals, based on cost, installation, and ease of interpreting the indication. I chose signals from Tomar Industries because they are inexpensive, and include options for triple-, double-, and single-head signal masts. Tomar also makes single- and double-head dwarf signals.

I also considered the system I wanted to employ, and what signal aspects I wanted to show. I considered whether I wanted a prototypical system or my own based on a common theme so that it would be easy for crews to pick up. I found the following information useful in gaining an appreciation for signal heads, aspects, and indications: www.railroadsignals.us/signals/searchlights/index.htm.

I derived a signal system for the JL&T Railroad from the *Conrail Signal Aspects -Guide 1988*. The complete document can be found here: www.multimodalways.org/docs/railroads/companies/CR/CR%20Signal%20References/CR%20Signal%20Aspects%202010-1-1988.pdf. I opted to use only single- or double-headed signal masts and dwarf signals [1, 2].

In addition to controlling block occupancy, the signals also indicate maximum speed for passing trains:

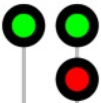
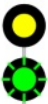
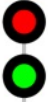
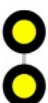
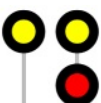
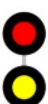
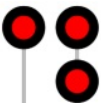
- Limited Speed limits passenger trains to 45mph and freight trains to 40 mph.
- Medium Speed limits speed to 30 mph.
- Restricted Speed limits speed to half the sight distance, equating to 20 mph outside interlocking or 15 mph within interlocking.
- Slow Speed limits trains to 15 mph.

The below [1] indications are not the entire range available from the Conrail Signal Aspects – 1988 Chart. To implement all of them would be overkill, and would take a considerable amount of time for operators to learn.

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Aspect	Description	Name	Rule	Indication
	Green single-head or green over red double-head	Clear	281	Proceed at posted speed.
	Yellow over flashing green double-head	Approach Limited	281b	Proceed approaching the next signal at Limited Speed.
	Red over green double-head	Medium Clear	283	Proceed at Medium Speed within interlocking limits and through turnouts.
	Yellow over yellow double-head	Approach Slow	284	Proceed approaching next signal at Slow Speed. Train exceeding Medium Speed must begin reduction to Medium Speed as soon as locomotive passes Approach Slow signal.
	Yellow single-head or yellow over red double-head	Approach	285	Proceed at medium speed, prepared for stop at next signal.
	Red over yellow double-head	Restricting	290	Proceed at restricted speed until the entire train has passed a signal displaying more favorable aspect.
	Red single-head or red over red double-head	Stop	292	Stop.

1. Aspects and indications table for single- and double-headed signal masts.



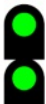


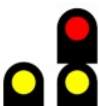
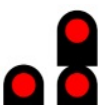
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[INDEX](#)

[TABLE OF CONTENTS](#)

The range shown below [2] illustrates a good subset of signal indications for a model railroad that should allow for good flow of traffic, without being difficult to implement or for operators to learn. ✓

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Aspect	Description	Name	Rule	Indication
	Green over green double-head	Clear	281	Proceed at posted speed.
	Green over flashing red double-head	Medium Clear	283	Proceed at Medium Speed within interlocking limits and through turnouts.
	Green single-head or green over red double-head	Slow Clear	287	Proceed approaching the next signal at Limited Speed.
	Yellow single-head or red over yellow double-head	Restricting	290	Proceed at Restricted Speed until the entire train has passed a signal displaying more favorable aspect.
	Red single-head or red over red double-head	Stop	292	Stop.

2. Aspects and indications table for single- and double-headed dwarf signals.

JASON MILLER



Jason lives in Diamond Creek, Victoria in Australia. Jason has been working on his HO JL&T layout for the past eight years. It's based on the Reading Railroad from the early 70s into the Conrail merger era (1976).

Jason has been a professional firefighter for 19 years. When not at work, he enjoys spending time with his family, coaching Toby's Australian Rules Football team.

Jason is married to Linden and has two sons. ■



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[INDEX](#)

[TABLE OF CONTENTS](#)



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[INDEX](#)

[TABLE OF CONTENTS](#)

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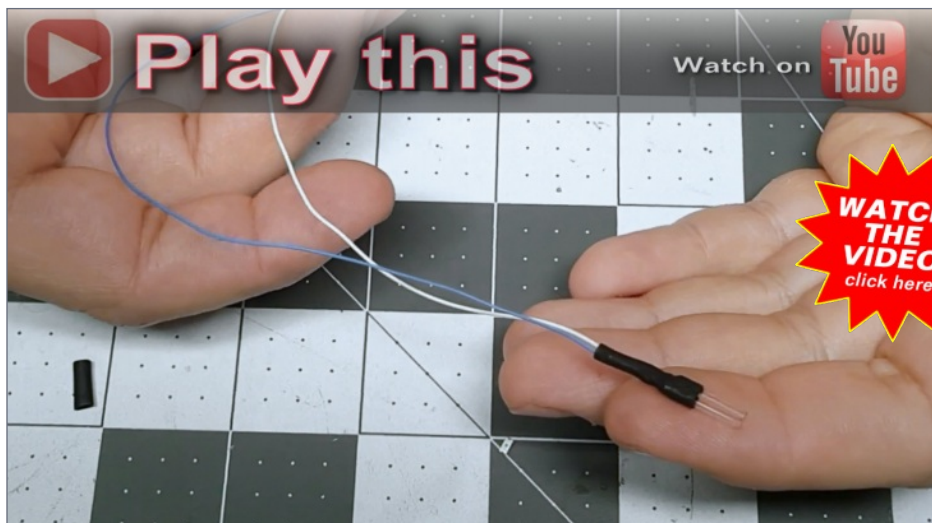


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Model Railroad Hobbyist | July 2022



Easy LED lights for Athearn diesels

YouTuber **Solo Contracting** shows here how he makes dual head-lights using a single SMD LED and 1/16" clear Plastruct acrylic rods. He solders his own leads to the LEDs, but you can also get prewired 1206 SMD LEDs for less than \$1 each and save yourself the tricky soldering headache.

Rather than using two smaller LEDs, this method uses only *one* LED per two head-lights, reducing your loco's current needs. ☑



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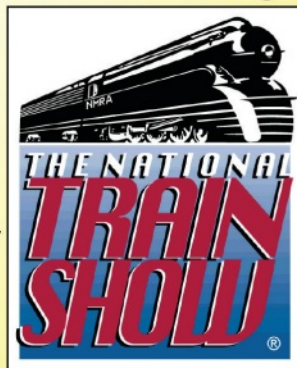
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INDEX

TABLE OF CONTENTS

JULY NEWS

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Model Railroad Hobbyist | July 2022

RICHARD BALE AND JEFF SHULTZ

REPORT THE LATEST HOBBY
INDUSTRY NEWS ...



INDUSTRY NEWS

Fox Valley Models acquired by Scale Trains

Shane Wilson, president of Scale Trains of Benton, TN has announced that his company has acquired tooling and other assets of Fox Valley Models from founder Matt Gaudynski. According to the announcement the first models to be produced by Scale Trains will be Fox Valley's N Scale GE Evolution Series ES44 diesel locomotive and Trinity RD-4 4200 cu. ft. coal hopper. Gaudynski has been employed at Scale Trains for the past year as a senior product developer, and also runs Des Plaines Hobbies. He noted that the former Red Caboose and Deluxe Innovations N Scale lines will be consolidated with Centralia Car Shops, S Scale America and O Scale America under the Scale America Model Trains umbrella at Des Plaines Hobbies.

Atlas Ukraine Peace Car Program

In May, 2022 Atlas announced that new Limited Edition Ukraine Peace Cars were available for pre-order, with all profits from the sales being donated to relief organizations. The announcement was met with enthusiasm by

THE LATEST MODEL RAILROAD PRODUCTS, NEWS & EVENTS

model railroaders and pre-orders of the N & HO scale Trainman 50' 6" boxcar and O scale 40' PS-1 boxcar exceeded expectations. As a result of the support of consumers, dealers and distributors, orders placed to date have generated a total of \$30,000 to be donated. The funds will be distributed to several organizations supporting the Ukraine. Atlas extends a heartfelt thanks to all of you who supported this effort.

ClassOneModel Works.com

A new company named ClassOneModelWorks.com, has announced plans to develop several HO scale locomotives and freight cars. Based in Kansas City, MO, the company will be managed by president and chief executive officer Mike Brusky and chief operating officer Stephen Priest. Brusky founded Dimensional Modeling Concepts, a 3D printing company that produced model railroad detail parts and kits in various scales. Priest is the former editor of *Railroad Model Craftsman* and the *NMRA Magazine*. He has also worked as a product designer for several model railroad manufacturers.

Info: classonemodelworks.com

NEW CLUB CARS



The Nickel Plate Historical & Technical Society is selling an HO scale kit for a 40' aluminum express boxcar. The model is based on a

group of ten prototypes the NKP operated in its passenger trains beginning in the late 1940s. The kits were produced for the Society by Accurail and includes appropriate trucks and Accurate knuckle couplers.

Info: nkphs-shop.myshopify.com

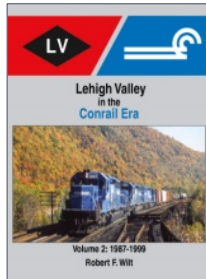
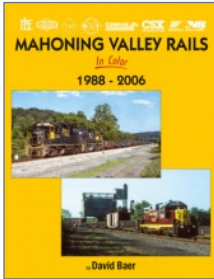


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[INDEX](#)

[TABLE OF CONTENTS](#)

NEW PRODUCTS FOR ALL SCALES



New titles from **Morning Sun Books** include *Mahoning Valley Rails in Color 1988-2006*, in which author David Baer details the changes to carriers in the Mahoning River Valley around Youngstown, Ohio. During this period, the Baltimore & Ohio had been taken over by CSX, and

Conrail would be purchased by Norfolk Southern and CSX. The Pittsburgh and Lake Erie disappeared; the Ohio Central System arrived in the Mahoning Valley and the Youngstown and Southern would be operated by more than one railroad company.

Lehigh Valley in the Conrail Era explores the evolution of the railroad's remaining vestiges under the new operations of Conrail during its reign as a megalithic corporation. The Route of the Black Diamond lives on in author Robert Wilt's impressive all-color book.

Info: www.morningsunbooks.com

O SCALE PRODUCT NEWS



HO scale knuckle couplers, and arch bar trucks with metal wheelsets gauged for HO track.



Bachmann is selling an On3 gondola with wood plank sides. The truss-rod-era car comes with body-mounted

The model is available decorated for East Broad Top and White Pass & Yukon. Cars with data only

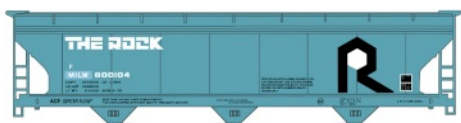
are available painted black, oxide red, and MOW gray.

Info: www.bachmanntrains.com

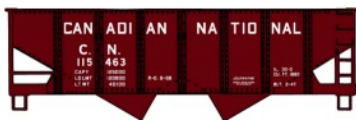
HO SCALE PRODUCT NEWS



New HO scale freight car kits from **Accurail** include this ACF Center Flow covered hopper decorated for Burlington Northern. The kit is available singly and in a 3-car set with different numbers.



The same triple hopper ACF car is available decorated for Rock Island with patched Milwaukee Road reporting marks.



Accurail's HO scale kit for this Canadian National twin-bay hopper represents a prototype built in early 1947. The kit is available singly and in a 3-car set.



This Richmond, Fredericksburg & Potomac covered hopper is based on a 4750 cu. ft. prototype with outside vertical bracing built by Pullman-Standard in April 1980.



This 40' wood sheathed Great Northern/Western Fruit Express reefer has ice bunkers at each end and 4' insulated swing doors.

All Accurail HO car kits come with Accumate knuckle couplers and appropriate trucks with Delrin wheels.

Info: www.accurail.com



REGISTER
(free)

[INDEX](#)

[TABLE OF CONTENTS](#)

Athearn is preparing tooling for Genesis series models of Amtrak California II, aka Surfliner, passenger cars. Each car will be individually named and numbered. Interior details will include separate paint colors for floors, walls, seats, tables, and control compartment. Depending on the decorating scheme and era being modeled, cab coaches will have either original or modified headlight and antenna arrangements.



The initial release, scheduled for August 2023, will include a coach car named Pebble Beach, and a combination coach/café car named Treasure Island.



The late 2023 release will include Amtrak California cars decorated for service on

the San Joaquin and Capitol Corridor trains. They include cab/coach Mount Pinos. Named coaches will include Sacramento River, Klamath River and Pit River. Completing the release of individual cars will be dining car Salinas Valley with a complete upper level serving area and lounge furnishings.

A four car set consisting of one cab coach, two coaches, and a dining car will also be available. General features on all cars include tinted window glass, end details including train line hoses, and HEP receptacles. Sound versions will have recordings of actual California cars.



Union Pacific modelers will be pleased to learn that Athearn has scheduled another

release of it's EMD DDA40X diesel locomotive. The huge locomotive will be available in UP's red, white and blue Centennial scheme. Locomotive No. 6900, the only DDA40X to be built without classification lights on the long hood, was

delivered in time for the Golden Spike Centennial Celebration and is currently on display in Omaha with Big Boy No. 4023.



R. Bale

EMD DD40AX LOCOMOTIVE

EMD's DD40AX is a 6,600hp monster that incorporates two 16-cylinder prime movers in a single chassis that is nearly 100 feet long. It is essentially two GP40s. Six radiator cooling fans and two dynamic brake fans are spread along the flared hood. The undercarriage includes enormous fuel tanks and a pair of huge four-axle trucks. Built exclusively for Union Pacific, a total of 47 units were produced between 1969 and 1971. UP named its DD40AX locomotives Centennial, to honor the 100th Anniversary of the driving the golden spike at Promontory, Utah.



In addition to the Centennial scheme, Athearn will also offer No. 6900 in the as-delivered yellow scheme. DDA40X No. 6901 will be available in Athearn's Primed for Grime version of UP's traditional yellow livery.



HO scale version will not have running boards or end ladders.



The Centennial DDA40X locomotive will come with a Genesis International CA-10 class caboose also wearing the red, white and blue scheme. Like the prototype CA-10s, Athearn's Four Genesis HO scale UP CA-10 class cabooses will also be available along with a group of three CA-9 cabooses with running boards and ladders. The



REGISTER
(free)

[INDEX](#)

[TABLE OF CONTENTS](#)

P on the cupola indicates the caboose was in pool service. A K on UP CA-9 cabooses indicated the car was assigned to trains operating between the Kaiser Steel plant in Fontana, California and the Sunnyside Mine in Utah.



A CA-9 caboose decorated for Western Pacific will be included in this release.



All of the Genesis series cabooses in this release will have full underbody details, interior lighting with brightness control in DCC mode, and

appropriate caboose trucks with machined metal wheels. Those with roller-bearing trucks will have rotating axle caps.

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R. Bale

EMD GP40-2 LOCOMOTIVE

The EMD GP40-2 is a four-axle diesel-electric locomotive introduced by General Motors Electro-Motive Division as part of its Dash 2 line in 1972. The locomotive's power is provided by an EMD 645E3 16-cylinder engine that generates 3,000hp. Spotting features of the GP40-2 are three large radiator fans and a turbocharger stack. Although the GP40-2 was among EMD's most successful models, with a total of 1142 units being built, production ended in 1986 as interest in high-powered locomotives shifted to six-axle models.

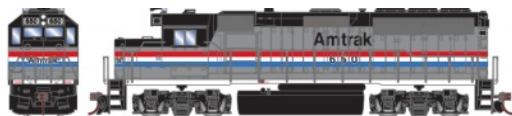


Athearn has included a GP40-2 diesel locomotive in its August 2023 production run.



Locomotives with chicken-wire type grilles will be available decorated for CP Rail, BNSF and Amtrak.

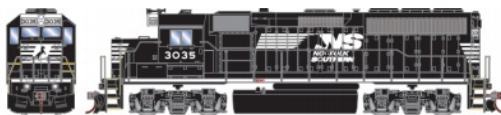
The CP unit will also have a 2600 gallon fuel tank. All others will have a larger 3600 gallon tank.



Locomotives decorated for CSX and Norfolk Southern will have corrugated grilles.



All versions will be sound-ready with speakers installed and a 21-pin plug for installation of an aftermarket decoder.



REGISTER
(free)

[INDEX](#)

[TABLE OF CONTENTS](#)



Fifty-foot high-cube boxcars with double plug doors in a selection of six road names will be available from Athearn in August 2023.



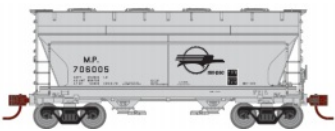
The models will have mostly molded-on details.



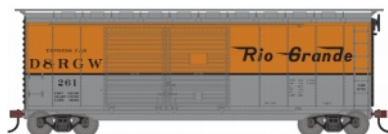
Road names will be Union Pacific, Santa Fe, Conrail, Penn Central, BC Rail, and Norfolk Southern.



Corning Glass Works, Missouri Pacific, and Chicago, Burlington & Quincy.



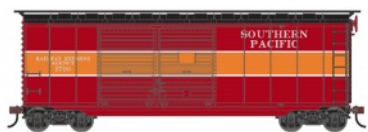
Athearn's August 2023 production schedule includes an ACF 2970 cu. ft. twin-bay covered hopper decorated for CSX, ACF Leasing, Burlington Northern, Missouri Pacific, and Chicago, Burlington & Quincy. Features on the HO scale model include a photo-etched metal roof walk, wire grab irons, individual stirrup steps, and detailed outlets. Round or trough-style roof hatches will be applied depending on the prototype being modeled.



Forty-foot express boxcars coming from Athearn in late summer 2023 will feature double Youngstown sliding doors and high-speed trucks.



The HO scale models represent specialized equipment that handled mail and express LCL traffic in passenger trains.



Road names will be Union Pacific, Pennsylvania, Baltimore & Ohio, Canadian Pacific, Denver & Rio Grande Western, and Southern Pacific.

The decorating schemes match the 60' Harriman passenger cars Athearn has scheduled for release next April.



A Genesis series HO scale PS-2 2893 cu. ft. triple-bay covered hopper will be available decorated for Chessie System, Grupo Cementos Mexicanos,

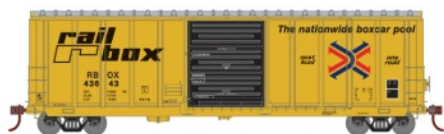
Milwaukee Road, Southern Pacific, SSW Cotton Belt, and Chicago, Burlington & Quincy.



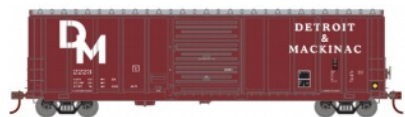
Details on the Genesis model include a photo-etched roof walk, wire grab irons, coupler lift bars, brake and trainline hoses, and full under body detail.



A group of six Pullman Standard 50' 5277 cu. ft. boxcars are coming from Athearn in August 2023. The HO scale models will feature a 10' version of Pullman Standard's distinctive freight car door. Additional details include individual grab irons, and etched-



metal cross-over platforms.



Road names will be Detroit & Mackinac, Chicago & Illinois Midland, Pearl River Valley, Lake Superior & Ishpeming, Pickens Railroad, and Railbox.



Athearn Roundhouse brand HO scale models scheduled for release in August 2023 include this 34' twin-bay composite

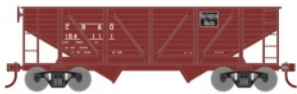


REGISTER
(free)

[INDEX](#)

[TABLE OF CONTENTS](#)

hopper. The car is based on war emergency cars built with wood sides to save on steel needed for the war effort. The model will be produced from tooling originally developed by Athearn in 1973.



The HO scale model comes with a removable coal load. Road names will be Santa Fe, Chicago, Burlington & Quincy; Baltimore & Ohio, Chesapeake & Ohio, Nickel Plate Road, and Virginian.

All of the Athearn and Roundhouse models mentioned in this report will come with machined metal wheelsets and body mounted McHenry operating knuckle couplers.

Info: <https://www.athearn.com>



R. Bale

MP-36 LOCOMOTIVE

The MP-36 is a 3,600hp variant of the MPXpress series of diesel-electric passenger locomotives built by MotivePower Inc., a subsidiary of Wabtec.

The MPXpress line of locomotives were the first production passenger units to meet the FRA fire and safety regulations and both APTA and FRA crashworthiness standards. Numerous public transit agencies in Canada and the United States have ordered MPXpress locomotives for commuter rail service.



Atlas is scheduled to release a new HO scale MP-36 diesel locomotive during the fourth quarter of this year. The all-

new Atlas Master series model will be available decorated for Metra, Metrolink, MBTA (Massachusetts Bay Transportation Authority), Milwaukee Road Hiawatha, Rock Island Heritage, and West Coast Express.



Features include a detailed cab interior with in-cab lighting, ditch lights, metal grab irons, MU and trainline

hoses, coupler cut levers, and metal knuckle couplers. A minimum track radius of 22" is recommended.

Atlas Gold series DCC models will have an ESU LokSound decoder. Atlas Silver series locomotives will come with a speaker for easy conversion to sound with the addition of an after-market decoder.



Also coming late this year from Atlas is a Metra type 6000 passenger car and a

type 8500 cab car with a 21-pin plug for optional DCC operation. Interior details include seating and LED illumination. Exterior details include directional LED headlights, ditch lights, and red marker lights. A 22" minimum radius is recommended. The cars will be available separately and in a three pack with one cab car and two trailers.



R. Bale

GE C40-8 LOCOMOTIVE

The GE C40-8 is a six-axle diesel electric locomotive built by General Electric between 1987 and 1992. It is part of the GE Dash 8 series of freight locomotives.

The locomotive model is often referred to as a Dash 8-40C. The Dash 8 refers to the electrical control system, the 40 referring to the 4,000hp rating. When introduced, the locomotives were identified by an enlarged exhaust stack and positioning of the dynamic brake grids in a square housing with an enlarged blower fan behind the cab. Later units were supplied with a wide-nose cab and are designated Dash 8-40CW.



REGISTER
(free)

[INDEX](#)

[TABLE OF CONTENTS](#)



A new Atlas Master series GE Dash 8-40C diesel locomotive is scheduled for release late this year.



Road names on this production run will be Cimarron Valley, CSX, Providence & Worcester, Rock Island Rail, Canadian National, Pan Am, Norfolk Southern, and Union Pacific.



Gold series DCC models will have an ESU LokSound decoder. Atlas Silver series locomotives will come with an NMRA compliant 8-pin plug for installation of an after-market decoder.



Atlas has included a distinctive 50' plug door boxcar in its 2022 fourth quarter production schedule. Spotting features of the 1950s-era car include riveted 8/8 panel sides, a straight side sill, 7' 7" plug doors and improved dreadnaught ends. The HO scale models will come with Accumate knuckle couplers and appropriate trucks with blackened metal wheels.



Road names will include Burlington Northern, Chicago Great Western, Chicago North Western, TPBX, Union Pacific, and Pennsylvania Railroad.



An HO scale model of an International Car Co. class NE steel caboose is listed in Atlas' 2022 fourth quarter production

schedule. The model will be available with the windows in two different locations.

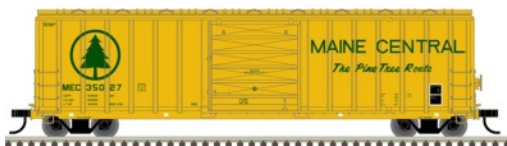


Caboose decorated for Chicago, West Pullman & Southern; Monongahela, Morristown & Erie, New Haven, Pittsburg & Shawmut, and Susquehanna will have the

windows closer to the center of the car.

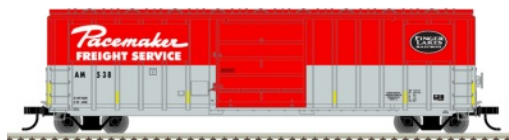


The windows on the Nickel Plate Road caboose will be positioned closer to the ends.



In 1972, Berwick Forge & Fabricating Co. began producing modern 50' sliding door boxcars that featured Berwick's new

corrugated non-terminating sine-wave ends.



Atlas has included an HO scale version of the Berwick car in its 2022 fourth quarter production schedule. In addition to the

distinctive ends, the Atlas Master series model will have full underbody detail with brake rigging, an overhanging X-panel roof, wire grab irons, and blackened metal wheels.



Road names in this release will be Arkansas & Missouri, Canadian National, Finger Lakes Railway, Illinois Central,

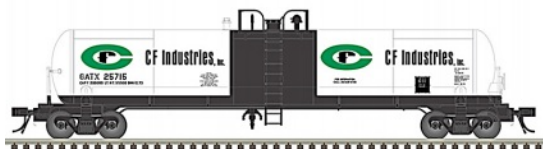
Maine Central, North Louisiana & Gulf, Ontario Northland, and Seaboard System.



REGISTER
(free)

[INDEX](#)

[TABLE OF CONTENTS](#)



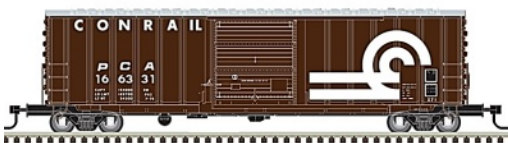
general purpose, non-insulated, non-pressure prototype introduced in the mid-1960s by General American Transportation Corporation, aka GATX.



features include a detailed bottom outlet, safety vent, see-through end walks, and full brake gear rigging.



GATX-Mobay Chemicals, GATX-Ozone Waters, GATX-Standard Chlorine of Delaware, Union Pacific, and Pemex.

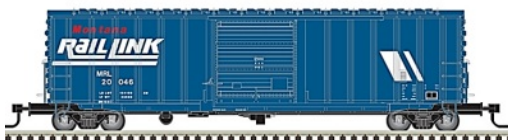


The third boxcar in Atlas' 2022 fourth quarter release is a 50' 6" car with sliding doors as built by ACF in the late 1960s.



Atlas' HO scale version will be available decorated for Conrail, Union Pacific, UP (ex-Rock Island), BNSF, Canadian National, Chicago & North Western, Montana Rail Link, and Rock Island.

Info: www.atlasrr.com



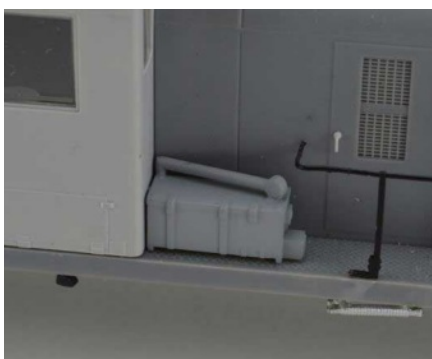


Bachmann is selling an HO scale passenger car decorated for Ringling Bros. and Barnum & Bailey Circus. The model features a lighted interior.

Additional circus rolling stock available from Bachmann includes a flat car with crates of circus equipment. The

HO scale cars come with knuckle couplers and metal wheelsets. A Pie Car, aka circus diner, is scheduled for release this winter.

Info: www.bachmanntrains.com



English's Model Railroad Shop, Division of Bowser, is selling several 3D printed HO scale detail items including this container load for a GS gondola.

Additional items include signal boxes with two and three straps (shown), and a deck signal box.

Info: www.bowser-trains.com



REGISTER
(free)

[**INDEX**](#)

[**TABLE OF CONTENTS**](#)

Broadway Limited has scheduled the release of a group of HO scale SD45 diesel locomotives next month.



Units with low short hoods will be available decorated for EMD Demo, Santa Fe,

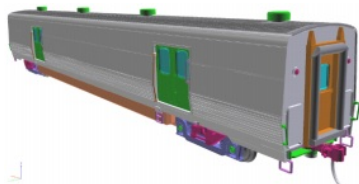
Burlington Northern, Pennsylvania Railroad, Southern Pacific and Union Pacific.



SD45s with a full height noses will be available for Norfolk & Western and Southern Railway.

The models will come with Broadway Limited's Paragon4 sound and DCC control system.

Info: www.broadway-limited.com



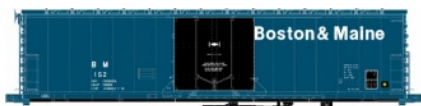
The latest HO scale release from **Kato USA** is an Amtrak single level baggage car.



The Viewliner II car is decorated in a special rendition of Phase III

Heritage scheme that includes Amtrak's new modern logo and Amtrak America slogan. Two road numbers are available.

Info: www.katousa.com

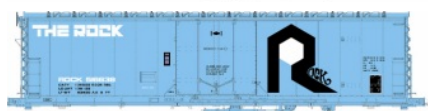
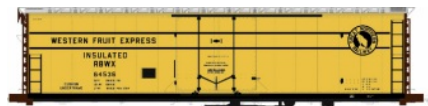


HO scale model is planned for the second quarter of 2023.

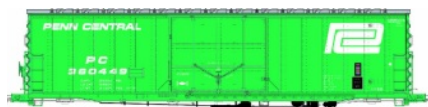


Road names with 10' plug doors will be Boston & Maine,

Providence & Worcester, Great Northern, and four versions of The Rock.



prototype being modeled.



Cars with 12' plug doors will be available decorated for Northern Pacific, Penn Central, and Burlington.

Handbrakes will be Ajax, Ellcon-National, Equipco, Klasing or Universal depending on the

Additional features include a cushion underframe, etched Morton running boards, rubber air hoses, metal corner stirrups, Stanray ends, Kadee Whisker couplers, and 70-ton trucks with metal wheelsets.

Info: www.molocotrains.com



National Scale Car is selling a mini-kit for prototype modelers to build an HO scale Baltimore & Ohio class M55 1937 ARR standard 40' boxcar. The craftsman-style kit replicates cars built by Pressed Steel Car

and Pullman-Standard to the 1937 design with car builder ends, flat seam roofs with interior carlines, and Duryea under frames. Kits are available with a choice of Pressed Steel or Pullman-Standard car ends. There is also a choice of underframes.

Completing the model begins with a donor car to be supplied by the modeler. A suitable donor car is a 40' boxcar with a 10'



REGISTER
(free)

[INDEX](#)

[TABLE OF CONTENTS](#)



inside height and 6' doors as sold by InterMountain, Red Caboose, or IMWX. The mini-kit includes all of the components needed to rebuild the donor car into a prototypically accurate model of a B&O 40' class M55, M55A, or

M55B 1937 ARR boxcar.

Info: www.nationalscalecar.com



Rapido Trains is booking advance reservations for Canadian National GMDD GP9RM locomotives and matching slugs. The HO scale models replicate GP9s rebuilt at

CN's Pointe St. Charles shops in the early 1980s. The extensive rebuilding project involved three locomotive groups: The CN's 4000/4100 series were rebuilt as road units, the 7000 series as switchers and the 7200/200 series as mother/slug pairs.



Lacking a prime mover, the slugs drew power from the mother to operate traction motors. The long hoods were cut down and their weight was increased with ballast. The external difference in

the slugs was the application of either Blomberg or Flexicoil trucks.



Features on Rapido's GP9RM locomotive include detailed piping and traction cables, metal handrails, front and rear plows or curved plate pilots, and detailed Blomberg trucks.

Lighting features include track lights, classification lights, control stand lights and flashing belt pack light on select mother-slug sets, and working ditch lights on 4000, 4100 and 7000 series locomotives.



The initial release of the GP9RM will be available decorated for Canadian National in a choice of either the stripe or large noodle scheme. GP9RM/Slug sets will be available in CN early and CN late schemes.



R. Bale

GE C30-7 DIESEL LOCOMOTIVE

The six-axle C30-7 was General Electric's upgrade of its U30C locomotive. Improvements centered on a 16-cylinder 3,000hp FDL series diesel engine. Built between September 1976 and May 1986, over 1100 C30-7s were produced for many Class I North American railroads for use primarily in heavy freight service. Many would have extended careers with regional lines owing to the C30-7s reliability and pulling power. GE's successor to the C30-7 was the 3600hp C36-7 which was otherwise quite similar to the C30-7.



Rapido has added a C30-7 to its growing series of classic General Electric locomotives. Rapido's HO scale edition of the C30-7

will be available in four road numbers each for Atchison, Topeka & Santa Fe; Burlington Northern, Conrail, CSX Transportation (YN2 scheme), Ferrocarriles Nacionales de México, Norfolk & Western, Norfolk Southern, and Union Pacific.



REGISTER
(free)

[INDEX](#)

[TABLE OF CONTENTS](#)



The body of the C30-7 will have accurate nose and body contours, separate grab irons and handrails, fully detailed underbody with correct piping and conduits, and operating headlights and rear lights.



Options, depending on the road name and era being modeled, include high or low headlights, Rockwell or Adirondack trucks, and operating roof-top beacons and classification lights. Sound-equipped versions of the C30-7 will feature ESU LokSound V5 decoders. Info: www.rapidotrains.com



Tangent has released another production run of HO scale Pullman-Standard PS-2CD 4750 cu. ft. covered hopper.

This release includes body variations from Pullman-Standard's 1978-1980 production. Decorating schemes includes a GA-905 class ATSF car with light blue lettering and Miner Selflok outlet gates.



Family Lines System cars with wider jack tabs and a brake linkage access hole on one side of the car will be available with both L&N and SCL reporting marks.



Models decorated for Frisco represent prototypes built by P-S in 1977 with ribbed roof hatches.



Cars decorated for Soo Line include the distinctive yellow wheat stalk graphic. They will be fitted with Miner Selflok outlet gates and truck

mounted brake beams. Cars decorated for Lapeyrouse Grain will have body mounted brake linkage and an early version of Miner outlet gates. Additional road names include IC and PLCX.

All versions of Tangent's HO scale PS4750 covered hopper have see-through etched-metal walkways and crossover platforms, separate air hoses, wire grab irons and coupler lift bars, Kadee couplers, and 100-ton Barber S-2 trucks with 36" machined metal wheels and rotating bearing caps.

Info: www.tangentscalemodels.com



Walthers is scheduled to release a Proto series 67' quadruple-bay covered hopper this month. The HO scale model is based on a

6351 cu. ft. prototype Trinity introduced in the early 2000s.



Features include individual grab irons, see-through etched-metal walkways and end platforms, two styles of

trough hatches, metal knuckle couplers and roller-bearing trucks with 36" metal wheels.



Road names include ADMX-Archer-Daniels-Midland, BNGX-Bunge North America, CHSX-Cenex Harvest States

Cooperative, CEFX-CIT Group Capital Finance, BRIX-Incobrasa Industries, TILX-Vera-Sun Energy, and two Trinity Industries Leasing schemes with a 75th Anniversary logo.



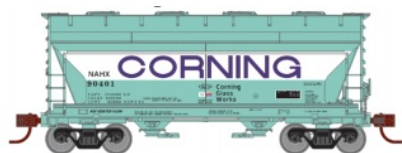


Walthers is quoting an October release date for HO scale code 83 turnouts with broad curves. The nickel silver DCC-friendly turnouts will have 24 and 36-inch

radii. Features include solid rail snap-action points, isolated frogs with built-in jumpers, and a fully insulated tie bar. The low profile wood grain ties are molded in dark brown. Both left and right versions will be available. Walthers code 83 curved turnouts with 24 and 28-inch radii are currently available.

Info: www.walthers.com

N SCALE PRODUCT NEWS



Athearn plans to release two new N scale covered hoppers in August 2023. An ACF 2970 cu. ft. twin-bay covered hopper will be available decorated for CSX, ACF Leasing,

Burlington Northern, Chicago, Burlington & Quincy; Corning Glass Works, and Missouri Pacific.



The N scale Genesis series model will have rubber trainline hoses, coupler cut levers, wire grab irons and photo-etched roof walks.



The second N scale covered hopper coming from Athearn in August 2023 is a PS-2 2893 cu. ft. triple-bay car with ten round roof hatches.



Road names will be Chessie System, Chicago, Burlington & Quincy; Grupo Cementos

Mexicanos, Milwaukee Road, Southern Pacific, and SSW Cotton Belt. Athearn's N scale 2970 and 2893 covered hoppers will come with machined metal wheels and body-mounted McHenry knuckle couplers.

Info: www.athearn.com



models will feature golden-white LED directional lighting, blackened wheels and Accumate magnetic knuckle couplers.



Lackawanna, Pennsylvania, Burlington Northern, and Louisville & Nashville.



will be sound-ready with a speaker installed to simplify conversion with the addition of an aftermarket decoder. Gold series versions will come with factory installed ESU LokSound.

Atlas has scheduled the release of Alco RS-3 and RSD-4/5 locomotives during the fourth quarter of this year. The N scale

The four-axle RS-3 will be available decorated for British Columbia Rail, New Haven, Delaware & Hudson, Erie

Road names for the six-axle RSD-4/5 will be Jersey Central, Santa Fe, and Chicago & North Western. Silver series models

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REGISTER
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INDEX

TABLE OF CONTENTS



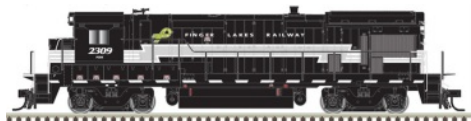
R. Bale

GE DASH 7 LOCOMOTIVES

General Electric's Dash 7 diesel locomotives were developed as replacements for GE's earlier Universal series. The B23-7 was introduced in 1977 with a total of 537 being built. It utilized a V12 prime mover and was rated at 2250hp. The externally identical B30-7 had a 16 cylinder engine that produced 3000hp. GE built a total of 399 B30-7s. The B36-7 locomotive was introduced in 1980. It also had a V16 prime mover but a combination of a turbocharger, a new GTA-24 alternator and GE 752AF traction motors boosted the B367 rating to 3600hp. Production ended at 230 units.



Atlas is scheduled to release three N scale versions of GE Dash 7 locomotives during the fourth quarter of 2022.



First on the list of Master series locomotives is a B23-7 which will be available decorated for Conrail, Finger Lakes Railway, Minnesota Commercial, Santa Fe, and Southern Railway.



A virtually identical B30-7 will also be released late this year. Road names will be Chessie System, and Southern Pacific in the speed lettering scheme.



A B36-7 will be available decorated for BC Rail. All of the Dash 7 variants will have directional lighting. They will

be available for DC operation and with factory installed DCC with ESU LokSound.



An N scale model of an International Car Co. class NE steel caboose is listed in Atlas' 2022 fourth quarter production schedule.



Road names will include Chicago, West Pullman & Southern; Monongahela, Morristown & Erie, New Haven, Pittsburg & Shawmut, Susquehanna, and Nickel Plate Road.



Also coming from Atlas late this year is a 20,700 gallon tank car. The N scale model is based on a general purpose, non-insulated, non-pressure prototype introduced in the mid-1960s by General American Transportation Corporation, aka GATX.



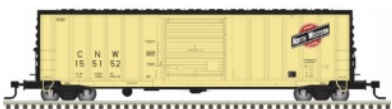
Atlas will offer the model with both Type-10 and Type-20 saddle and platform variations. Additional features include a detailed bottom outlet, safety vent, see-through end walks, and full brake gear rigging.



Decorating schemes will be CRCX-Calumet Refining, GATX-CF Industries, GATX-Eastman Chemical, GATX-Mobay Chemicals, GATX-Ozone Waters, GATX-Standard Chlorine of Delaware, Union Pacific, and Pemex.



Atlas' 2022 fourth quarter release includes a 50' 6" boxcar with sliding doors as built in the late 1960s by ACF.



Atlas' N scale version will be available decorated for Conrail, Union Pacific, UP (ex-Rock Island),



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(free)

[INDEX](#)

[TABLE OF CONTENTS](#)

BNSF, Canadian National, Chicago & North Western, Montana Rail Link, and Rock Island.



A 45' logging flat car is included on Atlas' fourth quarter production schedule. The N scale model will be available decorated for Boise Cascade, Ontario Northland, Weyerhaeuser, British Columbia



Rail, Burlington Northern, Great Northern, Milwaukee Road, and Northern Pacific.



Also due for release late this year is a 3500 cu. ft. Dry-Flow covered hopper with triple discharge bays.

The N scale model will feature an etched metal brake platform, body mounted couplers, and 70-ton roller-bearing trucks with 33" metal wheels.



Decorating schemes include Monsanto, Quaker Oats, Pennsylvania Railroad, Union

Pacific, Bakelite Plastics, Petrothene UCI, Santa Fe, Wisconsin Southern, and WR Grace.

Info: www.atlasrr.com

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R. Bale

ALCO RSD-15 LOCOMOTIVE

The Alco RSD-15's were built between 1956 and 1960 in Schenectady, New York. Power was supplied by a 2,400hp Alco 251 V16 diesel engine. The RSD-15 was suitable for both mainline freight and passenger service. The locomotive rode on three-axle trucks with all axles powered by GE model 752 traction motors. The trucks have asymmetrical axle spacing because of the position of the traction motors. The six-motor design allowed for higher tractive effort at lower speeds than a four-motor design. The RSD-15's could be ordered with either a high or low short hood, with the low hood versions quickly earning the nickname alligators due to their unusually long noses.



two Santa Fe schemes.



Broadway Limited is scheduled to release an N scale version of the Alco RSD-15 in August.

Units with a low nose will be available decorated for Southern Pacific, Lake Superior & Ishpeming, and

Road names for RSD-15s with a full height nose will include Bessemer & Lake Erie, Duluth Missabe & Iron

Range, Pennsylvania Railroad and Penn Central. All versions of the RSD-15 will be available with Paragon4 sound and DCC control system.

Info: www.broadway-limited.com



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[INDEX](#)

[TABLE OF CONTENTS](#)



Centrailia Car Shops has released N scale lightweight 4-4-2 sleepers and 13 double

bedroom sleepers. The N scale models feature wire grab irons, interior details and lighting. The cars are equipped with Micro-Trains trucks with InterMountain metal wheels and Micro-Trains couplers.



The 4-4-2 sleepers are available in multiple road numbers for Pennsylvania Railroad,

Pennsylvania Railroad (Fleet of Modernism scheme), Union Pacific, Southern Pacific (Sunset and Lark schemes), New York Central (20th Century scheme), Illinois Central (two schemes), Rock Island (Golden State), Canadian National, Chicago & North Western, Union Pacific (Overland scheme), New York Central, Long Island Railroad, Penn Central, and Amtrak.



Decorating schemes for the 13 double bedroom sleepers are

Pennsylvania (Fleet of Modernism and Tuscan three stripe scheme), New York Central (1946 postwar, and 20th Century Limited), Southern Pacific (Lark and Sunset), Long Island Railroad, Ferrocarriles Nacionales de Mexico, and Ringling Bros. and Barnum & Bailey Circus.



Both car types are also available undecorated.

Info: www.intermountain-railway.com



New N scale models coming from **Micro-Trains** include a 4-pack of Archer-Daniels-Midland triple-bay covered hopper cars.



Inspiration for this Micro-Trains N scale model comes from a 50' B-74A class plug-door boxcar built for the Baltimore & Ohio in 1967.

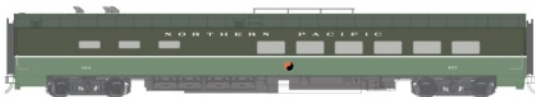


This N scale ACF triple-bay covered hopper is decorated in BNSF's Swoosh paint scheme.



This well-weathered ex-Chessie System triple-bay coal hopper with a CSX patch is available now from Micro-Trains dealers.

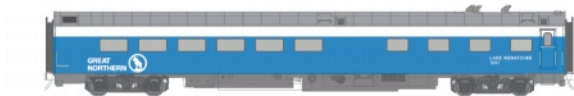
Info: Contact a dealer.



Northern Pacific lightweight diners. The selection includes NP diner #453 from the 1954 edition of the North Coast Limited.



RailSmith is booking reservations for N scale Great Northern and



Diners in Great Northern's Big Sky Blue scheme include Lake Wenatchee. GN cars decorated in the Empire Builder's

scheme include diner Lake Union and diner Lake McDonald that was assigned to GN's Western Star. Availability is planned



REGISTER
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[INDEX](#)

[TABLE OF CONTENTS](#)

for the first quarter of 2023.

Info: www.lowellsmith.net



Rapido has announced plans to produce an N scale version of the Rohr Turboliner. Rapido officials noted that since they are unsure of the demand for an N version of the Turboliner, this

is a conditional new product announcement with actual production depending on the level of advance orders received. To encourage response, Rapido will offer a 5% early bird discount on orders, both dealer and direct, received by September 15, 2022.



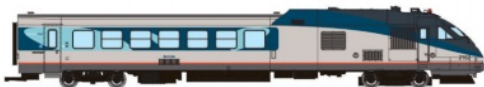
Rapido's N scale model of the Turboliner will be

designed from a combination of original Rohr blueprints and numerous field measurements of the prototype.



Features will include interior details, tinted windows, and

flicker-free interior lighting, working headlights, marker lights and cab-mounted strobe lights. DCC models will feature ESU sound decoders.



Paint schemes on the first release Amtrak Phase III (early),

Amtrak Phase III (late), and Amtrak Phase V.

Info: www.rapidotrains.com



SD40-2 locomotive in N scale. Including railroad, road number and era specific details, the model will feature high or low short hoods, prototypical horn types and placement, either standard or extended range dynamic brakes, locomotive specific fan housings, correct radiator grille types, cab interiors, factory applied wire grab irons, windshield wipers, LED lit headlights, numberboards, and front and rear ditch lights according to the prototype.



and the Norfolk Southern SD40-2 "Admiral Cab" locomotives.



Roadnames include Burlington Northern, Chessie System, CSX, Norfolk Southern, Southern (two paint schemes), and Union Pacific. The UP locomotives will be the "Fast Forty" type. The SD40-2 "Fast Forty" were a set of 100 locomotives in the 8000 series that were geared for fast intermodal service.

Info: www.scalettrains.com

Scale Trains has announced that they will be producing a Rivet Counter level

The first run includes unique versions of the locomotive such as the CSX SD40-3 square cab

Roadnames include Burlington Northern, Chessie System, CSX, Norfolk Southern,

NEW STRUCTURES & SCENIC SUPPLIES



Frenchman River Model Works has released a kit for BargainZ Second Hand Shop, a 1:48 scale turn-of-the-century concrete block structure designed by Thomas Yorke. The individual walls and other



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[INDEX](#)

[TABLE OF CONTENTS](#)

components are of unpainted cast resin. Additional components include laser-cut window decal signs, tar paper roofing material, and signage including the large billboard. When assembled the structure has a foot print of approximately 5.5" by 7".

Info: frenchmanriver.com



Ipswich Hobbies has released a 1:48 scale craftsman kit for this Union Freight House. Ipswich has previously released HO and N scale kits for this structure. The

model is based on a prototype structure that served the Boston & Maine Railroad in Union, New Hampshire. Fully restored, the freight house is now part of the Heritage Park Railroad Museum in nearby Wakefield. The kit is composed of laser-cut basswood, scribed interior floor, and loading dock details. When assembled the O scale structure has a footprint of 20" x 7".

Info: www.ipswichhobbies.com



Multiscale Digital is selling HO and N scale boilers that can be used as oversized loads or to add detail to an industrial scene. The 3D printed items are available unpainted.

Info: multiscale.digital

Rusty Rail is selling a cast resin kit for an HO scale 1925 Ford Model T truck with a stake bed. The HO scale model includes an open interior with a seat and steering wheel. The model comes with a load. Also new is a kit for a Harbor Masters



office. This is Rusty Rails' first building in a new series of kits for wharf structures called Anchor Bay. A bait shop, small cannery and boat repair shop are

under development.

Info: www.rustyrail.com



New items from **Showcase Miniatures** include a kit for an N scale signal tower. The kit includes etched stainless steel components and a wood deck. One-

inch expansion spans are available as a separate purchase.



Showcase Miniatures has upgraded its 1:160 scale 1990s Volvo/White WG single

and tandem axle tractors to allow positioning of the front wheels. The cab is a high-resolution 3D print with a vacuum-formed windshield. Details are photo-etched.



Also available now is a resin cast 1:160 scale pumper fire engine that can be built with the tool doors open or closed. Info: www.showcaseminiatures.net



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[INDEX](#)

[TABLE OF CONTENTS](#)



Walthers has released Garage Detail kit #2. The HO scale SceneMaster model includes a wide range of equipment for detailing a gas station or vehicle service center. The items include two types of lifts, a portable lift table, wheel balancing machine,

tire changer, portable and upright air compressors, engine hoist, low profile drain pan and waste oil tank, a floor jack, jack stands, ramps and two tool carts.



Walthers has announced a Cornerstone model of an HO scale Stamping Plant kit. Including the stamping plant building, an office, substation, and large sign, the kit represents a factory that produces

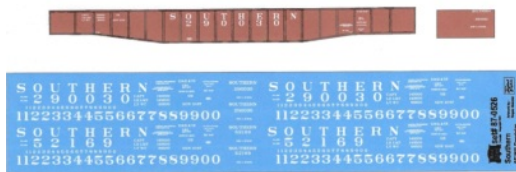
stamped metal parts. Part of the Auto Industry series, the model simulates metal and brick construction, and includes rooftop air conditioners and vents. Molded in three colors and clear plastic, the finished stamping plant measures 14 x 9 x 6", the office 6 x 4 x 3", and the substation 5 x 3 13/16 x 2 7/8".

Info: www.walthers.com

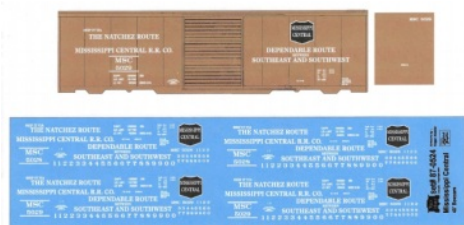
NEW DECALS, SIGNS AND FINISHING PRODUCTS

BrightFuture Decals is a new business specializing in prototypically accurate lettering sets for CSX locomotives and freight equipment. The high-quality water slide decals are printed in Italy by Cartograf. HO scale CSX locomotive decals currently available include grey scheme (pre YN2), YN2 GE factory paint (shown here), YN2 repaints, and YN3 scheme.

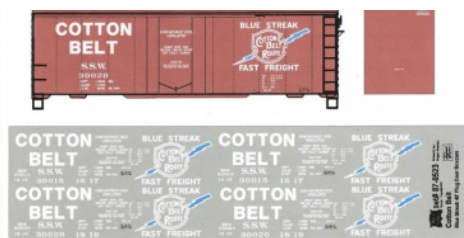
Info: www.brightfuturedecals.com



Mask Island has released several new HO scale water slide decals including a set for a Southern Railway mill gondola.



Also new are lettering sets for a Mississippi Central Railroad 40' boxcar and a repainted SSW Cotton Belt 40' plug-door boxcar.



Completing this release is a decal set for an early 40' KATY flat car.
Info: www.maskislanddecals.com

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[INDEX](#)

[TABLE OF CONTENTS](#)

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BRIEFLY NOTED AT PRESS TIME ...

Rapido is developing both HO and N scale versions of an NSC 73' centerbeam car. An order deadline and arrival date are TBA...

ScaleTrains expects to have HO scale Rivet Counter GE ET44 locomotives available for release late this month....

Walthers has announced several new HO scale models for delivery later this year including a 55' Trinity 30,145 gallon tank car, a 68' Railgon gondola, a 60' PS flatcar and a Mainline series GE ES44 GEVO diesel locomotive...

MRH will have detailed report including road names images next month ... ■

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[INDEX](#)

[TABLE OF CONTENTS](#)

SELECTED EVENTS



Model Railroad Hobbyist | July 2022

JULY

Please check with any organization hosting an in-person event for the latest status of the event.

Ongoing 2022

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/](https://www.youtube.com/channel/UCMA_VhPb5pjdkAYTdXLceJA)

[UCMA_VhPb5pjdkAYTdXLceJA](https://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

ONLINE, Zoom, Second Tuesdays, 8pm EST. "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

July - August 2022

CANADA. NOVA SCOTIA, WEST HANTS, WINDSOR August 27, 2022. Fourth Annual Windsor Railroad & Hobby Show sponsored by Eastern Benders in support of The Windsor & District Food Bank. Royal Canadian Legion, 35 Empire Lane, Windsor.
Info: www.facebook.com/events/458062749485961

CALIFORNIA, POMONA, July 30, 2022. Orange Empire Model Trains Swap Meet. 894 B Garey Ave #101.
Info: orangeempiremodeltrains@gmail.com

CALIFORNIA, SAN DIEGO, July 30, 2022, Regional Community Swap Meet, San Diego Model Railroad Museum, Casa de Balboa, 1549 El Prado.
Info: <https://www.sdmrm.org/events>

CALIFORNIA, SAN DIEGO, August 6, 2022, Western Prototype Modelers Meet, San Diego Model Railroad Museum, Casa de Balboa, 1549 El Prado.
Info: www.sdmrm.org/events

INDIANA, FRANKLIN, August 27-28, 2022. NMRA CID Franklin Train Show. Johnson County Fairgrounds, 250 Fairground St.
Info: www.cidnmra.org

MASSACHUSETTS, ORLEANS, Wednesday evenings, July-August, 2022, Nauset Model Railroad Club Open House. Rear of Hilltop Plaza, 180 Route 6A.
Info: www.nausetmodelrrclub.com

MINNESOTA, ST PAUL, July 23-24, 2022, Twin City Model Railroad Museum Garage Sale, 668 Transfer Rd. Suite 8.
Info: www.tcmrm.org



MISSOURI, JOPLIN, July 16, 2022. Model Railroad Show and Swap Meet, hosted by TriState Model Railroaders. Joplin History & Mineral Museum, 7th & Shifferdecker.

Info: www.tristatemodelrailroaders.com/NewSite

MISSOURI, St. LOUIS, August 7-14, 2022, NMRA National Convention and National Train Show. St. Louis Marriott Grand Hotel, 800 Washington Avenue.

Info: gateway2022.org

NEW HAMPSHIRE, CONCORD, August 14, 2022. 36th Annual Concord Model Railroad Show. Everett Arena, 15 Loudon Rd.

Info: www.facebook.com/events/3606561932904325

OHIO, VAN WERT, July 23 & 24, 2022. Van Wert Railroad Heritage Weekend. Van Wert County Fairgrounds, 1055 S. Washington St.

Info: www.vwrrhw.com

PENNSYLVANIA, STRASBURG, August 20 & 21, 2022, Model Railroading Days, The Railroad Museum of Pennsylvania, 300 Gap Road • PA Route 741.

Info: rrmuseumpa.org

TEXAS, AUSTIN, August 27, 2022, 2022 Austin Area Train Show, Palmer Events Center, 900 Barton Springs Rd.

Mailto: info@austintrainshow.org

WISCONSIN, WEST BEND, August 20-21, Kettle Moraine Ballast Scorchers Open House, 215 N. Main St. Suite 60 .

Info: www.facebook.com/events/249999943918195/249999953918194

Future 2022-2023 by location

UNITED KINGDOM, CREWE, November 4-6, 2022, Crewe North Junction 2022, British Region NMRA Regional Convention. The Heritage Center, Emperor Way, Crewe Business Park, CW1 6BD.

Info: convention.nmrabr.org.uk

CALIFORNIA, SAN DIEGO, September 7-11, 2022. Back on Track in 2022, Pacific Southwest Region convention. Four Points by Sheraton San Diego, 8110 Aero Drive.

Info: web.cvent.com/event/1474b6bc-b18a-49ec-9b4e-9f58fb4665cd/summary

CONNECTICUT, WINDSOR, September 15-18, 2022. Connecticut Yankee, Northeastern Region Convention 2022. Marriott, Hartford/Windsor Airport, 28 Day Hill Road.

Info: ner-conventions.org/connecticut-yankee

MARYLAND, HUNT VALLEY (Timonium), October 13-16, 2022. Mid-Atlantic RPM meet. Delta Marriott Hotel and Conference Center, 245 Shawan Road.

Info: www.marpm.org

MARYLAND, TIMONIUM, October 15-16, 2022. Great Scale Model Train and Railroad Collectors Show, Maryland State Fair, 2200 York Rd.

Info: www.gsmts.com

NORTH CAROLINA, CHARLOTTE, October 20-23, 2022. Carolina Special Look South 2022, Mid-Eastern Region Regional Convention. Hilton University Place, 8629 M Keynes Drive.

Info: www.carolinasouthern.org/MER2022.html

OHIO, MIDDLEBURG HTS., 1 October 2022. The Great Berea Train Show. Cuyahoga County Fairgrounds, 19201 Bagley Rd.

Info: thegreatbreatrainshow.org

PENNSYLVANIA, HAMBURG, September 16-18, 2022. Reading Railroad Modelers Meet X, hosted by the Reading Company Technical & Historical Society and the Anthracite Railroads Historical Society. Reading Railroad Heritage Museum, 500 S. Third St.

Info: readingrrmm.com

TEXAS, GRAPEVINE (Dallas Area), Summer 2023. NMRA National Convention, Gaylord Texan Resort & Convention Center, 1501 Gaylord Trail.

Info: www.2023texasexpress.com



VERMONT, WHITE RIVER JUNCTION, October 16, 2022. Upper Valley Model Railroad Show, sponsored by the Connecticut Valley Model Railroad Club. Connecticut Valley Auto Auction Building, 1567 VT-14.

Info: cvrr.railfan.net/cvmrr

WASHINGTON, TACOMA, September 1-4, 2022. 42nd National Narrow-Gauge Convention, Hotel Murano, 1320 Broadway.

Info: www.seattlenngc.com ■

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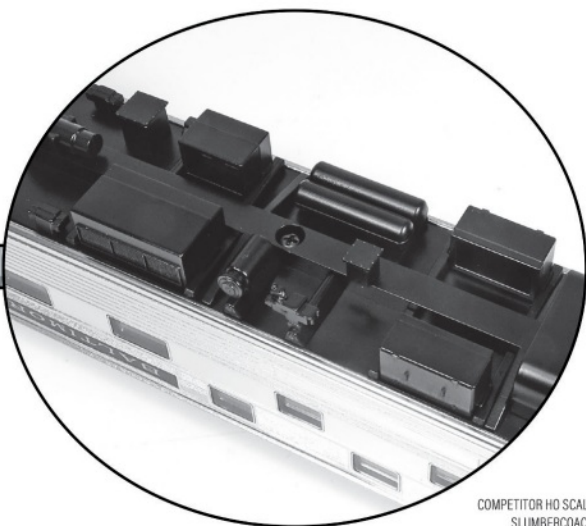
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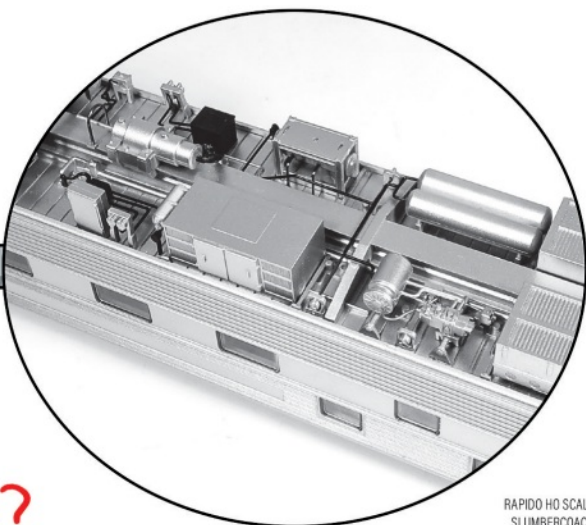
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[TABLE OF CONTENTS](#)

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[INDEX](#)

[TABLE OF CONTENTS](#)

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