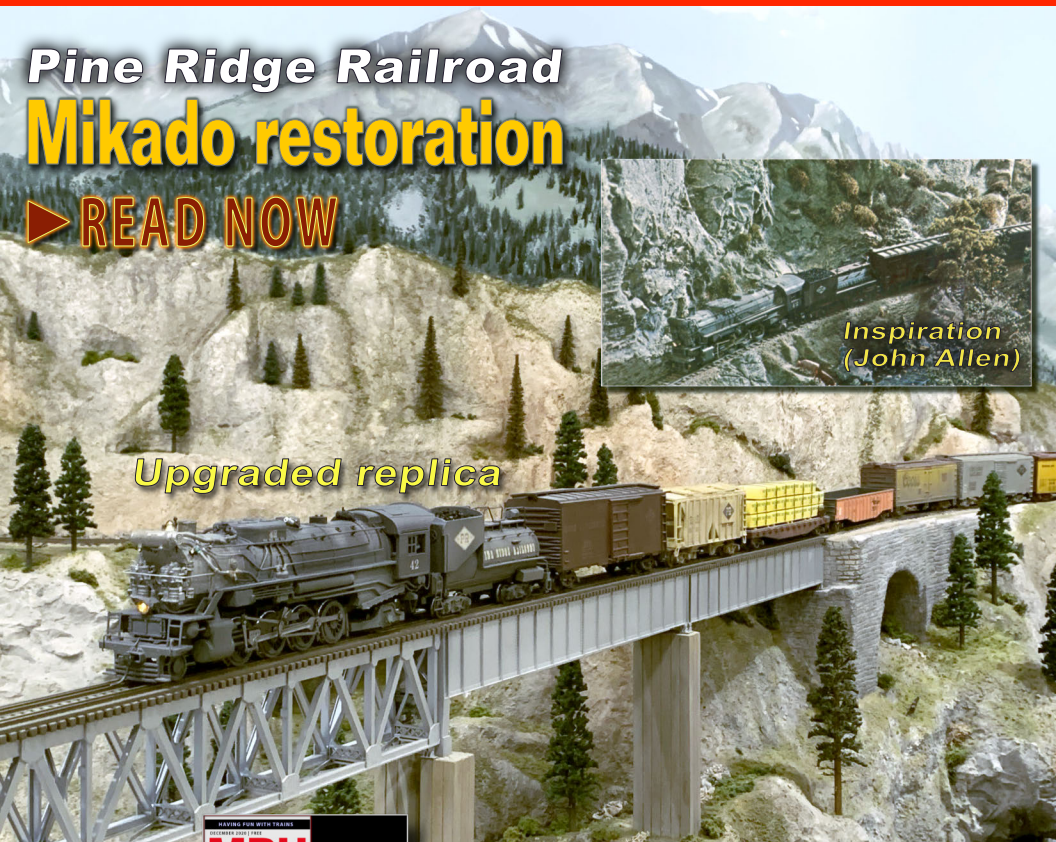




RUNNING # # # # # **EXTRA**

Apprentice with savvy modelers



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The facing pages in this PDF have been merged into a single wide page, making them landscape.

Full
December
MRH
inside!



ALSO in this month's edition:

- Layout design using LDEs
- Prepping cars for the layout
- A story of modeling six switchers
- Build a VIA Rail passenger combine
- ... and much more inside!

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**RUNNING
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ALL SCALES

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The story of modeling six switchers

MIKE ROSE

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KEN PATTERSON



Custom circuit boards for modelers

EARL HACKET, JR.



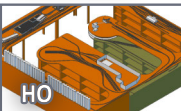
Make your own stone ballast, any scale, any color

JOE FUGATE



Ops for the rest of us: easy, realistic, fun!

DOUG MATHESON



BNSF Witchita 24x24 layout design

DEREK DUNCAN



First Look: East Coast Circuits fully lit police car

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December 2020 news and events

RICHARD BALE and JEFF SHULTZ



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PUBLISHER'S WELCOME

introduction



MRH Running Extra | December 2020

JOE FUGATE GIVES SOME NEAT AND TIDY DCC INSTALL TRICKS ...



RATE THIS ARTICLE

UNRULY WIRES GETTING SNAGGED BETWEEN THE LOCO SHELL AND THE CHASSIS on a DCC install can be extremely annoying. Neatness definitely counts when it comes to keeping DCC installs hassle free and easy to maintain, especially if anything ever goes wrong.

Two items: Kapton tape [1], the modern replacement for gunky black electrical tape, and fine black waxy thread [2] meant for leather work – both come in extremely handy for keeping unruly wires under control [3], among other things [4].

The Kapton tape also works as an insulator. I use it, for instance, to put under the motor mount area on Athearn Blue Box locos to iso-



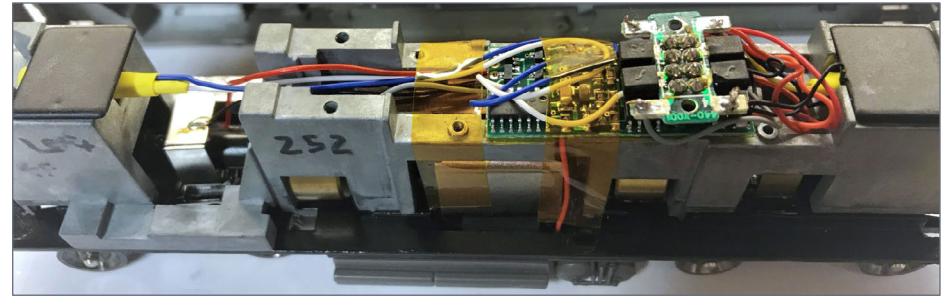
1. Kapton tape works very nicely to tack electrical wires and decoder boards in place and to insulate them.



2. This fine black waxy thread does a great job when you want to tie unruly wires into tidy cables.

To get a shopping list for this article, visit the *MRH* website at this link: mrhmag.com/magazine/running-extra/2020-12/publishers-welcome

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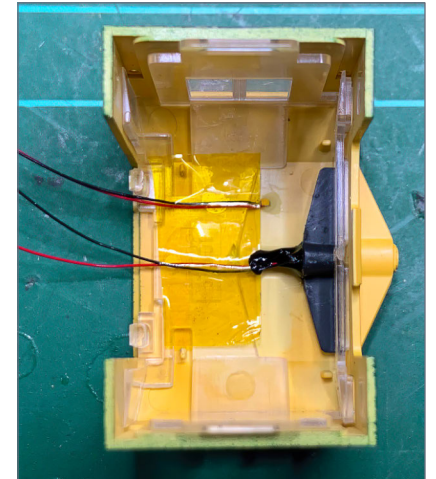


3. In this install, Kapton tape helps keep the wires in place so they don't accidentally snag the shell when putting it back on.

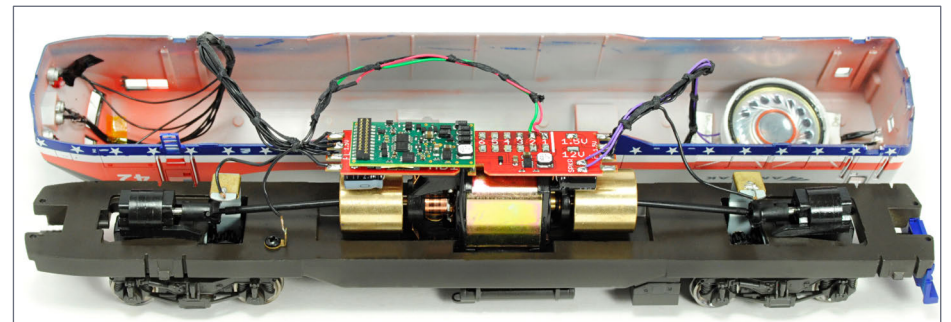
late the motor from the chassis. The tape resists heat, making it excellent for use around any electronic components that might get hot.

The black waxy fine thread works great as tiny cable ties for decoder wires inside a loco [5]. Train Control Systems uses it a lot in the installs shown on their website.

If you don't have these two items in your DCC install arsenal, time to add them. They really help! ☑



4. Kapton tape also neatly holds LED leads in place such as inside this diesel loco cab.



5. The waxy black thread nicely ties loose wires into tidy cables, making it much easier to install the shell without pinching wires. *Train Control Systems photo*



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THE LIMITED MODELER

column

Images are from the author's
collection, except as noted.

MRH Running Extra | December 2020



JIM SIX SHOWS HOW TO BUILD
WITH LAYOUT DESIGN ELEMENTS ...



COVER: It's 1940 and as the war rages in Europe and the Far East, it is a year away for America. USRA Mike 1853 chuffs into Monroeville with a NYC freight out of Elyria. It will stop for water and some switching. Before leaving town, it will wait for an oncoming eastbound passenger train.



DOING MORE WITH LESS

THE LIMITED MODELER | 2

THE HOLIDAYS ARE UPON US. The weather has turned cold outside. Summer is fast becoming a distant memory and the lawn equipment is stored for the winter, though the snow thrower is ready and waiting for the first good snow! Model railroading season is well under way.

LDES AND THE LAYOUT

I continue to explore a setting to model for my new, rebuilt layout. As I consider possibilities, I am very seriously considering modeling the New York Central's Norwalk Branch in northern Ohio. We took a close look at Clyde in October and Monroeville in December, both on the NYC Norwalk Branch. I have devised two Layout Design Elements (LDE) to represent these two Norwalk Branch towns. I borrow the term *layout design element* (LDE) from my long-time friend and well-known model railroader Tony Koester, who published the LDE concept decades ago.

I have been promoting prototype freelancing for the past several years. That is, prototype modeling with compromises. There were my *foobie* freight cars along with some accurate prototype freight cars. A year ago, I built my NYC K3 Pacific as accurately as I could – within reason [1]. More on the motive power later on.

Along my journey in model railroading, I have progressively become more of a prototype modeler. Not necessarily the kind of modeler who counts rivets and is overly focused on freight cars and little else, but instead I am about the bigger picture. I want my locomotives and rolling stock to reasonably match specific prototypes, and I want my layout itself to be an accurate representation of the modeled prototype – more so than most modelers would.

I decided on modeling some parts of the Lake Shore & Michigan Southern (LS&MS) mainline across northern Ohio



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between Elyria, just west of Cleveland, and Millbury, just east of Toledo. I think that an important part of prototype modeling is knowing the basic history of your subject, so I did some internet research on the line.

The LS&MS was established in 1869 through the merger of the Lake Shore Railway with the Michigan Southern and Northern Indiana Railroad. In 1877, Cornelius Vanderbilt and his New York Central and Hudson River Railroad (NYC&HR) gained control of the LS&MS. When the merger between the NYC&HR and the LS&MS formally merged into the New York Central in 1914, the LS&MS formed a major portion of the railway's route between New York and Chicago.

A second line was built through Sandusky and across the Sandusky Bay in 1896. This new route became the primary LS&MS line across northern Ohio, and now serves as part of the Norfolk Southern mainline between Cleveland and



1. This NYC K3q class locomotive will be used on the new layout to haul passenger trains. It is a Broadway Limited model of a USRA Pacific that I reworked to represent a specific NYC prototype.

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Chicago. The original line through Monroeville was relegated to branch line status, and the entire Norwalk Branch was eventually swept into the dust bin of history.

The Sanborn maps I had used for the November "Limited Modeler" were from 1898. Since then, Ray Breyer sent me six more Sanborn Maps of the town from 1922. Studying the 1922 maps, I found that some things had changed since 1898. The town had grown, with even more to model [2].

J.P. Easton built a new grain elevator complex in 1917 to replace the Fish & Hills grain elevator. The new J.P. Easton complex included a large grain and flour warehouse just east of the elevator. Standard Oil added an oil distribution dealership just down from the west end of the NYC freight depot. These changes prompted me to revise my Monroeville LDE to reflect the town's appearance in 1922 [3].



2. This old photo shows the area represented by my Monroeville LDE when looking west across the bridge over the Huron River. The LDE plan includes everything seen here and some items not seen.



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Let's get on to my overall layout design. Based on the 1898 Sanborn maps shown in the November "Limited Modeler" and the 1922 Sanborn Maps that Ray Breyer provided since then, I designed my Monroeville LDE and Clyde LDE.

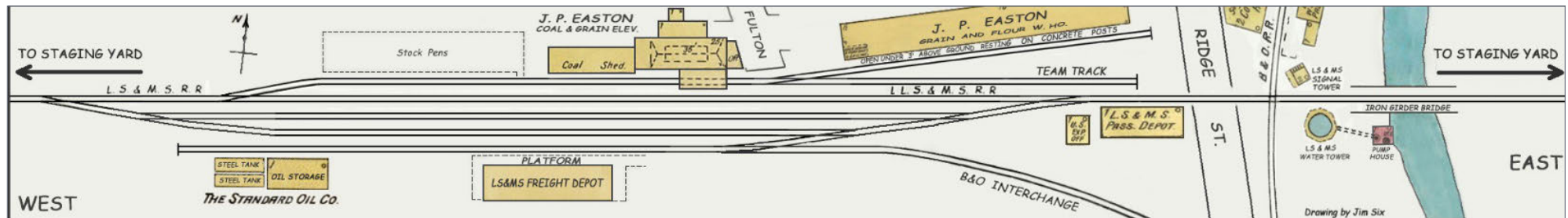
Since I already studied Clyde in October, why not do Clyde as the second LDE for my layout [4]? Clyde, as you know, was also on the Norwalk Branch. I have included a track plan for a Clyde LDE here [5]. Since I will not get to a second LDE for at least two years, the location I actually settle on could be one of the other several other towns that were located on along the Norwalk Branch.

Designing the overall layout means locating these two LDEs so that the west end of Monroeville somehow connects to the east end of Clyde. My thought is to locate each on one of the long walls of my train room, and connect them with a staging yard at each end. This arrangement will provide the most operating possibilities for the available space.

THE WHOLE LAYOUT

My plan is to have two LDE towns, Monroeville and Clyde. One LDE will be located on each of the two long walls of my train

3. This track plan of Monroeville is simple, but accurately represents the prototype in 1922, including the industries served. There are six places to spot or to pick up freight cars, and a depot for passenger trains. There is a water tower to replenish the locomotive tenders.



4. Here is the scene in Clyde from which I chose to design the LDE. All the tracks, industries, customer names, etc. match the prototype. Again, this is prototype modeling. This scene is looking down the LDE from the west end.



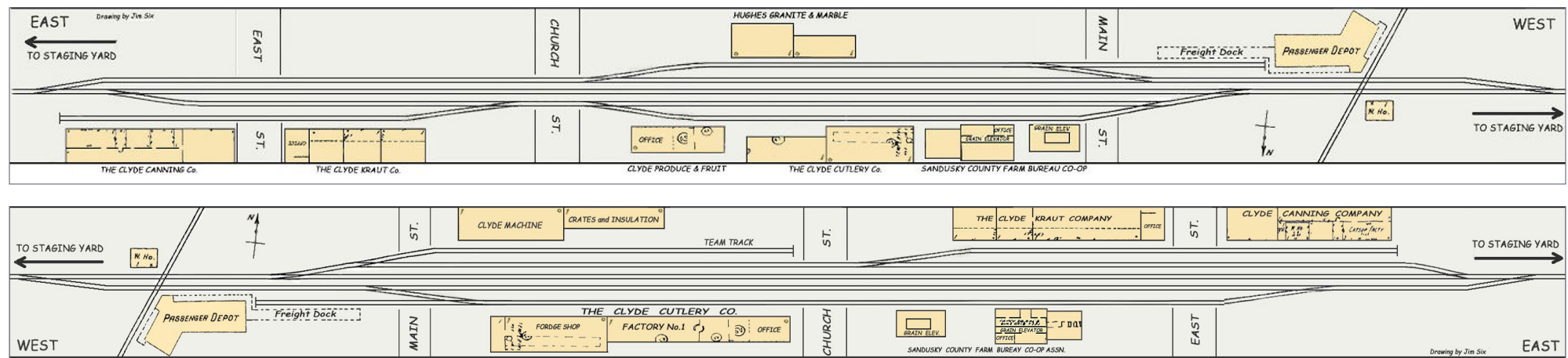
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room. I will stage a train at the right end and run it into Monroeville if westbound or run it into Clyde if eastbound. When in town the train will switch the industries then leave town to arrive at the next town to be switched. When done the train proceeds arriving back at the right end of the layout as pictured here [7].

I can have two or three tracks at the right end of the layout as staging tracks, which will allow for more trains and more operating possibilities, including overtaking and passing, opposing train passing, etc. The left end of the layout will remain one track and have full scenery. The right end won't need scenery. It's just staging.

Each LDE would match its prototype in all respects. The tracks, the sidings, the industries they serve, even the business and street names, would be faithful prototypical recreations of Monroeville and Clyde as they were back in 1922. In my opinion this is really good prototype modeling.

5a, b. This track plan represents the NYC through Clyde, OH. All of the online customers of the early 1920s are included. The track is a close match for the prototype of the time.



THE LIMITED MODELER | 8

I am not worried about run-time of any trains. Operating time will be spent switching the town. Depending on through trains that might complicate local train switching, an operating session can easily last one to two hours. Keep in mind that operation is about the way a freight does all of the switching in towns along the route.

Each town will have its own clock that will be set to match the timetable for the train running. This way, the trains will arrive



6. NYC 5155 is resting in Clyde awaiting an eastbound passenger train to arrive and clear before proceeding. Keep in mind that the Norwalk Branch was single track with a good many passing sidings. Trix Mikados are among the finest-running locomotives ever produced, steam or diesel.



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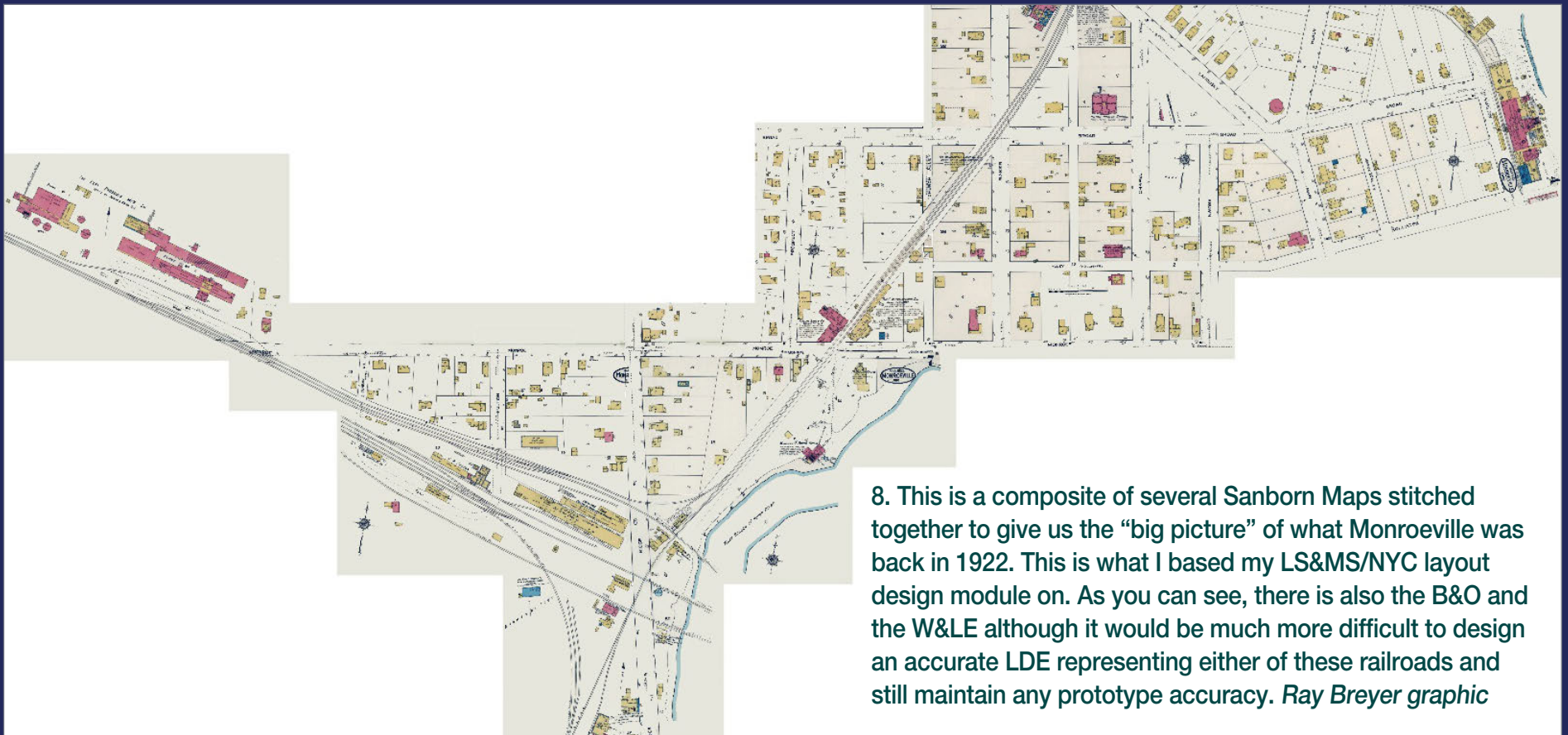


J. Six

Narrowing the scope for practical operation

Permit me to digress for a few moments. Ray Breyer has encouraged me to model Monroeville with all three railroads – the B&O, NYC, and W&LE since they were all in close proximity. Admittedly, that is appealing, and I considered doing so. The problem is fitting all three railroads into a 24'x12' rectangular

train room [8]. The fact that the NYC and W&LE were parallel means the layout shelf would have to be about 3' deep. That is too deep for a shelf layout, since the “reach” would become a serious concern. Shelf layouts are best when the depth is minimized. Also, there is the B&O which crossed the NYC and W&LE at about 90-degrees. I have no clue about how to fit all of this into my 24'x12' room and won't even try – as appealing as it may be.



8. This is a composite of several Sanborn Maps stitched together to give us the “big picture” of what Monroeville was back in 1922. This is what I based my LS&MS/NYC layout design module on. As you can see, there is also the B&O and the W&LE although it would be much more difficult to design an accurate LDE representing either of these railroads and still maintain any prototype accuracy. *Ray Breyer graphic*



and depart each town per the timetable, without using a fast clock. I see fast clocks to be a nuisance and a major contributing factor to unrealistic operation. I always operate in “real” time.

Keep in mind while studying my little track plan that all the industries and buildings were there in the 1920s. I have matched them one-for-one. Anyone who wants to model modern times can forget about it. All are gone today, and have been gone for decades. The tracks were taken out of service in the 1970s and in fact, most were gone before 1970. Today the Monroeville depot is restored, but not for any railroad purposes. In place of the NYC railroad is the North Coast Inland Trail – a public bicycle trail that stretches the entire length of the former NYC Norwalk Branch. I have bicycled it many times.

Picking a time to model is critical regardless of the location. Modeling the Norwalk Branch today is obviously out of the question since it’s long gone. Actually, any time after the early 1960s is pretty much not doable. Think about this. My interest in railroading in this area starts in the mid-1800s and stretches all the way to the present. People talk about modeling a window of time – say, 1985 to 1995. However, it isn’t possible to model such a stretch as from the 1850s to the 1970s. That won’t work for many obvious reasons. Instead, you can “follow” the railroad(s) you are interested in over the entire time with photos, books, reading about them, and even bicycling some of the lines that are now public cycling trails. However, you do not have to model them.

I researched the area to determine when railroading was at its prime and had the most to offer to the model railroader. What you will find in most locations is that time is between 1910 and 1930. Such is the case with Monroeville and all other towns along the Norwalk Branch of the NYC. I settled on the 1920s because it is one of the most modelable times based on available models.



9. NYC 1853 brings a Toledo freight off the Norwalk Branch in Elyria, Ohio in the summer of 1940. The 1853 is a regular on the branch. The Cleveland-to-Chicago mainline passes through Elyria.

Folks, we are prototype modeling. My two Norwalk Branch LDEs very closely match their prototype and will operate in the same way that the real railroad operated in those towns. All of the tracks belonging to the LS&MS/NYC are included as are all of the online customers. In short, everything matches the prototype of 1922. Nothing is made up or freelanced.

MOTIVE POWER FOR THE NORWALK BRANCH LAYOUT

Learning which locomotives would have worked the Norwalk Branch and how they would have been configured in the 1920s is an important part of prototype modeling, too. Mikados of the H5 class [10] and H6 USRA class [11] were common freight haulers on the line. I have three locomotives of the H6 class and one of the H5 class that form the core of my freight locomotive roster [cover, 6, 9].

Even with the right locomotives, it is important to pay attention to the locomotive’s appearance in the layout’s specific era, since railroads constantly updated their motive power to incorporate the latest innovations to increase power



and efficiency. One such locomotive is the 1853 of the H6 class. NYC updated the locomotive to include a feedwater heater and a booster engine [12]. I detailed my Trix model of the 1853 to match this unique prototype, and it looks great [9]. The problem is that the prototype received these upgrades about



10. Here is an NYC H5 class 2-8-2. This class of locomotive was a regular on the NYC Norwalk Branch starting in the mid-1910s. I have one Overland Brass model matching this prototype.

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12. NYC 1853 is a unique prototype. In the mid- to late-1920s the Elesco feedwater heater, commonwealth trailing truck, and a booster engine were added. The booster was removed after WWII. I detailed one of my Trix Mikados, the 1853, to represent this prototype [Cover, 9]. I may remove these details and restore the engine to standard configuration to make it usable before 1927 – the year I think the modifications were made to the prototype.

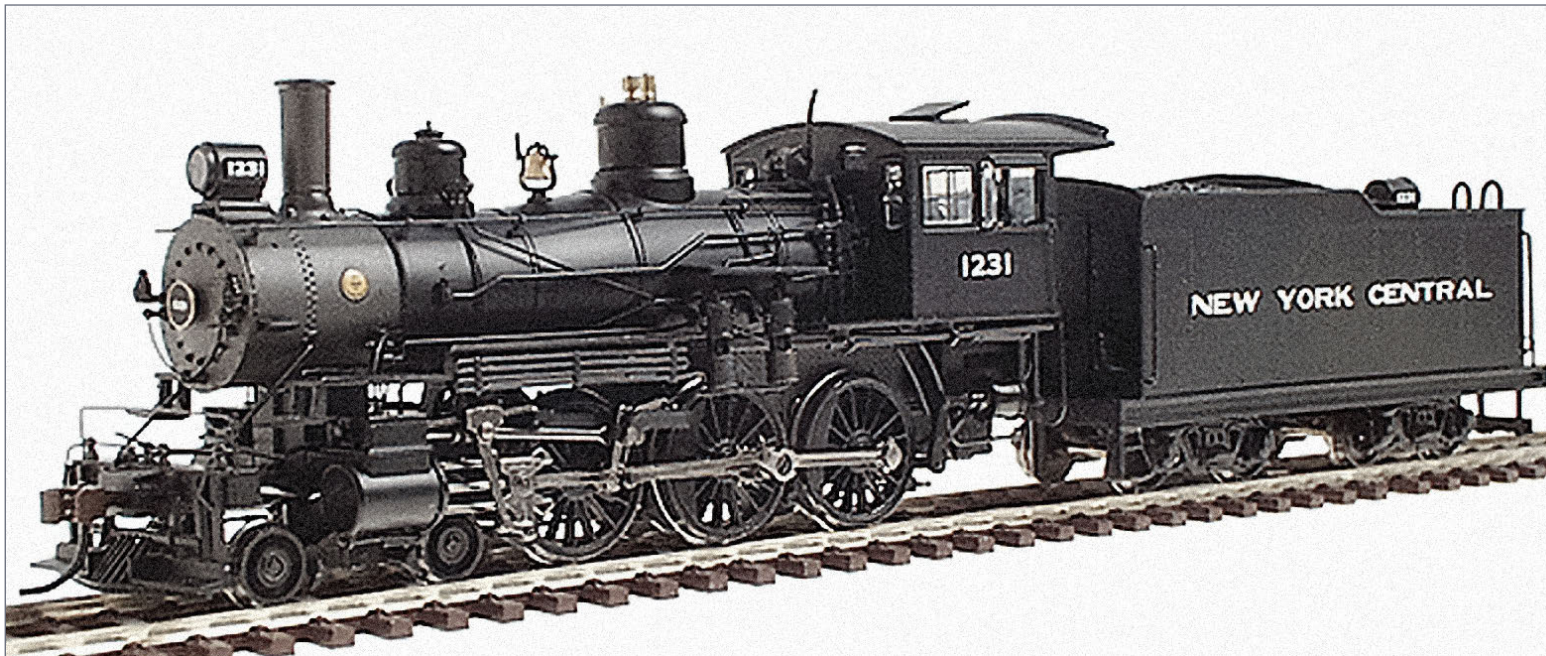


13. Here is a B&A (NYC Subsidiary) class K3 locomotive. I modeled one and it will perform passenger service on my new layout.





14. This photo was taken in the 1950s. Looking back now, it is difficult to imagine that such an old prototype would have still been working at such a late date. I find it interesting that there are arch bar trucks under the tender in this photo. *Ray Breyer collection*



15. Here is the Bachmann model. As you can see, it is a pretty close match for the NYC prototype. This is a nicely detailed and good running model. *Bachmann photo*

1927, meaning that I will have to consider removing these details so the model will appear as the locomotive did in 1922.

The New York Central used K3 class 4-6-2 locomotives for passenger service during the 1920s, and locomotives, and these would have made regular appearances on the Norwalk Branch, too [13]. I modified a BLI USRA to match the prototype, and this big locomotive will be pulling passenger trains on my new layout [1]

For general service, pulling both freight and passenger, the NYC frequently used 4-6-0 locomotives. They would have appeared on the Norwalk Branch and elsewhere as early as the 1910s, but if NYC 1290 is any indication, they soldiered-on into the 1950s [14].

Bachmann makes a model 4-6-0 that represents the NYC prototype reasonably well [15]. I may re-detail a few of those to match the prototype as it would have appeared in the 1920s. The job will call for changing only a few details, touching-up the paint, and adding weathering. ☑

★★★★★
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GETTING REAL

column



MRH Running Extra | December 2020

MIKE ROSE SHOWS SIX SWITCHERS
WITH UNIQUE STORIES ...



IN MY MAY 2020 COLUMN, I described a major project on my layout (Dupont, PA), that had been followed by yet another big layout effort, and by that time I felt like it was time to do something completely different for a while.

I'd piled up a number of locomotive sound installs for my Dartmouth Locomotive Works side business, plus there were

► **MODELING REAL RAILROADS AND WHAT THEY DO**

GETTING REAL | 2

several of my own diesels that needed attention, so it seemed like shifting over to work on diesels for a while would make sense. It all began innocently enough. I figured I'd take a month or so and catch up. Little did I know I'd be embarking on a locomotive building project that would last all summer and well into the fall!

But don't worry, we won't be covering all of the 25 or so projects I worked on during that time. Instead, let's focus on six unique, visually interesting end cab switchers.

PNE NW2 NO. 87

The first one I tackled was a Kato NW2 for my Pocono Northeast (PNE) shortline. In my 1984 time frame, they



1. Prototype photo of PNE number 87, an ex-Conrail NW2. The Conrail logo is gone, but the blue color makes the heritage obvious.



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rostered an SW1 and GP9 in their paint, along with an ex-Conrail NW2 that was just a paint-out (still in blue) [1]. Since I already had the SW1 and GP9 completed, why not finish up this last loco for their roster?

Of course, there's a story on this one. This was an OLD locomotive that I'd sent out about 15 years ago to have the frame halves milled-out for a DCC decoder. Kato built their NW2s just like N scale locomotives, with a solid block of metal pairs that is hollowed out to be the motor cavity. This was OK for DC, but not so good for DCC.

Unfortunately, by the time I got back to upgrading this loco, plain DCC had given way to sound. The slot I had milled out was completely inadequate for a sound install. I had acquired my own milling machine in the meantime, so I began the process of re-milling the frame halves to make the most room possible.

After a test re-assembly – never a trivial task for this kind of loco – I discovered I needed to mill several wiring channels for hardwired truck electrical pickup, so apart it came once again. The loco sat for several more years while I worked on my layout, built an addition, and rebuilt the layout to get it operational again, and here we are now.

I thought I'd enjoy the challenge of getting this little beast up and running, but I was unhappy with the performance and the over-stuffed nature of the innards once I did. Furthermore, the Kato chassis made some of the modifications I needed to make to the fuel tank to match prototype difficult. I needed a work-around. I devised a way of using a Walther's Proto SW8 switcher chassis for the NW2 and found a friend who was willing to take the Kato chassis off my hands.

The Proto drive enabled me to do the heavy modifications needed for the fuel tank area. I used a Custom Finishes kit to get the extended fuel tank and cooling coils. To finish the overall look, I used roller bearing truck side frames from Train Station Products [2].



2. The finished PNER no. 87, modified with a Walther's Proto chassis and detailed to look like the prototype [1]. Note the SW1 in the attractive PNER paint scheme coupled to 87.

CONRAIL SW7 NO. 9072

Swiping a drive from one of the many Proto SW8s I'd squirreled away got me looking at other half-done switcher projects. Conrail SW7 9072 looked like an interesting prototype to model. It was rebuilt with E-unit cooling fans over the radiator and had other interesting features like plated-over center cab windows [3]. I had a disassembled Broadway Limited SW7 that had been waiting forever for a sound installation, so this sounded like a fun project.

The project seemed to go quickly once in progress. I added radiator fans from an Intermountain F-unit and used sheet styrene to plate-over the center windows. Pretty straightforward. I even added the air piping to the bell. I was pleased with the progress and posted a photo on my Facebook group for my podcast "Crew Call with Mike Rose" [4].

I had just finished painting the unit with a coat of Conrail blue when my buddy Bob Teusink pointed out that my new radiator



assembly was incorrect! Sure enough, my fan box was just wrong. The prototype was somewhat longer, with more space between the fans and on the ends of the radiator assembly. This was very annoying, since I'd already painted the unit!

I knew it would bother me from that point on, though, so I had to correct it. I dismantled the radiator, rebuilt the box with sheet styrene for added spacing and reassembled. I had it looking right in no time [5]. The end result was a very convincing replica [6].

CONRAIL SW9 NO. 9124

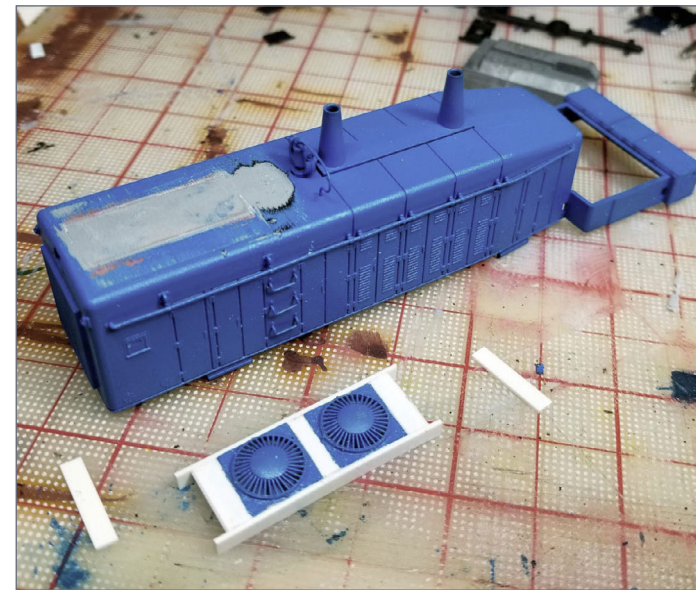
I chose Conrail SW9 no. 9124 for the next project's prototype. In addition to the plated-over center windows, this locomotive featured a raised area on the hood taper to accommodate a



3. Here's the prototype SW7. This gave me the overall look I was trying to achieve.



4. Detailing upgrades included Intermountain radiator fans, sheet styrene window plating, and an air line for the bell.



5. I corrected the fan box by cutting it apart and adding styrene for proper size and spacing.





6. The finished 9072 in service on my layout.

new air filter. It had an expanded tank with compressed air cooling coils. The unit's weathering provided additional visual interest [7].

I had a disassembled original-run Proto 2000 SW9 on the shelf next to the disassembled BLI SW7 from the previous project. I wanted to replace the motor in this one because the old Proto2000 motors were huge and took up far too much valuable under-hood real estate.

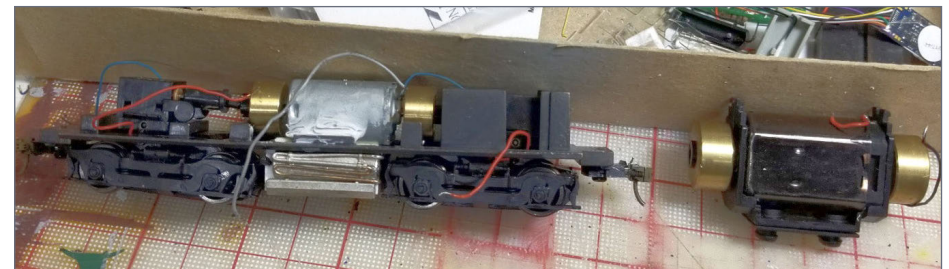
I chose an Atlas switcher motor for the replacement, and this made a marked improvement. While I was working on the chassis, I replaced the fuel tank with a tank from Custom Finishes and used 0.025" brass rod to represent the cooling coils [8].

I plated-over the center cab windows with sheet styrene. To represent the raised area on the hood taper, I cut a styrene

block to size. Then I carefully cut out a rectangle to give the styrene block a snug fit [9]. With the block installed and the locomotive assembled, it was ready for the paint booth [10]. I painted it and weathered it to match the prototype as it appeared in 1980 [11].



7. Conrail SW9 no. 9124 in Baden, PA on 11 September 1980. Photo from Charles Lahickey



8. I mounted the new Atlas motor in proper alignment with double-sided tape, then bonded it with Loctite Power Grab. The space savings under the hood were significant, as the old motor to the right illustrates. It's as high as the new motor plus the trucks!



VARIATIONS ON EX-LEHIGH VALLEY SW8 “PUPS”

Two variations on Conrail SW8s came next, both representing ex-Lehigh Valley “Pups”. The LV special-ordered these units from EMD with extra ballasting and dynamic brakes for service



9. Conrail 9124's prototype had a raised area on the hood taper. Here I've drilled-out the hood area to be removed. It will be a snug fit for the styrene block, which will represent that raised area.



10. Ready for paint! A-Line sunshades have been added on the cab.



11. The completed model. This was my favorite weathering job of the group.

in the railroad's mountainous coal fields. No models of this specific prototype are commercially available, but I had seen that someone designed a 3D-printed part in N scale to adapt the switcher's hood taper to represent dynamic brakes.

I contacted the designer and asked if he could do this for HO scale as well. To my pleasant surprise, he said yes. He made the part available on Shapeways under Wasatch Scale Models, so I ordered a pair of them and used them to modify two Walthers Proto SW8s.

CONRAIL 8687

The first model I did was of a Conrail 8687. By the specific prototype date, the pup's dynamic brakes had been removed, though the housing remained. I filed-smooth the grill areas of the 3D-printed dynamic brake part and filled them with body putty. Then I simply cut off the standard tapered section and test-fit the dynamic brake section to the original



shell. After filing and sanding for perfect fit, I used Cypox to bond the 3D-printed part to the original shell. It was all fairly straightforward [12].

CONRAIL SW8 8678

One of the SW8s I had was in the original factory Lehigh Valley paint, so I decided to stretch my era ever so slightly to model a paint-out in Conrail days that still had its dynamic brake equipment.

The procedure for adding the 3D-printed dynamic brake part was the same for this unit as for 8687, though I left the grills and fan intact, of course.

The model had the correct handrails on the rear but only straight pipe handrails with no walkway on the front, for some reason. I was able to procure the missing parts from an industry contact friend. The rest was painting and weathering.



12. Conrail 8687 is an otherwise-stock Walthers Proto unit. Only the 3D-printed dynamic brake part, paint, and decals were used to make this model.



13. Some paint matching and decal striping are needed, along with the Conrail paint-out decals, but the full dynamic equipment is evident here. Note the Conrail blue single-chime air horn.

The prototype had a neat new Conrail blue single-chime horn on the cab roof in place of the original, and I just had to model that [13]!

CONRAIL 9376

After all that work, I saw a solitary SW1200 sitting there, one of the newest runs from Walthers Proto, an undecorated model that I'd ordered to do an ex-New Haven switcher. This was to be the only one on the layout with Flexicoil trucks. When I opened the box, I was stunned at the assortment of possibilities for modeling with this unit! While it came with Flexicoils, it also had AAR sideframes and each could have your choice of bearings.

The kit also offers options for full-length handrails or the more common end handrails on the walkway. On Conrail, the units with full-length handrails all had AAR trucks, so I wanted the end handrails. I milled off the handrail spots on the frame sides and fill the holes. The rest was a paint and decal job [14]. ☑





14. Note the difference in the frame skirting between 9376 and 8687, needed on the prototype to allow the air cylinders to clear properly. On the AAR it's a single, centered cylinder. I was very pleased to find a Hancock air horn included among the incredible assortment of parts! That reminds me, to really "Get Real" I need to change that horn on my Lok Pro-programmer for this loco.

Mike also has an online hobbyshop. [Click here to learn more.](#)

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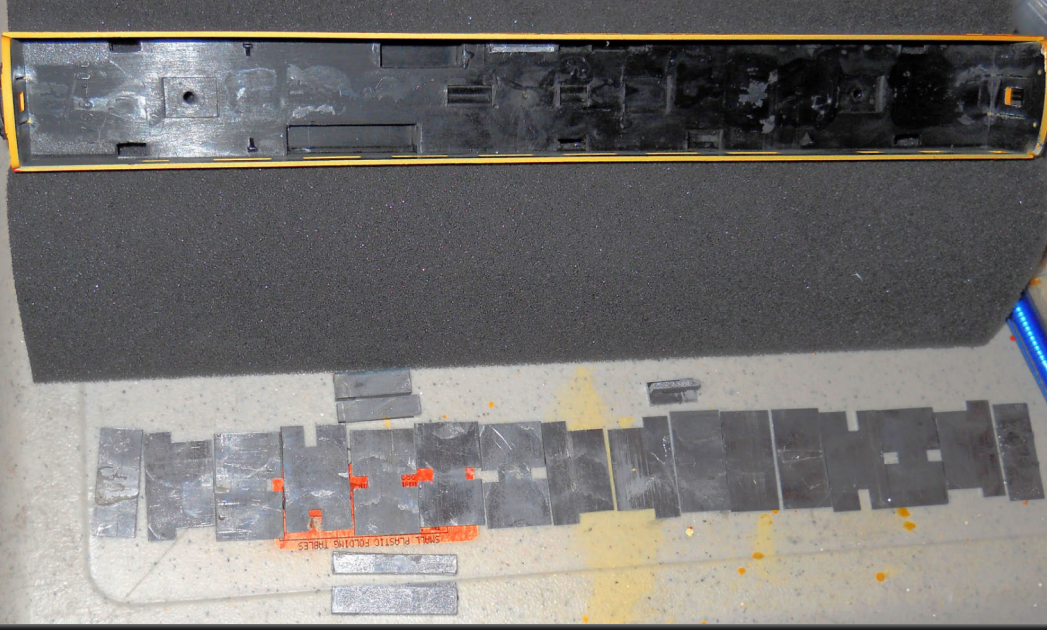
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Prepping Cars for Operation

MRH Running Extra | December 2020



JAMES J. EAGER OFFERS TIPS ON HOW TO TUNE UP YOUR ROLLING STOCK AND ADD WEIGHT ...

MANY MANUFACTURERS SELL THEIR ROLLING STOCK “READY TO RUN.” Theoretically, this means that all you as a modeler have to do is open the package and place the car on the rails. However, between operating needs and club rules, there is often work to be done on cars to tune them

up before putting them on the layout. The list of items on the checklist is usually short, including couplers, wheelsets, and weight, though some cars will need more work than others. If you have a fleet of older cars, don't give up on them! Using these same techniques can bring them up to spec, too.

Couplers are first on the list. For most recently produced cars, this is no longer as much of an issue, since they arrive from the manufacturer with knuckle couplers already installed. I started converting my cars to Kadee no. 5 couplers (www.kadee.com) in 1995.

I took a long-term approach, as money was tight (I was on disability at the time) and I had a bunch of rolling stock to convert. I started with one passenger train, starting at one end, working my way through the length of the train over a period of time. I finally finished all the cars I have a few years ago, though that involved a set of three very old cars that needed new trucks as well.

The long-term project of converting my cars to Kadee couplers pushed me into building a Microsoft Access database for my rolling stock. I included a column for what couple type was on each car. Once I had the database established, it was handy to provide a ready list for any large-scale conversion with the addition of a new column to denote the progress for each upgrade.

This documentation was especially helpful for upgrades such as wheelsets and weight that were not obvious at a glance.

Wheelsets are the second major area for upgrade. With the rise of DCC and its heightened need for clean, conductive rails, some clubs now require the use of metal wheelsets. After trying a few, I found wheelsets from Intermountain to be my preference (www.intermountain-railway.com). They seem to work on all my rolling stock, they're relatively economical, and they come in bulk packs of 100 wheelsets. I finished updating all my rolling stock with metal wheelsets a few years ago with those same three cars requiring new trucks.



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J. Regier

THE IMPORTANCE OF ALL-METAL WHEELSETS AND COUPLERS

Many manufacturers today offer their products exclusively with knuckle couplers and metal wheelsets. It is important to note that not all knuckle couplers or metal wheelsets are created equal. If plastics are used for the knuckle couplers or axles, it can lead to problematic operation over time. It is a worthwhile investment to make sure couplers and wheelsets are of all-metal construction.

Plastic couplers can be prone to breaking or otherwise malfunctioning, especially in high-stress situations like hauling a heavy train up a grade. A failed coupler at the wrong time can lead to a great deal of grief in an instant. Metal couplers are far more durable, and with proper height adjustment, can offer many years of reliable performance.

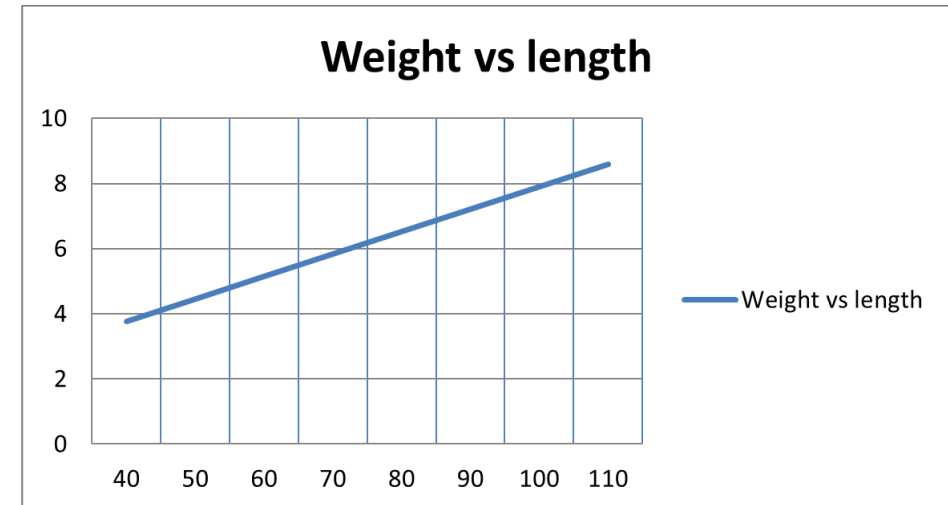
Plastic axles can be problematic because the journal pins tend to dull over time, leading to poor car tracking and performance. As car weights increase, the problem worsens. The journal pins of metal axles are much less prone to erosion. With proper truck tuning, all-metal wheelsets should turn freely and reliably for a lifetime.

Tell your friends what they're missing by not being a Running Extra subscriber!

Weighting is the third and final major item in prepping a car for operation. Any discussion of car weighting should start with the NMRA recommended standards. Specifically, the NMRA recommends a starting weight of 1oz., with an additional 1/2 oz. of weight for each inch of a car's length (www.nmra.org/sites/default/files/standards/sandrp/pdf/rp-20.1.pdf). By way of illustration, [1] and [2] show a chart and a graph of some standard HO scale car lengths and their corresponding recommended weight. All my examples are HO scale. Although for scales other than HO, the formula constant changes, the concept is much the same.

For some modelers, the NMRA recommendations are enough, though there are still cars that arrive from the manufacturer underweight. Other modelers, including me, see the NMRA standard to be a minimum weight for any given car. In any case, modelers will frequently find themselves adding more weight to cars.

The challenge is to add the weight without compromising the looks of the rolling stock.



1. NMRA weight chart for various HO scale car lengths.



Car length in feet	Car length in inches	Scale car length in inches	Length-based weight	Total weight
40	480	5.517241	2.758621	3.758621
50	600	6.896552	3.448276	4.448276
60	720	8.275862	4.137931	5.137931
70	840	9.655172	4.827586	5.827586
80	960	11.03448	5.517241	6.517241
90	1080	12.41379	6.206897	7.206897
100	1200	13.79310	6.896552	7.896552
110	1320	15.17241	7.586207	8.586207

2. NMRA weight graph for HO scale.



3. Commercial break-off weights.



M. Dodd

HIDING WEIGHT IN EMPTY FLAT CARS

I use birdshot – available at many hunting supply stores – glued in underframe cavities, to add weight to empty flat cars. No. 7 birdshot spheres are 0.1" in diameter, smaller than BBs, at 0.18". In

the past, shot was made of lead, but now it is more likely to be steel or tungsten. *Important! Lead is toxic. I always use the old spoon to handle it.*

To begin, I use a digital scale to weigh the empty car to determine how much weight must be added. I replace the car on the scale with an empty plastic drinking cup or condiment cup, and hold the tare weight button to zero the scale. Next I spoon birdshot into the cup until it holds the needed weight.

I turn the car upside-down on my workbench, and identify cavities between underframe members that could hold the shot, making sure they're spaced evenly side-to-side and end-to-end, so the car is balanced. Typically, shot isn't needed in every cavity. Then I pour or spoon one layer of shot into the designated cavities.

When done, I add a few drops of full-strength matte medium, using a skewer to spread it around and thoroughly coat the shot. When the matte medium is dry, I weigh the car, and return it to the layout. The matte medium adds a bit of weight, but I'm not concerned about that.

Even though BBs are larger than #7 birdshot, they might still be hidden by underframe members. It's worth a try.



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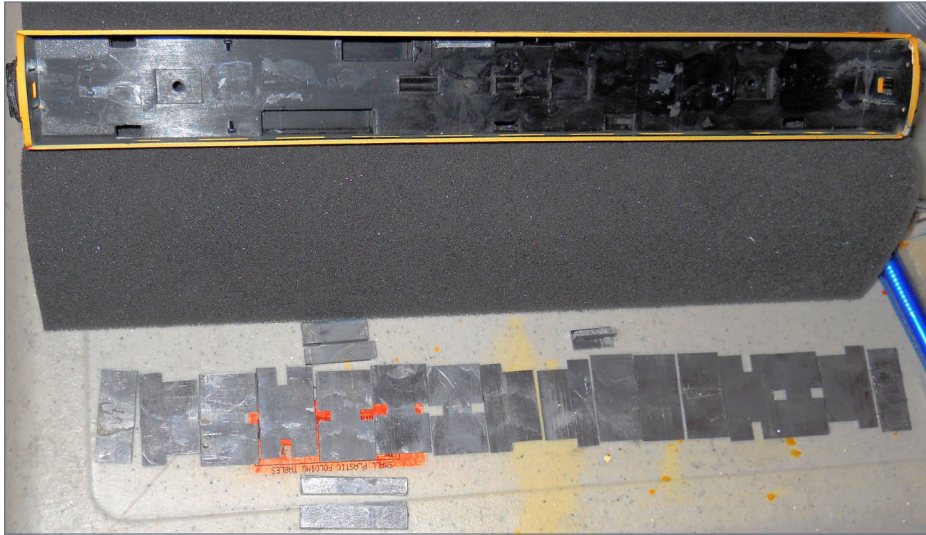
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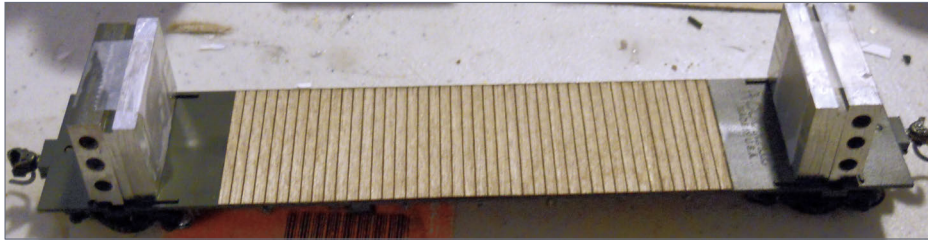
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4. City of Miami coach weights.



5. boxcar end weights (heavy set).



6. Empty Intermountain flat car.

For plain boxcars or other cars that you can readily open, but would normally run closed, hiding weight is easy. You have the whole interior to fill with pennies, washers, BBs, or anything you can glue down to bring it up to desired weight. Alternately, you can purchase lead or steel weights in ¼-oz. segmented bars with dual-sided foam tape already on them. Simply break the bar at the seams and stick them inside the car.

What about those other cars, including passenger coaches, flat cars, hoppers, and gondolas where hiding weight is more difficult? Or tank cars, where accessing the interior for adding weight might be more difficult?

In the July/August 2013 issue of *Model Railroad Hobbyist*, I had a two-part article about building the City of Miami passenger train. The train's seven IHC/Rivarossi cars were underweight, but I found weight kits that allowed me to install flat weights under the car floor like a jigsaw puzzle [4]. The weight kits came from Adair Shops (www.adairshops.net), which specializes in internal car weights and carloads.

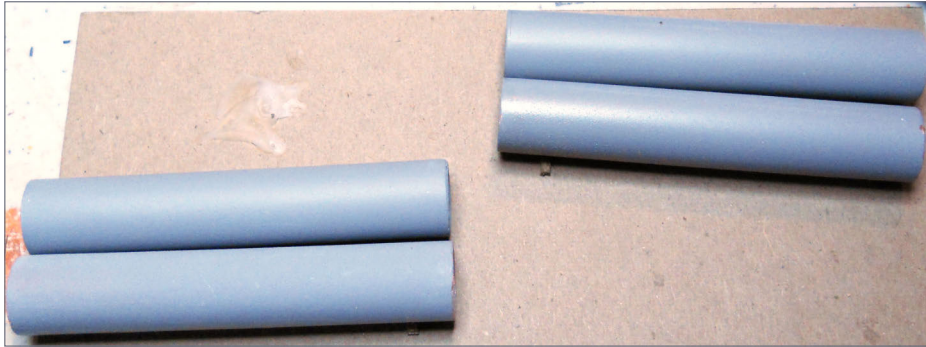
After I finished the City of Miami, I found that Accurail (www accurail.com) was releasing a nice 50' Welded door boxcar in my chosen railroad, the Illinois Central. I ordered a dozen of them and a set of decals to renumber them for a unit train. I also decided to open up a few of the boxcars to detail the interior. These cars included steel weight bars for modelers to glue to the floor, but the weight makes for an ugly, unprototypical floor if you open the door. What to do?

My answer was to use end weights and a wooden deck originally destined for a flat car, trimmed to fit. I did this for four of the 12 cars, since I wanted to draw the eye toward the cars I did extra work on. The end weights are even heavier than the original weight bar that came with the cars. I added weight to the remaining boxcars to balance the set, with the final weight above NMRA standards. Alternately, you could stack other metal like washers or pennies in the car ends as well, just be sure to weight both ends the same.

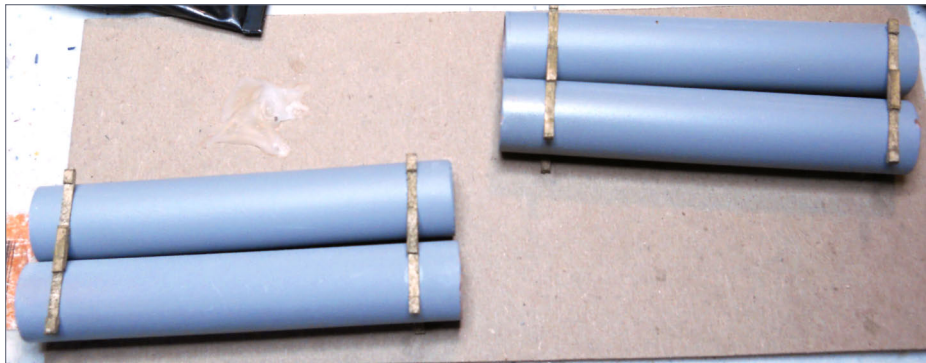




7. Custom wood cradles.



8. First layer of pipes.



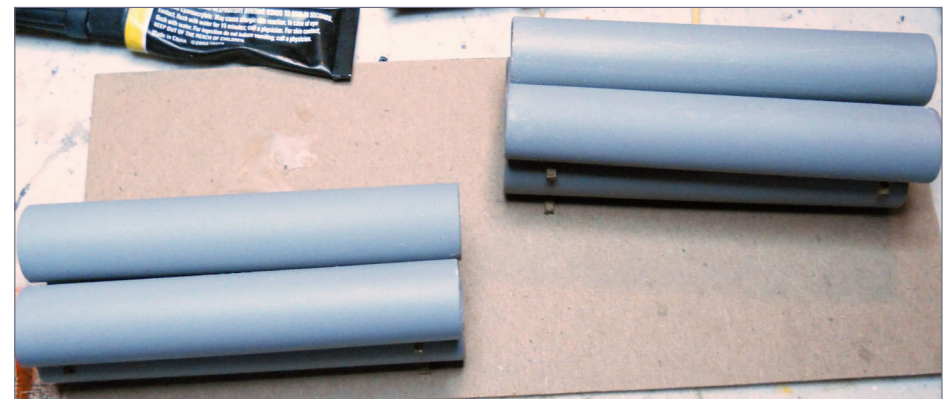
9. Second layer of cradles.

The next thing I have been working on is wood-deck flat cars. Intermountain makes some really nice ones [6]. They started out years ago as kits, but now you can only get them ready to run. With each release, Intermountain offers new road numbers. Then as now, however, the cars are too light. These don't even come up to NMRA standard weights, which makes them track poorly.

There is nowhere to hide weight on an empty flatcar. While I could tape some weight to the bottom of the car, it would show. The answer here is the load itself. Several companies make metal flatcar loads for this purpose. Adair shops offers nice steel plates, steel beams, even steel pipe loads.

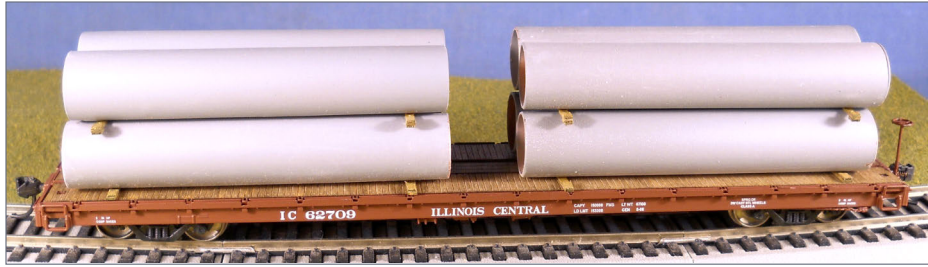
It's not difficult to build your own load. Find some metal pipe from a plumbing company at an appropriate diameter. Cut it into segments of appropriate length for your load and paint them. Build yourself wooden cradles and spacers for the loads [7]. Layer the pipes onto the cradles and stack [8, 9, 10]. Building the loads as a unit allows you to add and subtract the load during an op session if desired [11].

If you really want to get fancy, each car can have different loads for different stops on the op session. The above pipe



10. Second layer of pipe.





11. Fully loaded flat car.



12. Intermountain flat car with plate load.



13. Gondola with steel beam load.



14. gondola with pipe load.

loads lift right off, and I have a steel plate load for the same car [12]. Of course, if you are a little more detail-minded, you might want to add straps and tie-downs to your loads, which would make them a little bit more cumbersome to remove during operating sessions.

Another unit train I am still working on is a set of 16 gondolas from Accurail. Before assembly, I found that one can upgrade the factory weight, which goes under the floor of these cars, with heavier custom weights from Adair Shops.

Loading gondolas or open hoppers is another option for adding weight. There are numerous options for loading gondolas. Some of my favorites are steel beams or pipes, because these loads allow people to see the wooden decks I like to put on the floor of my gondolas (13,14). Again, my preferred method is to make these loads as a unit so that operators can unload or reload the cars during sessions.



But there are other kinds of loads you can create to add weight to the cars and still be able to change things up if desired. You can build a wooden cover and glue anything you like on the top (The “trash” gondola load) and any amount of weight under the deck. With hoppers, maybe coal gets put over the top, or sand. Let your imagination run – or match it up to the industries your op session will serve.

There are enclosed cars such as tankers, hoppers, and others where there is no obvious way to get into the car to add weight. Here, too, there are options. Perhaps the easiest method to add weight for such cars is to buy them in kit form and add weight during the process of building them.

For cars that are already assembled, a closer look might just reveal opportunity. Some cars disassemble readily. Athearn used screws to hold its old blue-box tankers together, for example. You can easily open them up to put additional



15. Weight bars through the hole.

weight inside the tank. Adair Shops has a custom solution, but just about any kind of weight will do.

Even in cars that are already assembled, there are

usually options. Intermountain cylindrical hoppers, for example, have a small hole on each end. Adair Shops makes small metal weight bars that you can slide into those holes. The holes are small enough for BBs, though it will take quite a few BBs to do the job [15].

If there is no apparent hole to fill in weight, find a drill bit just slightly larger than a BB and drill a hole in an inconspicuous spot on the car. You can cover the hole up later on after adding weight.

Finally, you may not be able to weight every car, such as unladen flat cars. If this is the case, then make sure that the ends of the train have heavy cars and put the light ones in the middle for best operation. ☑

★★★★★
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JAMES EAGER



James (who passed away June 3, 2016) had been a programmer and database administrator for several major corporations.

He and his brother each received train-sets which led to a father and sons' layout in the basement, a Model Railroad Merit Badge, and a long-term interest in model railroading.

In 1997, as part of a Jacksonville model railroad club, one of his structures was shown in a TV commercial for the Ronald McDonald House Christmas charity layout at the mall.

James had a long-time interest in the Illinois Central, along with the B&O and ATSF. ■





Pine Ridge RR #42 Restoration

TOM HOKEL RESTORES A GORRE & DAPHETID RAILROAD
#42 2-8-2 LOCOMOTIVE ...



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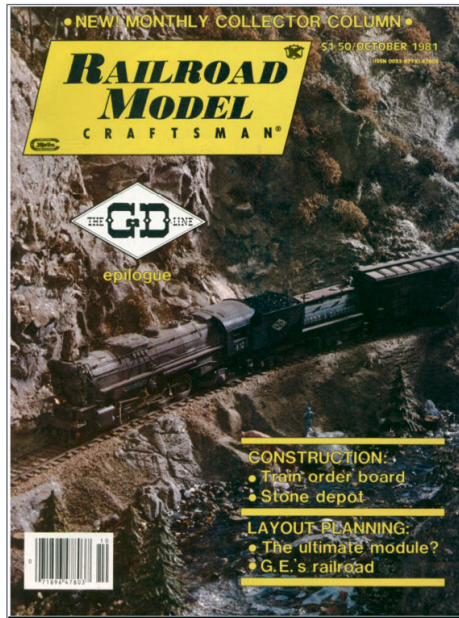
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MRH Running Extra | December 2020



FROM EARLY-ON, the work of John Allen has been highly influential in my approach to model railroading. One locomotive of his in particular really caught my eye, the Gorre and Daphetid (GD) no. 42. It was a superb kitbash and detail job on a Mantua Mikado kit. When I saw the GD no. 42 on the cover of the October 1981 issue of *Railroad Model Craftsman*, and again on the cover of *Model Railroading with John Allen* (Kalmbach, 1981), I knew that I had to build my own version.



1. The cover of October 1981 *Railroad Model Craftsman* from 1981 and the book *Model Railroading with John Allen* both feature John's #42 Mikado. Tom's restored PR #42 is shown on the right.

Model Railroading with John Allen held a few good pointers to get me started. The locomotive's roster notes on page 125 showed that this was a Mantua Mikado kit that John had purchased in 1952 and modified in 1960. Upgrades included changes to the sand box, cab and pilot using Hobbyline Berkshire parts. John also scratchbuilt a Vanderbilt tender for the locomotive.

I had an unbuilt Tyco 2-8-2 kit and, thanks to my brother, two Hobbyline Berkshire kits. Each Hobbyline kit contained two air pumps, although I wound up using brass detail parts instead. Based on the surviving photos, John had added a brass or metal feedwater heater.

From an image on page 15 of *Model Railroading with John Allen*, John had two of the Tyco 2-8-2 kits. The other one was GD no. 45 Berkshire with SIM Lab mechanism. Quite a few locomotive and detail parts added detailing to the Great Divide Terminal garden tracks [2].



2. Great Divide engine terminal garden tracks – GD no. 45 rolls off the turntable. GD no. 42 is three locomotives to the left of no. 45.



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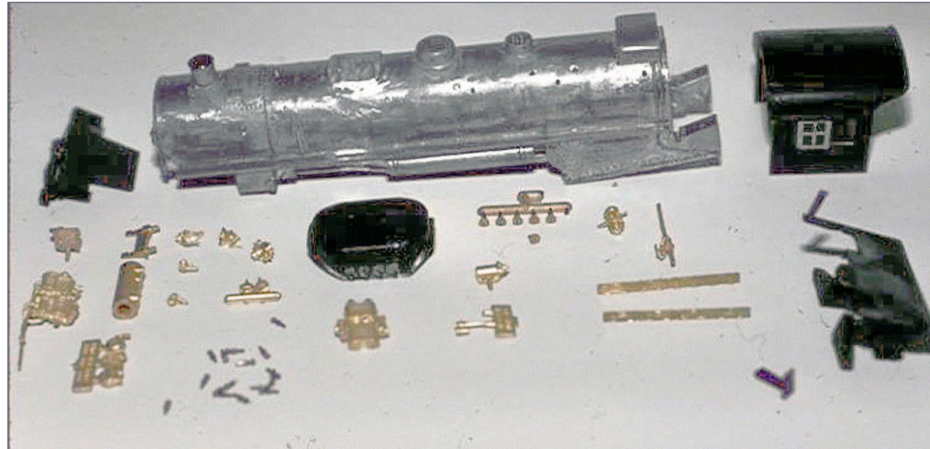
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Pine Ridge RR No. 42, a first attempt

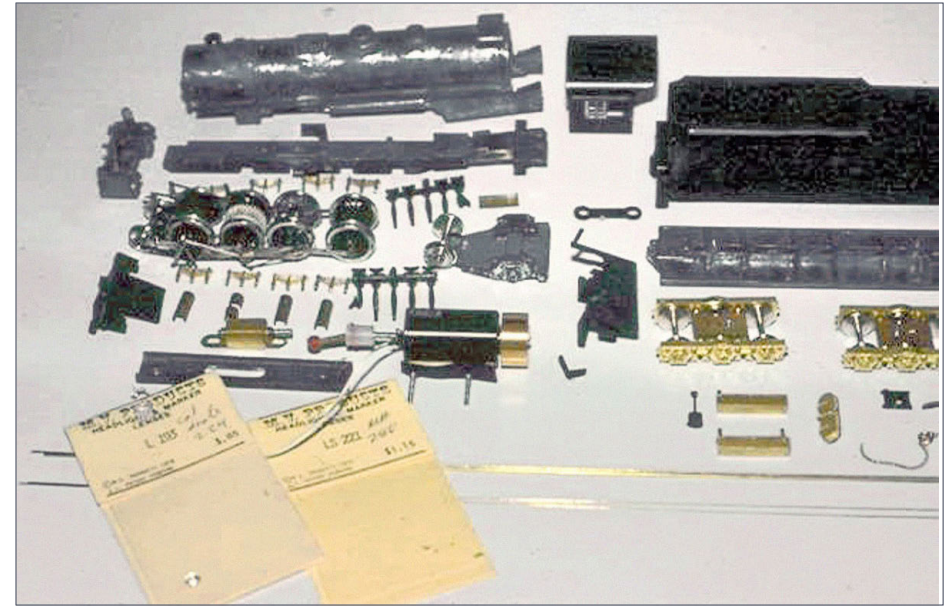
My recollection is that I built her in 1982. The cast-on details on the boiler and stanchions seemed clumsy and shallow, so I wanted to replace them. Filing off all the cast-on details proved to be quite a workout for me, and may have been what motivated me to purchase a Dremel motor tool. I had an assortment of brass castings ready to go, and even wanted to add plastic boiler bands [3].

I replaced the original Tyco motor with a 20x32 Sagami can motor, and the original gearbox with an upgrade from NWSL. I used the stock tender, but added some details to that, too, including a nice pair of brass trucks. Considering that she was the first loco I customized, I thought I did a decent job [4].

I decommissioned my version of GD #42 decades ago and parked it in my display cabinet. There were several parts I was not satisfied with. The biggest visible flaw was that the four-hatch sand dome was raked and not horizontal. She also retained the stock blind middle drivers because she couldn't



3. I filed smooth the detail castings on my diecast Tyco 2-8-2 boiler to replace them with separately applied brass details.



4. I upgraded the motor and gearbox and added additional detailing to the tender.

negotiate the 24" radius curves on my old layout using all flanged drivers. Of course, she also needed a proper Vanderbilt coal tender [5].

I had my friend paint her because I didn't have my Paasche airbrush at that time. He used Scalecoat paint (not Scalecoat II), which crazed some of the plastic parts. Needless to say, he was quite apologetic. I sanded the crazing off the sand box, which was still evident but not too noticeable. I might have done some minor sanding on the cab, but it looked OK.

Dave Gorelle (DG Locos) pointed out to me a few years ago that John also shortened the boiler. This was confirmed by Rod Smith's "survivor" photos. Darn! I still wanted to re-create no. 42, but my first effort had fallen frustratingly short.



PR #42 Restoring the Dream

Since she had a few issues, my initial plan was to build a completely new no. 42 and leave the original on its display shelf for old times' sake. But then, as I studied the original, I thought about all the work I had put into her. It would seem wasteful to start over. I decided to fix her up, upgrade her with Tsunami II DCC Sound and put her back to work.

I began my restoration on February 24, 2020, by removing the sand dome and overly thick pipes. It took a couple of tries to get the sand dome level. In the process, I discovered that the boiler itself wasn't level! I resolved the issue with two Kadee fiber washers on each side of the boiler endpoints over the frame screw holes.

I knew John had shortened his locomotive's boiler, likely to give it a stockier, stronger look, but I wavered about the work it would take. Comparing my #42 to the other Mikados in my collection, I determined it was almost three scale feet longer than the others at 48'9". That turned the tide. After weighing



5. My Pine Ridge RR #42 Mikado as I originally configured it. Note the racked sand dome.

my options, I decided all I needed to do was to saw/file about a scale foot off the cast-on valve cover on the top of the boiler, next to the cab. This would allow me to slide the cab forward. I had epoxied the cab originally, so I had to trim it off with an X-Acto saw.

I didn't damage the cab, but I still replaced it. Preparing the new cab was a little tricky because moving it forward meant modifying the floor and underside. I also had to trim off three pipe ends and do some re-bending. I reattached a few pipes and the firebox grates that had come unglued in the restoration process.

This brought the new length to 47'10". Though it didn't seem like much, and though PR 42 was still longer than the other Mikes, I think she looks much better. Not sure if it's just my imagination, but at least I won't have to obsess about what I might have done.

I also replaced the two blind middle driver sets with flanged drivers. I quartered the drivers with my new NWSL Quarterer II tool. The new tool is way better than their less expensive plastic version.

Vanderbilt Tender

John's GD no. 42 featured a Vanderbilt tender, and I decided to use a Bachmann Union Pacific Vanderbilt coal tender for the project. It was DCC-ready, and its bunker height was fairly close to the original GD no. 42. I had to trim the sides down, though. I made my cuts at the transition line where the curved sides ended and the flat sides began. I didn't have to modify the tank walkway handrails [6].

I wanted to install a Tsunami2 TSU-1100 sound decoder, a TDS 18mm x 13mm x 2.5mm sugar cube speaker, and a TCS KA1 Keep Alive. All of this had to go in the tender. I removed an underside screw holding the coal bunker. I noticed two tabs on



the front, so I pulled slightly down on the platform and was able to lift up the front of the bunker and then slide off the water tank.

I removed the electrical circuit board and the two-pin and four-pin connectors and bracket so I could push the new Miniatronics two-pin and three-pin connectors inside the tender. (After some testing, I ended up enlarging the opening to allow for more flexibility in the connector wiring.)

I mounted the sugar cube speaker with Elmer's Tacky Glue facing down under the coal load, and drilled six holes in the bottom of the tender. I fit the Tsunami decoder and the Keep alive side-by-side in the tank [7].

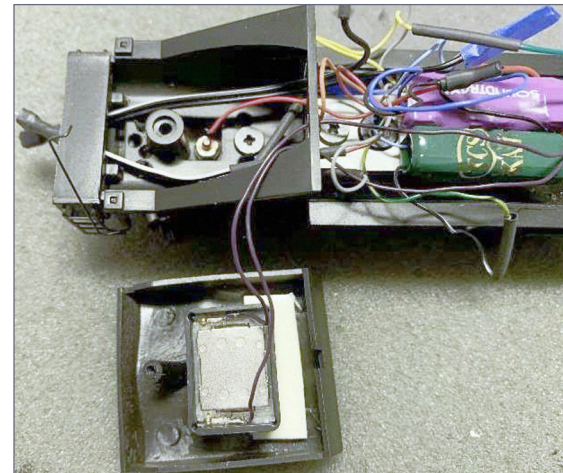
There are plastic screw posts in both the tank top section and the coal load, so I needed to make sure that wires were clear of them. I retained the 12v tender rear light bulb.

For the locomotive headlight, I drilled out a brass CalScale #229 hooded headlight casting to accept an old PFM 1.8v 60ma grain-of-wheat bulb and added a 330-ohm resistor. I think a 250-ohm would have been fine, too; but I didn't have one. If these bulbs ever burn out, I'll replace them with LEDs.



6. I tested two Vanderbilt tenders, an oil tender from Southern Pacific and a coal tender from Union Pacific. The UP tender was the best fit.

I connected the locomotive to the cab electrically with two-pin and three-pin connectors. I drilled two small holes under the cab deck to enable me to pull the two-pin and three-pin connector heads through, so that I could completely remove the cab/boiler shell. I ended up cutting more of a slot than a hole on the fireman's side to allow greater flexibility for the three-pin connector. It took me three attempts to get the drawbar just right.



7. The Vanderbilt coal tender and decoder parts. I used Tacky Glue instead of double-sided tape.



8. PR #42 out on the mainline for a test run.



Test run

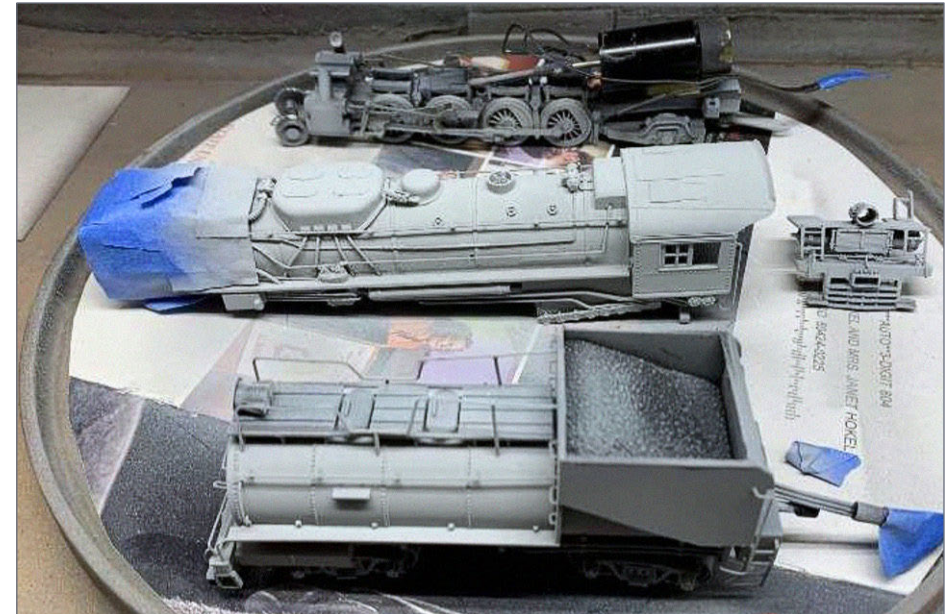
The locomotive tested very well on its run over all the mainline track. My uneducated 50-50 guess on the orange-gray motor leads was correct. She negotiated my 26" minimum radius curves with all flanged drivers! I can tell you that 24" curves won't work. I have a feeling that John Allen was well aware of this, too. That little sugar cube speaker sounded great! I was quite impressed.

Repainting and decaling

I masked the locomotive's smoke box and prepared to apply primer [10]. I sprayed the loco and tender with Floquil Gray Primer. I highly recommend stripping off the factory tender lettering, as it was painted on thick, rather than stamped [9].



9. PR #42 Ready for painting and Floquil Gray Primer coat.



10. PR #42 sprayed with a coat of Floquil Gray Primer.

I then sprayed a loco black mix of Floquil colors ... 70% Engine Black, 25% Antique White and 5% Signal Red. I sandwiched the decals between layers of Floquil Crystal - Cote. I brush-painted the tender's wooden deck with PollyScale lightened D&RGW boxcar red, then sprayed everything with Vallejo Clear Flat [11].

Applying the decals was a challenge. I found that using a good pair of scissors that left a nice, clean edge helped the process. I also cut the tender lettering to fit between the overly large seams and rivets. I used only MicroScale MicroSet, and applied a good layer of Vallejo Clear Gloss, which is thicker than Floquil. Close up, the result looks like the paint crew renumbered the loco and, of course, they had to mask out the old "GORRE & DAPHETID" lettering. Well, that's my story ... and I'm sticking to it! From any distance, you can't really tell.





11. PR #42 ready for weathering.



12. PR no. 42 painted Gray, Sand and Rocky Mountain Dirt Weathering and thinned Rust over rivets.

Don Manlick made my number decals using a non-standard style that is very close to the GD's with larger "dots" at the ends of the 2, 3, 5, 6 and 9 numbers. I designed my decal sheets to have the numbers "42" together, as well as some other paired numbers.

Weathering

Replicating John's loco weathering is challenging, to say the least. I sprayed thinned colors: Gray firebox, Antique White pop valves and generator, and Sand on and below the sand dome. I used a thinned Rocky Mountain "dirt" mix of three

TOM HOKEL



It's an understatement to say that Tom is a big fan of John Allen and his infamous Gorre and Daphetid RR. One of Tom's most memorable moments, while stationed at Vandenberg Air Force Base, Calif. in 1970, was meeting John Allen and touring his GD Lines.

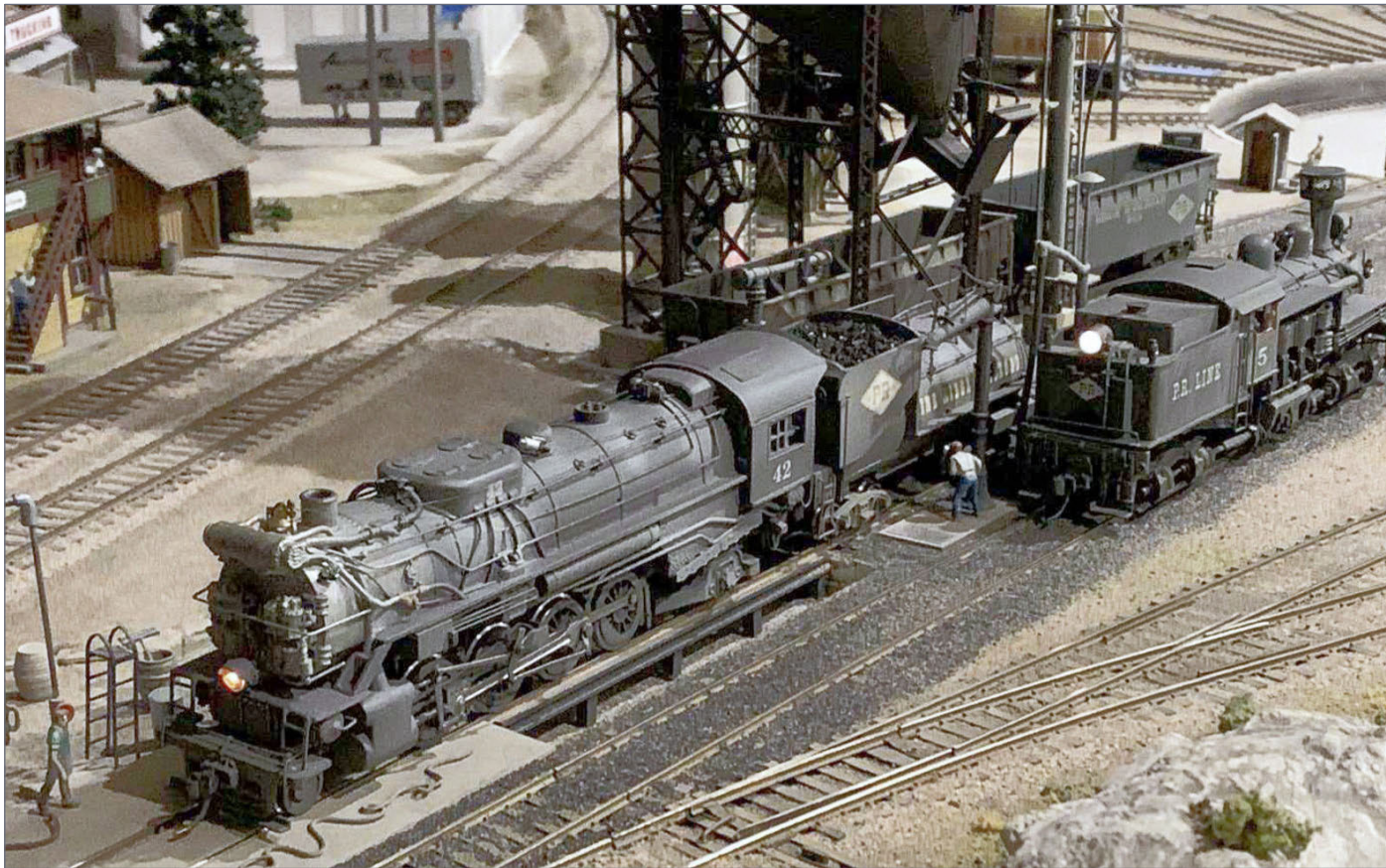
Tom enjoys building GD-inspired structures, rolling stock and locomotives, as well as the creative process of researching, designing and developing his remaining layout scenes. Tom's wife, Janet, also helps out on many of the projects.

Tom is employed by Deloitte Consulting as a Project Delivery Specialist focused on enterprise and data architecture. His other interests include classic cars, basketball and all of the great things that come with living in a mountain community. ■



parts Vallejo Earth and two parts Cement Grey to spray the lower loco and tender areas. I brushed thinned Rust over the tender rivets.

I then sprayed a control coat of thinned loco black mix and a final coat of Engine Black soot from the smokestack back over the tops of the boiler and tender. I brush-painted the side rods with a Vallejo mix of 5 parts Gunmetal Grey and 2 parts Silver [11].



12. PR no. 42 at my Great Divide engine terminal, posed to recreate The John Allen book.

I added Kadee scale whisker couplers. I also added a half-ounce weight to the coal bunker to help the tender truck track well despite the stiff loco connector wires. I used a Campbell Coal Load, which is just the right size, sealed with thinned white glue, to fill up the bunker. I finished the spot touch-up painting on April 4, 2020. The project spanned 41 days [12].

PR no.42 weighs a hefty 25.9 oz. When I built the original, I added some Cerrobend to balance the drivers. She really didn't need that extra weight! She'll pull 13 cars upgrade from a dead start with no problem. She must have been a favorite with GD operators – I can see why John assigned her as a fast freight! ☑

For more photos of no. 42 in action, see the [bonus extras this issue](#).



ULTIMATE SANDER | 2

As tools go, the Ultimatum Sander is about as solid as they come. When the box arrives, you will notice its hefty weight. When you open the box and make your way past the bubble wrap, you'll find the sander, its instructions, an extra sanding disk [1].

The sander appears ready to be use right out of the package, with the first sanding disk mounted and ready to go. However, they put on the crank reversed, with the handle facing inward, to save packaging space. As-is, the handle will collide with the sanding table, preventing rotation.

Ultimatum included a 4 mm Allen key specifically to resolve this packaging issue, enclosed in a baggie marked "REVERSE CRANK ARM FOR OPERATION." Remove the Allen screw on the



The Ultimatum Sander

MRH Running Extra | December 2020



JEFF PALMER TRIES OUT THE NEW
ULTIMATUM SANDER PRECISION TOOL ...

UNTIL NOW, I had always thought of a sander as a finishing tool. A tool used to remove burrs, splinters, and other sharp edges from a finished surface. Let me introduce the Ultimatum Sander, which reinvents the sander as a precision tool. This sander rotates by a hand-powered crank or wheel.



1. The box includes the Ultimatum Sander and everything you need to get started.



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ULTIMATE SANDER | 3

sander crank. Reverse the crank arm so the handle sticks out toward you, and place the handle back on the crank shaft. When you removed the Allen screw, a washer came with it. Be sure to put the washer is back in place when replacing the Allen screw. Make it snug. Now we're ready to sand [2].

With the sander ready to perform its magic, let's explore the sander's options and figure out its features. To start with, there is a plastic bag that contains a yellow paper that I will refer to as the "yellow package" in this article. When you open the plastic envelope, you will retrieve the folded yellow paper, an extra sanding disk, and two Allen keys. The yellow note is labeled "Tip" and provides care instructions for the sanding disk, as well as recommended replacements [3].

Taking a closer look at the sander itself, the disk is mounted and ready to go. The table includes a machined 90° protractor marked in 1° increments [4]. The table itself is of heavy-duty construction. The cranking action on the sander is quite smooth. The machine characterizes a professional quality tool. Even better, the tool comes ready to use.

Before we get started, let's double check the quadrant, using a machinist square, or as I did, a tool that has a reliable 90° angle, which is the default factory setting. The quadrant is set

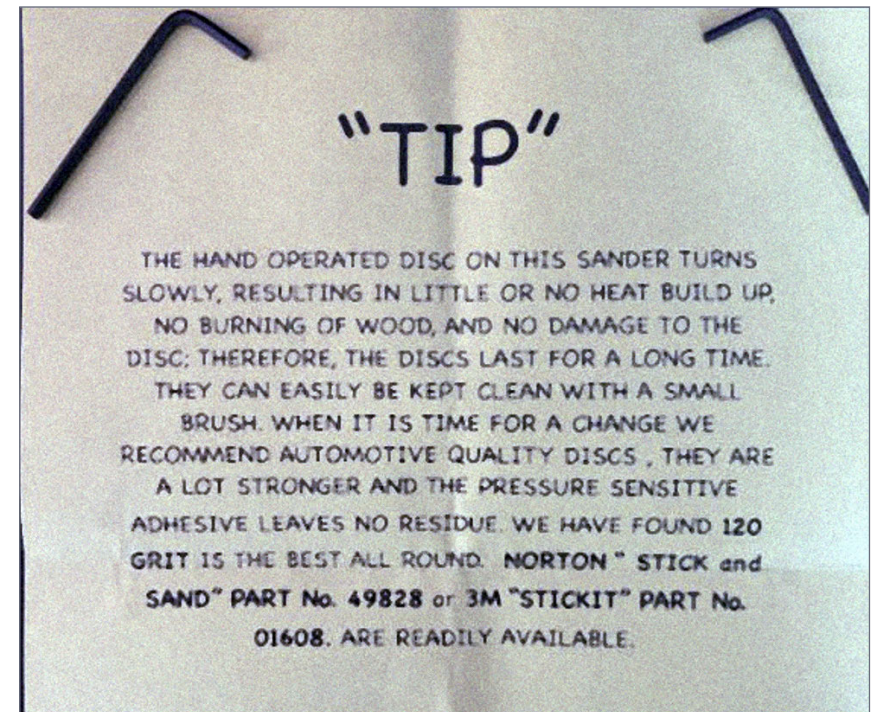


2. Reversing the handle so that it faces outward is the first step.

ULTIMATE SANDER | 4



3a, b. The "Tip" note below provides useful information.



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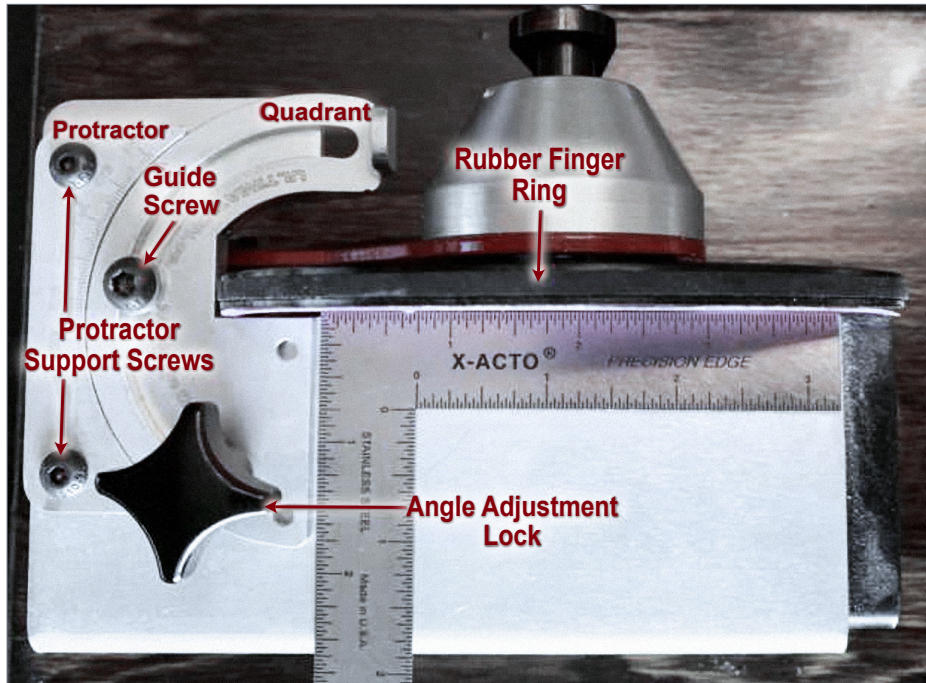
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ULTIMATE SANDER | 5

and checked at 90° and 45° before it leaves the factory, but because of bumps and jostles during shipping, you still want to verify the quadrant/protractor alignment.

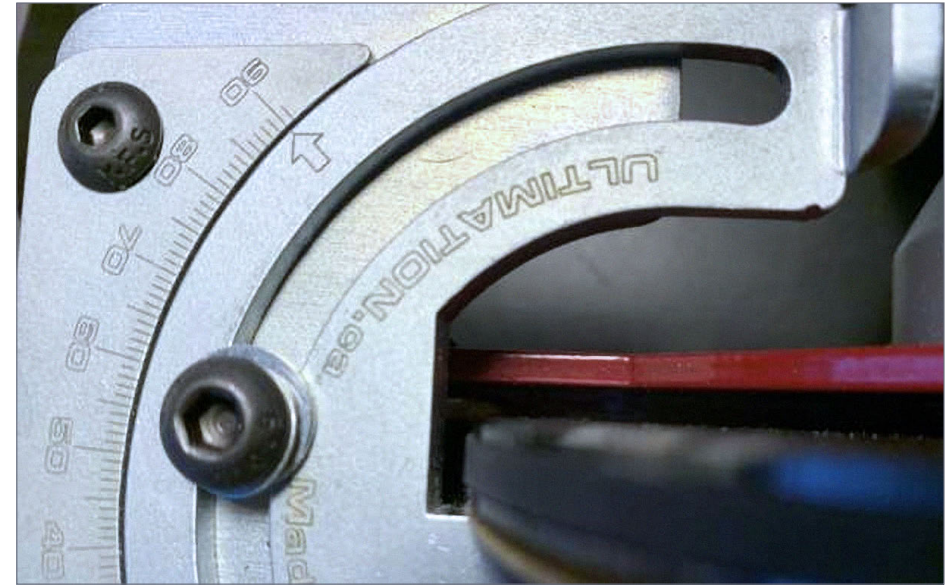
The machinist square should be matched to the guide and the disk surface at the same time. If not, loosen the angle adjustment lock, and match up the two surfaces, then lock the angle adjustment, making sure the reading on the quadrant/protractor 90° [5].

If alignment is still off, loosen the two protractor support screws with the included 3mm Allen key (don't remove, only



4. The Ultimaton Sander offers a quadrant to precisely set angles for sanding. If you're simply wanting to smooth the face of a cut, the black area on the right end of the sanding table offers a perfect 90° angle, without having to adjust.

ULTIMATE SANDER | 6



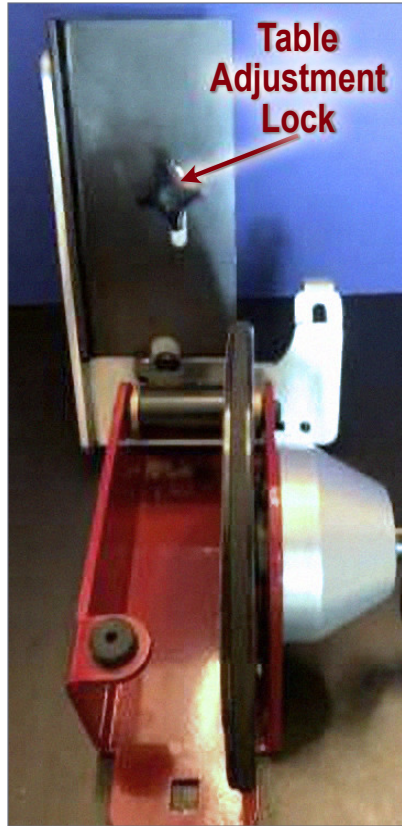
5. Before usage, be sure to use a machinist's square to verify that the quadrant is properly calibrated, pointing at 90°.

loosen), adjust the protractor until the 90° angle reads correctly (there is enough play in the protractor), and tighten the screws. This tool is so well-designed that the possibility of needing this adjustment was planned and built in.

Lifting the tabletop reveals the table adjustment lock, which allows the table to be moved left or right (lengthwise) to find a fresh band on the sanding disk as it begins to wear smooth [6]. This should extend the usable life of the sanding disk.

Finally, you can adjust the gap between the bale edge and the sander with a 2.5mm Allen screw located on the back side of the sander, underneath the quadrant area of the tabletop. I found the default setting perfectly acceptable for the included sandpaper, but adjusting it for a wider or narrower gap could accommodate heavier or finer sanding disks [7].





6. (Top) Lift the sanding table to reveal a table adjustment lock.

7. (Bottom) The gap set screw requires a 2.5mm Allen Key, but allows adjusting the gap between the sanding disk and the tabletop to accommodate various grits of sandpaper.



8. The Ultimation Sander is a bit tall and top-heavy, but mounting it to plywood helped a great deal with stability.

I almost never work on just one project at a time, so my workbench tends to be crowded. At any given time, I have several tools and related materials in various states of use. I found that I kept knocking the sander over, even though it is heavy, especially as I moved things around on my workbench. Mounting the sander to a left-over piece of plywood solved the problem [8].

As I spent more time using the Ultimation Sander, I found myself preferring to use the rubber finger ring along the edge of the sanding disk plate instead of the crank. This allows for a slower turn speed and greater precision in achieving the correct angle and exact material length. Whereas using the crank on the Ultimation Sander can remove a lot of material, I already have choppers, saws, and knives that I prefer for that job. I like the precision the sander offers.



ULTIMATE SANDER | 9

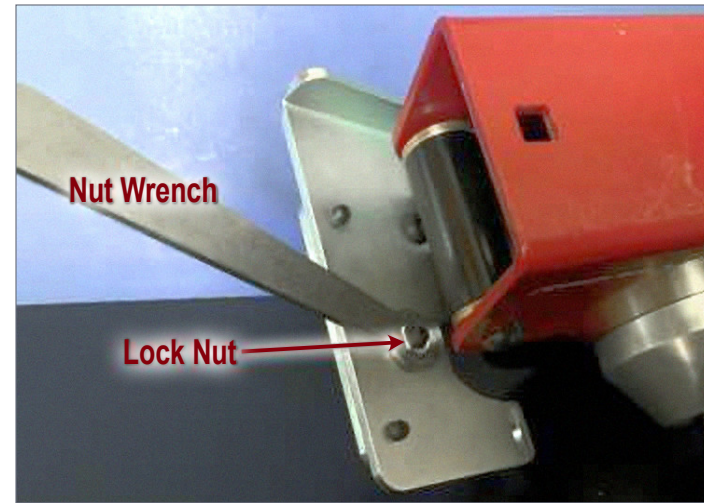
I had used the sander primarily to cut trim for buildings and houses, but building a trestle bridge for a friend's layout really put it to the test. Like most modelers, I have a jig for most of the bent construction. Normally, I would set up the angle on my Chopper, make the cut, and take it to my NWSL True Sander to square-up the cut. With the Ultimatum Sander, I simply set the angle and grind away, cutting the bents to length and proper angle in about half the time, and the pieces all fit together perfectly.

Shortly after I finished the trestle bridge, Ultimatum released an add-on for its sander called the "Repeater." The Repeater is an arm with a built-in quadrant that you can screw to the Ultimatum Sander in place of the original quadrant. The arm has a spring-loaded holder that allows you to set length. As you turn the wheel, the spring feeds the material into the sander at the correct angle, allowing for easy repetition of identical parts [9]. I wish I had this for the trestle!



9. The Repeater comes with a pamphlet, a 10mm nut wrench, and three different Allen keys (1.5mm, 3mm, and 4mm).

ULTIMATE SANDER | 10



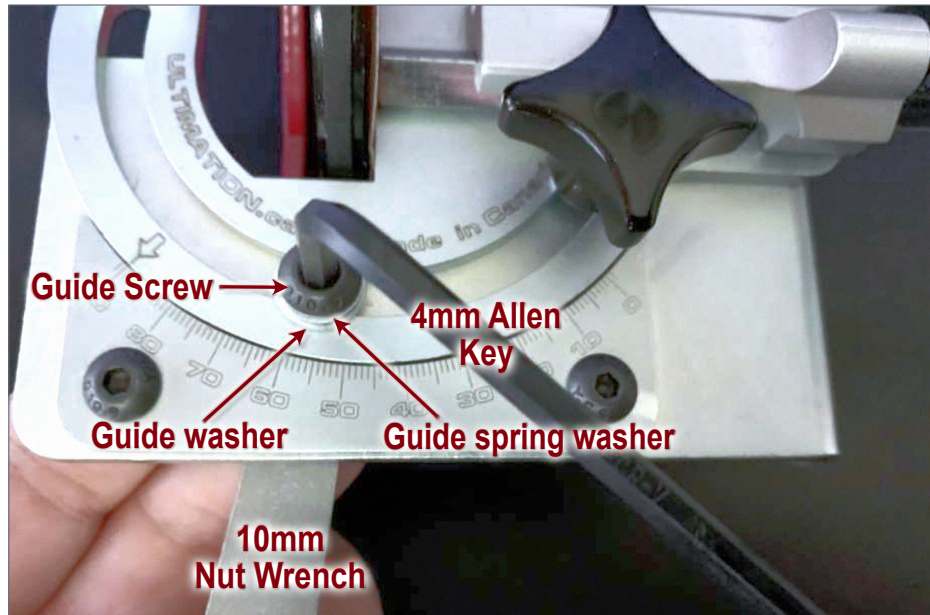
10. Removing the locknut on the guide screw.

Installation of the Repeater is straightforward, and all necessary tools are included in the package. Ultimatum has a 10-minute video to walk you through the process (www.youtube.com/watch?v=z310bI4Q044&feature=emb_title).

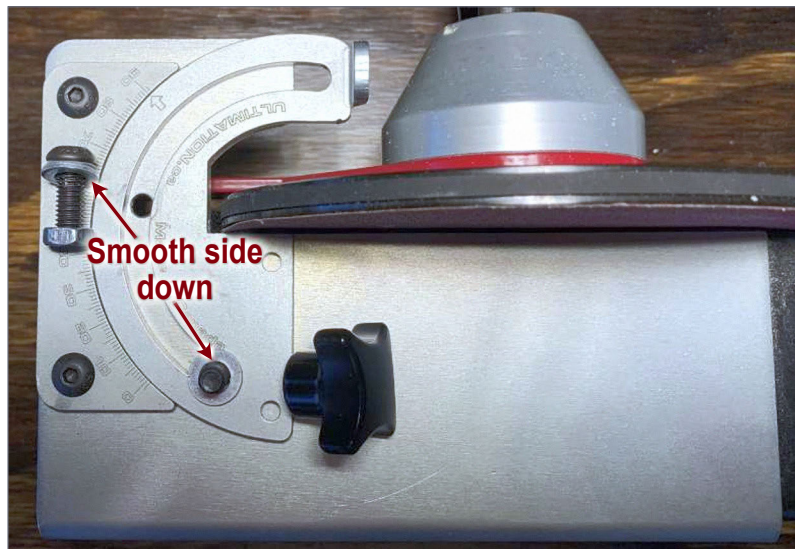
First step is to flip the sander over and remove the lock nut from the guide screw using the provided wrench [10]. Next, turn the sander right-side-up and use the 4mm Allen key to remove the guide screw from the quadrant [11]. Finally, unscrew the angle adjustment knob. Note that the guide screw and the adjustment knob both have washers to protect the quadrant from marring. These washers are shiny, smooth-side down [12]. With this, you can remove the original guide quadrant from the sander.

Replace the quadrant and Repeater assembly. Place the washer and angle adjustment knob onto its screw, but only tighten enough to hold the quadrant in place while inserting the guide screw and washer. Screw the guide screw down until it is finger-tight. Check to make sure that the quadrant moves





11. Removing the guide screw.

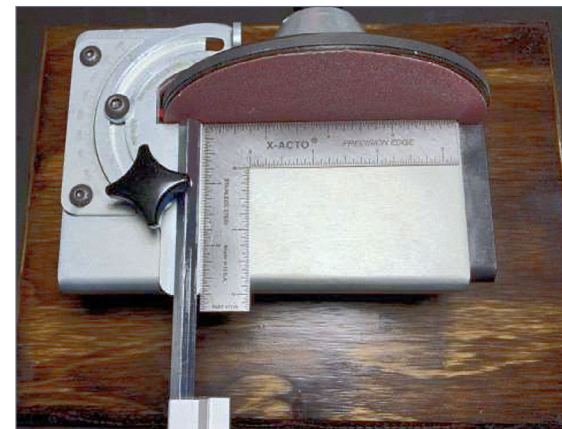


12. Take careful note of the washers on the guide and adjustment screws.

smoothly, but without too much play, and adjust the guide screw accordingly. Flip the table over and replace the lock nut. Once everything is snug, verify that the quadrant moves smoothly. Slide the carriage adjustment on the repeater arm so that it is out of the way [13]. Verify the quadrants alignment as discussed before with the original quadrant [14].



13. You must slide the carriage adjustment back all the way to verify quadrant alignment.

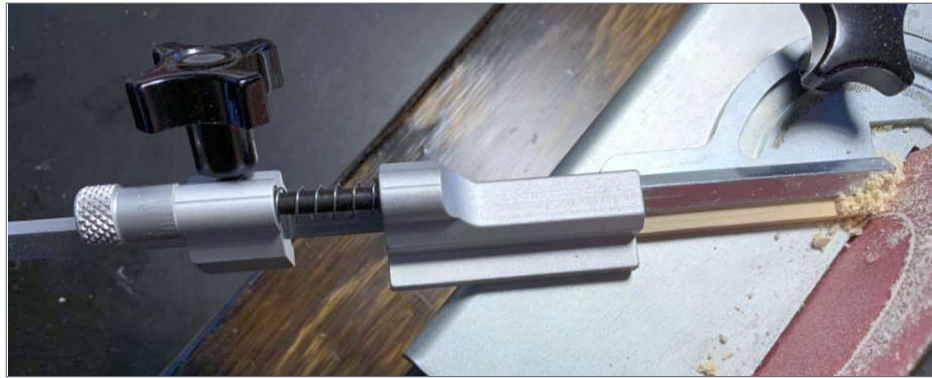


14. Verifying the alignment.

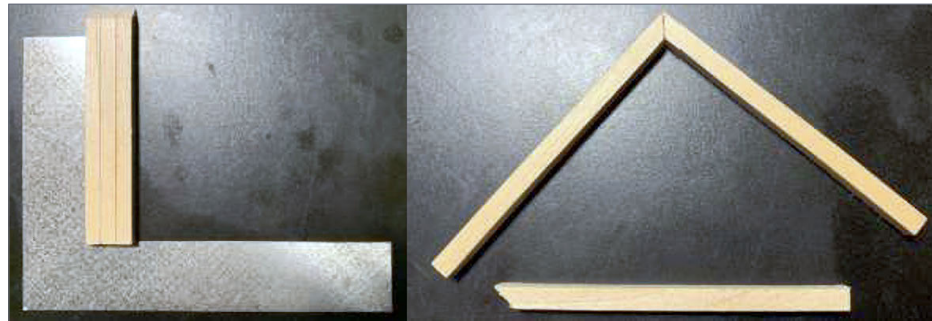


ULTIMATE SANDER | 13

To perform my initial test of the Repeater, I cut three pieces of ¼" stock to different lengths. I set the quadrant to 45° and then put the first, smallest piece on the carriage and sanded it until the end was at the correct angle [15]. I used this first piece as a master and set the carriage adjustment on the repeater arm. I created a lot of sander dust, but all three pieces of ¼" stock came out exactly the same length with the same 45° angle on one end. Not only was this a better result than the Chopper, but the pieces came out perfectly, so no further cleanup was needed [16].



15. Sanding the first 45° piece of ¼" stock.



16. All three pieces came out clean and identical. The 45° angles were a tight fit with each other.

ULTIMATE SANDER | 14

This would have been a great tool for the trestle bridge project. Let me re-state that. This is a must tool for any bridge project. The sanding disk cleans up nicely with a toothbrush.

This left one more feature to explore on the Repeater. On the end of the carriage, there is a micrometer. Each mark on the micrometer represents a thousandth of an inch [17]. This feature should be useful for those times when you need to shave a little bit off of a part you just cut, but a hobby knife or scalpel would be too imprecise.

To test the micrometer, I made six identical posts 1" tall. For the initial post, I set the micrometer to zero. For each post after that, I increased the micrometer by five. In the end, I had the expected stairstep pattern when laying the posts side by side.

The Ultimition Sander is very impressive and has changed how I view sanders. Previously, my Mirco-Mark electric disk sander was a tool of mass removal. My NWSL True Sander could be a precision tool, but the protractor was less than reliable. The Ultimition Sander has changed the way I work. It provides me with the precision I want when working on a contest model, while the repeater provides me with the repeatability I need for reproducing the same part over and over as in wood bridge construction. The Ultimition Sander with the Repeater has earned a prominent spot on my workbench. ✓



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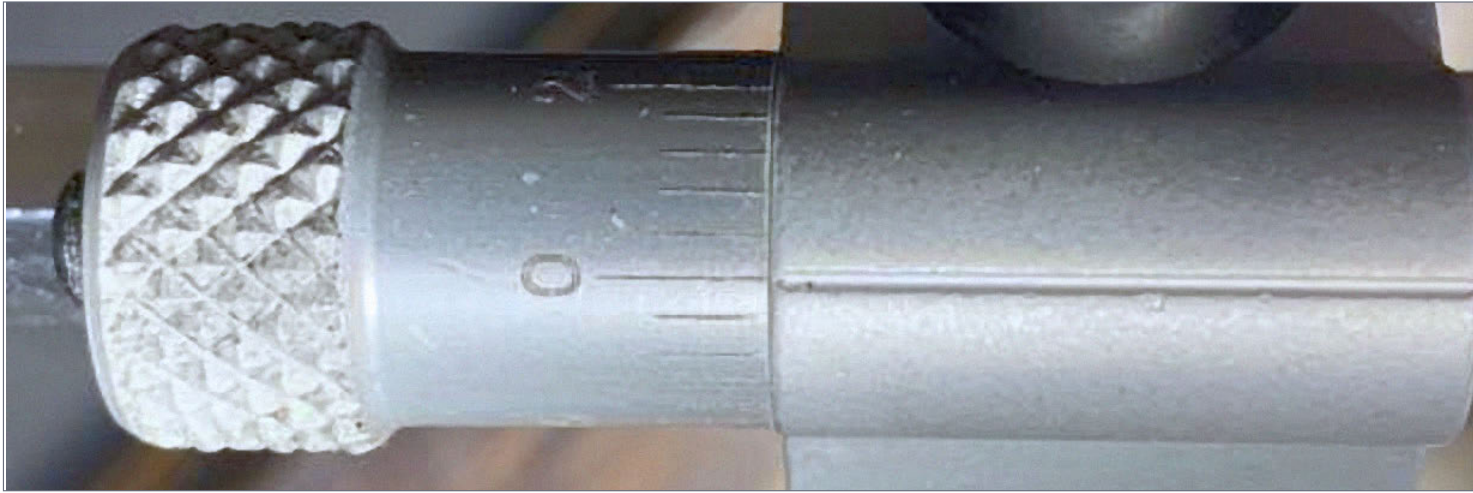
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17. A micrometer allows for precision adjustments to a thousandth of an inch.



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JEFF PALMER



Until Jeff retired, he spent 50 years developing software, and 25 years as a college professor.

His interest is in logging and mining with narrow gauge.

About two years ago, he completed his MMR (Master Model Railroader) certificate from the NMRA. During that journey, he had the privilege of meeting many of the modelers he looked up to. His goal is to be recognized in this group someday. ■



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Building a VIA Rail passenger combine

MRH Running Extra | December 2020

MARC SIMPSON MODELS COLONIST
COMBINE NO. 7189 FOR MIXED TRAIN SERVICE...



IN THE SUMMER OF 1988, after my first year of university, I took a summer job working for the Manitoba Geological Survey in the far northwestern part of the province, the town of Lunn Lake. I was fascinated by rail operations in the region, especially the tri-weekly “Lynn Lake Mixed,” which

ran from The Pas, approximately 242 rail miles to the south. The train featured clerestory-roofed, six-wheel combines behind a short string of freight cars [1].

The region’s railroading, with its short, mixed freights captured my imagination and inspired my model train layout. I had long wanted to build one of these ancient combines for my layout. When BGR Group released its HO resin kit of the combine a few years ago, I finally could get underway with the project. The kit has everything required for a very nicely detailed combine, including the resin molded coach body and clerestory roof, along with plastic and brass detailing parts [2].

The kit included an instruction manual with line drawings and diagrams for detailing a Colonist combine as it would have appeared immediately after emerging from rebuilding. However, I wanted to replicate a specific car, VIA 7189, as it appeared in the 1980s, after several decades of operation and updates [3]. I found the diagram didn’t always match the specific prototype in some areas, notably the number and placement of clerestory vents.

When modeling specific cars as they appeared at a particular time, it helps to find and study as many prototype photos as you can. These coaches changed a great deal during their long careers, as we will see, so your prototype may not match the diagram. Further, some of these modifications were to the structure of the combine itself and should be taken care of early in the build.

HISTORY OF THE PROTOTYPE

VIA Rail’s combines were originally built as Colonist coaches in the 1910s and 1920s. Canadian National predecessor



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VIA RAIL PASSENGER COMBINE | 3

Canadian Northern had ordered 130 heavyweight coaches in anticipation of a continuing wave of immigration to Canada's prairie regions from Eastern Europe and elsewhere. These cars were of steel construction with simple, spartan interiors.

When immigration dried up after WWI, many of these coaches became surplus, and Canadian National rebuilt 34 of them into combines for secondary passenger and mixed train service across Canada.

Because these combines typically operated behind several freight cars, the CN fitted the combines with a diesel generator in the vestibule of the baggage end. CN also added an extra heating stove to the passenger compartment to help keep passengers warm in the harsh northern areas where they would assign these coaches.

Many of these coaches continued on with VIA Rail in 1978, and only retired in the early 1990s [4].



1. GP38-2W 5564 with the Lynn Lake Mixed at Lynn Lake, MB, in August 1988. The day's train consisted of a boxcar, two Colonist combines, and a caboose.

VIA RAIL PASSENGER COMBINE | 4



2. Unbuilt BGR combine kit (note this is an older version with a separate roof).

ROOF DETAILING

Referring to prototype photos [3,4], I placed smoke jacks and clerestory vents on the roof of my combine. I used 0.005" styrene to represent protective sheet metal plating on the clerestory behind two of the coach's three smoke jacks [5].

The kit included two complete smoke jacks, but 7189 had three. Fortunately, the kit also included an assortment of smoke jack bases and stove pipes to represent various prototypes. I used one of the extra bases and 0.12" styrene tubing for the third smoke jack assembly [6].

I added the rooftop grab irons and ladder rests per the kit instructions. I removed the fill cap on the baggage compartment end of the car as this was not present on the 7189. The brass drip strips over the baggage doors were carefully added ensuring they are square and even.



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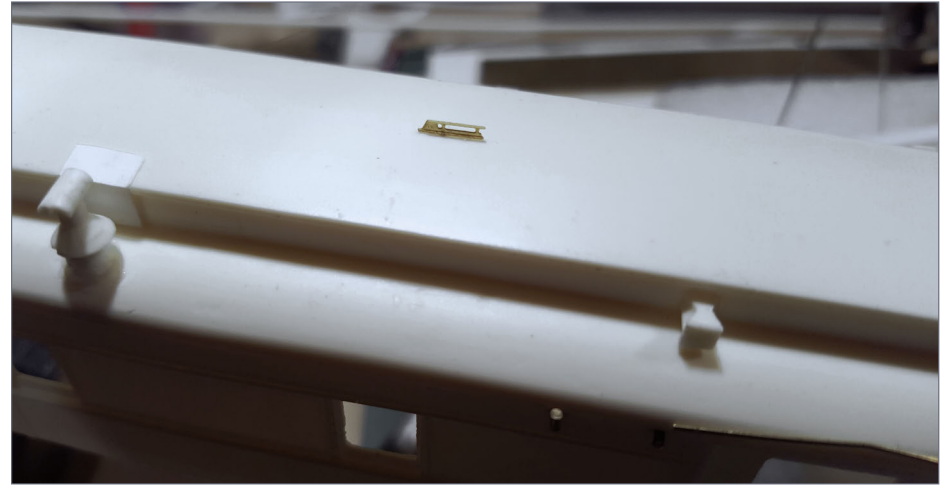


3. VIA Rail Colonist combine no. 7189 is stopped at the Churchill, MB, depot in January 1987. The view is of the battery-box side. Note that the coach's original trucks have been upgraded with roller bearing axles. *Mark Perry photo*

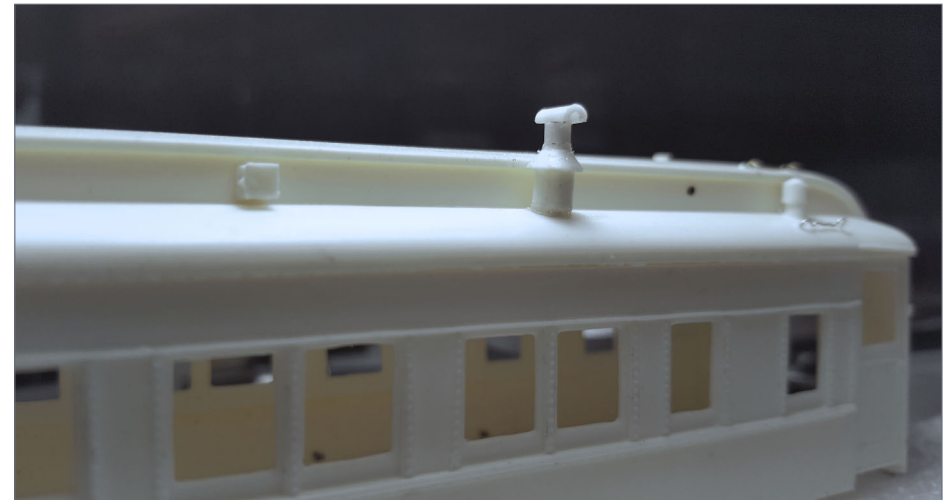


4. VIA 7189 as she appeared in 1978, viewing the brake gear side. The combine is still in CN's gray-and-black scheme. The vestibule in the baggage end has been modified to house a generator and the extra chimney and plated windows in the passenger end that denote an additional stove. *Mark Perry Photo*

VIA RAIL PASSENGER COMBINE | 6



5. Roof detailing on the combine's battery-box side. Note the styrene strips used for plating behind the smoke jack. Also note the Sinclair antenna. Because the combines were often at the end of mixed trains in remote locations, the coach crew needed a stronger radio to communicate with the dispatcher.



6. The combine had a third smoke jack for a stove in the rear of the passenger compartment on the brake gear side.



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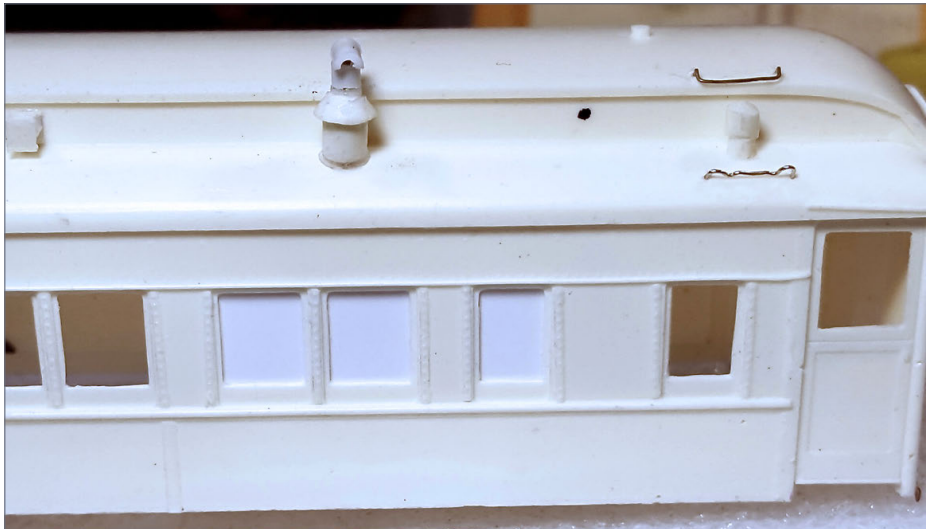
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CAR BODY DETAILING

A number of car body modifications are required for the 7189. As discussed above, a third heating stove was located in the passenger compartment of the car, taking the place of several seats. The railroad plated-over three windows around the stove with sheet metal on the prototype. I used a 1.3" x 0.4" piece of 0.020" styrene to do the job on the model [7].

The slow speeds of northern branch line service meant that truck generators on the combine were not viable, so CN had fitted it with a diesel generator located in vestibule of the baggage end. The shops plated-over the brake-gear-side entry door, and replaced the stairs with ladder stirrups [4].

To represent this on the model, I used a 0.020" styrene panel that I cut to size and fit flush in the door area. I used 0.030" brass wire to represent the fuel filler and breather pipes for the diesel generator's fuel tank. I made an exhaust and muffler



7. Blanked windows at stove location under 3rd smoke jack.



8. I plated-over a vestibule door and added fuel filler, fuel vent, and smokestack details to represent a generator that CN installed in the baggage end vestibule of the combine. Note the five-grab ladder. I used a template to achieve an even 18" scale spacing between them.

assembly with 0.030" brass rod and 0.12" styrene rod, and affixed it to the end of the car [8].

The BGR kit included wire grab irons and diagrams for their correct placement. I drilled no. 79 holes for the mounts. In some instances, I found that the prototype's grab irons were different. I bent my own grab irons from 0.012" phosphor bronze wire using photos as a guide. I found a file handle helpful for bending the curved grab irons to shape. I found it easier to add some of the grab irons after painting and decaling the cars [9].

FLOOR AND UNDERFRAME

The floor/underbody casting were slightly warped, which is not uncommon for resin parts. I fixed this by immersing the casting in hot water for a few minutes to soften the resin. I straightened



the casting and laid it flat side down, on the kitchen counter under some weights to cool. I then cut some 0.060"-thick x 0.8"-wide brass stock to a length of about 9.6" and epoxied it so it would fit between the inner vestibule walls of the car. The brass stock would add rigidity and weight [10]. I added nine ounces of weight. Well above the NMRA's recommendations, this added heft would help prevent derailments.

BRAKE SYSTEM AND OTHER UNDERFRAME DETAILS

I used the parts supplied in the kit for the underframe details for the most part. The resin air tanks were damaged in shipping, so I used some spare Branchline plastic air tanks instead, and they fit right in. I laid the brake piping per kit instructions, though there was a fair amount of guesswork required. I hung



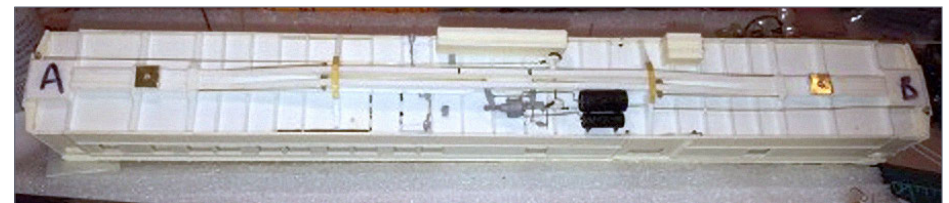
9. I made my own grab irons, including the curved ones here, with 0.012" phosphor bronze wire that I bent to shape. These grab irons would have interfered with the VIA Rail striping if I had placed them before painting and decaling.

the brake pulleys into place, complete with a dangling chain for added underframe detail. The end result looked reasonably convincing, though an actual carman might take issue [11].

The kit includes two nicely rendered etched brass vertical steps to attach below the baggage door, aligned with the inner edge of the baggage door. On the prototype, the lower rung of the steps was offset outward relative to the mounting location on the car, likely to line the steps up with the outside of the combine. I used flat-nose pliers to bend the steps to represent the offset. I cut two slots in the car body to fit the mounting tabs and secured the steps with gap-filling CA [12].



10. I used seven clamps to hold my brass stock weight to the combine's floor/frame assembly as the epoxy cured.



11. Underbody details. The brake piping and rigging was a combination of following the kit instructions and guesswork. Note the chain hanging between the pulley and the brake cylinder.

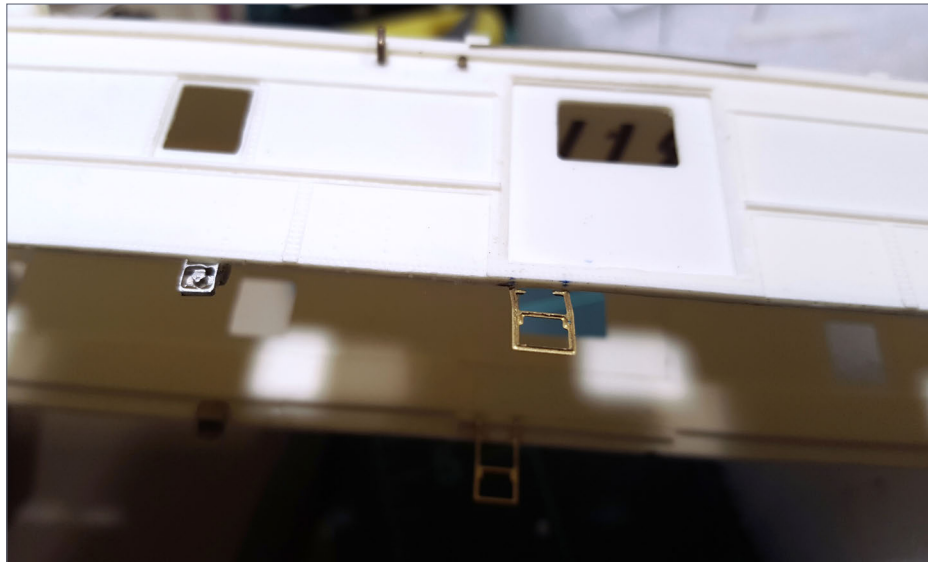


I used the kit step wells for the entryways on the passenger end of the car and on the one remaining doorway on the baggage end of the car. There is another vertical step below the blanked-out doorway. After some study I decided to use an etched metal vertical step from a Rapido Trains baggage express car I had on hand [13].

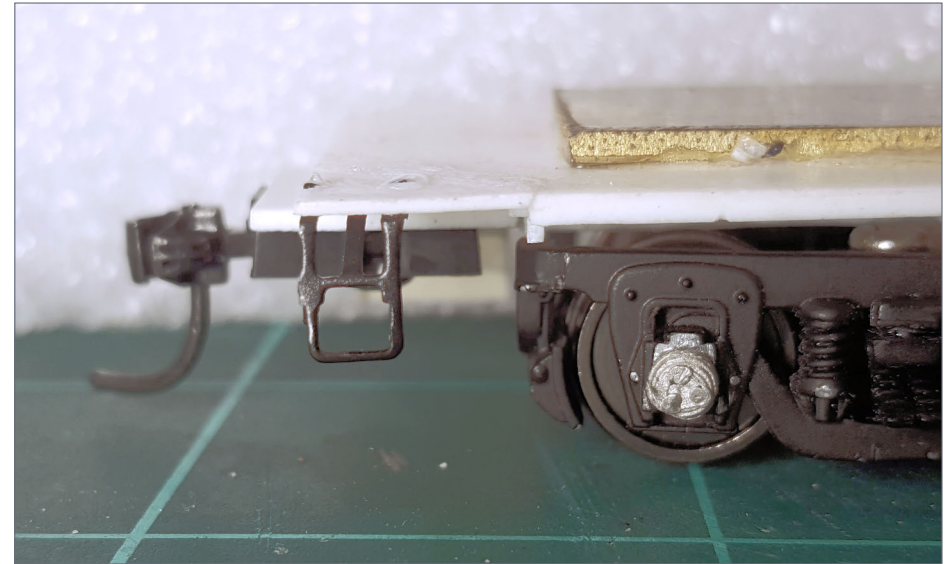
TRUCKS

I decided to use Walthers heavyweight trucks on my car instead of the BGR resin trucks included with the kit, since the resin trucks have proven to be problematic on a friend's layout. The Walthers trucks mount differently, so I had to do some additional work on the underbody.

I had to remove the original truck bolster from the underframe



12. Etched step with bend per prototype. Note the electrical outlet to the left of the steps. Proper placement of these outlets required painstaking research of 7189 prototype photos.



13. In-progress shot of vertical step in step well and blanked doorway.

and replace it with a new one 0.2" outboard of the original location. I used a 0.25" square of Evergreen Styrene strip 0.06" thick. This gave me the height I needed. I drilled and threaded for a 2-56 mounting screw, then epoxied the mounting block in place.

Epoxy has good hold, but not much shear strength. For reinforcement, I drilled four 0.030" holes through the corners of the mounting block and into the underframe. I inserted pins I made from 0.030" brass rod and filed them flat before gluing them in place. This allowed me to turn the trucks' mounting screws without breaking the epoxy bond holding the mounts. I had to trim some cross-bolster detail on the trucks for proper fit, but the details should not be visible under the car anyway [14].

To mount the trucks, I used a 5/8" x2-56 screw with a two Kadee washers above and below a 0.3"-diameter plastic bushing made from a length of plastic rod. This bushing keeps the truck from flopping around on a small screw in the truck's large hole.

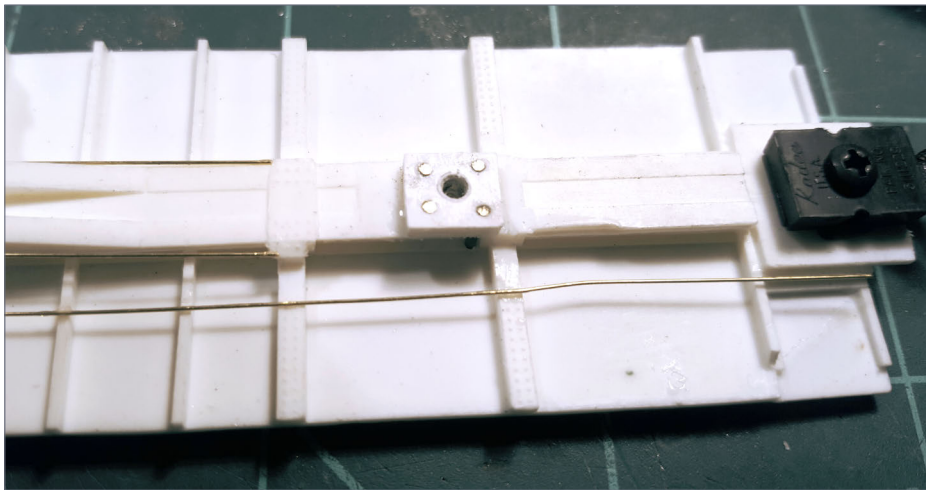


VIA RAIL PASSENGER COMBINE | 13

This combination also puts the couplers at the correct height above the rail. The metal washers keep the trucks freely swiveling and minimize wear on the mounting faces.

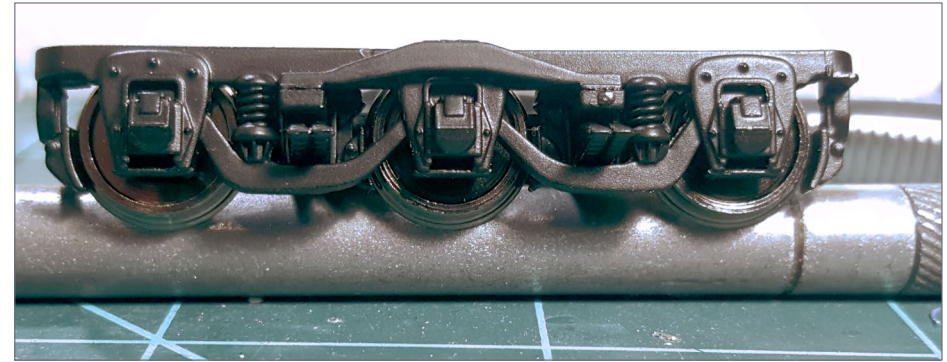
Of course, the heavyweight trucks from Walthers had journal boxes [15]. At some point before the early 1980s, the six-axle trucks were rebuilt to do away with the journal boxes and accommodate roller bearing axles. I wanted to represent this detail on my model of the 7189. Details West roller bearings (Part # BC-244) replicate the roller bearings on the heavyweight trucks.

After some experimentation, I decided my best approach would be to file off the old journal boxes. This required removing the angled support above the middle axle. I was cautious to keep the file flat and square to the truck, and checked my progress frequently [16]. Once the frames were prepared, I trimmed the Details West roller bearings so that



14. Mounting pad with brass rods to secure the new mounting pad. The cross members have been trimmed back to clear the truck and wheels. This is not visible from normal viewing angles, and disappears when the underbody is painted black.

VIA RAIL PASSENGER COMBINE | 14



15. Truck with journal boxes as it comes from Walthers.

most of the metal behind the face was gone [17]. I then epoxied the roller bearing castings onto the Walthers truck frame [18].

CAR INTERIOR

The BGR kit had a basic interior, consisting of resin seats and interior walls. I cut .020" styrene to make a floor, using the kit drawings as a guide so it fit snugly inside the walls. I removed the seat underneath the rooftop smoke jack and replaced it with a rough stove I cobbled out of a rectangular styrene shape. I used a length of styrene rod to represent the stovepipe. I didn't worry about detailing the stove because it will be very hard to see. With that, the interior was ready for painting [19].

PAINTING

Many thanks to my friend Chris Cullen for painting the car for me; he did a great job on it.

When dealing with resins, there are a few necessary preparation steps before painting. I had cleaned the castings prior to starting construction with Sylvan Scale Models "Resin Prep," followed by rinsing with warm water. Before having the



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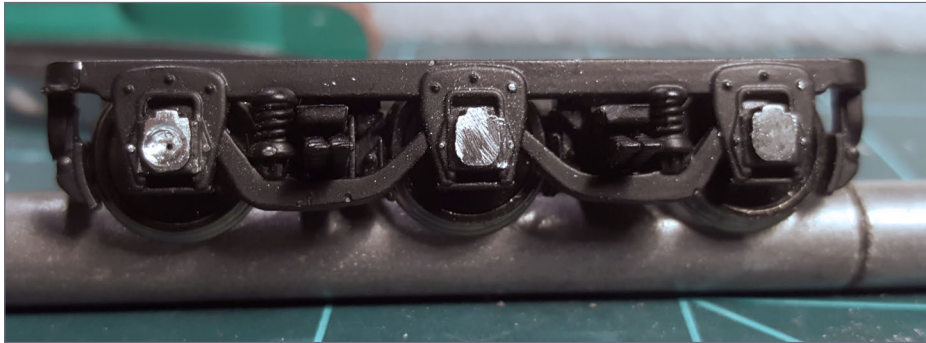
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VIA RAIL PASSENGER COMBINE | 15

car painted, I was sure to wash it again in soapy water to remove oils or fingerprints.

Chris primed the car with “Mr. Surfacer 1200” from Gunze Sagayo. After priming, Chris noticed that a portion of the strip above the windows was missing. This is a common issue with resin cars, but I didn’t notice this during construction. Chris used a piece of 0.015” wire with some CA to make the problem



16. Truck with journal boxes filed off. My initial idea had been to drill out the journal boxes, but I was dissatisfied with my ability to center the hole, as evidenced by the journal box on the left.



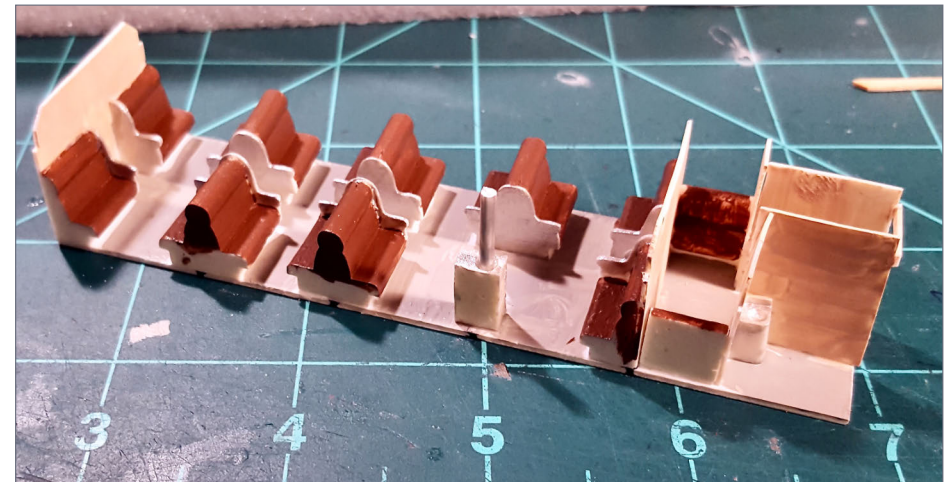
17. The original roller bearing casting is on the right, and my trimmed-down version on the left. This task became easier and quicker as I learned what I was doing. This was a good thing because there were 12 of them.

VIA RAIL PASSENGER COMBINE | 16

disappear. This is just one more good reason to prime a model before painting.



18. All finished, with roller bearing wheelsets. I questioned my sanity when I began upgrading such small parts, but I think it was worth it.



19. Painted passenger compartment interior.



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Chris painted the car with Tru Color TCP-095 VIA blue. He painted the roof and ends with TLT 010016 warm black. The underbody and trucks received Floquil weathered black.

DECALING

I chose Black Cat decals for the VIA logo and striping. Their printing process uses a layer of white on the decal sheet before the yellow, which improves the decals' opacity so that the underlying blue does not show through. The decal is thicker, but application of Solvaset solves that issue.

I started with the yellow VIA stripes. Fortunately, the stripes go along the bottom of the window sills, which helps keep the stripes straight. The process is a bit tricky because the Black Cat decal stripes are segmented and have to be applied in sections. I tried to end the decal sections at the vertical batten strips to hide the joints. An extremely important part of doing the decals is patience! I didn't rush this step, as that only causes grief. The decaling process probably took longer for me than most of the other tasks building the car.

I floated the decals into place with Microscale Microset. Once I had the decals placed, I followed with Microsol and Solvaset to settle the decals. I repeated application as many times as necessary to get the decals to snuggle-down over the batten strips, rivets and windowsills. Getting the decals to settle over the horizontal batten strip took what seemed like gallons of Solvaset.

I touched-up minor flaws with TLT VIA yellow paint. The color is a close match to the decal stripes. There are other brands (Rapido Protopaint, Trucolor, Scalecoat 2) that also have an acceptable CN/VIA yellow.

Based on photos, I placed the car number at the center of the car body, centered on the rivets at the car mid-point and 3 rivets vertically above the bottom of the car. Several photos had enough resolution that I could actually count the rivets (I'm one of those people!) to locate the car number.



20. Finished decals on car with unpainted grab irons installed.

Once I had all the decals in place, I sealed them with Tamiya TS-80 flat clear coat.

FINISHING DETAILS

I applied the remaining grab irons in their mounting holes at the various locations on the car and touched them up with paint. The vertical grabs by the doorways were painted VIA blue. The curved grabs were painted yellow on the grab over the yellow stripes, with the remainder painted blue.

I applied cut levers to the ends of the cars. These were more modern style than the cars were delivered with using Details West part CL-1028. I also applied air hoses to the appropriate locations on the car.

I used the supplied clear glazing for the windows. I cut the material to 0.4" strips per the instructions and then cut the window sections to fit. I attached the windows using canopy glue, which dries clear and doesn't fog styrene.

I replicated the frosting on the washroom windows by painting the inside of the clear styrene with white paint. I modeled window shades using Microscale gray Clearfilm decals. I varied



VIA RAIL PASSENGER COMBINE | 19

the shade heights on the windows, since they were almost never uniform in the photos.

With that, the combine was ready for service to the various remote locations along the Hudson Bay Railway [21, 22]. Now I need to get going on the other two combines that ran in mixed-train service in northern Manitoba. ✓



21. A view of the completed battery side of 7189.



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VIA RAIL PASSENGER COMBINE | 20



22. A view of the completed brake-gear side of 7189.

MARC SIMPSON



Marc, 51, lives in the Greater Vancouver, British Columbia area with his wife and 3 children. Marc works as a geologist in mining exploration.

Marc has long had an interest in trains, with some of his earliest childhood memories involving watching passing Canadian National and Canadian Pacific freight trains on family roadtrips. These were often the highlight of the trip for him.

When he and his wife purchased the current family home one of the selling points was a dedicated room for a layout. The Flin Flon Subdivision of the Hudson Bay Railway circa 1983 is well underway in the dedicated 14x20 space. ■



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THE AH-HAH MOMENT

column



MRH Running Extra | December 2020

JOE FUGATE FINDS A SAFE LINER FOR
ROLLING STOCK STORAGE DRAWERS ...



RATE THIS ARTICLE

AS I STARTED DISMANTLING MY SISKIYOU LINE 1, I realized I needed a good place to store all my rolling stock and locos until Siskiyou Line 2 could start taking equipment.

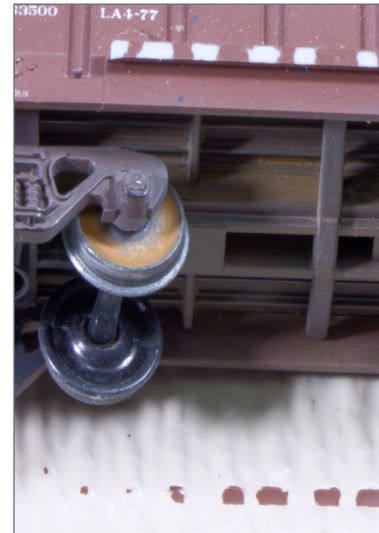
I decided to use plastic bins on rollers with pull-out drawers [1]. I like the rollers because I can easily move them anywhere I need at any time. And when it comes time to move, I just roll them right out of the house and up into the moving van!

I lined the drawers with vinyl drawer liners and laid the cars on their sides. But as I got thinking about it after a few months, I became concerned the car paint might stick to the drawer liners and get damaged. It turns out my fears were not unfounded [2].



1. I'm storing my rolling stock in these plastic storage bins on rollers. If I need to move them around the room for any reason, the rollers make that fast and painless. Note I use bungee chords around them to keep the drawers from accidentally flying open (ask me how I know that could be a problem). I also line the drawers with acid-free archival paper. See text for details.

THE AH-HAH MOMENT | 2



2. After only six months in drawers with vinyl drawer liners, some cars started sticking to the liner, damaging the paint.



3. Before any worse damage could befall my rolling stock, I replaced the old liners with acid-free archival paper intended to be used between photos in storage. I figure the cars will be a lot safer now.

While only a few cars had paint damage after 6 months, the wake-up call is quite clear: replace those vinyl drawer liners immediately!

I reasoned my best option would be to find some kind of archival paper liner using acid-free paper. I found exactly what I was looking for: archival paper intended to be used to separate photos in storage, made by Archival Methods. *Ah-hah!*

My drawers are 9x11 inches and the best paper size as to cost is 100 sheets of 11x14 paper for \$16.95 (plus shipping), making each sheet just 17 cents per drawer. A very small price to pay to keep the finish on my rolling stock and locos safe from damage!

I trim each sheet on a paper cutter and it fits right into the drawer [3]. ☑

To get a shopping list for this article, visit the *MRH* website at this link: mrhmag.com/magazine/running-extra/2020-12/ah-hah-moment



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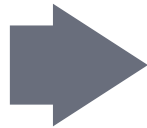
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Here are all the pages from
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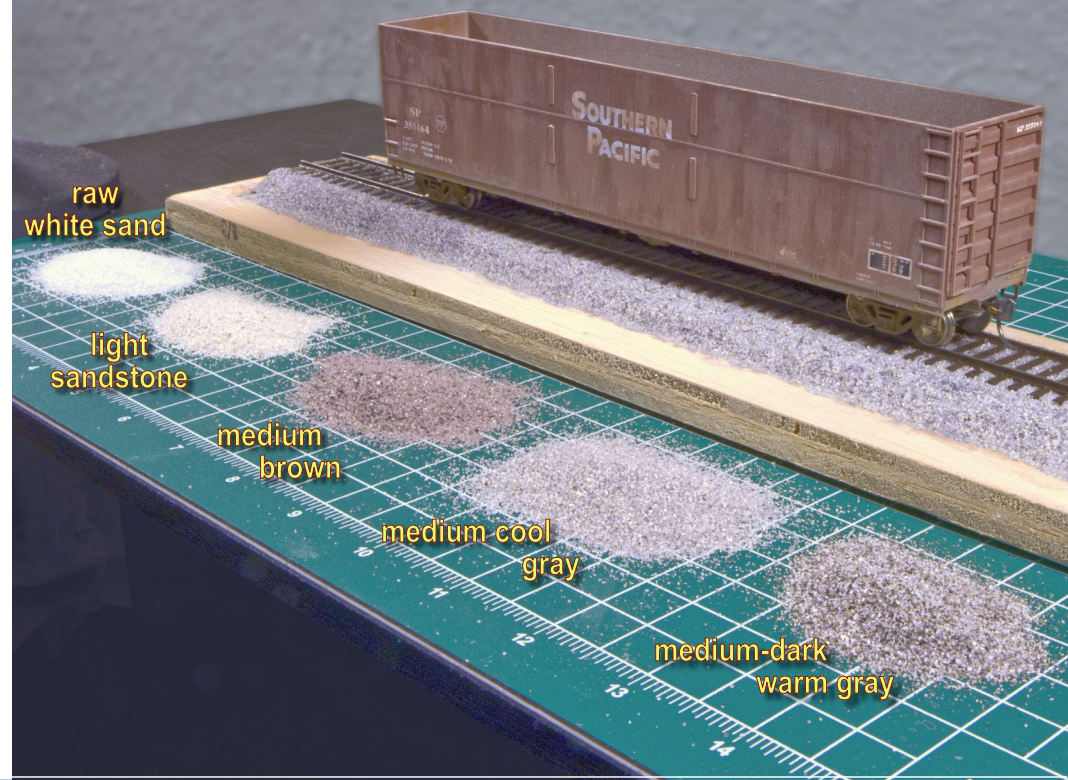


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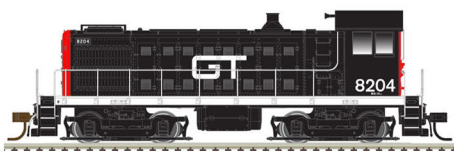
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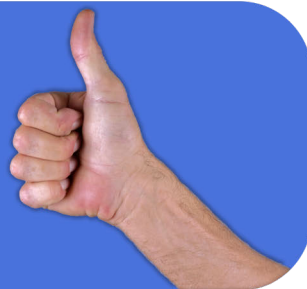
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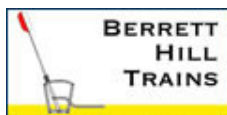
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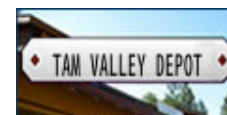
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PUBLISHER'S MUSINGS



Model Railroad Hobbyist | December 2020

JOE FUGATE DISCUSSES LAYOUT
LIGHTING WITH LED STRIPS ...



WHEN I STARTED DISMANTLING MY OLD SISKIYOU LINE 1 (SL1) layout a couple years ago, I felt quite excited at my newfound freedom on my next layout, Siskiyou Line 2 (SL2).

Layout construction options now exist here circa 2020 that didn't exist when I started SL1 in 1991 and I could now explore the latest and greatest tech. One of these new tech innovations that's come about is LED strip lighting.

Shopping for LED strips

The first question with LED strip lights: how much light do I need to get a well lit layout space?

LED strip vendors measure light output in lumens, so some conversion to incandescent lights can be helpful. For example, if a 5 meter (16.4ft) LED strip listing says it's 300 lumens per meter, what does that really mean?

Looking at table [1], I can see 300 lumens per meter equals roughly 30 watts of incandescent light per meter. In other words, that sounds rather dim – but is it really?

Let me throw in another consideration as well – the distance of the light from the layout surface. If you remember your high school science class, light drops off with the square of the



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1. Table of lumens to much more familiar incandescent light bulb watt equivalents.

Comparing light to energy					
Lumens	220+	400+	700+	900+	1300+
Incandescent	25w	40w	60w	75w	100w

distance. Actually there's another term for this intensity of light on a surface – it's called a lux.

As a minimal illumination level on your layout surface, start at ~500 lux. If you want more details to be visible, aim more for ~1000 lux. More on how to compute lux in a bit.

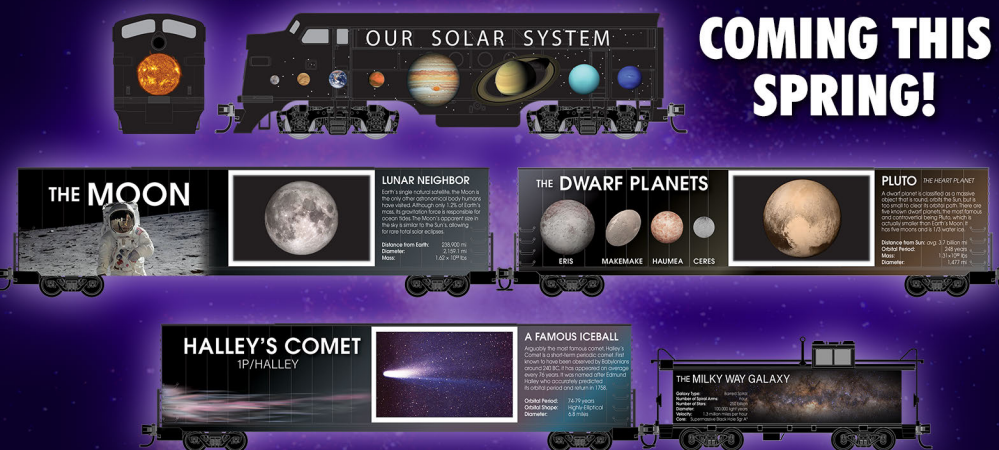
For my layout, I like to use a shadowbox type of construction, with the viewing window being about 13 -15 inches or so.

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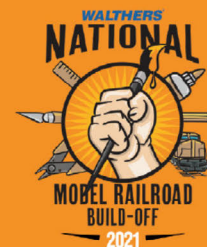
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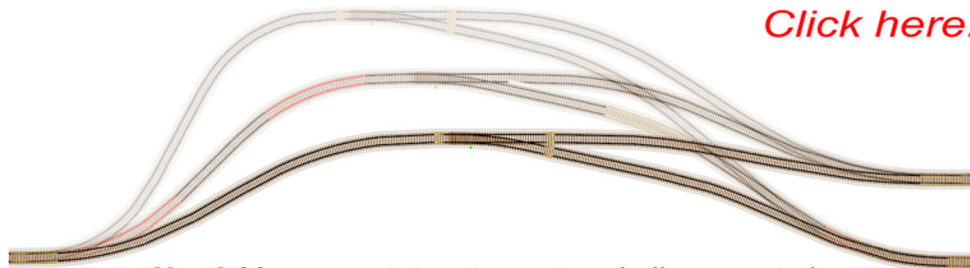
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PUBLISHER'S MUSINGS | 3

That may sound small, but if I have the layout height at 50" minimum, then the bottom of the valance comes to 65". Higher deck heights can see the bottom of the valance move to 70" or more in short order.



2. My SL2 TOMA modules on display, with an estimated 1000 lux of light.

If I take that 300 lumens and compute the lux at 14" using the lumens to lux calculator here [dmslighting.com/tools/il-luminationconverter.html], I get about 1000 lux, nice and



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PUBLISHER'S MUSINGS | 4

bright, actually! To see what this looks like in real life, here are my TOMA modules [2] at the last National Train Show – looks plenty bright to me! So that 300 lumen LED strip works fine.

Notice if I put this LED strip instead behind a valance that's hanging from an eight-foot ceiling, the strip now sits at least 40" above the layout surface for a layout that's at 50" from the floor.

Using the lumens to lux calculator again, I get a bit less than 100 lux, which is way too dim!

It's important to not only know the lumens of output from the LED strip, but to also know how far the light will need to travel to get to the layout surface. Using lumen/lux math, you can pretty much nail the look you're after.

Avoid waterproof strips

You can get LED strips that have a waterproofing plastic coating so they can be used safely outdoors.

However, various modelers have reported the waterproof coating will yellow over time as the heat from the LEDs cause it to change color. Yes, the LEDs don't put out a lot of heat, but with the coating being right on top of the LEDs, what heat there is builds up and yellows the coating.

That yellowing will change the light color of the LED strip, which isn't good news. Long story short: avoid LED strips that have a waterproof coating.

LED strips have what's called an IP (ingress protection) rating. You want an IP of 20 or less to avoid the waterproof coating. An IP of 65 or more has the waterproof coating, so avoid those.

What's a good LED color?

LED strips also come in different color temperatures such as warm white, cool white, and so on. A more precise description of light color uses Kelvin temperature ratings.

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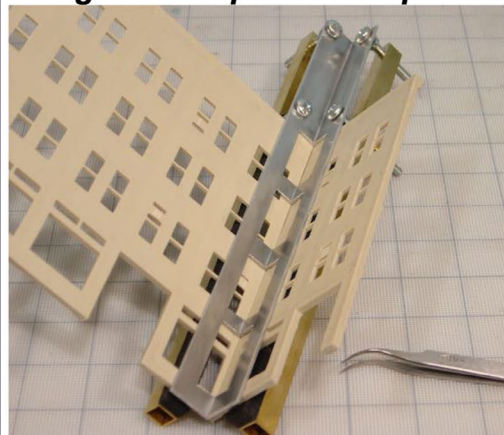
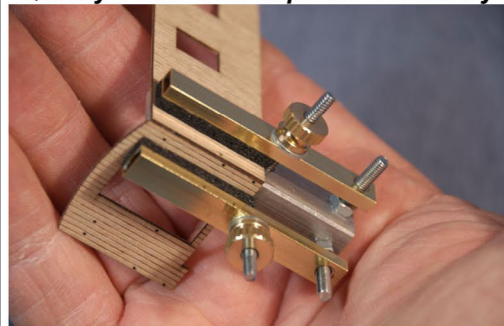
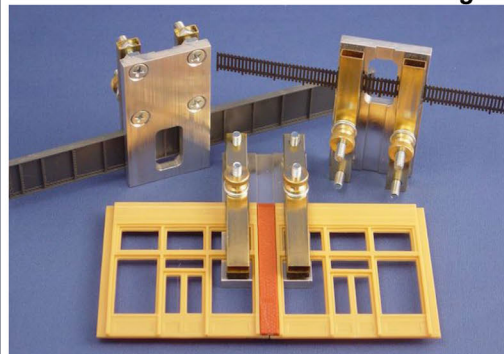
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A standard incandescent light bulb has a color temperature of about 2700K. See chart [3] for a comparison of the different lighting colors.

Halogen lights come in at about 3200K.

Warm white fluorescent tube bulbs run about 3500K, and cool white fluorescents come in at around 4200K.

Light at around 4000K is considered "neutral white" or "daylight."

Moving up to "crystal white" fluorescent bulbs, their color approaches 5000K. I call it "hospital light" because an area lit with light of this color makes me feel like I'm in a hospital. For me, it's an uninviting light color to use for a layout space.

If you're not sure, 4000K is a good safe light color to aim for.

I personally prefer a warmer white color, say about 3000K. This color feels like a warm summer day to me – which I find gives a quite pleasant look to the layout.

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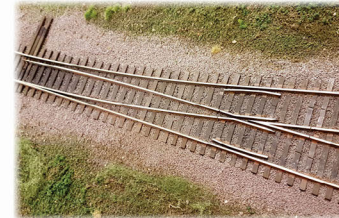
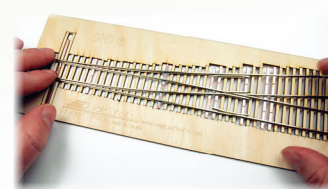


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3. Light color diagram showing the different Kelvin (K) temperatures of light.

I just feel happy inside when I look at 3000K layout lighting. It's a tad more blue than 2700K incandescents, which look too orange to me. I know Tony Koester said he liked the more bluish daylight color on his previous Appalachian layout because it brought out the greens and increased the sense of being up in the high mountains.

While I'm discussing light color, one notion I've seen thrown around has been using RGB LED strips since you can program those to be any color you want. You can literally have a red sunset look, to a blue moonlight look, all the way to a white light look or anything in between.

In fact, RGB LED strips don't produce a very smooth white light, it's always got a tinge of color to it, especially in photographs. You can run a second strip of RGB LEDs along the valance with a consistent white LED strip. Then use dimmers to control the mix of white light with other colors such as red or blue to get special looks.



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I've just scratched the surface

I've just scratched the surface here regarding all the considerations needed to get great layout lighting using LED strips. The strips don't cost too much, especially if you shop online, so get a strip or two and try them out for yourself.

I'm also planning to do a much more in-depth video on Train-Masters TV about LED strip lighting. I will delve into all the different considerations such as double row LED strips, LED color rendering index (CRI), and how to pick a good power supply for your LED strip lights.

I encourage anyone who is using LED strip lights to post their experiences in the reader comments for this article. The collective wisdom you all have can be extremely helpful to the rest of us trying to decide on the best way to go with our layout lighting.

See you online! ☒



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LAST ISSUE'S RATINGS

The three top-rated articles in the [November 2020 issue](#) of *Model Railroad Hobbyist* are:

4.7 First Look: miniprints

4.6 Truck painting "jig"

4.6 November 2020 News

Issue overall: **4.6**

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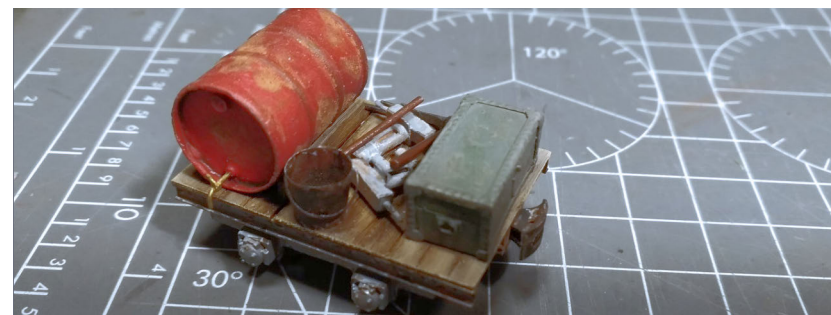
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Best of the
MRH WEBSITE Website MRH mrhmag.com
THIS MONTH

Model Railroad Hobbyist | December 2020

Compiled by **JOE FUGATE**



O scale narrow gauge fun

MRH forum member **py_fr** (Pierre-Yann Bridé) has a long-running blog about his micro-TOMA module that he's doing:

"Yes it is O scale, narrow gauge. More exactly 0e, similar to On30 but with a scale of 1/43.5 (French/British O scale).

I like O scale, especially for the level of detail I can build on the model. I never was able to something like that in HO."

Go have a look and follow along to enjoy some great modeling in a small space!



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

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

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1. Greg Baker has been experimenting with how to make conifers that have a more realistic needle texture.

Making conifers that have needles

MRH forum member **Mountangoatgreg** (Greg Baker) decided to explore making more realistic conifers that have a true needle texture:

"I have been honing my skills in regards to making fir trees. I am working on it, I want to make sure I can get consistent results before declaring victory. Once I have mastered my methods I will work on write up. They are getting better.

The paint is still wet on this one, it will still need a bit of a trim when it dries, but this one, this is looking right."

Check out Greg's thread to see how it's coming!

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



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2. Bob Morningstar shows his own spray paint booth and then asked other forum members to share their solutions.

Finding the perfect home made spray booth

Forum member **bobmorning** (Bob Morningstar) describes his approach to making a spray booth:

"I used a plastic storage container tipped on its side, a bright white under kitchen cabinet LED light unit, and a inexpensive bathroom ventilation fan. The 3" ducting is stored in a storage caddy until I extend it out the basement door.

I don't shoot oil based paints (Floquil) any longer, so the lack of an "explosion proof" fan is not a factor."

Bob then went on to ask for others to share what they have done: many have posted their home made booth designs.

If you're thinking of making your own spray booth, this thread has some great ideas for making one inexpensively.

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



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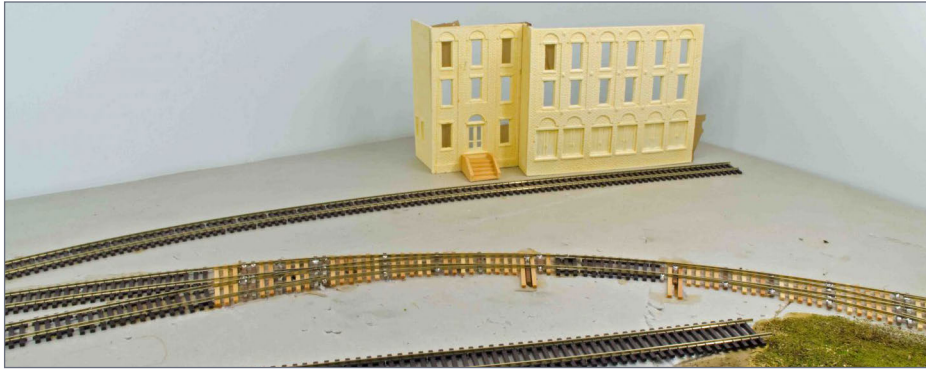
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3. Here's a before and after shot of a Cornhill Town urban scene being developed by Rob Clark.

Developing an urban scene, step-by-step

MRH forum member **fernpoint** (Rob Clark) chronicles the process building his Cornhill Towb urban scene on his *MRH* blog.

"I would like a lot more buildings arranged in an interesting fashion (I love Earl Smallshaw's approach), but downtown Chicago it ain't, so I have to be inventive in a very small space."

Visit Rob's blog and follow the progress, step-by-step!

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

Latest *MRH* Weekly photo fun thread

Every week, a new Weekly Photo Fun thread appears. It's frequently loaded with inspiring photos of great modeling ...

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



4. Forum member **rjthomas909** posted a photo of his new Baldwin Frisco diesel, complete with DCC sound. On the bottom, Mark Mathu posted this fantastic lumberyard scene.

★★★★★
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WHAT'S NEAT

column



Model Railroad Hobbyist | December 2020



KEN PATTERSON'S COLUMN THIS MONTH ...

- Installing a TCS Trainspeed1
- Using glue to glue coal loads, glue ground foam, and glue ballast
- Merry Christmas!



WHAT'S NEAT! MODEL RAILROADING install a train Speedometer



November 2020 show

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ON THIS MONTH'S WHAT'S NEAT VIDEO, Ken shows how he installed a Train Control Systems (tcsdcc.com) Trainspeed1 speedometer on his layout and demonstrates using Deluxe Materials (deluxematerials.co.uk) Ballast Magic and Ballast Bond to glue down ballast, as well as using it to glue some other things.

Installing the Trainspeed1 Speedometer



1. Ken installs a TCS Trainspeed1 speedometer (tcsdcc.com/1547) on his River Diorama in the first segment. Here he uses a caliper to measure out the 7.283" that equals 1/100th of a scale mile in HO scale.



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2. Ken installs the sensors between the rails. The speedometer can be used with Z, N, TT, HO, OO, S, O, and G (1:24) scales and with sensor separations of 1/25, 1/50, 1/100 (factory default) and 1/200 of a mile. Kilometers are also supported.

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3. The display on the speedometer is nearly as thick as the plywood Ken uses as the fascia for his layout. Cutting and filing the correct sized hole was easy.



4. Ken spray painted a faceplate for the speedometer, using dry transfer letters for the MPH. The second hole is for an on/off switch. To finish up he repainted the entire fascia with a layer of high-gloss polyurethane.

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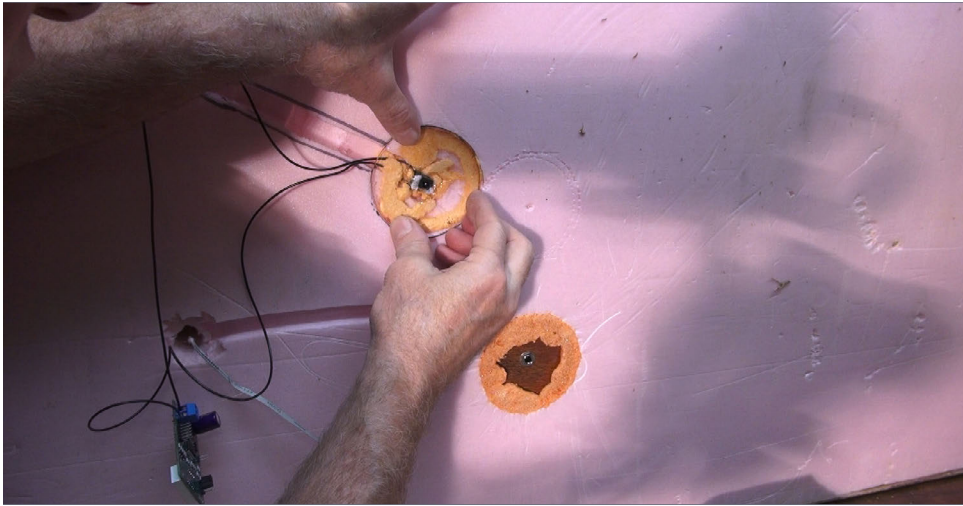
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5. Ken salvaged a power socket from an unused electronic device and connected it to the speedometer to make the power connection detachable. Ken excavates the foam bottom of the module for the wire runs and connections so that the bottom will lay flat when he returns it to the layout. Here he uses Great Stuff foam to secure the power socket.

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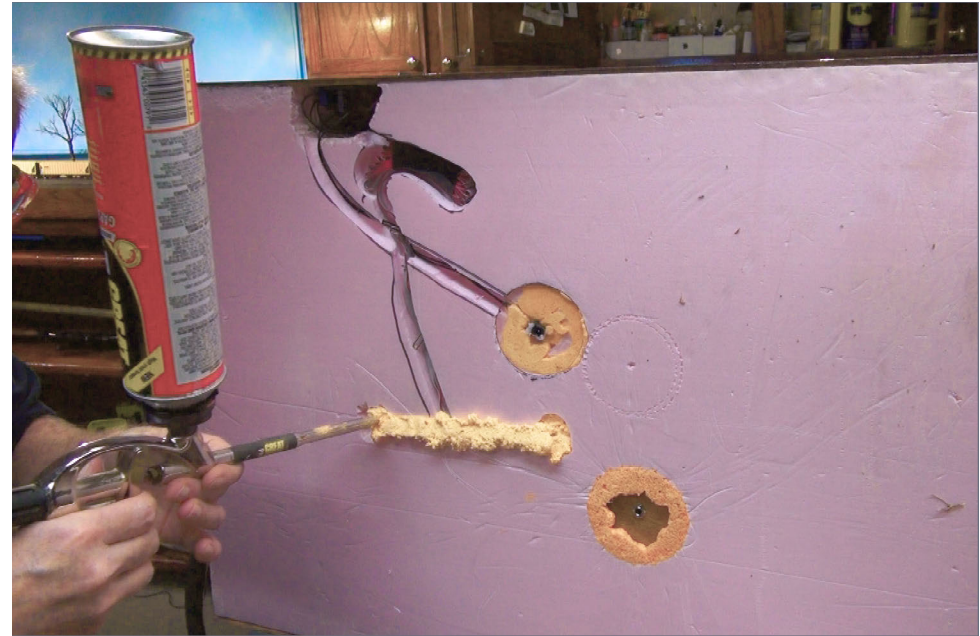
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6. Ken fills in the trenches he excavated in the foam with Great Stuff expanding foam.

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7. After the foam cures, he uses a saw to cut the excess foam off flush with the base of the module.



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8. With the module reinstalled on the layout and the power plugged in, it's time for the speedometer to earn its keep.

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Bonding rocks and trees with Ballast Magic and Ballast Bond



9. Ken shows how to use Deluxe Materials Ballast Magic powder adhesive to glue ballast down, and then goes on to demonstrate a couple of other uses for it.

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10. Here Ken has mixed the Ballast Magic with pulverized coal to add a layer of real coal to the top of the molded plastic load, then mists it with water to activate the adhesive.



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11. Two hours later the coal was solidly attached to the plastic load, without spilled glue damaging the weathering.



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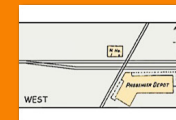
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12. Ken also demonstrates how he used the Ballast Magic dry adhesive to glue Woodland Scenics ground foam onto a SuperTree. After two hours the ground foam was firmly attached to the tree armature.

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13. For those who prefer liquid adhesives, Deluxe Materials also has Ballast Bond, which has a wetting agent built into it.

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14. Ken demonstrates how to use the Ballast Bond on real rock ballast. The two sections to his right are real rock on the end and Woodland Scenics ballast in the middle, both of which were mixed with Ballast Magic. The Ballast Magic sections were solidly dry in two hours, and Ballast Bond section soon thereafter. Watch the video for how Ken does everything step-by-step.

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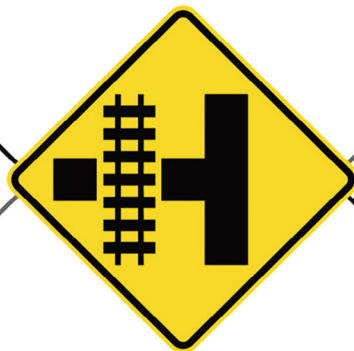
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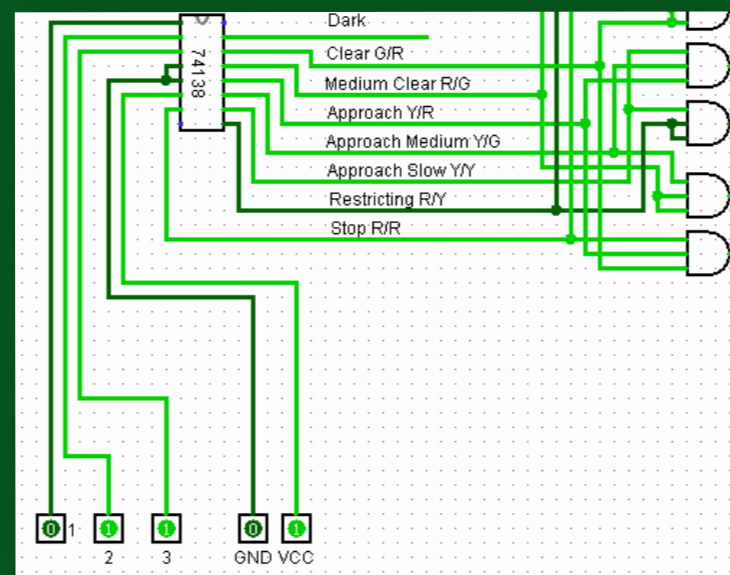


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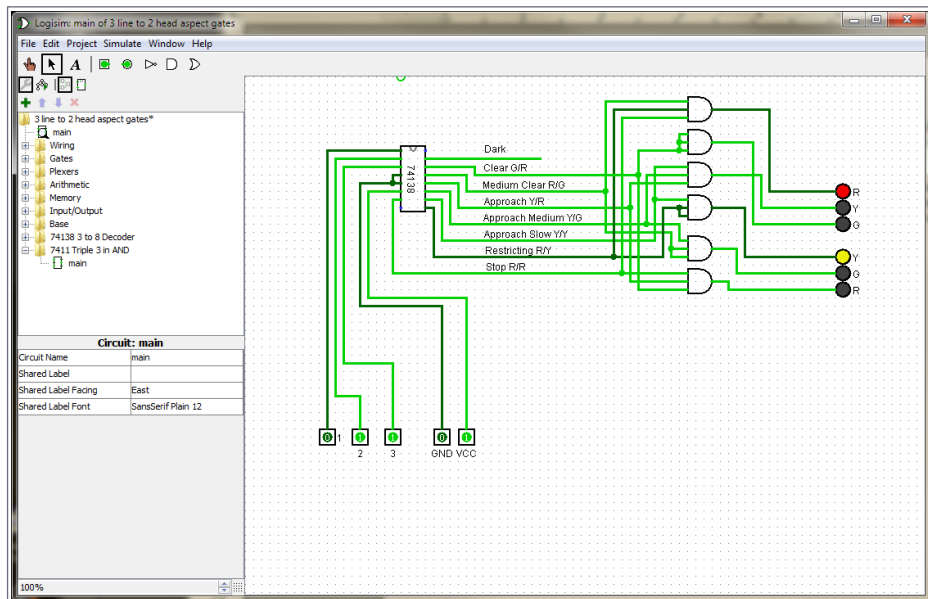


EARL HACKETT JR. DESIGNS SMALL CIRCUIT BOARDS ...

AFTER READING COMMENTS IN THE JANUARY ISSUE ABOUT DOCUMENTING WIRING and Eagle from Cadsoft (currently owned by AutoDesk), I wanted to share how easy and inexpensive professional quality circuit boards can be produced. If I'm only going to build a single circuit, I'll sometimes hardwire it on a prototyping board. If multiple boards are needed, a custom PC board is the only way to go.

CIRCUIT DESIGN

The first step is to design the circuit and make sure it works as planned. For this I use a little circuit design program called Logisim. It was created by Professor Carl Burch at Hendrix College as an aid in teaching digital circuit design. It's a free download at the Sourceforge website. Google Logisim and you will get plenty of links. Unlike many free programs, Logisim is very capable. It has tri-state components so you can even design a complete computer. If a component is not in the library, you can easily create it by copying the logic diagram from the component data sheet. Professor Burch left Hendrix College some years ago and is no longer supporting Logisim. Development has been taken over by a group of Swiss institutions. The latest version is Logisim Evolution and is available at [Github.com](https://github.com).



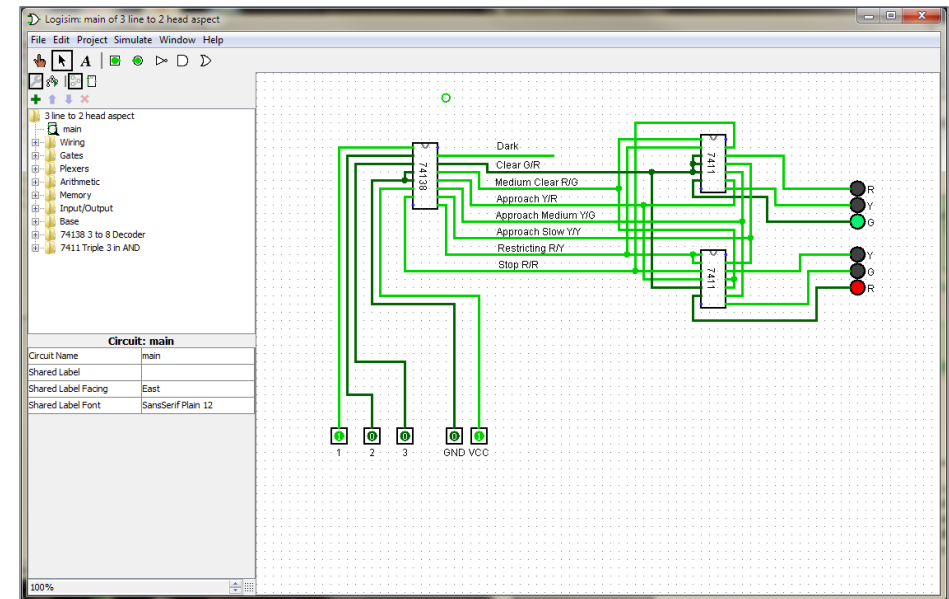
1. A circuit design for signals using a 74138 integrated circuit (IC) chip.

A simple circuit can be created to produce the 1952 C&O aspects for a three-head signal [1]. The 74138 is known as a “decoder.” It accepts a three-bit binary number and activates one of eight outputs that correspond to that number. In my circuit [1] these outputs correspond to individual signal aspects (e.g., red/green).

The 74138 is one of many digital integrated circuits in libraries available as free downloads. They are all shown as 74nn series, but you can use whichever family you prefer – LS, HC, HCT, etc.

I've shown the logic portion of the circuit as individual gates. This allows maximum flexibility when designing more complicated circuits. Once you know the circuit works, you can replace the individual gates with ICs, in this case a pair of 7411 triple 3-input gates.

Logisim assumes you know to hook up the GND and VCC pins on the ICs so they are dummy pins in the models. GND and VCC inputs are needed to enable some chips such as the 74138.



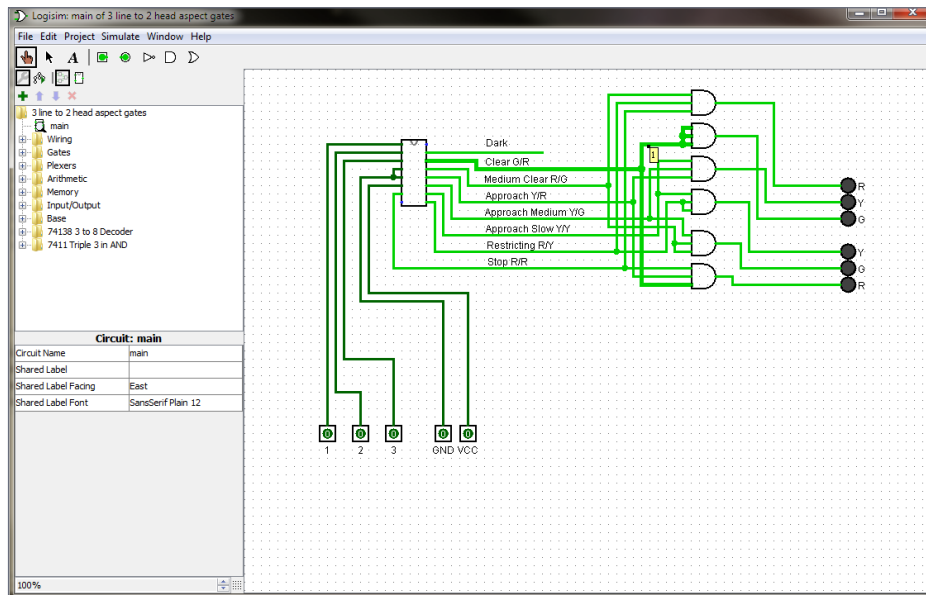
2. Six gates have been replaced with a pair of 7411 ICs.

Drawing [2] is the circuit schematic, which you can test to see if it still has the desired behavior. Once you are satisfied with the design it's time to design the circuit board.

CIRCUIT SCHEMATIC

I like using Eagle v7.3 to design the boards; newer versions may have a slightly different interface. Eagle Lite is a free download of the full program. The only limitation is the board size, about 3" x 4". That doesn't sound like much, but I've crammed as many as a dozen ICs into these small boards. Keeping the board as small as possible also minimizes cost.

Complex ICs like the 74138 are presented in Eagle as a logical image. ICs containing only individual gates are presented as individual gates. This allows you to swap logical gates between physical ICs and swap pins on individual gates to simplify the wiring layout. This is an important feature when wiring a



3. Clicking on a wire in the Logisim design software highlights the path.

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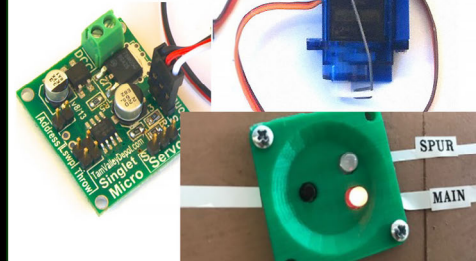
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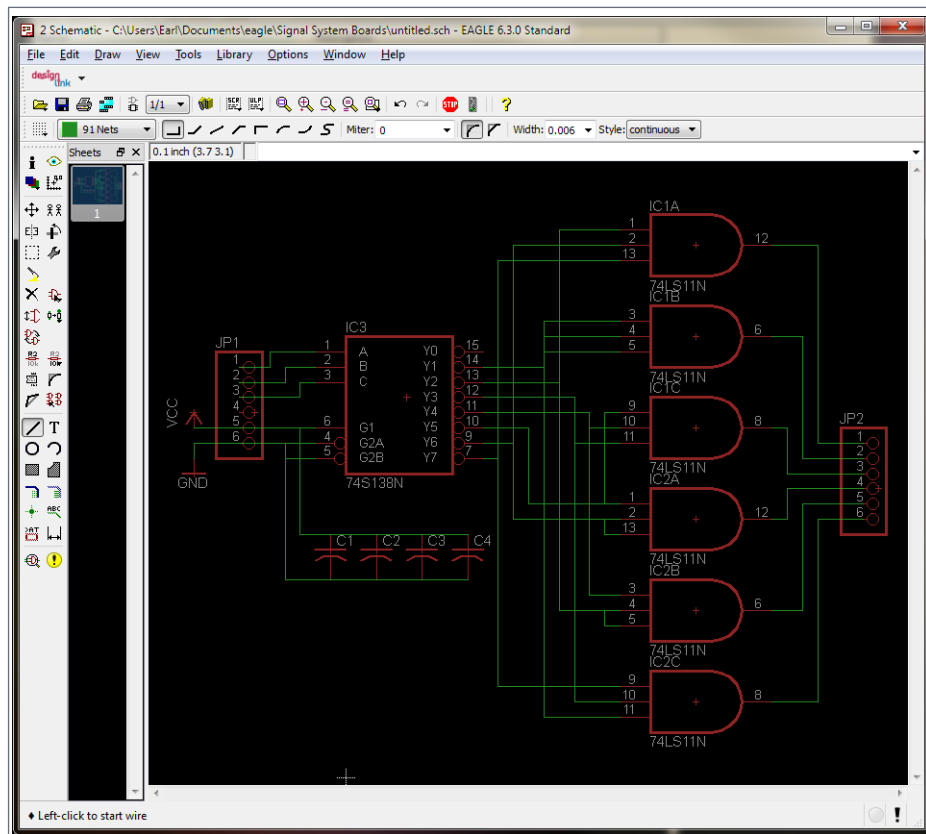


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complex logic circuit. We'll switch back to the original Logisim gate format to generate the circuit in Eagle.

A handy feature of Logisim is that when you click on a wire, the entire net is highlighted [3]. This makes it easy to copy the circuit from Logisim into Eagle.

You will need to experiment to learn how the libraries work in Eagle. The biggest problem is finding the desired component. Most libraries have easily understood names, but some are not; headers are in "pinhead" and resistors etc. are in "rcl." Otherwise

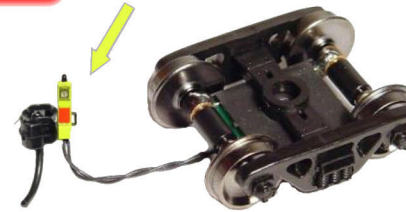


4. The circuit schematic created in Logisim is copied into Eagle to prepare for making the circuit board.

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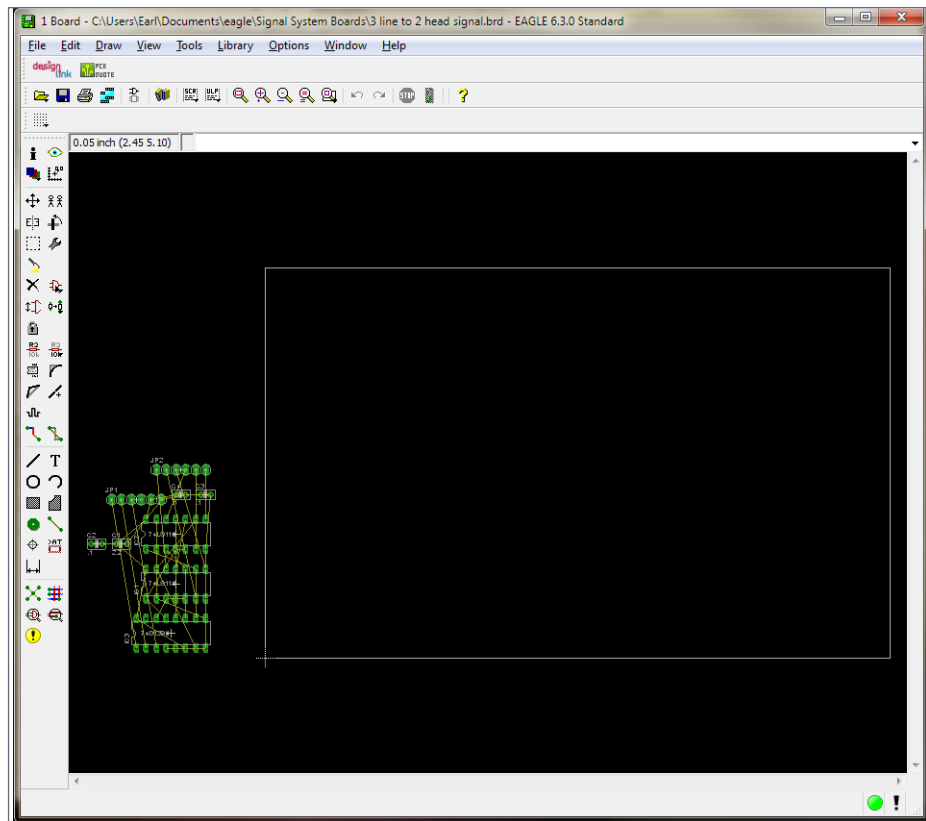
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CUSTOM CIRCUIT BOARDS | 6

the interface is like other Windows programs. The Logisim circuit easily copies into an Eagle schematic [4]. The Logisim LEDs and input pins have been replaced with headers that can interconnect with cables going to the physical hardware. I've added filter capacitors that are not on the Logisim schematic but are necessary for reliable operation of the real circuit.

DESIGNING THE CIRCUIT BOARD

Now comes the fun part, converting the schematic to a circuit board. You just click the 5th button from the left on the top bar



5. The Eagle software positions the components and creates a circuit board outline at the click of a button.

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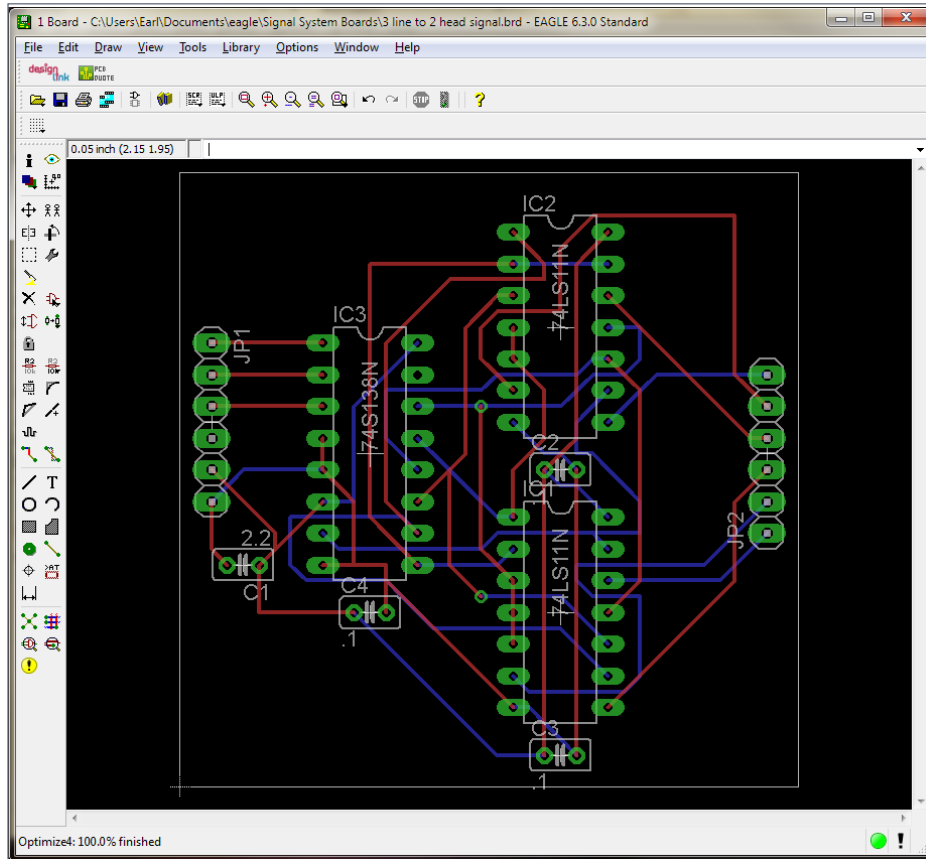
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CUSTOM CIRCUIT BOARDS | 7

and Eagle creates the board outline and loads the parts off board for you to position [5].

That's a big board for such a small circuit so we'll shrink it. The next thing to do is position the components on the board. You can play around with them to minimize wires crossing each other. In this case I'll put the header connections on either end of the board. Eagle comes with an autorouter; software that automatically runs the wiring traces for you.



6. The components are positioned on the circuit board to minimize wire crossings. Connections are made with the Autorouter feature.

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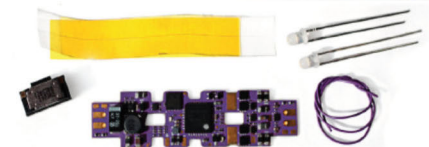
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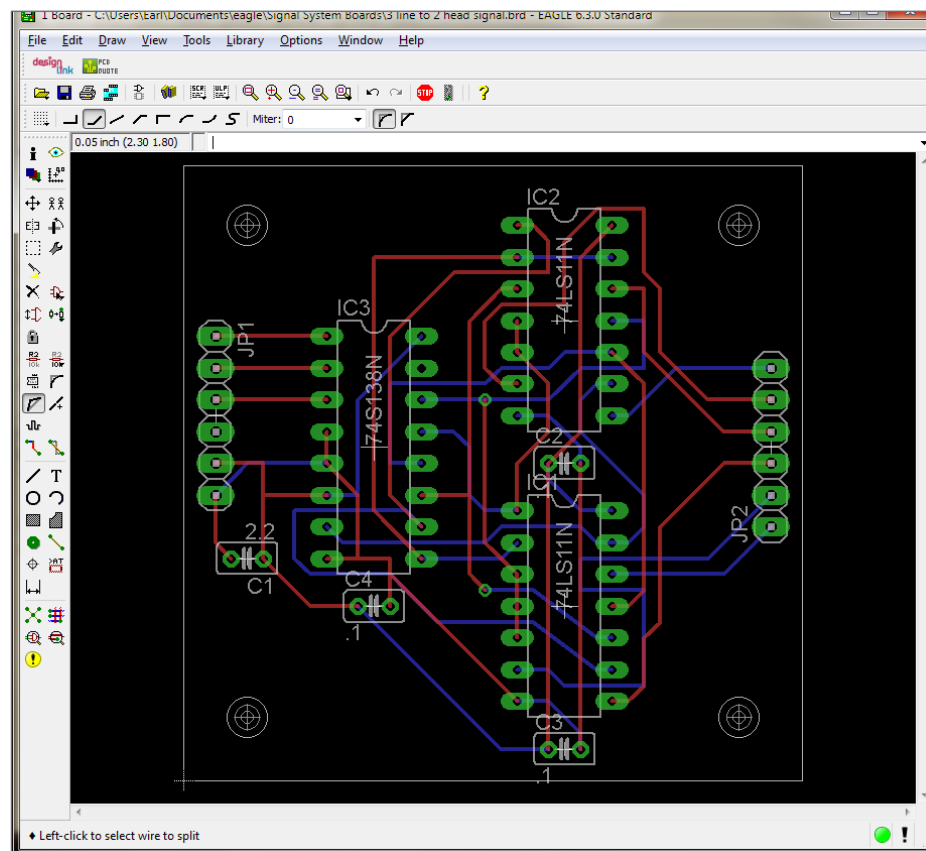
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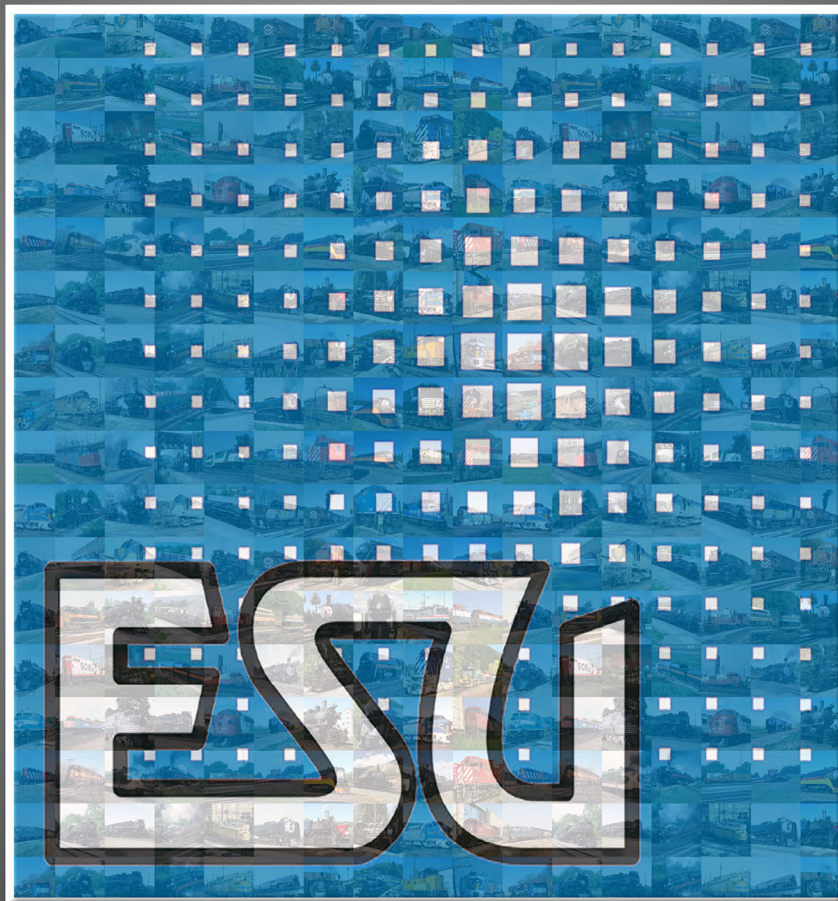
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7. The connections to the solder pads are cleaned up. Four 0.125" mounting holes for #4 machine screws have been added. The board design is now ready to be sent to a PC fabrication shop.

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pins to its IC as short as possible. The autorouter doesn't understand this and sometimes makes a mess.

Of the inexpensive off-shore board shops, Pcbcart (pcbcart.com) has the best combination of low price, quality, and customer service. Many shops, including Pcbcart, request you send the Gerber files used to create the artwork for the board. Eagle generates these files in the CAM processor under the files tab. You should ask the board shop which version of the files they prefer. When ordering from overseas, the board cost is low, but transportation costs are high – air freight across the Pacific. On small orders transportation can cost as much as the product. You should compare total costs with some North American suppliers. I have used both Advanced Circuits (pcbnet.com) and Accutrace (pcb4u.com). ✓



EARL HACKETT JR.



Earl has lives on the East Coast, and has been fascinated by trains from childhood.

Earl is a retired DuPont chemist, and very loosely models the Chesapeake & Ohio from Ronceverte to Allegheny summit in October 1952. He scratch-builds almost everything and is constantly experimenting with different materials and techniques. He has a collection of metal and wood working machines and to him it's more about the journey than the destination. ■



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Floquil/PollyScale stash running out?



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



MRH's Floquil / PollyScale Paint Equivalents Conversion Chart - 1

Floquil / PollyScale Color (approx.)	Model Master	Vintage Model Color	Model Color	Notes
Primer Gray	MM 4313	VMA 71.050	15-12	
Engine Black	MM 4328	HL 30000 VMA 71.231	15-01	
Streamliner Black	MM 4352	VMA 71.037	15-44B	
Gray Black	MM 4379	VMA 71.031	15-43F	
Weathered (Charcoal) Black	MM 4310	HL 30003 VMA 71.044	15-15S	
Rustier Gray	MM 4387 MM 4391	VMA 71.045	15-04	
Rustier White	MM 4372	HL 29004 VMA 71.033	15-02	
Gring Black	MM 4381	HL 30002 VMA 71.032	15-03	
Calabrese Red	MM 4320F MM 4331F	HL 30001 VMA 71.032	15-08	HL 30001 with 20% black paint is a very dark red. HL 30001 with 10% black paint is a medium red.

MRH's Floquil / PollyScale Paint Equivalents Conversion Chart - 2

Floquil / PollyScale Color (approx.)	Model Master	Vintage Model Color	Model Color	Notes
Tan	MM 4000F	VMA 71.035	15-15	
Rustier Orange	MM 4381F	VMA 71.033	15-09	
Rustier Yellow	MM 4379	VMA 71.035	15-10	
Rustier Brown	MM 4384	HL 30009 VMA 71.349	15-07B	
Rustier Teal	MM 4385	HL 30005 VMA 71.049	15-40F	Close match to VMA 71.049. HL 30005 is a dark teal.
Rustier Blue	MM 4390F	VMA 71.039	15-15S	
Rust	MM 4375	HL 30005 VMA 71.037	15-102	
Concrete	MM 4376	VMA 71.047	15-11F	
April Concrete	MM 4375	HL 30005 VMA 71.043	15-08F	Close match to VMA 71.043. HL 30005 is a dark gray.

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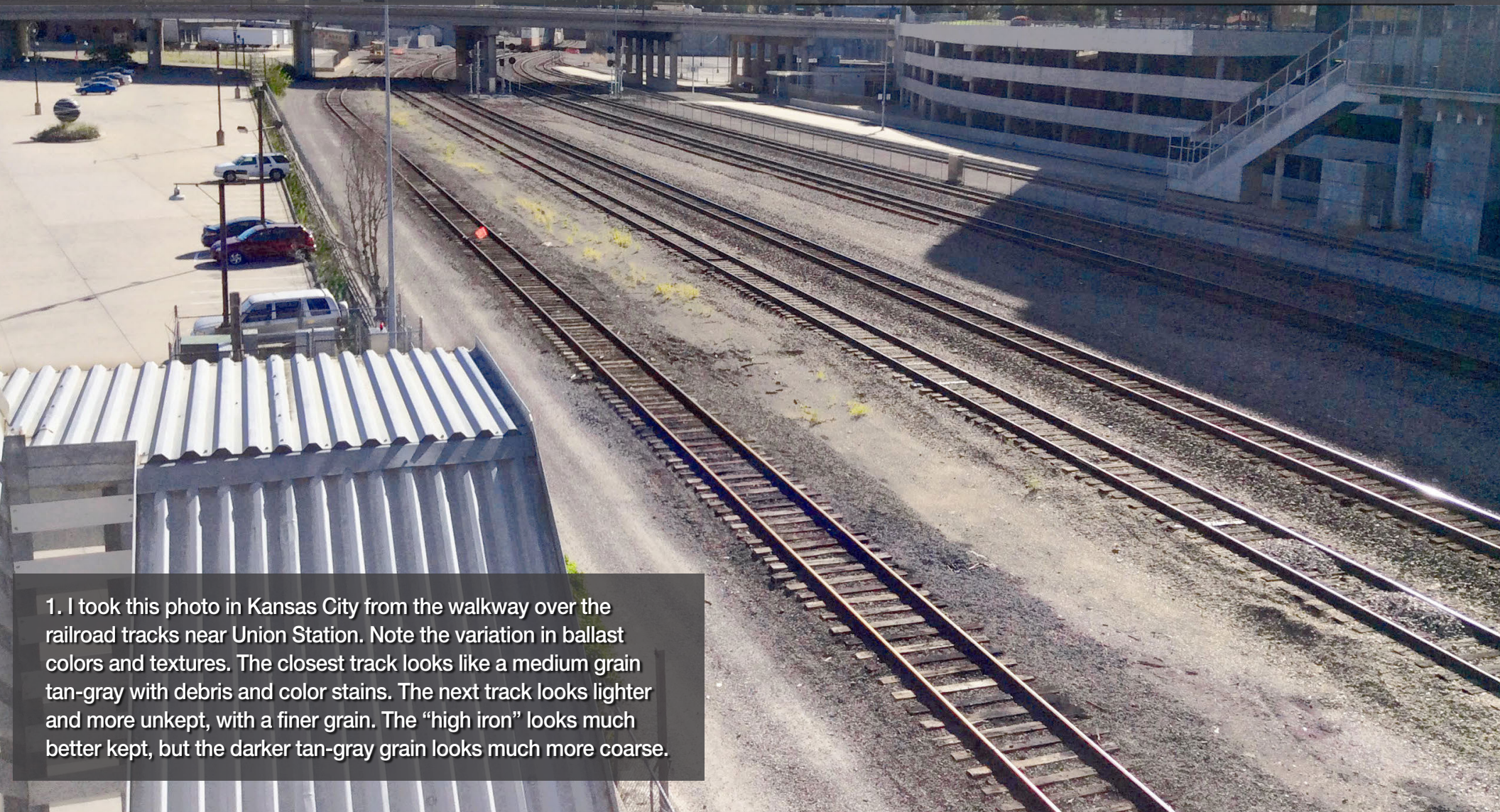
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Making your own ballast

Model Railroad Hobbyist | December 2020

Joe Fugate shows how you can make your own stone ballast for any scale and any color ...



1. I took this photo in Kansas City from the walkway over the railroad tracks near Union Station. Note the variation in ballast colors and textures. The closest track looks like a medium grain tan-gray with debris and color stains. The next track looks lighter and more unkept, with a finer grain. The “high iron” looks much better kept, but the darker tan-gray grain looks much more coarse.



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BACK WHEN I WAS DEVELOPING MY ZIP BALLASTING PROCESS, I found that some hobby ballast isn't made from stone but from crushed walnut shells. This ballast tends to be rather light-weight and will easily "float" in liquid ballast glue mixtures.

I know you can buy real stone ballast from a number of vendors such as Arizona Rock and Mineral, but I wanted to see if I could make my own stone ballast from fine sand. I also thought if I could find a very light whitish sand, I might be able to make it any color I needed.

Sand tends to be fairly inexpensive, so I thought I might be able to make a lot of stone ballast for a quite affordable price.



START WITH THE PROTOTYPE

It's best not to work from your imagination on this, but like all good modeling, use prototype references. Take photo [1], notice how much variation you can see in the ballast across just three side-by-side tracks in Kansas City.

The third track from the left with the best manicured ballast also has the most coarse looking grain. The leftmost track has what looks like a mix of dirt and fine ballast, with some very coarse stone randomly mixed in here and there.

Finally, the second track from the left has a consistently fine light-colored ballast with the least manicured look. All that in just one location in Kansas City!

So how large are real railroad track ballast aggregate grains supposed to be? I did some research to find out.

In [2], you can see the various AREA ballast grading sizes from coarse to fine. The more coarse sizes such as AREA 3 seem to

have been used more on mainlines in the past (prior to 1970). The finer sizes such as AREA 4 appear to be used more consistently for mainlines today (after 2000).

Studies done by the railroads have shown ballast that's more varied in size but not too large tends to have a longer service life. In the past before these studies, railroads used more consistently larger ballast sizes in general.

The finest ballast sizes, AREA5 and AREA57, tend to be used mostly in yards and on industry spurs.

Also note, these are "nominal" ballast sizes, which means a few of the stones may be slightly outside the bounds of the sizes shown, especially on the small end. For instance, AREA4 may actually have a small number of 1/2" stones mixed in, making the total mix more like 1/2" – 1-1/2" in size.

It also seems in the classic railroad era (before 1970), the ballast tended consistently toward the large end for the mix. That means AREA3 likely had more 1-1/2" and fewer 1" stones on the bottom end, making classic era ballast mostly 1-1/2" – 2" ballast stones.

Grading	Smallest	Largest
AREA 24	3/4"	2-1/2"
AREA 25	3/8"	2-1/2"
AREA 3A	1/2"	2-1/2"
AREA 3	1"	2"
AREA 4A	3/4"	2"
AREA 4	3/4"	1-1/2"
AREA 5	3/8"	1"
AREA 57	3/16"	1"

2. American Railway Engineering Association (AREA¹) ballast size specifications, in order from coarse to fine.

1. AREA merged into the American Railway Engineering and Maintenance-of-Way Association in 1997 and is now known as AREMA.

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For modeling purposes, I've simplified table [2] down into what I'm calling "Classic" and "Modern" era ballast sizes in [3]. I'm defining classic as pre-1970 and modern as since the year 2000. If you're modeling an era in between 1970 and 2000, then either ballast size works, just take your pick.

Prototype ballast size		
Classic	1-1/2"	2"
Modern	1/2"	1-1/2"

3. For modeling purposes, we can simplify [2] to just these era-specific ballast sizes.



4. Now that we know the various prototype ballast grain sizes, we can see from this 1990's photo along the SP Siskiyou Line that the ballast looks to be about 3/4" to 1-1/2" or AREA4.

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PROPER MODEL BALLAST SIZE

Now that we know the size of prototype ballast, let's see what size that translates into for modeling.

Let's start with HO. Two inches in HO is about 0.020" and half an inch in HO is about 0.005." So for the classic era, we're looking at ballast grains from 0.015" to 0.020" – and for the modern era, we're looking at ballast grains from 0.005" to 0.020."

Since I'm doing stone ballast, then we're talking about a fine sand with grains at 0.020" and below, but not so fine they just look like powder.

In fact, back in the 1970s, the NMRA Bulletin published a study done of ballast grain size and which size "looked right." The study found that especially in the "small scales" (HO and smaller), fully scale ballast grains at 1" and below start to look like powder and not like gravel when viewed from the aisle.

The NMRA Bulletin article made the case that slightly oversized ballast (2-4") actually has a more realistic granular texture and looks less like just a gritty powder.

Getting the right sand granule size

I found it easiest to get the proper ballast granule size by using sifters intended for mineral panning.

Mesh	Max	Avg	Min	Z	N	HO	S	O
20	0.050	0.040	0.034	9"	6-1/2"	3-1/2"	2-1/2"	2"
30	0.033	0.029	0.026	6-1/2"	5"	2-1/2"	2"	1-1/2"
40	0.025	0.022	0.020	5"	3-1/2"	2"	1-1/2"	1"
50	0.020	0.018	0.017	4"	3"	1-1/2"	1"	3/4"

5. Various sifting mesh sizes have these granule sizes that they pass. The right shows the approximate scale size in inches. The light orange boxes represent the size sweet spot (see text).



6. I bought this set of mineral sifters to use for sifting the various bags of sand to get the granule size I needed. The numbers 20, 30, 40, and 50 give the mesh-per-inch screen size, with larger numbers being a smaller screen mesh.

I bought a set of mineral sifters on Amazon in various mesh sizes listed in this table [5] (see the end of the article for a shopping list). I computed the approximate scale granule size represented by each mesh size and from there I could decide how to sift the sand to get a ballast size that looked best.

In setting the “ideal” granule size, I used the idea that slightly oversize actually looks better – so I marked those sizes with a light orange color on the table.

I had previously used Woodland Scenics fine ballast and I checked it with the sifters and found it’s all about 40 mesh, or ever-so-slightly smaller than ideal for HO (again, the “slightly oversize looks better” finding in the NMRA Bulletin article).

I’m aiming more for 30-mesh and smaller with my homemade ballast, which per table [5], hits the light orange sweet spot size. Notice after 1970, railroad ballast studies revealed a broader range of granule sizes actually helped the ballast have a longer service life.

In terms of the mesh sizes, then ballast granules that sift through 30-50 mesh will fall within the 1-1/2” to 2-1/2” range, slightly oversized but big enough to look like gravel and not powder in HO. Anything that doesn’t fall through the 30 mesh sifter is too large and gets set aside for general scenery use and discarded as HO track ballast.

If you’re modeling in a scale other than HO, then just use table [5] to determine the size that’s correct for your scale. With N scale for example, I’d go with sand granules that pass through a 40 mesh sifter.

Finding the right sand source

With a target sand granule size in mind, I began searching for a good inexpensive sand source. Since I know I’d like to color the sand myself, I researched coloring sand enough to know my best sand should be a very light buff or off-white color.

I started looking online for sand sources. I first checked the DIY home hardware stores like Home Depot and Lowes.

I found I could not trust the photos of the product to be accurate (which is too bad). For example, I found some Sakrete play sand on the Lowes website that appeared to be a fine buff colored sand [7] per the bag photo.

Once I got a bag (\$5, so it’s literally dirt cheap), it turns out to be more of a darkish warm gray fine gravel than the buff colored sand on the bag [8]. Not at all the light colored fine sand I had hoped I was getting!

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7. The photo on this bag image for Sakrete play sand (from a Lowes online listing) looks like a fine buff-colored sand. However, see [8] for the actual color and granule size.



8. The Sakrete play sand on the left came from Lowes and does not at all match the online item listing as to color or texture. It's more of a warm gray fine gravel than the fine buff-colored sand on the bag [7]. On the right, CleanBurn silica sand from Amazon did turn out to be the promised off-white color, with a consistent fine sand texture.

After looking at many sand samples from a lot of different sources, I finally settled on the sand sources I list in [9]. I also computed the cost per ounce. By comparison, commercial model railroad ballast sells for about 40-50 cents per ounce.

I have verified the color and granule size of these various sand products to make sure they're suitable for ballast using the methods I present in this article.

MAKE YOUR OWN BALLAST | 9

Product	Quantity	Color	Mesh	Price	Cost per oz	Source	Suggested scale
Firepit silica sand	10 lbs	light tan	20-40	\$33.00	\$0.21	Home Depot	O, S
CleanBurn silica sand	12 lbs	off-white	30-50	\$18.00	\$0.09	Amazon	HO, N
Santastic play sand	25 lbs	bright-white	40-50	\$19.00	\$0.05	Amazon	N, Z

9. Best commercial sources for sand that can be used to make ballast you can color as needed. See the shopping list link at the end of this article for specific links for purchasing.

COLORING THE BALLAST

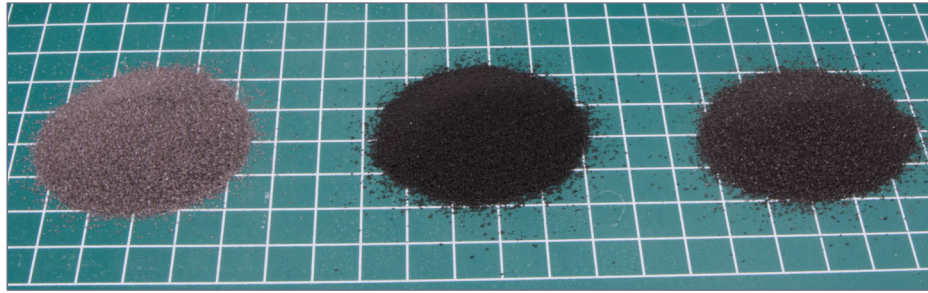
Now comes the most fun part, coloring the ballast to the rock color we want!

I did a lot of research online and found a number of ways to color the sand. One method uses latex paint, but I don't like that method because it makes the sand granules larger and more rounded.

The other method I found online uses Rit dye to color the sand granules. After trying it, I find it's very effective [10, 11].



10. Here I show some examples of the ballast colors I've made using Rit dye. From left to right: original off-white sand, light sandstone, medium brown, light cool gray, and medium warm gray. The track in the background has the light gray ballast glued in place.



11. It's also possible to make the ballast quite dark starting with the off-white sand. In this case, I am aiming to make a very dark cinder ballast. From left to right: dark warm gray, fresh black cinder, and weathered cinder ballast.

Dye colors the sand nicely without obscuring the angular shape of the sand granules and it doesn't increase the granule size.

I buy the Rit liquid dye and make a concentrated ink using 70% isopropyl alcohol. With the dye colors shown [12, 13] plus some dry powdered pigments (more on that later), I can make all the ballast colors I show in this article and more.

You may be surprised that I'm using Navy blue as one of the dye colors. Actually, that allows me to make a cool gray tone. If I want to warm the gray tone up, I can use the Sandstone or the Cocoa brown dye with the gray pigments.

One important concept to keep in mind here: don't just do one batch of sand with a single color. The most realistic ballast comes from making a blend of several colors of similar shades.

For example, I make a basic medium cool gray, a medium neutral gray, and a medium warm gray batch. Then I blend them all together to get a very natural looking ballast. If I just use a single color batch, the sand tends to look less realistic and a bit "plastic."

Blending various similar tones looks much better. In some cases prototype ballast has a salt & pepper look – you can get that by blending much darker and much lighter batches together.



12, 13. To color the ballast I use Rit liquid dye. These colors shown here give me the color ranges I show in this article: Charcoal grey, Pearl grey, Navy blue, Sandstone, and Cocoa brown. I mix the dyes with 70% isopropyl alcohol to make a concentrated "ink" for coloring the sand.



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14. I mix these dye solutions in 30ml dropper bottles. For most I mix 50% dye to 50% isopropyl alcohol (IPA). For the Navy blue, I am using that more as a tint, so I mix it 25% dye to 75% IPA.

Making the dye solution

I mix the dye solution in 30ml dropper bottles I bought on Amazon (see end of article for shopping list).

For most of the dye solutions, I mix 50% dye and 50% isopropyl alcohol (IPA) and I shake the bottle thoroughly. With the Navy blue dye, I want to use that more as a cooling tint than to make blue ballast, so I mix that 25% dye and 75% IPA.

Before each use, I shake the dye bottle vigorously to make sure the dye is mixed well with the IPA.

Dying the sand

Let me describe the basic sand dying process, then I will give a couple actual examples so you can see the process of matching colors in action.

I put a half cup of the off-white sand [15] into a 1 gallon plastic ziplock bag. Then I dribble say 50 drops of the basic color I'm

15. I measure out about half a cup (4 oz) of sand in a Pyrex measuring cup. Note: I have my own measuring cup in my workspace so I don't risk getting residue from my modeling materials into our food!



16. I pour the sand into a 1 gallon zip lock freezer bag and then dribble at least 50 drops of dye solution at a time onto the sand. Then I seal the zip lock on the bag so nothing will spill out on the next step.



17. I knead and shake the sand in the bag until the dye gets thoroughly distributed into the sand. I repeat this process with more dye until I get the sand to the color I want. Then I spread the damp sand out onto a paper towel and let it air dry.



after, such as Charcoal grey [16] and then knead and shake the sand until the color covers all the sand.

If the sand hasn't reached my target color, then I repeat the process. I add more dye and do more kneading to darken the sand color still further until I reach my desired ballast color.

I do 40-50 drops of dye solution at a time, and I often end up using a total of 150-200 drops of dye to get my target color.

Once I am happy with the sand color, I pour the damp sand out onto a paper towel and let it dry overnight.

Making several similar colors: Real railroad ballast actually has subtle color variations and isn't all one uniform color. So to enhance the realism, I make several batches, varying the color formula slightly.

On one batch I might add 50 drops of Navy blue to make a cool grey and then on the next batch use 50 drops of Cocoa brown to make a warm gray.

After all the sand has dried, I blend the similar colors together to get a more realistic subtle variation to the granule color.

Let's look at a couple examples to see how I go about matching the ballast color.

Example 1: Siskiyou Line ballast

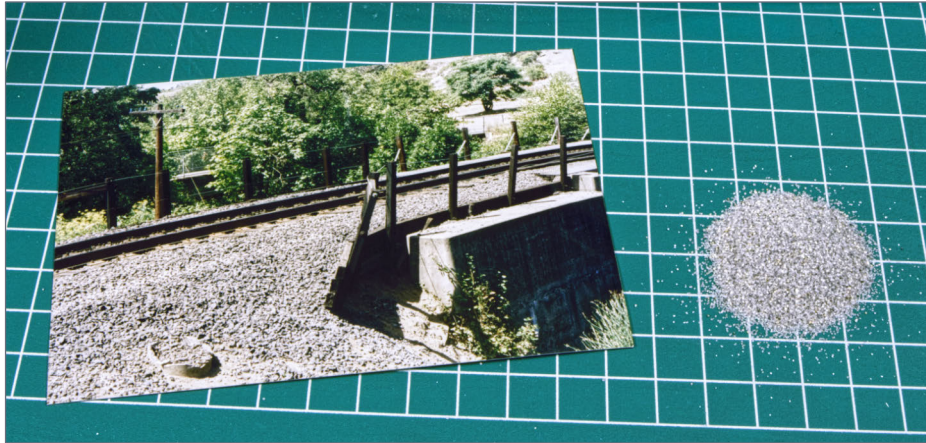
Because I model the Southern Pacific Siskiyou Line in southern Oregon, I wanted to match the ballast for my chosen prototype.

The first step when matching scenery elements on a given prototype is to collect reference photos [18, 19, 20].

I know of modelers who may take some ballast stones from their chosen prototype, for example, and try to match that. I've also seen modelers take paint chips from their prototype and try to match that on their models.



18, 19, 20. Work from prototype photos to create your ballast colors. Color balance can vary between photos, so use several like I'm doing here. My prototype Siskiyou Line ballast is a medium gray color with a bit of yellow or tan hues mixed in. Notice in the bottom right photo, the ballast looks a bit darker and a little more blue-gray. I'm aiming for a ballast color that's a good blend between all the shades of gray you see here – sort of the “happy medium.”



21. Using my reference photo, I matched the ballast color to how it appears in a sunlit photo. With commercial ballast, you can get into the ballpark as to color but it's an approximation only. With this method, I matched my prototype ballast color with pinpoint precision under my layout lighting. It doesn't get any better!

Such an approach doesn't work well because our indoor lighting tends to be a lot more yellow and less intense than outdoor lighting. As a result, anything we bring into the layout room will look a lot darker and more orange than it looks outside.

So how do we deal with the light color and intensity difference? We somehow need to make the color of what we're doing indoors look like it's outdoors.

The best way to solve this problem is to use reference photos that look good to us and are reasonably similar in white balance. Here's how it works.

If we take a photo that shows our reference prototype outside and we match the photo color when viewing the photo under our layout lighting, in effect, we're making that thing look like it's outdoors while under our layout lighting – which is exactly what we want!

If you want to match prototype coloring, that's how to do it – match good white-balanced photos of your prototype when viewed under your layout lighting [21].

I made several batches of ballast with each half-cup batch being slightly different colors. I put about 100 drops of Charcoal grey as my base color. Then I made the following variations:

Batch 2 variation: 100 drops Charcoal grey, then 100 drops Sandstone (tan-grey).

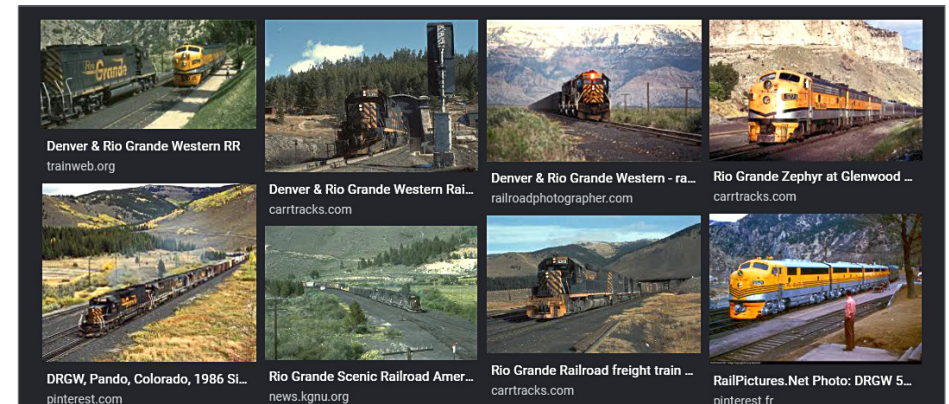
Batch 3 variation: 150 drops Charcoal grey, then 50 drops Navy blue (cool slightly darker grey).

Batch 4 variation: 150 drops Charcoal grey (slightly darker grey).

Once all the batches had dried, I mixed them all together to get the ballast you see in [21].

Example 2: "Weathered cinder" ballast

As an experiment, I wanted to see if I could make dark cinder ballast with this method. Since I'm starting with off-white sand, I wanted to see how dark I could get with the ballast color.



22. As a reference for a very dark cinder-like ballast, I chose the Denver & Rio Grande mainline as the prototype.

23. I also found this closeup reference photo of cinder stone ballast by doing an online search.



For my prototype, I selected the Denver & Rio Grande Western mainline, so I searched on Google to locate some photos [22]. I also searched online and found this closeup reference photo for cinder stone ballast [23].

As you can see in [11], I was able to make very dark cinder stone ballast. Here's how I did it.

Batch 1: To get a basic dark stone color, I used 400 drops of Charcoal grey dye.

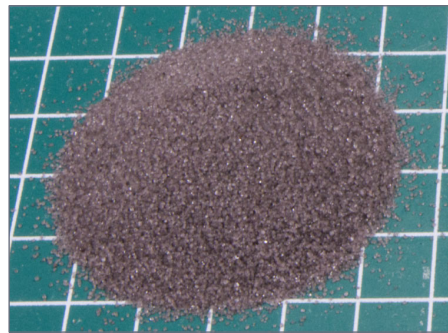
Batch 2: I used the same dye formula as batch 1, but I also added 50 drops of Cocoa brown.

Batch 3: I used the same dye formula as batch 1, but I added 50 drops of Navy blue.

Note: I apply the drops 50 at a time, knead and mix in the color into the sand, then do another 50 drops, and so on.

Once all these batches were dry, I mixed them together to get the blend you see in [24].

To me, cinder ballast has a dark dusty look, so I added 1 tea-spoon of dry black powder pigment to a half cup of my blended



24. My dark warm grey ballast blend. See text for details.

dark ballast in a plastic jar, then shook vigorously to get this quite jet black ballast [25]. Then I mixed equal parts of the dark grey blend with the jet black mix to get the dark weathered cinders in [26]. I could make it even lighter by mixing in more dark grey blend.



25. My fresh black cinder mix. See text for details.

Notice how you can mix in a dab of the dry powdered pigments I've discussed in my zip texturing articles to tweak the tone and look of the ballast to some degree. See the Sep/Oct 2010 issue and the Nov/Dec 2010 issue of MRH magazine for more:

■ mrhmag.com/magazine/mrh-2010-SepOct/zip_texturing_resurrected

■ mrhmag.com/magazine/mrh-2010-NovDec/weathering_powders

Concluding thoughts

I'm quite pleased with the results of my experiments in making and coloring my own stone ballast. Using these methods, it's possible to get ballast for most any scale in the right texture and color from O scale to Z scale. ☑



26. My weathered black cinder blend. See text for details.

SHOPPING LIST

To get a shopping list for the items mentioned in this article, visit this link:

<https://mrhmag.com/magazine/mrh2020-12/make-own-ballast>

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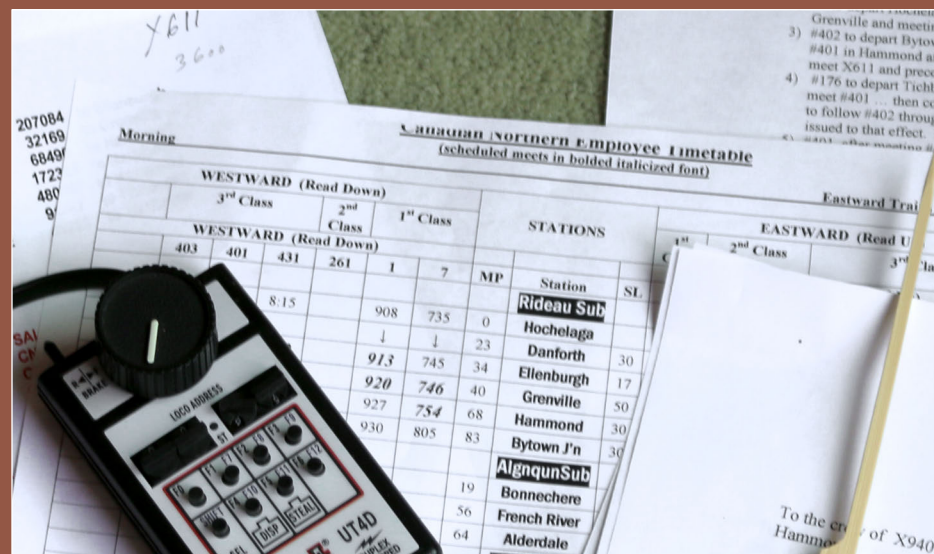
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Ops for the rest of us



Model Railroad Hobbyist | December 2020



DOUG MATHESON DIPS HIS TOE INTO PROTOTYPE OPERATION ...

MRH RAN A SURVEY IN 2018 WHICH REVEALED ABOUT 75% of their readers enjoyed operations on their model railroads. Some 50% of all MRH readers expressed the desire for a straightforward approach, with little to no paperwork. MRH calls this reader preference “lightweight ops” or “operations light.”

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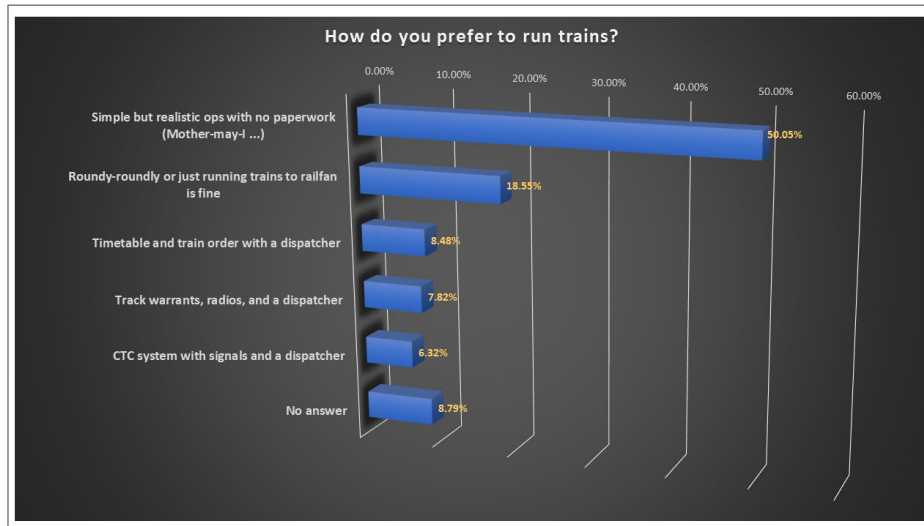
WHAT IS OPERATIONS LIGHT?

The idea of running trains instead of doing paperwork sounds appealing. However, it's basically just the opposite of "operations heavy" or heavyweight ops. Heavyweight ops describes a world filled with TT/TO rule books, employee timetables, complex car routing schemes, and arcane dispatching mechanisms.

Heavyweight ops has its basis in the prototype practices developed over the years for the safe and expeditious movement of rail traffic. Railroading without rules is a dangerous business, and these rules made running trains a lot safer and more efficient.

But getting to lightweight ops requires a *vast simplification* of what the real railroads did.

In this series, I present a foundation for a simple and relatively paperless approach to enjoying operations. At the same time, I

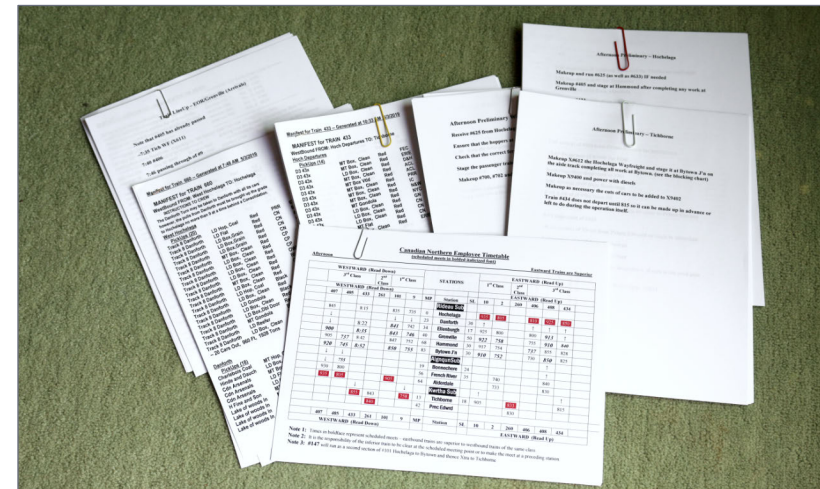


1. The MRH survey of 2018 show most readers want a simple paperless approach to operations.

provide a path forward for those who may want to evolve toward a more realistic "heavyweight ops" environment from simple beginnings.

A WORKING DEFINITION OF OPERATIONS LIGHT

The MRH survey defined heavyweight ops as the existence of a formal dispatching mechanism to identify what was light and what was not. While this works for a brief survey, I believe the



2. Tom Hood's Canadian Northern is an example of heavyweight ops. Each operating session requires generating more than 150 fresh pages to guide operators. This includes the timetable plus switchlists for each operator on the mainline. Yard crews require switchlists and lineups to guide their work. And in addition, Tom has trains staged on the layout for startup, which also need train orders for the layout's Timetable/Train Order environment. Additional documentation includes a set of instructions for the crews who stage the layout the week before an operation. All this paperwork and any paperwork created during the ops session (such as train orders and the dispatcher's trainsheet) are exactly what operations light is trying to *avoid*.

best approach to operations light involves more than simply saying no formal dispatching mechanism has been implemented.

I see operations light vs. heavyweight ops as a continuum:

1. Complexity of the layout: Size by itself does not define light or heavy operations, but does influence it – as layouts become larger, the complexity grows and the ops become heavier.

2. Numbers of trains operating simultaneously: Not the actual number so much as the degree of interaction between trains matters here. Of course, the more trains running, the greater the potential number of interactions. This ties back to the dispatching mechanism focus of the *MRH* Survey.

3. Car-forwarding: How you define the movement of cars influences the level of paperwork. Simple schemes with minimal paper fit the operations light approach while complex implementations of car cards or computer generated switch-lists sit at the other end. In-between sit a large number of approaches involving simplifications of the complex parts.

4. People and the relationship to prototype fidelity: Larger crew sizes drive more operation complexity. This complexity increases if the layout owner wants crews to perform their roles more the way prototype crews carried out their duties.

GENERAL APPROACH

Given a working definition of operations light, let's discuss operations in general here in Part 1. Later in this series, I delve into these further topics:

Part 2: Two example model railroads that qualify as running with operations light.

Part 3: Developing a model railroad transportation plan: What trains move when and/or in what sequence.

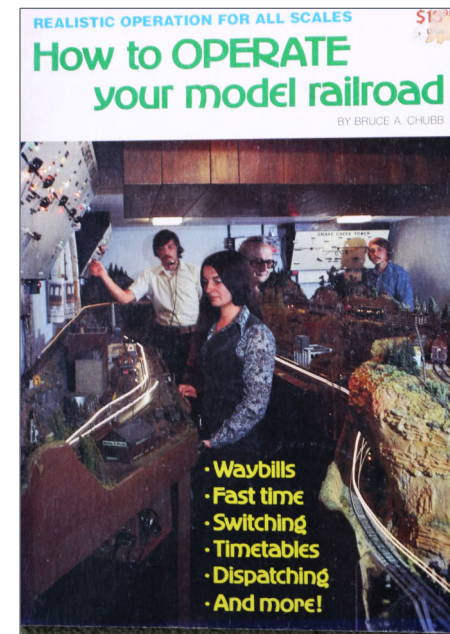
Part 4: Car-forwarding options, from paperless to limited paper.

Part 5: An evolutionary path to more complex operations.

OPERATIONS – WHAT IS IT?

Pioneers in operations (1940s through to ca. 1980): Model railroad operation has often been described as “a simulation of the purposeful movement of goods/people by rail.” A simulation carried out live, as opposed to on a computer, is essentially a role-play as a cooperative non-competitive game.

In the pioneering days of model railroading in the 1940s, Frank Ellison defined operations as a stage play where the trains are the actors.



3. Bruce Chubb wrote the definitive work on model railroad operations almost 50 years ago. Although it is somewhat dated from a technological viewpoint, the great majority of Chubb's thoughts remain as relevant today as when first written. Many others made valuable contributions to the development of operations in the hobby during the 60s and 70s – John Allen and Allen McLelland come immediately to mind – but none left the written legacy that Bruce Chubb did. Chubb made other innovations to the hobby including

developing CMRI as a standard interface between a computer and a railroad. He remains active in the hobby and his model railroad, the Sunset Valley Oregon System, continues to stand among the best-known for the operations sessions hosted.

Bruce Chubb made this concept central to his writings on operations. In his 1977 book, *How to Operate Your Model Railroad*, on p 37, Chubb wrote, “A railroad without trains would be like a movie without actors.”

In an era of cab control, both Ellison and Chubb seem to be right. The trains perform as the actors in a play set on the stage of the model railroad – with the operators controlling them from afar using cab control almost like puppets on a string. The march of technology gave us command control in the 1980s, and by 2000, DCC became the dominant control method.

Layout design evolved to keep step with control changes and now operators move *along with* their trains using handheld throttles. This slow crawl of technology has led to new ways of thinking about the simulation of the operation of a railroad that our model empires represent.

Operations thinking evolves (from 1980 to the present):

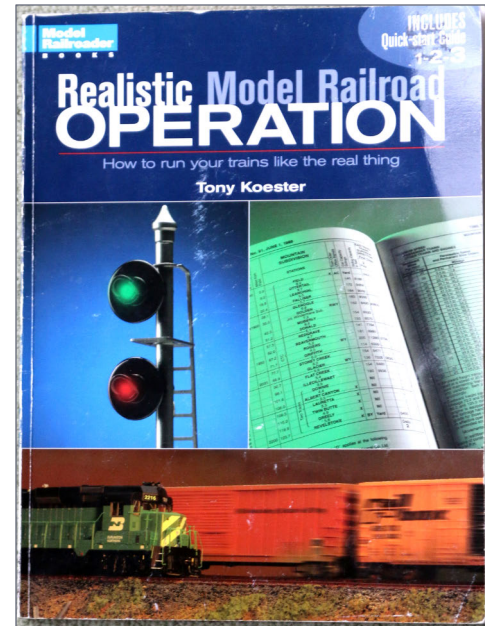
Think about the effort we put into building a piece of equipment or a structure. We try to make it as accurate as possible as a static object. But since our models can actually move, we incorporate them into a grand animated diorama: the model of a transportation system.

Further, as we bring this animated diorama come to life, we model the jobs of those who worked in the real world.

Essentially, the notion of the trains being the actors in an elaborate play has given way to the idea that *we the operators are the actors in a role-play* or simulation of a transportation system.

Tony Koester articulated this notion of role-playing in his 2003 book, *Realistic Model Railroad Operation*. He wrote at length about this, prefacing it with the remark (on p. 9), “We’ve discovered that what railroaders did or do for a living is often as fascinating to emulate as the train movements themselves.”

The 2017 OpSig publication, *A Compendium of Model Railroad Operations*, builds further on the role-playing idea. In chapter 3, Jim Providenza extended the cast of role-players to include many



4. Tony Koester was among the first to elaborate on the notion of role-playing railroad employees, a notion he set forth in his book. Tony takes a more philosophic approach in his book, being less prescriptive than the earlier work by Bruce Chubb. Nonetheless, Tony’s book represents another step in the evolution of model railroad operations.

new possible characters from the direct operation of a real train. He agreed with Tony Koester, writing, “We work hard and long on our layouts to create the conditions that allow those operating on them to experience the challenges and rewards of professional railroading.”

THAT SOUNDS COMPLEX!

The concept of model railroad operation as a role-play can be as complex as you want. The simulation can be at a high level with a focus on the operation of a single train through your modeled scene.

Complexity gets side-stepped to allow a lone operator to act as an engineer in an idyllic environment.

Or the layout, ops simulation can become so detailed that a modeler can calculate if the railroad is turning a profit, modeling all manner of jobs from train engineer to senior management.

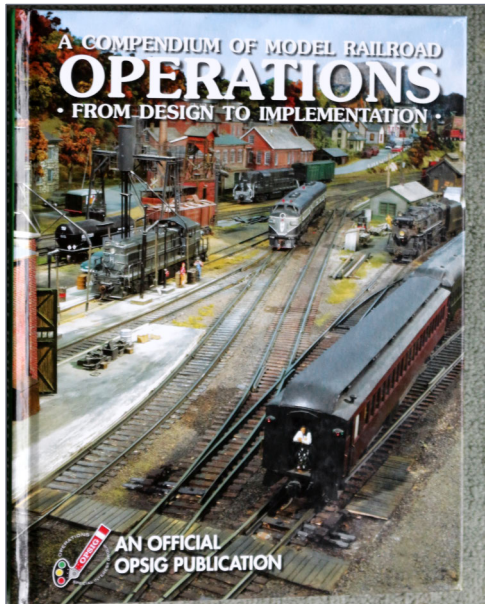
The point of this is simple: you create the role-play you want and you decide its complexity.

You decide which jobs to model and you decide how detailed to make the role-playing for your actors.

Almost universally, model railroaders want their hands on the throttle – we like to run our trains! In that sense, the engineer’s job invariably becomes a primary role of our simulation. For some modelers, just handling a heavy train on a steep grade can keep them happy, and we have to admit, you do need a certain skill to handle such a train.

Many modelers seem to prefer a more complex simulation for their ops role-playing. But as the guys involved with heavyweight ops confess, jobs unrelated to the movement of a train rarely are the model railroad operator’s first choice.

Those unrelated jobs tend to be clerical in nature. While the real railroad *requires* station agent/operators, yard clerks, and similar positions to keep the railroad running smoothly, most of us (as evidenced in the *MRH* survey) prefer our simulations to be high level enough to avoid most of the clerical side.



5. Editor Phil Monat pulled together a group of experienced operators to each write a chapter in this book. It represents, in 2017, a collection of current thinking about model railroad operations. It is not an easy read for a beginner, but for someone with some experience, it provides a valuable reference to all ops-related topics.

RAILROADING AS YOU LIKE IT

Obviously, most operators welcome the positions of engineer and conductor, and as such they form the central part of the role-play in an operations light environment. A *footboard yardmaster* – that is, a yardmaster who runs his own switcher – would also be a desirable role to portray.

From there, the roles become increasingly specialized. Ranked in order of popularity, dispatcher seem to come first, after which the roles such as a yard clerk or station agent become less desirable. Depending on your motivation, the size of your railroad, and the numbers of crew you want, you must decide how detailed you want the role-play to be. You decide which jobs to staff, and which real railroad functions can be ignored.

WHERE DO YOU BEGIN?

Playing baseball won’t be enjoyable until a player learns to catch and throw the ball. Similarly, hockey cannot be played until a player learns to skate. In the same vein, role-playing model railroad operations won’t be very enjoyable until a modeler masters a few basic skills.

Looking at the “purposeful movement of goods/people by rail,” a train does this by picking up goods or people and delivering them to another place. Our constraints of time, money, space, and skill mean we model part of this train movement and use staging or other means to suggest the unmodeled remainder.

The train originates somewhere, moves to “an action point or points,” performs some actions, and then departs. These actions are executed over and over by engineers and conductors operating a train:

1. Meeting or passing another train
2. Picking up or setting out one or more cars on a trailing-point spur
3. Making a runaround move

4. Picking up or setting out one or more cars on a facing-point spur

Experienced operators know these tasks by heart. A beginner to operations should study these simple moves – a tutorial called *Model Railroading 101* at slideplayer.com/slide/4536724.

Another resource with switching tips can be seen at: www.youtube.com/watch?v=2OU9c2_t6o4.

WHAT HEAVYWEIGHT OPS LOOKS LIKE

The following pictures briefly show what a heavyweight ops session looks like [6,7].

For many of us, handling all this paper may not be a pleasant experience – we don't relish being loaded down with all this stuff when we just want to just have fun operating trains.

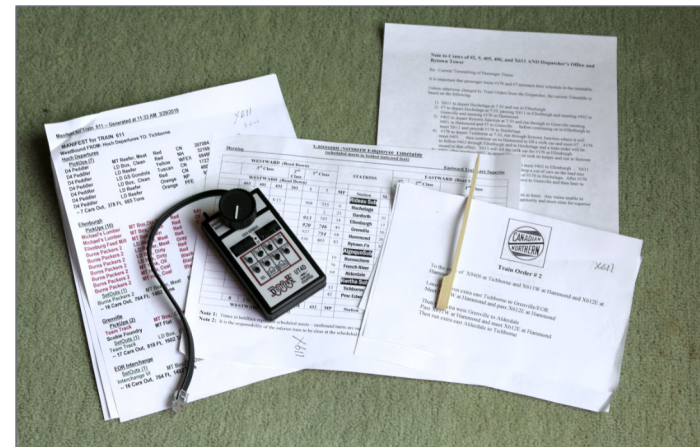
Expectations can run high for operators such as Pierre to play their role with fidelity to prototype practice. Such an expectation can put operators into a high pressure environment that's quite uncomfortable.

Operations light is aimed at preserving the enjoyment of operations and avoiding most of the heavyweight ops pressures.

RIVET-COUNTERS IN OPERATIONS TOO

Rivet-counters inhabit more than just the world of model building. They exist in the operations world too – they're critical of everything from the simulation details to how "professional" the actors may play their role.

Just as in the model building side of the hobby, some good-natured rivet-counting raises our awareness of accuracy and can be helpful. But harsh and legalistic rivet-counting comes across as pompous and misguided – it effectively discourages modelers from taking part in what can otherwise be a very enjoyable part of the hobby.



6, 7. Operator Pierre Lamontagne is well-dressed for his role, wearing an apron with multiple pockets. He is expected to carry (clockwise from left) his switchlist, the timetable, special instructions, train orders, an uncoupling pick, and most importantly, his handheld throttle.

Consider the frequently leveled criticism by the experienced heavyweight ops guys that “Ted over there on X3410 failed to do xyz correctly.” The rivet-counter then spells out how *they* think a real railroad employee on a certain railroad in a certain era would have done xyz.

As our hypothetical lone operator with train X3410, we expect Ted to play a variety of roles.

First, we expect him to act as the engineer and drive that train, operating his loco just as the real engineer would have.

Next, we expect him to be the conductor, keeping in mind all the car setouts and pick ups to be made – all while keeping in mind the schedule for all other trains on his part of the railroad.

At the same time, we expect Ted to act as the head end and tail end brakeman, aligning switches and handling the couplers.

Ted has to carry his throttle, his car cards or switchlist, an employee timetable, and any train orders or track warrants, an uncoupling pick, a pencil, sometimes an FRS radio – and if he is lucky and has a free hand, his drink.

The fast clock keeps whirling while Ted works in a crowded, noisy, narrow aisle, typical of most layouts.

So what horrifying error did Ted make? Ted forgot to dim his head-light while making a meet!

Belittling Ted about his “oversight” won’t leave him in a good frame of mind. In fact, Ted may decide participating in a realistic model railroad op session just isn’t worth it!

There is no place in operations light for such rivet-counters. They need to realize being so harsh is not helpful. If they can’t adjust their approach, it may be best to not invite them to op sessions.

When you organize your ops sessions, be specific. Define your role-play character activities based on the importance you put on your ops simulation outcome. It can help to not be too idealistic.

LOOKING FORWARD TO THE NEXT PART ...

Despite the challenges we face around getting realistic operation, take hope. Effective methods do exist to simplify ops processes and guide us in developing a lighter-weight ops plan. Exploring lightweight ops methods is something we all can be thinking about.

Stay tuned for Part 2. I want to show you two well-conceived model railroads and the operations light approach they take. We will be visiting Bruce Chandler’s Fn3 and Mike Hamer’s HO layout – and take a close look at their inspiring simplified approach to operations. ☑



8. Bruce Chandler built the Jackson and Burke, an Fn3 railroad in his back garden. Photo courtesy of Bruce Chandler



9. Mike Hamer models Boston and Maine on a modest HO layout.



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DOUG MATHESON



Doug authored a chapter in the OpSIG (Operations Special Interest Group) publication, *A Compendium of Model Railroad Operations*.

Doug has been participating in ops sessions for decades. He has also presented NMRA clinics on ops, organized ops sessions for a number of owners of large model railroads, and served on a model railroad as a dispatcher using Timetable and Train Orders, and on another layout using the Occupancy Control System (Canada's version of Track Warrants). These all fit into the more heavyweight category of prototype-based operations.

At the same time, Doug has built and operates a very modest HO scale layout. He has also long modeled in Fn3 in the garden, including running live steam.

Doug thanks Bruce Chandler for his help in allowing his Jackson and Burke RR to be used as an example and inspiration for this article. N scale modeler Mike Dawson provided insightful comments on operations in a scale where reporting marks are difficult to read. A big thanks also to a number of Doug's fellow members of the NMRA (Niagara Frontier – St Lawrence Division) who offered many suggestions and edits along the way. These include Alex Binkley, Mike Hamer, Chris Lyon, and Peter Nesbitt. In particular, Mike Hamer also allowed his Boston and Maine RR to serve as an example.

Besides operations, Doug's other railroading interests include the history of passenger travel by rail, and the historical development of signaling systems.

Doug retired from Canada's federal public service and lives in a rural area south of Ottawa, Ontario. ■



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BNSF - WICHITA, KANSAS



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**DEREK DUNCAN FITS THIS
CONTEMPORARY LAYOUT INTO A 24'x24'
SPACE ...**

I WAS IN THE PROCESS OF DESIGNING A 14" X 12' MODULAR SHELF layout to incorporate the Bel Aire Buzzi Unicem cement distribution facility, when *MRH* presented the "California Basement" Challenge. I chose the 2-Car garage version so that I could incorporate the Buzzi Unicem module into the layout, and thus the 24' x 24' constraint. To make my



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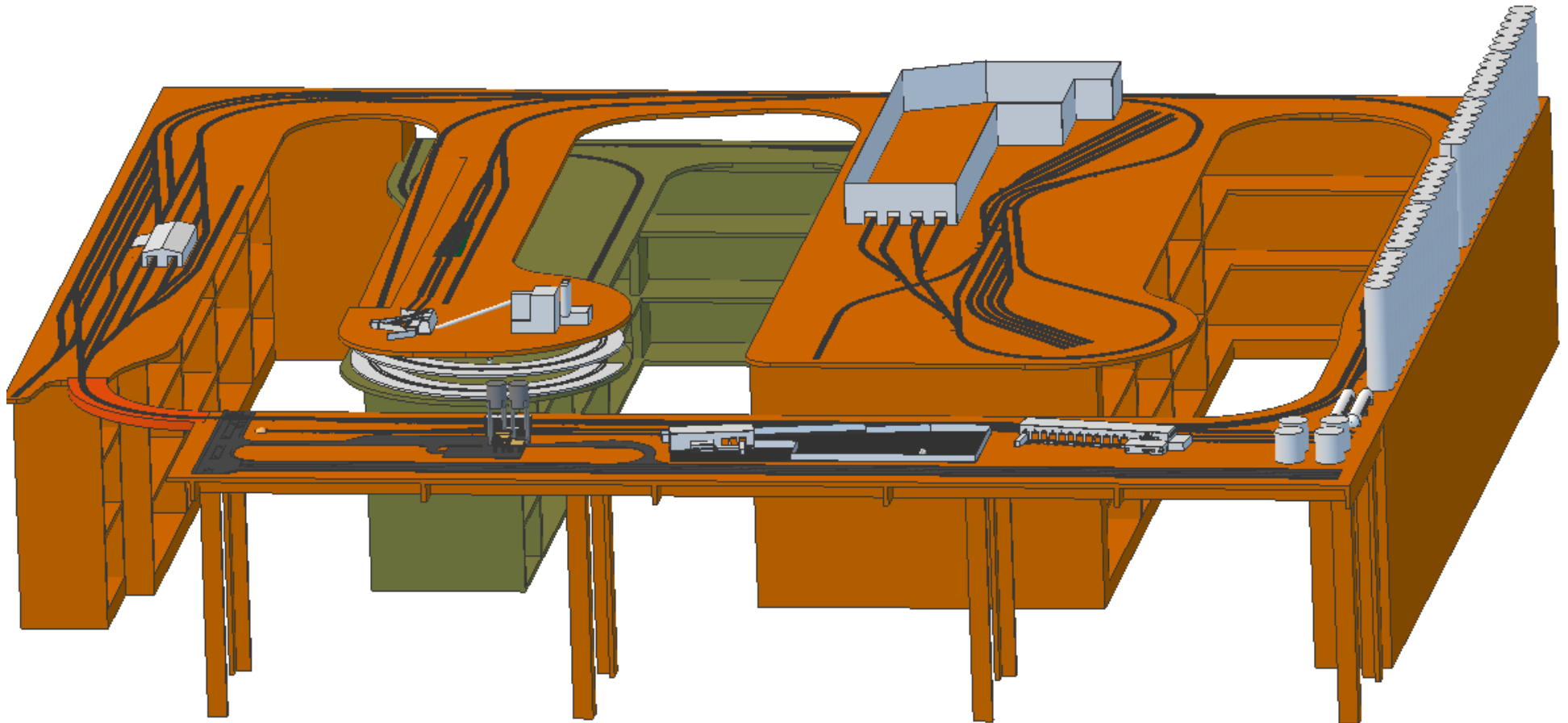
BNSF - WICHITA, KANSAS | 2

railroad viable, I needed a reason for Buzzi Unicem to exist on my layout, so I took the real reason the facility exists in Bel Aire, Kansas. Buzzi Unicem supplies cement to multiple concrete mixing plants in the Wichita and surrounding communities. Wichita is the largest city in Kansas (most of Kansas City is in Missouri), and there is a lot of construction going on all the time. I chose one of these cement mixing

BNSF - WICHITA, KANSAS | 3

plants (Andale Ready-Mix) to make Buzzi Unicem a useful industry on my layout.

Just having these two industries wasn't enough reason for this railroad. Having lived in Wichita for 30+ years, I started to think of what other industries would make interesting activities to ship-by-rail-to, and ship-by-rail-from. Another Industry in "The Air Capital of the World" is Spirit Aero Systems that makes 737



1. Side view.



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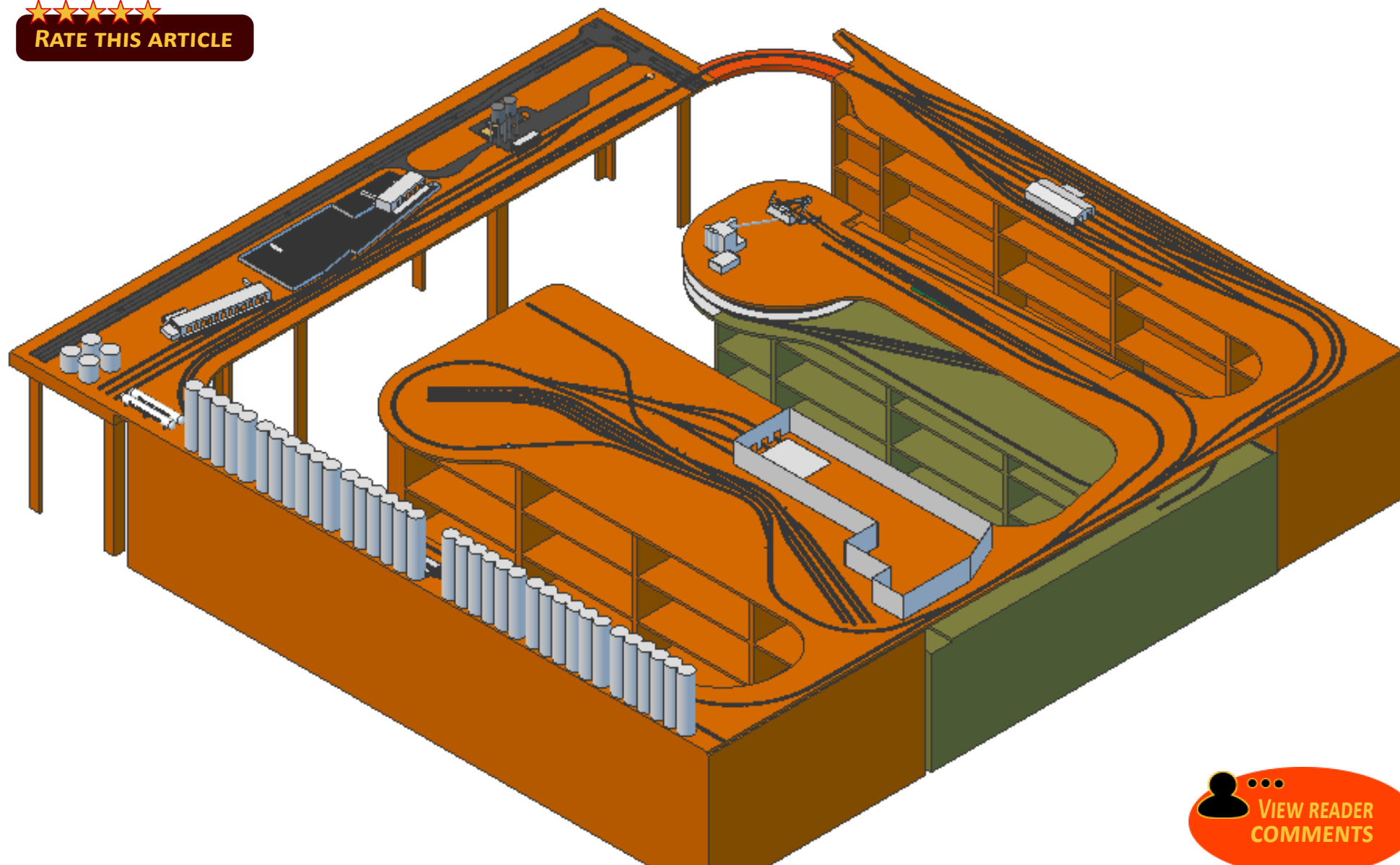
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2. Top view.

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fuselages for Boeing and ships them by dedicated rail cars to Renton, Washington. I knew that I would not be able to model even a compressed version of that trip, so I chose to make Renton sort of “off layout.” Stay tuned for how I accomplish that.

Wichita is a major terminal point for wheat shipment via covered hoppers. A facility which used to be Garvey Grain (now DeBruce Grain, Inc.) is located Southwest of Wichita and is a massive complex.

Wichita also currently has two yards, the UP yard along I-135, and the BNSF yard along North Broadway (US highway 81). I chose to simplify and modify the UP yard.

This 24' x 24' track plan represents industries around Wichita, Kansas. I have not tried to faithfully model the Wichita area, but have taken artistic license to incorporate five area prototype industries into the track plan. Refer to [5] for the prototype locations:

- Union Pacific yard (red circle)
- Buzzi Unicem USA cement bulk transfer station (orange oval)
- Andale Ready Mix concrete batch plant (blue oval)

LAYOUT SPECIFICATIONS

Track plan Dimensions: 24' x 24'
Scale: HO
Prototype Railroad: BNSF
Era: Present
Minimum Mainline Radius: 30"
Minimum Yard Radius: 22"
Maximum Mainline Grade: 0%
Maximum Grade: 3.0%

- Spirit AeroSystems (aqua rectangle)
- DeBruce grain elevator (brown oval).

I've also included four other freelanced industries in the Bel Aire Industrial Complex.

TRACK PLAN OVERVIEW

The track plan has two levels, but the main trackage is all on one level without any elevation change [3]. I designed an “empties-in, loads-out” arrangement for the Spirit Aero Systems Plant 2 building.

To accomplish this, I incorporated a lower section representing Renton, Washington (without any structures or scenery [4]) 10 inches below the main line track elevation via a 3% grade and 1.5-turn helix. 737 airplane fuselages ship as open loads on the flat cars, so I needed some way to “unload” the fuselages.

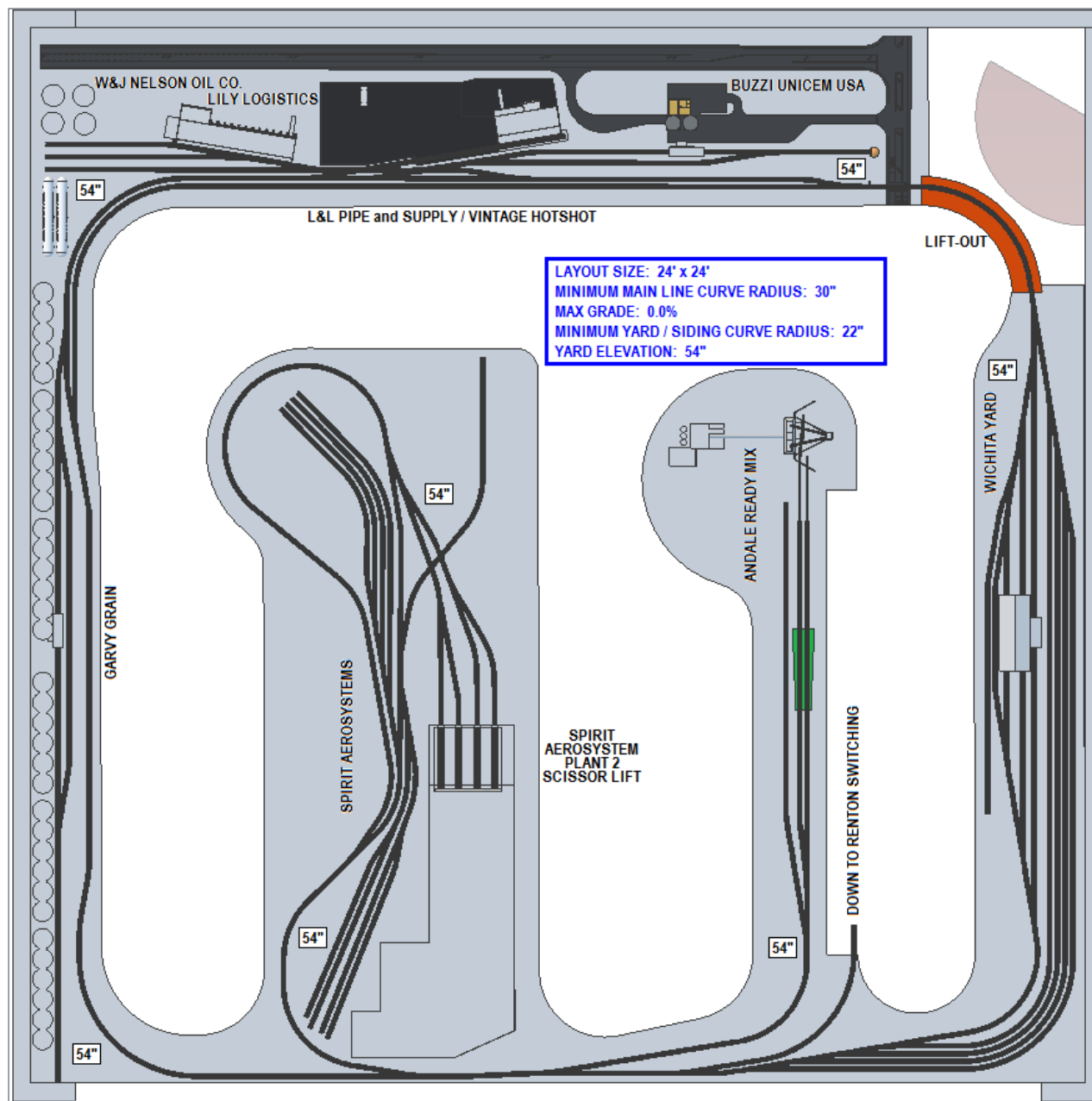
To keep from using the unprototypical method of hand-lifting cars around the layout, I designed this track plan to keep all cars on the track. I then added switching operations to switch the loads out of the train and put empties in for the trip from Renton to Wichita by using the lower level.

Then on-layout switching operations at Wichita build a train of fuselages out, and push empties back into Plant 2 building.

FURTHER TRACK PLAN DETAILS

Wichita has both a Union Pacific Yard and a BNSF Yard within city limits. I model the BNSF, but some of the industries I include are served by the Union Pacific here in Wichita. I made this entire track plan BNSF-served trackage, although an occasional UP engine might show up.

I based the yard loosely on the Wichita Union Pacific Yard (red circle in [5]) and the entirety of [6].



3. Main level of trackplan (Wichita, Kansas).

The prototype BNSF yard runs parallel to North Broadway (green oval in [5]) but does not have any shop facility. The BNSF yard does not connect directly to the Buzzi Unicem USA cement bulk transfer station in the Bel Aire Industrial Complex (orange oval in [5]).

On the prototype, moving cars from the BNSF yard to industries served by the UP would be through the Wichita Terminal Association (WTA), a jointly owned entity by the BNSF and Union Pacific railroads (lavender box in [5]). Trackage and motive power would be supplied per the agreed-upon arrangement, refer to wtarr.com.

The main level of the track plan has an around-the-room main line. The Spirit AeroSystems point-to-point transfer from Wichita to Renton uses a reverse-loop-to-reverse-loop arrangement, with switching at each end.



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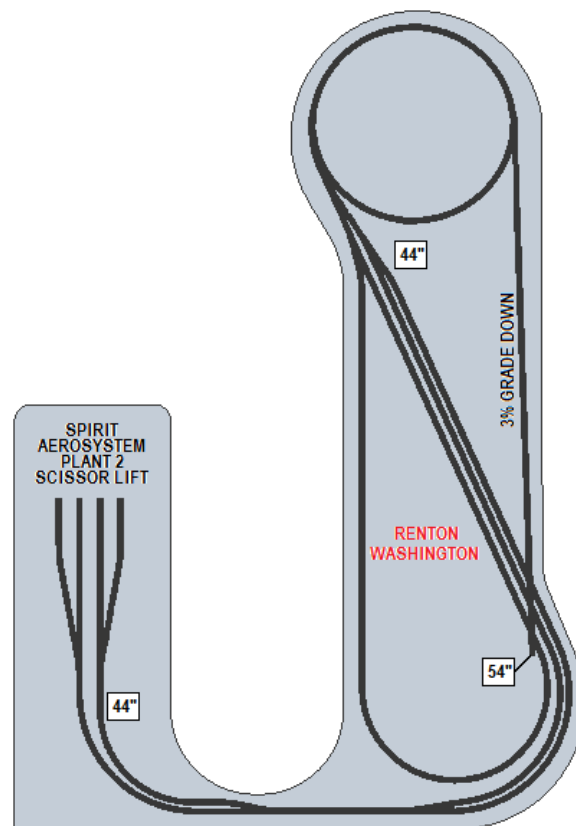
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4. Lower level (Renton, Washington).

CONSTRUCTION THOUGHTS

I envision the layout would be constructed as sections/modules using 2" foam – possibly several layers of 2" foam bonded together – placed on top of storage shelves.

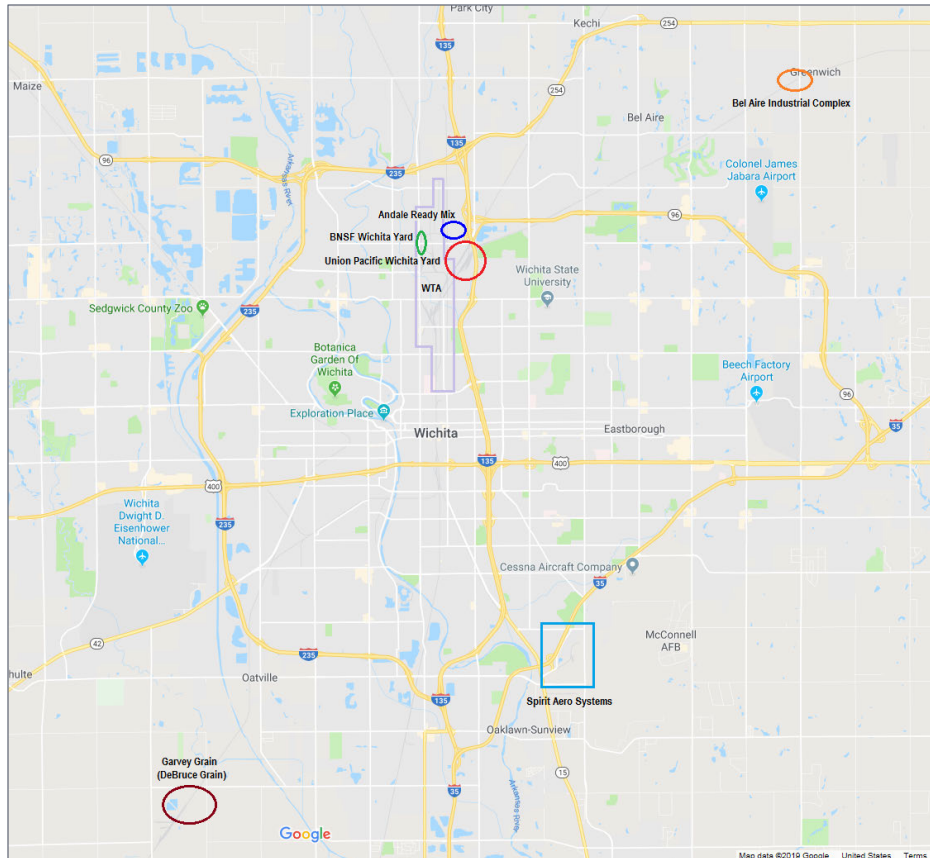
The Bel Aire industrial complex section is approximately 48" wide, so that section would be built with table-type benchwork, and the area beneath used to store large items, possibly with shelving and/or containers on wheels.

The Andale Ready-Mix and Spirit AeroSystems peninsulas would be constructed using benchwork on top of double-sided storage shelves. The trackwork along the garage door (bottom area in [3] and [4]) would be the same method, 2" foam on top of storage shelves. No part of the layout would be attached to the garage door.

All the foam and storage shelves are clear of the person door (represented by the arc in the upper right corner of [3] and [4]).

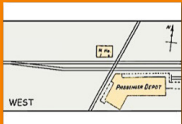
All the storage shelves could use a wood bookcase type construction. Another option would be to use pre-constructed cabinetry. (Salvaged from a kitchen remodel, perhaps?)

However wood L-girder type benchwork with joists and risers would also be a viable approach.



5. Wichita, Kansas map.

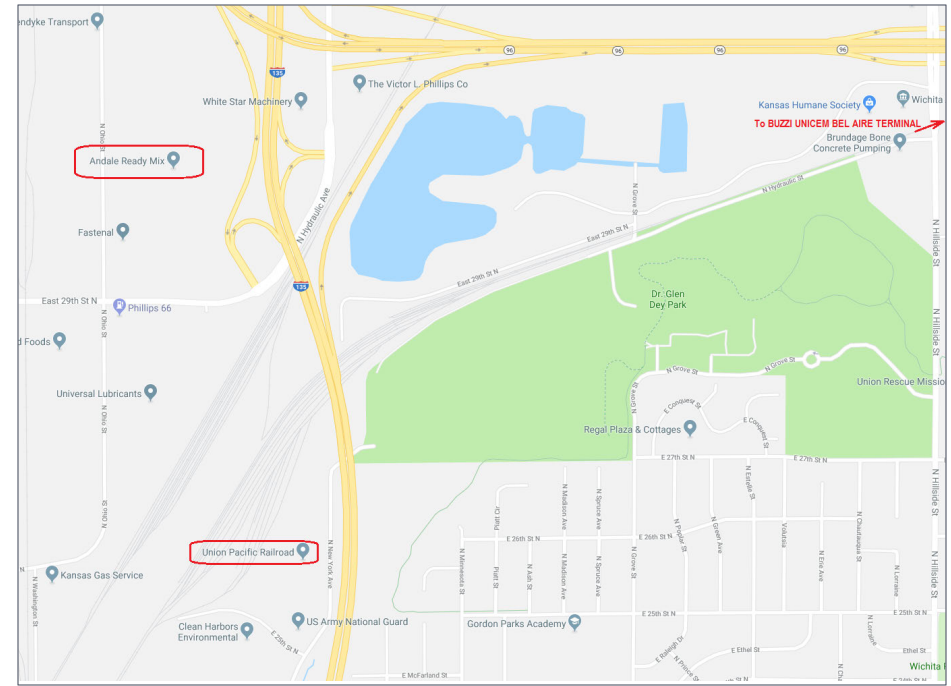
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6. Union Pacific yard in northeast Wichita.



7. Satellite view of the Union Pacific yard, Wichita, Kansas.



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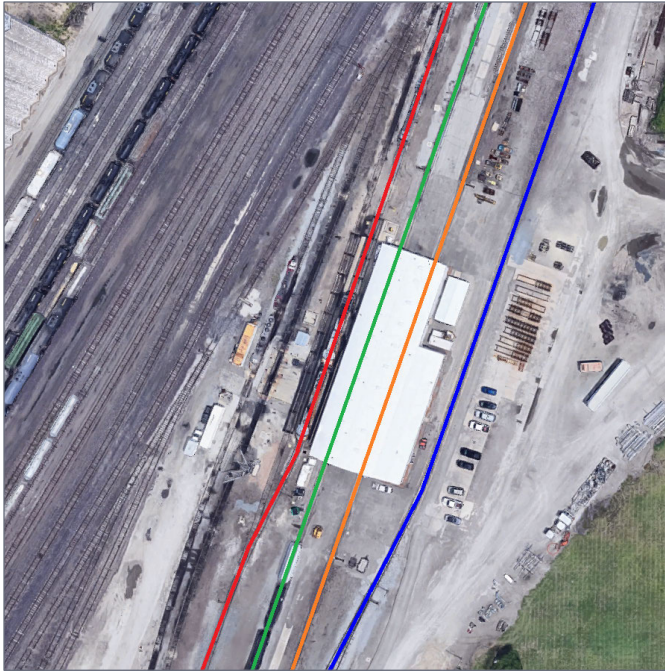
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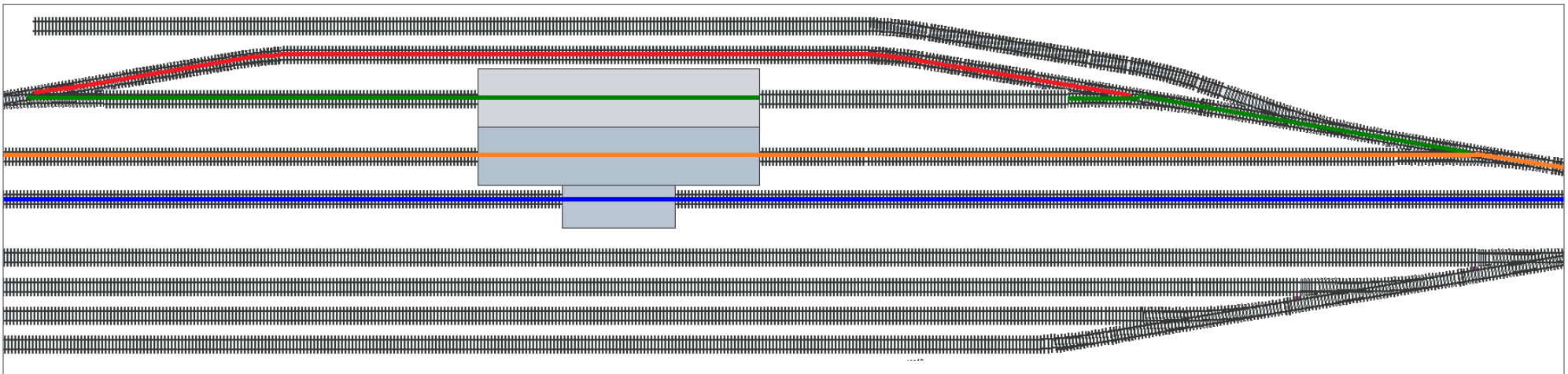
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8. Wichita's Union Pacific yard's shop building.

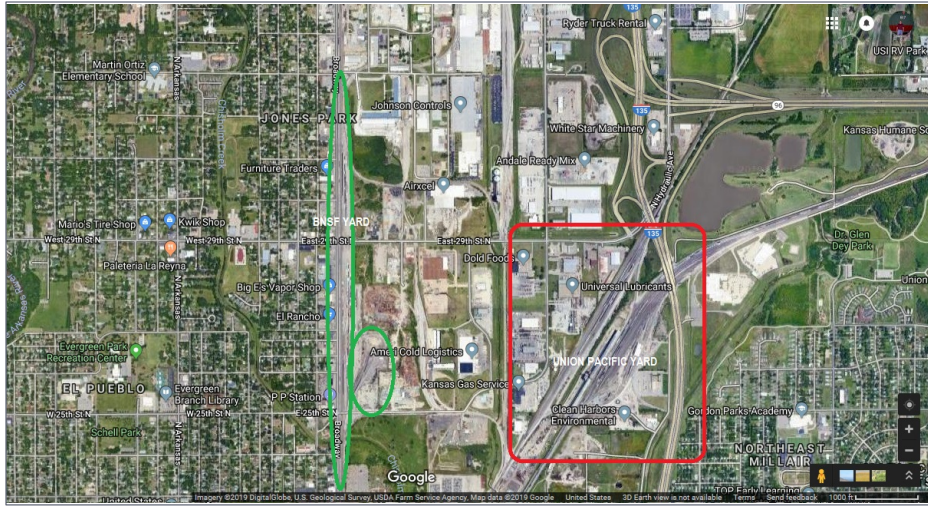


10. BNSF yard showing where the roundhouse had been.

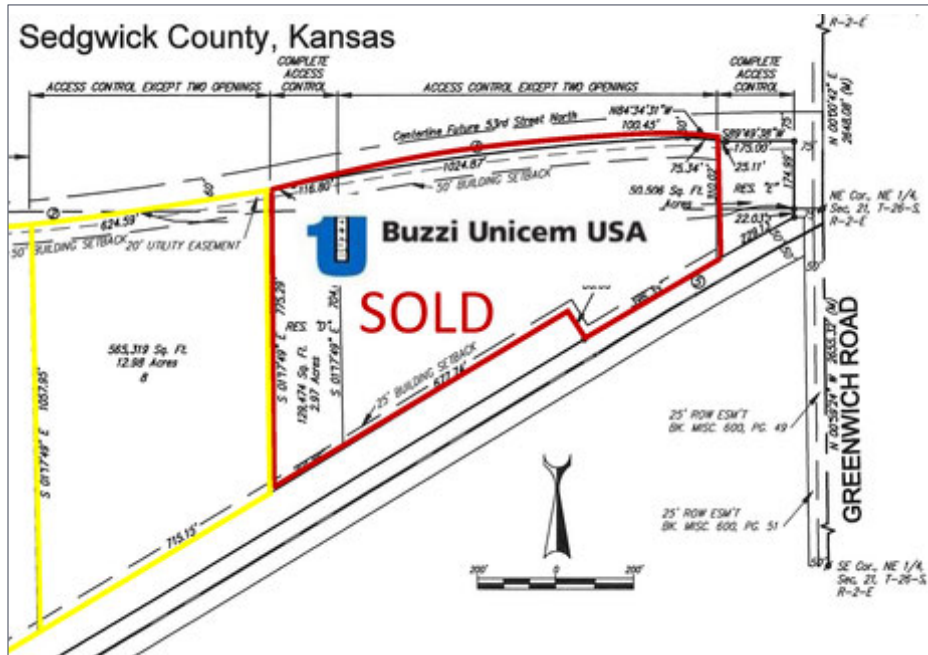


9. My yard track plan with similar trackage to [8].





11. BNSF (green) and Union Pacific (red) yards.



12. Plat map of Buzzi Unicem USA in Bel Aire, Kansas.

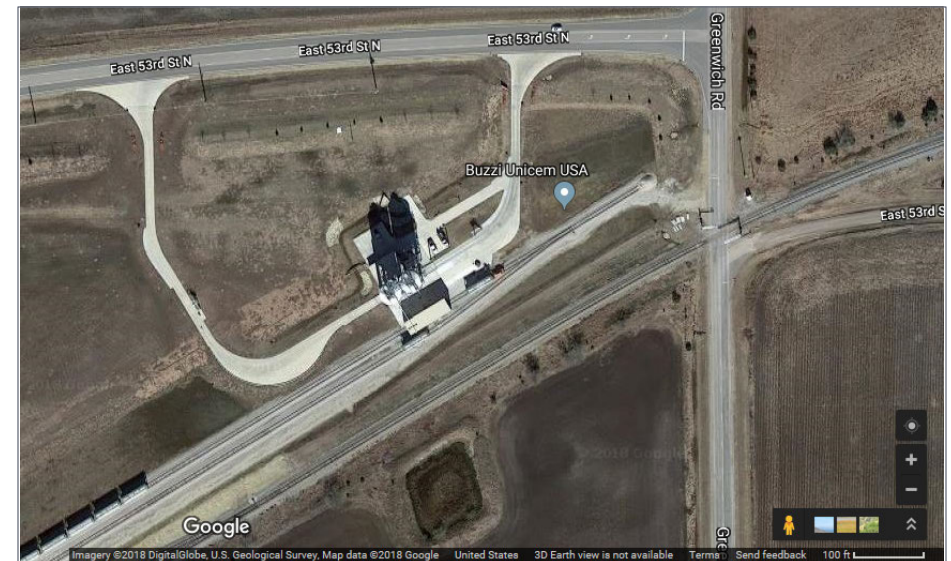
YARD TRACK PLAN

The current prototype BNSF yard does not have any service buildings, so I chose to model a modified Union Pacific yard to add operational challenge and call it a BNSF yard.

Follow along as I compare the BNSF yard layout to the UP yard layout [6-11].

The prototype Union Pacific yard has more than 12 parallel storage/classification tracks, as well as engine-servicing and RIP tracks.

My yard track plan has three storage/classification tracks and the engine and RIP tracks. Like the Wichita UP maintenance shop, on my track plan, the main building functions as both an engine service facility and a car shop. I locate motive power fueling on the parallel tracks on the “north” side of the shop (red trackage in [8] and [9]).



13. Google Maps satellite view of Buzzi Unicem USA in Bel Aire, Kansas.

The track on the “south” side of the shop passes through a lean-to area for light maintenance – that is, a RIP track (blue trackage in [8, 9]).

BUZZI UNICEM USA

Traveling counter-clockwise from the yard we find the Bel Aire Industrial Complex which includes the Buzzi Unicem USA bulk cement terminal. While my wife and I searched for our next German Shepard (our puppy, Jasper), we passed a complex with two large silos and a string of hopper cars on a siding [13], I said to my wife, “That would make a great small industry for our layout.”

At that time, I didn’t know what materials were being shipped to/from this facility. I did an internet search, starting with a Google Maps search of the intersection and learned that it is a Buzzi Unicem USA bulk cement transfer station.

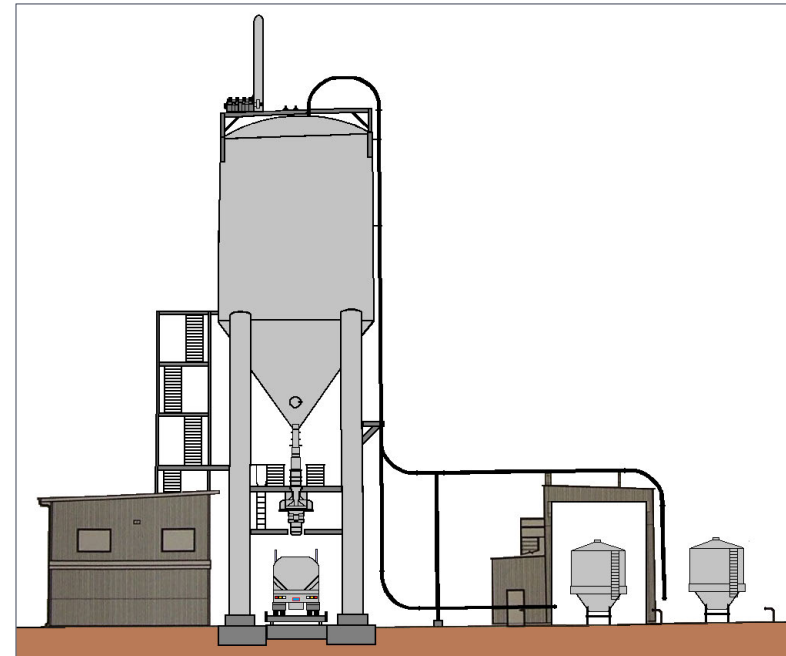


14. Author’s photo of Buzzi Unicem USA in Bel Aire, Kansas.

The prototype facility sits on a triangular plot of land by the intersection of 53rd Street (East-West) and Greenwich Road (North-South) where the rail road tracks transverse the area in a West-Southwest – East Northeast direction (approximately 30° to 53rd Street).

To make the facility fit into a smaller footprint, I rotated the railroad tracks to be parallel to 53rd Street. As I developed the BU facility, I tweaked the location of the exit so that it comes out on Greenwich road instead of the prototype facility exiting onto 53rd St. and moved the entire complex closer to 53rd street. Refer to [13] and [16].

Buzzi Unicem USA receives cement hoppers only, loads in, empties out. This facility unloads the hoppers by air injection and blows the cement up into the two silos. The majority of the unloading activity takes place from within the enclosed building, you can also see some unloading piping on the exterior of the building.



15. Drawing of unloading rail cars/loading semi-trucks.

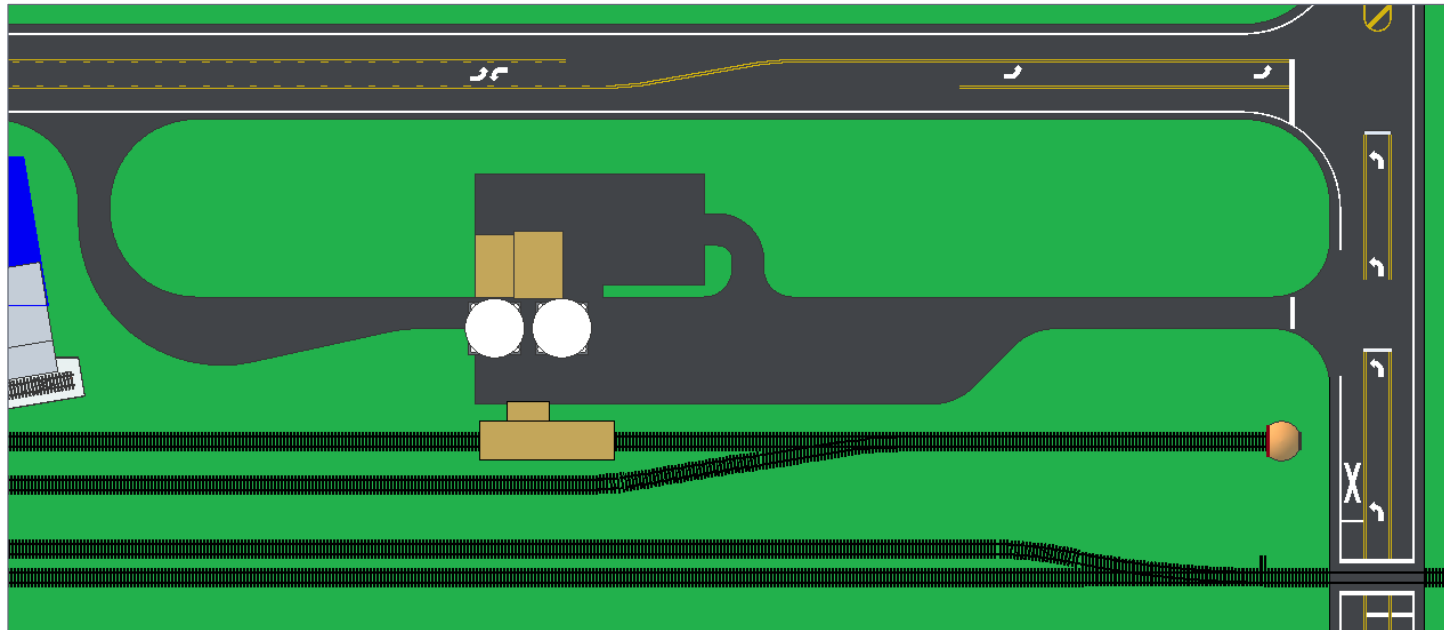
When a tractor-trailer pulls into the loading dock, the cement feeds into the trailer by gravity, assisted by air pressure to keep the cement flowing.

BEL AIRE INDUSTRIAL COMPLEX

I also wanted to move and switch boxcars, flat cars and tank cars. So I added four more freelanced industries to my Bel Aire industrial complex.

L&L Pipe & Supply is a freelanced, but historic named entity. My wife's father Walter J. Nelson was an oil man, and at one time had an oilfield pipe supply company named L&L Pipe and Supply, for his two daughters, Lynne and Lily (my wife). L&L Pipe & Supply on the track plan supplies drill pipe, well casings, well heads, valves, pump jacks, and other oilfield-related equipment. L&L ships these products via highway trucks, boxcars, flat cars, and gondolas (used for the larger well casings).

Vintage Hot Shot is a totally freelanced industry. I previously had experience working on the production side of the oil fields off the coast of Louisiana. I knew the need to get parts from New Orleans to our offshore facility quickly so production was not excessively delayed.



16. Model configuration of Buzzi Unicem USA facility.

A transportation industry known as Hot Shots uses trucks to transport parts as an urgent short-notice move. I took that basic idea and added Vintage Hot Shot as one of these short notice transportation services operated as a subsidiary of L&L Pipe & Supply. They have their dispatch office in the same building as L&L Pipe & Supply. VHS uses vintage 1950-1960-era trucks, rebuilt and maintained in the shop on the east end of the building.

Lily Logistics is another totally freelanced industry. I named it in honor of my wife, Lily. It acts a trucking distribution center, shipping and receiving packages by truck and rail.

W&J Nelson Oil Co. is a freelanced, but historic named entity. W&J stands for Walter and Jackie Nelson, my father-in-law and mother-in-law. They actually operated a company by this name. On the track plan, it receives fuel products (gasoline, diesel, and LPG) via rail, and distributes locally by truck.

I designed the Bel Aire industrial complex trackage to pose some unique switching challenges.

GARVEY GRAIN

DeBruce Grain, Inc. of Wichita operates a large elevator complex located southwest of Wichita. This grain storage and transfer facility has an elevator complex approximately a half-mile long with three rows totaling 79 35'-diameter silos.

DeBruce Grain, Inc. used to be Garvey Grain, and since I inherited several





17. DeBruce Grain Inc. (Garvey Grain) elevator complex.

hopper cars with Garvey Grain reporting marks, I am referring to this grain elevator as Garvey Grain.

Covered hoppers are switched into and out of Garvey Grain. For the track plan, I am using the grain elevators as a backdrop flat industry. I'm modeling only a portion of the entire complex with only one row of silos.

ANDALE READY-MIX

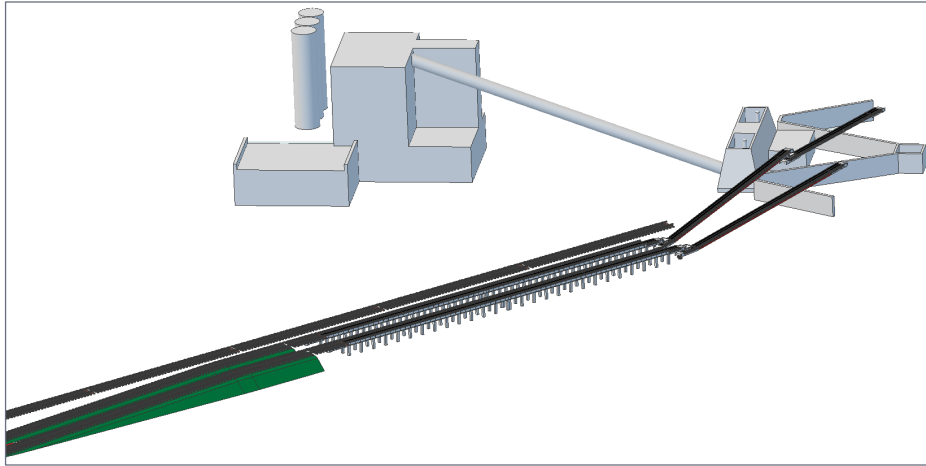
Andale Ready-Mix is a cement batch plant. On my track plan, it receives cement from the Buzzi Unicem USA terminal via truck, which unloads the cement into three raised cement silos. They receive the concrete aggregates by rail on my plan (the prototype receives aggregates by truck only).



18. Andale Ready-Mix, Wichita facility.



19. Andale Ready-Mix cement silos.



20. Track plan configuration. Conveyors at the end of the trestle carry the dumped material up to the bins.

On my plan, Andale Ready Mix has dual parallel unloading tracks with a conveyor belt under them to assist in rapid unloading of the hopper cars. Three to four hopper cars can be spotted onto each raised unloading track [20].

SPIRIT AEROSYSTEMS PLANT 2

At Spirit AeroSystems, empty 89' flat cars go into the four tracks of Plant #2 where a fuselage is loaded onto each empty flat car. Once loaded with the fuselage assembly, each car can be pulled out of the building, pushed onto a siding track and an empty car can be pushed into the building.

The same activity takes place with the 747/777 sub-assembly cars. Once the “empties” train (from Renton) has been disassembled, the loaded cars are built into a train destined for Renton, Washington.

On the track plan, I'm modeling the main 737 Fuselage assembly building (Plant #2) and the 747/777 sub-assembly building and I have repositioned them so that they fit into the layout easier and take us less real-estate than the prototype.

Operationally, I want the four (4) loaded 737 fuselage flat cars pulled out of Plant #2 tracks and the 747 and 777 sub-assembly cars to pull out of



21. Satellite view of Spirit Aero Systems Wichita, Kansas.

another building. The “loaded” 747/777 sub-assembly cars are positioned at the front of the outbound train with four fuselage flat car – idler flat car combinations to make up the rear of the train.

Once the outbound train has been made up, it can be pulled out onto the main line and circle the layout, then goes down the 3% grade to the lower deck Renton area where it is disassembled.

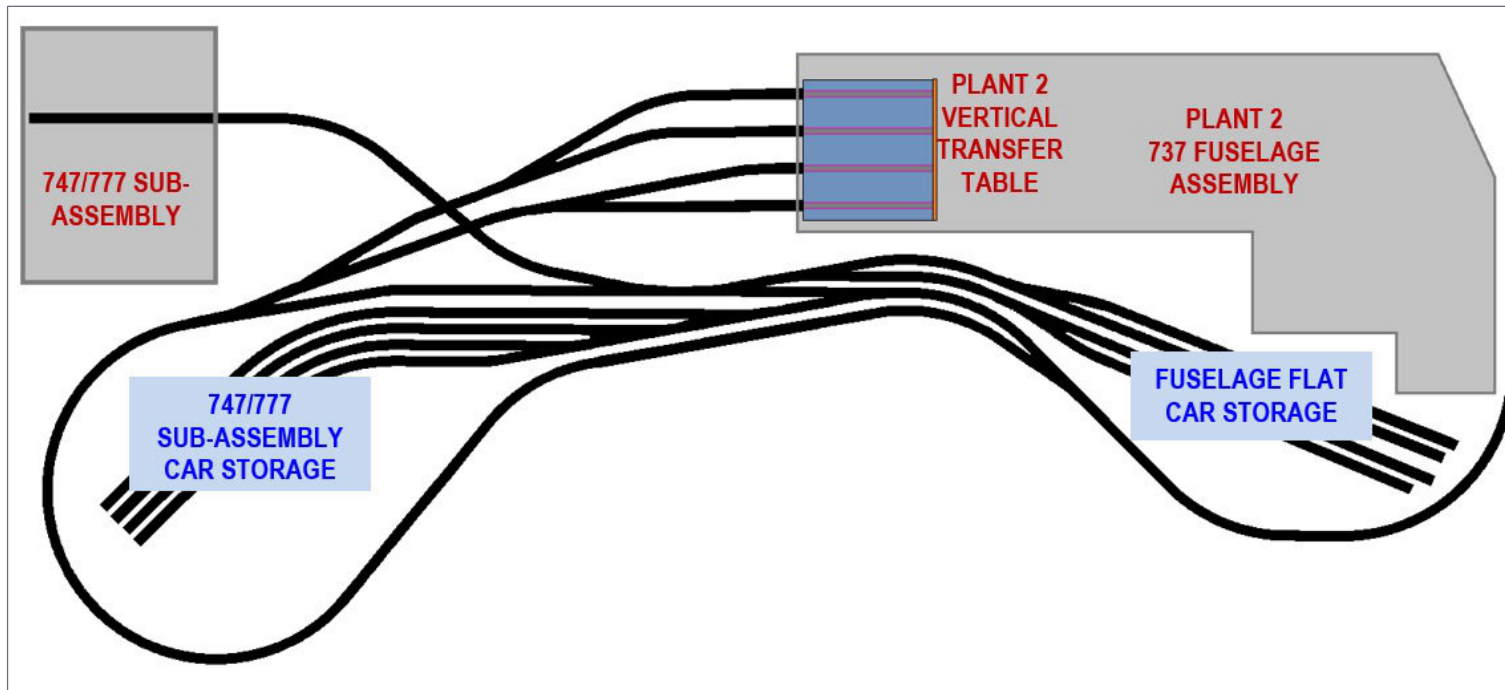
There I can swap full fuselage flats with empty fuselage flats of the same reporting marks.

Then I make up an empty inbound train that travels back up the 3% grade to Spirit Aero Systems. The switching job disassembles the inbound train and swaps empty fuselage flats with loaded fuselage flats.

The track plan of Plant 2 building uses the building to hide the scissor-jack vertical transfer table to move Load/empty cars between Renton and



22. Closeup satellite view of Plant 2 trackage.



Wichita. This gives much switching operation as well as removing the need to hand-carry the cars – all train movements can be accomplished by cars and locomotives remaining on the tracks.

At the beginning of an operating session, the four plant #2 tracks would have “loaded” fuselage flat cars in the building (on the scissor jack). These “loads” would be pulled out of the plant and empties would be pushed into plant #2, ready for newly constructed fuselages. The train to Renton would consist of the “loaded” 747 sub-assembly and 777 sub-assembly cars (special-built well cars with weather proof covers), are located behind the engines. The four loaded fuselage cars, with idler flats between, are located behind the sub-assembly cars. This train would traverse the layout a couple of times to give the impression of traveling across-country. It then takes the 3% grade down to the lower level (Renton, Washington), where it is broken up.

The scissor jack (with the four empty flat cars) is lowered to the second level. The crew then pulls a flat off the scissor jack table, and replaces it with a loaded fuselage flat. Each fuselage flat must be handled individually with an idler flat because of the large overhang of the fuselage. Once each of the four fuselage flat cars are placed on the scissor jack table, it then can be raised back up to Wichita Plant #2.

The train of empties to Wichita has been assembled and the engines only need to run around the train to get into the proper position to return to Wichita.

So that's my track plan for a 24' x 24' space, fitting into a garage, for instance. You can find track plans in the bonus extras, as well as a detailed operating plan for the aircraft plant's empties-in, loads-out scheme. ☑



RATE THIS ARTICLE

23. Track plan configuration of Spirit Aero Systems trackage.





25. Train with two 747 sub-assy, and one 777 sub-assy cars with four 737 fuselages.



24. 737 fuselages on flat cars with brush-cutter buildhead, and idler flat.

★★★★★
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DEREK DUNCAN



Derek got an 0-4-0 HO TYCO train set for Christmas when he was 11-years-old. That started him down the road to model railroading and a lifetime interest in electricity. As a freshman in high school shop, he built a 4' x 6' train table, but when he went to college all his train stuff was boxed up.

In 1989 he received two bachelor's degrees (Electrical Engineering Technology and Computer Science Technology). After graduation he was hired by

an aircraft company in Wichita, Kansas, and was a power generation/distribution engineer for 30 ½ years.

Later he married, built his career, had a child and stopped doing any railroading.

A couple of years ago he ran across model railroad YouTube videos (including "What's Neat this Week") and became interested in modeling again.

Derek is married to his wife Lily, and they have one adult son.

He currently is working as a power distribution engineer for an aircraft company out of Oklahoma City. They purchased a home there with a dedicated "Train Room" over the 4-car garage. ■



D. Duncan

WHAT'S A VERTICAL TRANSFER TABLE?

The vertical transfer table is a commercially available scissor jack (~\$70, Amazon, [see article shopping list here](#)). Transfer up/down can be done manually, or the hand knob could be replaced with

a motorized belt drive apparatus with automatic up/down stops.

This scissor jack from Amazon has a 10.1" travel. An 18" x 18" plate could be mounted on the scissor jack top plate to hold the four tracks. You can either glue the four parallel tracks to this plate, or get fancy and mill slots in a hardwood or aluminum plate for the wheels to ride on.

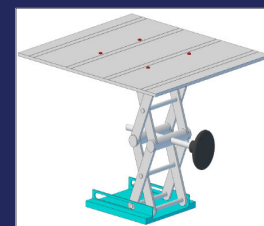
This transfer plate does not need to be powered, as only the fuselage flat cars will be moved on or off it. No engine should run onto the transfer table.

There will need to be some sort of stop for each end of the transfer table tracks to prevent the rail cars from rolling off while being moved up or down.

One simple idea would be to predrill some holes for push pins on both ends of each track. Then once the transfer table has been ramped up, pull the pins out of the open door end to allow switching cars in/out. Note you can leave the push pins on the other end as stops.

When you're ready to ramp the transfer table back down, push the pins back in first. Just reverse the process once the table has been ramped all the way down.

I'm sure some of you could envision even fancier ways of handling this.



24. Vertical transfer table.

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LOOK
column



**JEFF SHULTZ LOOKS AT THE EAST COAST CIRCUITS RICKO
DODGE CHARGER POLICE CAR ...**

EAST COAST CIRCUITS MODIFIES 1:48, 1:87, and 1:160 scale vehicles from a variety of manufacturers, such as River Point Station, Ricko, and Scenemaster, by adding LED lights to them.

On their newest offering, a 1:87 Ricko Dodge Charger police car, East Coast Circuits has added up to 16 LED lights, depending on the specific car model.

The Sheriff's car I received has 14 LEDs, including red taillights and white headlights, an interior light bar in the back window with six separate blue and red LEDs, blue and red LEDs in the light bar on top of the car, and a blue and a red LED in the windshield.

THE NICE THING

Powered by a 9-12V DC power source, such as a 9V battery, the lights seem almost hypnotic in their flashing, with the taillights

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and headlights going from steady to strobing, the blue and red LEDs in the windshield alternating, the LEDs in the roof light bar alternating and strobing, and the six LEDs in the back window flashing in three distinct patterns.

The power connects to the LEDs via a two-foot cable of two twisted magnet wires attached to the bottom of the car. The polarity of the connection is fixed, with the red wire positive and the green wire negative. The ends of the wires come pre-stripped.



1. The front of the Charger with a long-exposure shot to get all the LEDs illuminated. The 14 LEDs make this car an attention-getter.



2. The side of the Charger.

FIRST LOOK | 3

Click on the video below to see it in action. The models will be available for \$85 - \$90, including shipping, depending on the version purchased. ☒



3. The back of the Charger.

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East Coast Circuits Police Car

December MRH companion video

MRH
MODEL RAILROAD HOBBYIST

180-degree view of the Charger with the LEDs flashing.



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SAVVY MODELER *Online*



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Model Railroad Hobbyist | December 2020



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Make uneven music wire perfectly straight

Pupeteers *Alex and Olmsted* demonstrate how to take music wire that comes in rolls or is unevenly twisted into wire that's 100% perfectly straight. Watch the video and see how easy it is to do!

Don't be put off by this being a video by pupeteers instead of model railroaders. A lot of other hobbies and professions have great how-to videos like this loaded with some great tips! ■



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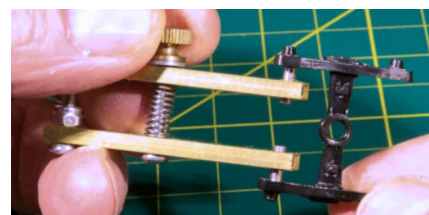
DECEMBER NEWS

column

Model Railroad Hobbyist | December 2020

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

NEW PRODUCTS FOR MULTIPLE SCALES

**Coffman Graphic Solutions**
has introduced an innovative
new tool that takes the
guesswork out of determining
the most efficient axle length
for replacement wheel sets.The new Coffman Truck Caliper is available for seven scales:
N, HO_n3, HO/S_n3, S/On3, and O scale. For additional
information visit www.coffmaneng.com.**Dwarvin** has introduced the
Lamplighter 2S. Based on the
Lamplighter 2 and capable of
holding up to 30 1.5mm fibers or 60
1.0mm fibers, the Lamplighter 2S
has double the light intensity and is**THE LATEST MODEL RAILROAD PRODUCTS, NEWS & EVENTS**[MRHMAG.COM](#)[INDEX](#)[TABLE OF CONTENTS](#)

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a whiter light source. For more information visit www.dwarvin.com.

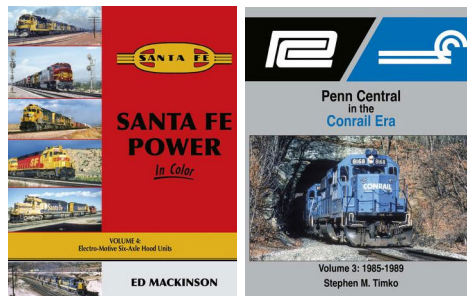


miniprints continues to expand its selection of high-quality multi-scale 3D printed figures. The newest line includes the CustomCrews figures, modeled after modern railroad employees.



All miniprints figures are available in O, S, and HO scales, with a selection now available in N scale. For details on purchasing items, such as the November figures seen

above, through an economical monthly subscription program visit miniprints.ca/subscriptions.



New hardback books scheduled for release during the Christmas season by **Morning Sun Books** include *Santa Fe Power in Color*, *Volume 4: Electro-Motive Six-Axle Hood Units*, by Ed Mackinson. For many years, six-axle Electro-Motive road switchers were the backbone of

DECEMBER NEWS O SCALE | 3

Santa Fe's mainline freight service. This new volume features them all, from the SD24s of 1959 to the Warbonnet SD75Ms of Santa Fe's final days.

Morning Sun also plans to release *Penn Central in the Conrail Era Volume 3: 1985-1989* during the holiday season. In this volume author Stephen M. Timko explores former Penn Central territory under the control of Conrail between 1985 and 1989. Former PC motive power, equipment, and structures are featured, along with freight operations. Over 335 full-color photographs are presented. For additional information contact a dealer or visit www.morningsunbooks.com.

O SCALE PRODUCT NEWS



3rd Rail Division of Sunset Models is booking reservations for O scale EMC Santa Fe E1 A and B units and Baltimore & Ohio

EA/EB diesel units. The models will be individually crafted using an ABS body with full cab interior, precision 5-pole DC skewed armature motor, and a ball-bearing drive mechanism with all units powered.



ERR Cruise, Railsounds & Smoke sound systems will be available in 3-rail units. Two-rail units

will utilize QSI "Titan" DC/DCC and Sound.



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These museum quality models will be built to reservation only. For more information visit

<http://www.3rdrail.com>.

Atlas O is calling for pre orders for two popular O scale freight cars scheduled for release during the 3rd quarter of 2021. Heading the list are three versions of a Trainman series 62' flat car with tall, short, and no bulkheads.



Cars with short bulkheads will be available decorated in two TTX schemes.



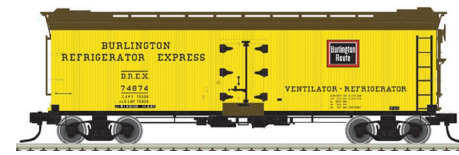
Models with tall bulkheads will be available for BNSF, GAEX-General

American, and two TTX schemes. Notable details on the bulkhead cars include side stake pockets, simulated tie-loops, and prototypical pull-plates and lift rings.



Road names for the flat car will be TTX, DODX-Department of Defense, and Norfolk Southern.

Atlas O will re-issue its popular 40' wood reefer car in several familiar paint schemes. The O scale model represents



prototype wood reefers that were re-built and modernized at various stages of their service life and remained in service into the 1940s.



Decorating schemes will be Burlington Refrigerator Express, Lackawanna Refrigerator Line, Pacific Fruit Express, Fruit Growers Express, Roberts & Oake Packers, and Western Refrigerator Line. Atlas O rolling stock is available with a choice of 2-rail or 3-rail trucks and couplers.



Also expected during the 3rd quarter of next year is another release of Atlas' operating oil pump. The action model will be available decorated in black as well as the two free-lance schemes shown here. The O scale model comes fully assembled and wired. It requires an 8 to 22 volt AC or DC power supply (not included). For additional information contact a dealer or visit www.atlaso.com.



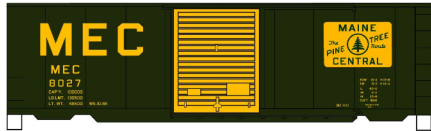
Ipswich Hobbies has introduced two new O scale craftsman structure kits. Both of the laser-cut kits are based on actual

structures. The prototype for the Crossing Shanty is located at the Railroad Museum in Ipswich, MA. The Section House is based on an old structure that once stood near the Eastern Route of the Boston & Maine Railroad near Topsfield Road in Ipswich. The kits can also be ordered pre-built. For additional information visit ipswichhobbies.com.

HO SCALE PRODUCT NEWS



The Plate C car has 10' Youngstown sliding doors.



This 40' Maine Central PS-1 boxcar is based on a prototype built in 1951. It was rebuilt in 1965.

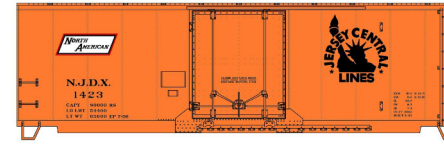


ends in December 1914.



Accurail's HO scale kit for this single-sheathed 36' boxcar is based on a real Fowler car that entered service on the Chicago & North Western Railway on August 11, 1914.

New HO scale rolling stock kits from **Accurail** include this Canadian Pacific 50' steel exterior



This 40' insulated all-steel boxcar entered service on the Central Railroad of New Jersey (aka Jersey Central Lines) in 1932.



Accurail's HO scale kit for this ACF Norfolk & Western 4650 cu. ft. Center-Flow covered hopper follows a full-size triple bay car built in 1964. The fine print on the side of the model reads: POLYCLUTCH LINING APPLIED 8-64. DO NOT USE STEAM BOILING WATER OR SHARP OBJECTS TO CLEAN. ENTER CAR WITH RUBER SOLED SHOES ONLY.



This HO scale Nashville, Chattanooga & St. Louis 40' steel boxcar is based on a prototype built in early 1942. All Accurail HO scale kits

include Accumate knuckle couplers and appropriate trucks with Delrin wheelsets. For additional information contact a dealer or visit www.accurail.com.



R. Bale

SD70ACU LOCOMOTIVE

The 4,300hp SD70ACU diesel was created in 2015 when the Norfolk Southern Railway launched a program to update its EMD SD90MACs. The rebuild included installation of the latest EMD cab to comply with FRA crash-worthiness standards, replacing the Siemens electrical control package with Mitsubishi electronics, and completely refurbishing the V16 710 prime mover. Most NS rebuilds had rear ditch lights added and modifications to the location of the horns, headlight and antenna array. In 2018, the Canadian Pacific Railway began a similar rebuild program for its SD90MAC fleet, which was performed by Progress Rail. In addition to new electronics and cab, CP changed the front plow and raised walkways for better snow management.

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Athearn plans to release SD70ACU diesel units next November. The fully featured HO scale models will be in Athearn's Genesis 2.0 line.



Canadian Pacific models will be available in several distinctive paint jobs including CP red with the new Beaver logo, and a gray and maroon heritage unit with script lettering.



Inspired by Canada's military forces, CP SD70ACU models will be available decorated in Canadian Army desert sand. The Royal Canadian Navy will be saluted with a SD70ACU decorated in RCN shipside grey and oxide red.



Athearn's Norfolk Southern version of the SD70ACU will feature deck mounted rear ditch lights, a prototypically correct 5-chime horn, high mounted headlight, and an NS style PTC antenna. All versions of the HO scale model will be available without sound and with an onboard DCC decoder with SoundTraxx Tsunami2 sound.



Athearn's November 2021 schedule lists three new freight cars including a Genesis series ICC caboose. Road names for the feature-laden caboose will be Burlington, Burlington Northern, Colorado & Southern, and Fort Worth & Denver.

In addition to LED interior lighting, the DCC equipped cabooses will offer a variety of sounds such as air horn or

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trainline air whistle, rail clickety-clack, brake set/release sounds including brake squeal, and adjustable flange squeal.



R. Bale

PULLMAN STANDARD 60' AUTO PARTS CAR

In the 1960's, the Santa Fe Railway, Ford Motor Company, and Pullman Standard, pooled their resources to develop a standard boxcar to meet the transportation needs of automobile manufacturers in the United States. Delivered in 1965, the Pullman Standard 60' auto parts boxcar became a prime example of this type of freight car. Many had two eight foot wide doors to facilitate forklifts rapidly loading and unloading the car. The design ultimately changed the face of automobile manufacturing and rail transportation.

Athearn has included a Genesis series 60' PS auto boxcar in its production schedule for next November. Features of the HO scale model include a detailed cushion underframe, etched metal coupler platforms, separately applied door closure rods, side ladders, metal grab irons and brake cylinder; etched metal end platforms, coupler lift bars, trainline and brake hoses, and 100-ton roller-bearing trucks with machined metal wheels and rotating bearing caps.



Road names will be Chicago, Burlington & Quincy; Milwaukee Road, Louisville & Nashville, Norfolk & Western, Frisco, and Southern Pacific.

The third new freight car coming from Athearn next November is a basic 60' flat car. The Ready-to-Roll HO scale model will be

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available in three road numbers each for Southern Railway, Canadian National, Canadian Pacific, BC Rail, BNSF, Southern Pacific, and three TTX schemes.



New intermodal equipment on Athearn's November 2021 delivery schedule includes a 40' Z-Van trailer with a new Thermo-King reefer unit mounted on the nose of the trailer. Carrier names will be Digby's Golden Arrow Route, Intermodal Systems, Leaseway Transportation, Martrac, Rock Island, and an unlettered owner operator unit. The trailers will be available individually as well as in combination with a Genesis F89 flat car.



Both yellow and brown versions of the TTX flat car will be available. They will have positionable hitches, wire grab irons, individual brake ratchet, and 70-ton roller-bearing trucks with metal wheels and rotating bearing caps. A minimum track radius of 24" is recommended. The Rock Island and Digby's trailers will be available with a brown TTX F89 flat car. Z-Van trailers decorated for Leaseway and Intermodal Systems will be available with yellow TTX flat cars.



Athearn plans to release HO scale versions of the IMPACK (Inter-Modal Package) spine car next November in four, five and ten car sets. The models are based on the unique "Fuel Foiler" cars built by the Santa Fe in 1978. The Fuel Foilers were designed to carry 40' to 45' trailers in 4 to 10-car sets. Athearn will offer the HO scale version of the spine car decorated for Burlington Northern, ITEL, Santa Fe, TTX, and SSW-Cotton Belt.

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The November 2021 production schedule for Athearn concludes with a Roundhouse brand 34' twin-bay coal hopper with ribbed sides. The economy priced model will be fitted with appropriate trucks with metal wheels. Road names will be Pennsylvania, Baltimore & Ohio, New York Central, Lehigh Valley, Norfolk & Western, BNSF, and Chesapeake & Ohio. For additional information contact a dealer or visit www.athearn.com.



Atlas is booking pre-orders for an all-new 5250 cu. ft. covered hopper. The HO scale Master series model is based on a prototype introduced by ACF in 1964.



The majority of the nearly 20,000 cars built were equipped with pneumatic outlets and eight 20" round hatches; two features designed to facilitate handling plastic pellets. The overall design evolved over the years with many of the plastics cars being rebuilt with gravity outlets and elongated hatches for grain type products. Accordingly, Atlas will offer three unique body style variations to represent those changes from the 1960s into the 2000s.



Road specific variations on the three body styles include hatch and outlet configurations, and types of roof walks. Additional features of the new model include etched metal roof walks, metal knuckle couplers, separately applied wire grab irons and wire brake lines, etched metal coupler crossover platforms, and 100-ton roller-bearing trucks.

Road names on Atlas' initial release will be CHEX-Chemplex Plastics, NDYX-Arco Polymers, ACFX-Honeymead, ADMX-ADM

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Molecule, HPCX-Hercules Pro-Fax, and GACX-General American. Availability is planned for the first half of 2021.

Also new from Atlas is an HO scale 10-1-12 Pullman heavyweight sleeper. By the late 1920s Pullman had built over 600 cars to the 10-1-2 (10 section, 1 drawing room, 2 compartment) 3585 plan making it the largest class of cars except for the ubiquitous 12-1 sleeper. Collectively, cars of plan 3585 became known as the "Lake"



series of cars, as the majority of them bore names of lakes in the United States.



Features of the new Atlas HO scale sleepers include full interior

detailing, operating diaphragms, prototype-appropriate air conditioning details, underbody details, and six-wheel passenger trucks with metal wheels. Atlas recommends a minimum track radius of 24".



Three Lake series names will be available for Pennsylvania (Tuscan

red), Southern Railway (green and black), Union Pacific (yellow, grey and red), and Southern Pacific (Pullman green and black). Lehigh Valley cars, in LV red, will be available in choice of two Lake names. Cars lettered for Pullman will be available in six different Lake names. An unlettered sleeper in Pullman green will be available along with one car lettered for México SCD.

Atlas' 3rd quarter production schedule for 2021 includes a rerun of its Alco S-4 switch engine with a retooled cab. The HO

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scale Master series model is based on a 1,000hp prototype Alco introduced in 1950.



The upgraded model features separately-applied grab irons, coupler cut levers, air hoses, and piping; redesigned AAR type truck frames, directional LED lighting, and a retooled chassis to accommodate DCC and sound.



Road names include Baltimore & Ohio, Boston & Maine, CP Rail, Grand Trunk Western, Pennsylvania Railroad, Santa Fe, Southern Pacific, and undecorated.



DC models will be equipped with a speaker and an 8-pin socket for conversion to DCC/sound with the addition of an aftermarket decoder. DCC versions of the S-4 will have an ESU LokSound Select Dual-Mode decoder.



Completing Atlas' 3rd quarter 2021 production of HO scale models are three versions of a Trainman series 68' fishbelly flat car. Details include individual side stake pockets, simulated tie-loops, and lift rings.



Models with standard (tall) bulkheads will be available for BNSF, GAEX-General American, Boise Cascade, and two TTX schemes. Road names for models with short bulkheads will be Colorado & Wyoming, and two TTX schemes.

Road names for a flat version without bulkheads will be Union Pacific (MOW green), DODX Department of Defense, and TTX. Each of the three types will also be available undecorated. For additional information contact a dealer or visit www.atlasrr.com.



R. Bale

EMD SD60 SERIES DIESELS

The EMD SD60 is a 3,800hp, 6-axle diesel electric locomotive designed for heavy-duty drag freight and medium-speed freight service. The SD60 was introduced by EMD in 1984 with production continuing until 1995. If the cab on the standard cab SD60 looks familiar it is because it is the same cab EMD used on its SD40-2.

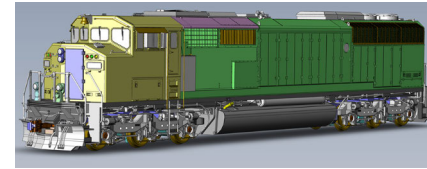
Variations on the versatile SD60 locomotive include the SD60I with a full-width short hood and a sound insulated WhisperCab; the SD60M with a short full-width hood and a North American safety cab with a three-piece windshield; the similar appearing SD60MAC equipped with AC traction motors; and the home-built Norfolk Southern SD60E that featured an NS-designed wide nose cab with increased crash protection, new electronics, and rebuilt engines rated at 4,000hp. GMD built SD60F units for Canadian National with a full-width cowl body and a crashworthy safety cab with a four-piece windshield.



Aurora Miniatures has announced plans to produce an HO scale Canadian

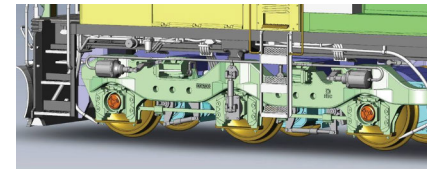
National SD60F diesel electric locomotive. Aurora is an established Chinese manufacturer of mostly domestic prototypes for the broad Asian market. The HO scale SD60F is Aurora's first model of a North American prototype. To service

North American customers Aurora has opened an office in Canada in Scarborough, Ontario.



Separately applied details listed in Aurora's SD60F announcement include individual windshield wipers, grab irons, handrails, steps and

ladders, lift rings, bell, horn, winterization hatch, radiator screens, mirrors, sunshades, plow, MU hoses, train line hose, coupler cut lever, sanding lines, handbrake chain, fuel tank, and underbody cables and piping. Of special note are operating radiator fans driven by an auxiliary motor that uses a double worm gear system to achieve appropriate fan speed.



Aurora's SD60F will have GMD/Dofasco HT-C trucks with traction motor detail, separately applied brake details, and rotating roller-bearing end caps.

Lighting functions will include headlights, ditch lights, number boards, tri-color classification lights, step lights, ground lights, walkway lights, and locomotive control desk lights. The locomotive will have Kadee-compatible proprietary couplers with scale size heads. Aurora will offer the SD60F for DC operation as well as DCC and DCC sound with a factory installed ESU LokSound 5 decoder. All units will have dual sugar cube-type speakers with enclosures. An optional smoke unit for installation by the hobbyist will be available as a separate purchase.



Decorating schemes will include CN stripes, CN wet noodle with a North

American map and CN wet noodle with the CN.NA website.

Availability is planned for summer 2021. Aurora is currently in the process of establishing a dealer network. For the latest listing visit auroraminatures.com/dealer-listing-canada.



Bachmann has released an upgraded version of its HO scale cable car. Improvements for the self-propelled model include a revised drivetrain. In addition to a Christmas theme, the ready-to-run model is available decorated for Powell & Hyde Street, Washington & Jackson Street, and Powell & Mason Street. For additional information contact a dealer or visit www.bachmanntrains.com.



Con-Cor's HO scale 2020 Christmas model is a pair of 53' containers. The switch by Con-Cor to containers for the Christmas model was prompted by inconsistent deliveries from China of some car parts. To purchase the holiday models visit www.con-cor.com.



by inconsistent deliveries from China of some car parts. To purchase the holiday models visit www.con-cor.com.



Credit Valley Railway is taking reservations for a Bowser 40' steel boxcar custom decorated for Canadian National. The brake rigging, safety appliances, and decorating scheme represent a car built in 1940 with Youngstown doors. For additional information, including reservations, visit www.cvrco.ca/CVSearch/default.aspx?Manufacturer=161&start=A161-2-5978&end=A161-2-5981.



R. Bale

C&O L-1 HUDSONS

The Chesapeake & Ohio was slow to invest in passenger diesels in the early 1940s, and as the nation's railways emerged from WWII, C&O's black steamers looked ancient compared to the competition's colorful diesels. In an effort to appear more up to date, in 1946 the C&O rebuilt five of its 4-6-4 Pacifics with 4-wheel trailing trucks, converting them to class L-1 4-8-4 Hudsons. Four of the five new Hudsons were clad with stainless steel shrouding including the boiler which was painted orange. The tenders were fitted with fluted stainless steel sheathing that curved at the top to match C&O's new Budd passenger cars. After C&O took over the Pere Marquette Railway, the boilers of the L-1s were repainted yellow. C&O engine No. 490 survives today at the B&O Railroad Museum in Baltimore, MD.



New releases coming from **Broadway Limited** this month include several versions of a Chesapeake & Ohio class L-1 streamlined 4-6-4 Hudson steam locomotive. Construction of the HO scale model is a combination of a brass superstructure and a diecast chassis.



BLI's streamlined C&O Class L-1 Hudson will be equipped with Paragon3 Sound and Operating System featuring Rolling Thunder.

The model will be available in the original orange boiler as well as with the later yellow boiler. An unlettered model

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painted brass will also be available. For additional information contact a dealer or visit www.broadway-limited.com.



InterMountain has released eight versions of a 60' flat car with a wood deck. Road names on the HO scale model are Illinois Central, Norfolk Southern, Soo Line, Canadian National, Nacionales de México, and three HTTX schemes.



The ready-to-run models come with appropriate trucks with machined metal wheels.



For additional information contact a dealer or visit www.intermountain-railway.com.



Kadee's Christmas model for 2020 is a specially decorated P-2 twin-bay covered hopper.



The newest addition to Kadee's regular line of HO scale ready-to-run models is this Chicago Great Western 40' PS-1 boxcar. The model accurately represents a prototype Pullman Standard built in 1951 with Youngstown sliding doors. It was also equipped with specialized internal loading fixtures. Kadee has decorated the model as it was repainted in 1959 with a black roof.

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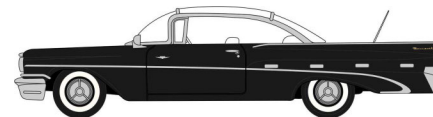
Also new is a 50' Chicago and North Western PS-1 boxcar with an 8' six-panel Superior door. All Kadee ready-to-run models come with Kadee couplers and two-piece self-centering trucks. For additional information contact a dealer or visit www.kadee.com.



KatoUSA has added the late Phase V paint scheme of the GE P42 to its stable of Amtrak Genesis locomotives. The HO scale model is available for DC operation or with factory installed ESU Loksound DCC and sound. Additional features include directional headlights and taillights on both the front and rear of the locomotive and illuminated pre-printed number boards. The model is powered by a pair of coreless truck-motor drive units. For additional information contact a dealer or visit www.katousa.com.



New 1:87 scale vehicles scheduled for release this month by **Oxford Diecast** include this 1942 Chrysler Town and Country Station Wagon. The maroon and wood model features a roof rack and broad white wall tires.



Also due for release in December is a 1959 Pontiac Bonneville Coupe in white over black.



Completing Oxford's list of new 1:87 scale vehicles is a California Highway Patrol scheme applied to a 1954 Pontiac Star Chief sedan.

Since California did not approve of white wall tires on state vehicles, meticulous hobbyists may want to paint the tires black. For additional information contact a dealer or visit www.walthers.com.



Summit USA has released an HO scale kit for a Starbucks Coffee restaurant with a drive-thru. The kit consists primarily of pre-cut and milled styrene, laser-cut white acrylic and self-adhesive

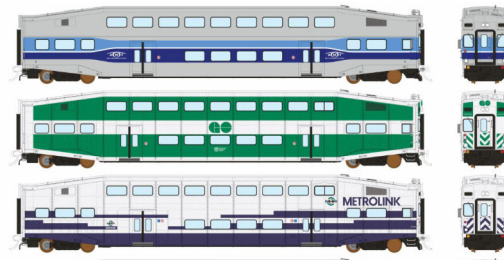
micro-plywood, window glazing, logo signs and decals, and illustrated assembly instructions. The completed building has a footprint of 8" x 4.75" x 3.25" high. The parking lot base, cars, vehicles, and landscaping are not included. For additional information visit www.summit-customcuts.com.



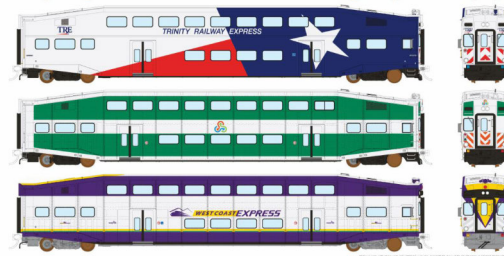
R. Bale

BILEVEL COMMUTER CARS

The contemporary North American Bilevel Commuter Car was introduced in the mid-1970s. The cars are currently in service on 14 transit agencies in Canada and the United States. The Bilevel design resulted from a request by the Government of Ontario to develop a higher-capacity solution for commuter trains in Toronto where the city's single-level commuter trains had grown to 10-car trains. It was determined that the solution was to increase the height rather than length of the trains. Built by Hawker-Siddeley of Canada, the first cars went into service on Toronto's GO Transit system in 1976. The cars have since been manufactured by Urban Transportation Development Corporation (UTDC), SNC-Lavalin, and currently by Bombardier. The first cab units came on line in 1983. The Bilevels are constructed with a riveted or welded aluminum body on a steel frame. Depending on the internal configuration, capacity of the 85' cars ranges from 136 to 162 seated passengers.

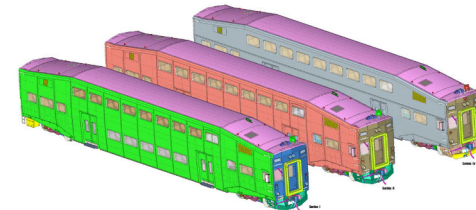


Rapido has announced plans to produce six different versions of North American Bilevel Commuter Cars. The HO scale models will replicate series I, II and IV of the popular prototype.



Specific details include body shell designs with or without rivets, five or four windows on the lower level as appropriate to the series, tinted windows, metal grab irons, constant interior lighting, controllable cab car

lighting, and detailed inside-bearing trucks with roller-bearing axles and metal wheelsets.



Underbody piping and rigging will get Rapido's usual attention to detail. A minimum track radius of 22" is recommended for reliable operation.



Road Names will be AMT Montreal, GO Transit (Toronto, early design), Metrolink (Los Angeles), Trinity Railway Express (Dallas/Fort Worth), Tri-Rail (Miami), West Coast Express (Vancouver), and undecorated.

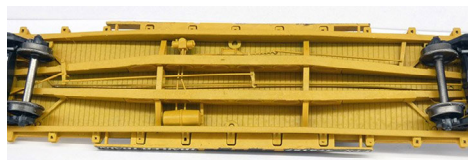




Rapido has also announced plans to produce three versions of the Pennsylvania Railroad's 50' class F30A, F30D, and F30G flat cars. The

HO scale model replicates the one-piece cast steel prototypes introduced in the early 1930s.

Beginning in the mid-1950s many of the workhorse flat cars were rebuilt for early piggyback service. The PRR designated theirs F30D. Modifications included perforated side rub rails, side posts and end loading ramps. In the late 1950s PRR transferred 86 cars to TTX where they received additional upgrades including retrofitting the trucks with roller bearings.



Rapido's models will have full brake rigging, separate grab irons, a die-cast chassis for weight, Kadee couplers, and PRR 2E-F10 trucks with solid

or roller-bearings as appropriate to the era being modeled. Six car numbers will be available for each paint scheme.



Basic F30A 50' flats will be available in original PRR scheme, for 1950 service, and 1960 service. The F30A will

also be available for Penn Central, Lehigh Valley, and in Conrail's MOW scheme.



F30D TOFC car with perforated side rub rails, end loading ramps and four side posts will be available decorated for TTX in both

early and late red schemes, and for PRR.



Rapido's F30G version of the 50' TOFC will feature an ACF trailer hitch, revised side rails, upgraded end ramps and roller-bearing trucks.

The F30G will be available for TTX yellow. All versions will be available undecorated. For additional information contact a dealer or visit www.rapidotrains.com.



Tangent has introduced a new series of HO scale Pullman Standard triple-bay coal hopper cars. Variations include the PS3526/3600 cu. ft. hopper favored by eastern railroads and the PS4000 cu. ft. version

preferred by western roads. To correctly replicate the prototypes, Tangent tooled four dimensionally correct car body variations with both trapezoidal and flat side panels, as well as offset and non-offset truck center arrangements.



Noteworthy details on Tangent's new coal hoppers include scale coupler lift bars, rubber air hoses, car shaker parts, see-through brake platforms, hidden weights, Kadee

couplers, and 100-ton Barber S-2 trucks with machined metal wheels and rotating bearing caps. Each model comes with a removable load.



The PS4000 version of the car is available decorated for Chicago North Western, and in two mid-1970s Burlington Northern schemes.

The PS3526 variant is available for B&O Chessie System. Undecorated models include the PS 3526, and Phase 1, 2, and 3 of the PS4000 cars. For additional details visit www.tangentscalemodels.com.





Walthers is selling a 67' 6351 cu. ft. quadruple-bay covered hopper decorated for Archer-

Daniels-Midland (Walthers 920-105821). The HO scale Proto series model is available in four ADM road numbers. Instructions for operating the outlets is stenciled on each of the four discharge bays. Details include etched-metal walkways and end platforms, and 36" machined metal wheels. For additional information contact a dealer or visit www.walthers.com.

N SCALE PRODUCT NEWS



Athearn plans to release an N scale 60' PS auto boxcar next No-

vember. The N scale model is based on a prototype developed by Santa Fe, Pullman Standard, and Ford Motor Company in the mid-1960s (see the side bar in the HO scale report).



Road names for the N scale model will be Chicago,

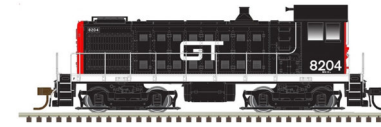
Burlington & Quincy; Milwaukee Road, Louisville & Nashville, Norfolk & Western, Frisco, and Southern Pacific. The model will ride on 100-ton roller-bearing trucks with metal wheels and an extended drawbar. A minimum track radius of 15" is recommended.



Twelve road numbers will be

available for Athearn's N scale F89F flat car which is set for release next November. Six of the cars will be in brown livery,

with the other half in yellow. The models will have positionable hitches, wire grab irons, separately applied brake ratchet, trucks with machined metal wheels, and body mounted knuckle couplers. For additional information contact a dealer or visit www.athearn.com.



Atlas' 2021 3rd quarter N scale production schedule includes an Alco S-4 switch engine with two styles of cabs; riveted or welded.

The new diesel model is based on a 1,000hp prototype the American Locomotive Company introduced in 1950.



The N scale locomotive features fine scale handrails, separately-applied air hoses and uncoupling levers, and directional LED

lighting. In addition to standard DC operation, the model will be available for DCC operation with a factory installed ESU LokSound decoder.



Road names include Baltimore & Ohio, Boston & Maine, CP Rail, Grand Trunk Western, Pennsylvania Railroad, Santa Fe, Southern Pacific, Boston & Maine, and undecorated.

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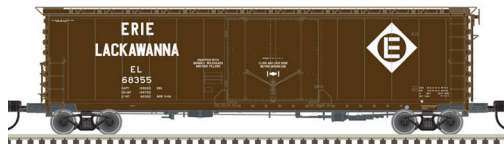
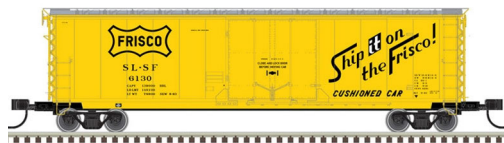
R. Bale

RBL BOXCARS

RBL is the AAR class designation for an insulated bunkerless refrigerator car with loading devices. The 50' RBL car General American Corporation introduced in 1960 was revolutionary for its all-welded body construction and the wide variety of load restraining devices available to customers. The cars were designed for transporting goods that needed to be shielded from extreme temperature variations. While initially used to transport canned goods and newsprint, the cars became very popular for shipping beverages and perishables. While not providing actual refrigeration, a pre-refrigerated load could expect to hold its temperature within a few degrees for several days while in transit.



3rd quarter 2021 production schedule.



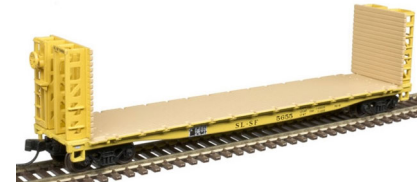
Road names on the initial release will be Missouri Pacific, Delaware & Hudson, Wabash, American Refrigerator Transit, Erie-Lackawanna, New York Central, Nickel Plate Road, Rock Island,

Atlas is developing new tooling for an N scale 50' General American RBL boxcar. The finished model will be included in Atlas's

Features on the new N scale model include separately applied wire cut levers, etched metal running boards, and etched metal crossover platforms.

Road names on the initial release will be Missouri Pacific, Delaware & Hudson, Wabash, American Refrigerator Transit, Erie-

and Frisco. An RBL with the running boards removed will be available decorated for Conrail.



Atlas has included a N scale version of a 48' GSI bulkhead flat car in its 3rd quarter 2021 production schedule.



Road names will be Frisco, Atlantic Coast Line, BC Rail, Burlington, Burlington Northern, Chicago Great Western, Gulf Mobile & Ohio, Missouri Pacific, and Union Pacific.



Also coming from Atlas next year is this Trinity 31,000 gallon crude oil tank car.



The N scale model will come with BLMA 100-ton ASF Ride-Control trucks fitted with 36" metal wheels. In addition to Ferromex, road names will be HSRX-High Sierra Energy, and CBTX.



Additional N scale models coming from Atlas include this all new 4180 cu. ft. Airslide covered hopper. Developed in the early

1950s, subsequent production went through several modifications. The new Atlas N scale double-compartment version follows a prototype introduced in 1962.

Road names will be Frisco, Rock Island, Northern Pacific, Santa Fe, Burlington Northern, BNSF (buffer service), Brach's Candy,



Chessie System, SSW-Cotton Belt, Golden West Service, and Western Maryland. Availability is planned for the 3rd

quarter of next year. For additional information contact a dealer or visit www.atlasrr.com.



Con-Cor's N scale 2020 Christmas model is a pair of 53' containers. The switch by Con-Cor to containers for the Christmas model was prompted by inconsistent deliveries from China of some car parts. To

purchase the limited run containers, visit www.con-cor.com.



Fox Valley Models has released three new N scale containers. They are available in 2-packs. Hanjin 20' (89-

1004) and Capital 40' (89-1104) containers both have corrugated sides.



A pair of 48' smooth side (89 1301) containers are available for BN America with one displaying anniversary graphics. For additional information

contact a dealer or visit www.foxvalleymodels.com.



ImagineThatLaserArt has released a craftsman style kit titled Allstate Machine. The N scale laser-cut model can be built in several configurations including as a conventional standing building. As shown here the N scale model has a footprint of 5.75"L x 3.5"W x 3"H.



ITLA's Allstate Machine model can also be built in an elongated format as a shallow background flat. Components in the kit include etched scale brick surfaces on solid MDF wood, and laser-cut windows with two styles of pre-cut glazing. Loading dock

details include distressed wood decking, interior bracing, positionable loading doors, positionable steps, pallets, and crates.



Wall details include fire escapes, ventilation fans, electrical and gas meters, and entry door security bars. HVAC ducting, a chimney, and a vertical stack are included for roof details. Color signs and an instruction booklet complete the model. A separate kit for a 4th and 5th floor extension is available as

an add-on module. For additional information visit www.itlascalemodels.com.



Kato USA is now taking reservations for the Southern

Pacific GS-4 4-8-4 locomotive in "Postwar" black. With a scheduled release of September 2021, the N scale model will



feature large "Southern Pacific" lettering on the tender, differentiating it from the wartime "Southern Pacific Lines" scheme. Kato is announcing this as a provisional pre-order, with a cutoff date of December 30th. At that time Kato will determine if there are enough preorders to continue the project. For additional information contact a dealer or visit www.katousa.com.



A list of new N scale models from **Micro-Trains** begins with this 50' Denver & Rio Grande Western boxcar with a plug door.

The model represents a car built in 1965 that has been updated with the running board removed.



This excess height 60' box car represents a car built in 1968 for high-cube, low-weight appliance service.

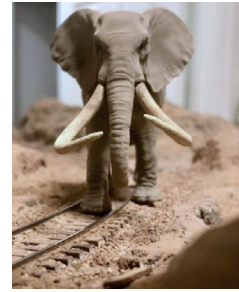


Micro-Trains has released two cabooses this month including a 36' conventional steel cupola caboose decorated for Milwaukee Road. The second new caboose is a 31' bay-window based on a prototype class C-27 car built for the Baltimore & Ohio that through mergers wound up on the CSX.



Contact a dealer for additional information on Micro-Trains models.

miniprints now has over 20 different animals and figures available in N scale. Figures include porta-potties and



Sasquatch with animals such as Texas Longhorns, African Elephants, Pigs, Donkeys, Bison, and Candian Geese also available. Visit miniprints.ca/#nscale

for a list of what is currently available.



RailSmith has been working on an all-new N scale coach/chair car accurately modeled to Pullman-Standard

plan 7510. Both skirted and non-skirted versions are being tooled. Details include sprung diaphragms, working knuckle couplers, metal wheels, and electrical pick-up. The first release, scheduled for January, will offer accurate paint schemes for Northern Pacific, Great Northern, and Spokane, Portland & Seattle. Although not dead accurate, cars decorated for Union Pacific and Southern Pacific will be very close to the prototype. For additional information visit lowellsmith.net/railsmith.



ScaleTrains.Com is booking advance reservations for an Operator series GE ES44

Tier 4 GEVo diesel locomotive.



The Operator series models use the same motor and drivetrain as the top-of-the-line Rivet

Counter versions, however, to achieve a low selling price on Operator models, cosmetic variations within each road name are kept to a minimum. Accordingly, all ES44 locomotives in this run will use the same cab and long hood.



Road names on this run will be Kansas City Southern (Belle scheme), Norfolk Southern (Horsehead), CSX (boxcar logo), Canadian National (wet noodle with website), and BNSF (Heritage III).

For hobbyists wanting to upgrade their Operator model, an ES44 detail kit with nearly 100 individual parts is available as a separate purchase.

Traditionally ScaleTrains.com has announced new locomotive models at TrainFest. While TrainFest

may not have occurred this year, ScaleTrains.com announced that they are taking pre-orders Norfolk Southern's unique GE Dash 9-40C "Top Hat" locomotive in N scale in the Rivet Counter line. Alone of the Dash 9 line to be built with standard cabs and a prime mover derated to 4000hp, Norfolk Southern purchased 125 C40-9s in 1995. Numbers 8764 through 8888, they were delivered in the Thoroughbred paint scheme. A rebuilding program between 2015 and 2018 converted the Top Hats to AC, upgrading their prime movers to 4,400 hp, and replacing the cab with a wide cab. The rebuilt units are designated as AC44C6Ms.



Additionally, pre-orders are being taken for Rivet Counter BNSF

Heritage II Dash-9s with road number and era specific details, including two road numbers with Heritage I painted engine cabs, two with faded orange replacement HVAC units, and one unit with an ex-Conrail Quality nose door. For additional information visit www.scaletrains.com.



Trainworx has announced it is taking reservations for an assortment of modern over-the-road trucks in 1:160 scale. Company names

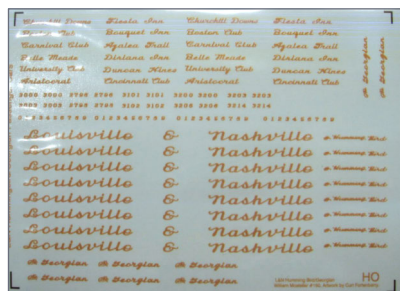
include CR England, JB Hunt, Marten, Schneider National (two eras), Swift, Swift Refrigerated, Walmart and Werner. Several model and paint variations will be available for each name. Reservations are due by December 31, 2020 with delivery expected in the 3rd Quarter of 2021. To see detailed flyers on all of the offerings, go to mailchi.mp/9050488d2213/trainworx-news-12967290.

NEW DECALS, SIGNS AND FINISHING PRODUCTS



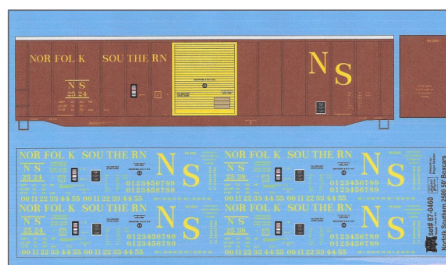
Great Decals has HO scale lettering sets for Southern Railway early cupola and bay window cabooses. The dulux gold decals include road names (in both modern sans serif and older serif typefaces), heralds, road numbers, safety heralds,

labels specific to cabooses, and multiple "canned" road numbers. Set #149 was designed by Robert Wingo as a replacement for Champ HC-235.

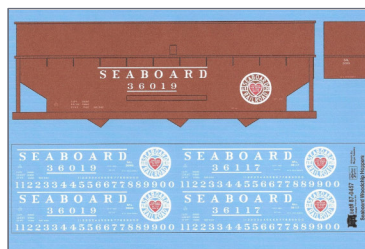
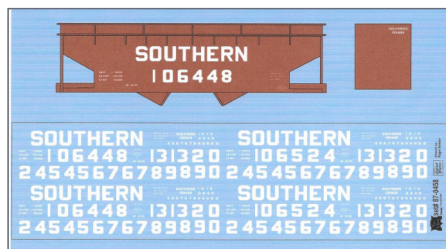


Also available from Great Decals in HO scale is set #150, the L&N Hummingbird/Georgian tavern-lounge and dining car decal sets in dulux gold. Each set has the letterboard script, numerals, and car names specific to this group of cars. Each sheet can decal up to

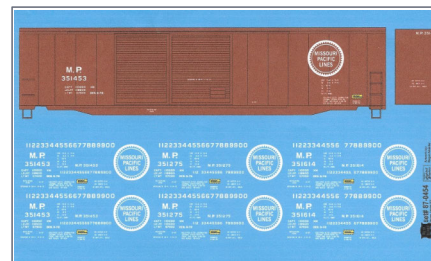
four cars, with car names including Churchill Downs, Boston Club, Carnival Club, Belle Meade, University Club, Aristocrat, Fiesta Inn, Bouquet Inn, Azalea Trail, Dixiana Inn, Duncan Hines, and Cincinnati Club. For additional information visit www.greatdecals.com.



Mask Island has released several new waterslide lettering sets including a 1973-era Norfolk Southern 50' boxcar. Also new is a decal lettering set for Southern Railway hopper cars modified for extra loading.



Lettering sets for Seaboard extended height hopper cars and a Missouri Pacific 50' double-door boxcar have also been recently made available.



Additional new Mask Island lettering sets are available for decorating 40' and 50' Rock Island DF cars, and a Houston Belt Terminal switch engine. All sets mentioned are for HO scale. For additional details visit www.maskislanddecals.com.



DISCLAIMER

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! BRIEFLY NOTED AT PRESS TIME ...

Digitrax has released the UT6 utility throttle, featuring a color 1.5" LCD display screen and backlit buttons. Available as the UT6 wired, the UT6D Duplex Radio, and the UT6DE Duplex Radio (Europe) versions, it replaces the UT4 series. digitrax.com.

FastTracks has introduced "The Diamond Line," a series of cast diamond crossing kits. Available first in HO scale, the kits will include individual frog and guard rail castings, precision cut laser cut ties, PC board ties, rail for the crossing, four sanding blocks in two grits, and a wire brush. handlaidtrack.com.

Morning Sun Books has released *Norfolk Southern – Southern Railway Merger* in which author Kurt Reisweber presents a mid-1970s look at two of America's most storied railroads. Details are available at morningsunbooks.com.

National Scale Car has reissued resin mini kits to create prototypically accurate 1937 AAR boxcars with Duryea Z26 underframes for Rock Island and Chicago, St. Paul, Minneapolis & Omaha Railways. For each mini-kit the modeler must supply an InterMountain 10'6" IH 40' boxcar kit with 5-5 ends. For additional information visit nationalscalecar.com.

Woodland Scenics has released a video that demonstrates how to develop realistic landscapes with fine turf scenery. The video can be viewed at:

woodlandscenics.com/show/video/FineTurfProduct/?utm_source=scenicview202011&utm_medium=email&utm_campaign=scenicview202011. ■

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Model Railroad Hobbyist | December 2020

DECEMBER 2020

Due to COVID-19 restrictions, please check with any organization hosting an in-person event for the latest status of the event.

Ongoing

ONLINE, Zoom, dates vary, see website. Operation Special Interest Group Meetups – limited attendance available. For more information visit www.opsig.org/Virtual. Past meets are available online at www.opsig.org/Virtual/Past.

ONLINE, Zoom & YouTube, dates vary, see Facebook page. "New Tracks" Meetup, hosted by Jim Kellow, MMR. See www.facebook.com/groups/544983829687669/user/100012440913008 for more information.

ONLINE, Facebook & YouTube, dates vary, see Facebook page. "NMRAX" organized by Gordy Robinson, Martyn Jenkins, Gert Muller, Jordan Kramer. See www.facebook.com/groups/nmraxgroup for announcements.

ONLINE, YouTube, every other Saturday. 4th Division, Pacific Northwest Region, NMRA hosts online layout tours and clinics. Archive available at www.youtube.com/c/4DPNRMovies.

ONLINE, Zoom, Second Tuesdays, 8pm EST. "Off the Beaten Track" featuring Narrow Gauge layouts and manufacturers. For more information visit groups.io/g/NNG December 2020, by location.

ONLINE, Facebook, December 1st 8:30pm – 9:30pm PST, Understanding Railroad Signals. Hosted by the Sacramento Model Railroad Historical Society and Mike Roqué. For more information go to www.facebook.com/events/145197060635888.

ONLINE, Zoom, December 5, Hindsight 20/20 5.0 – A Virtual RPM. Registration required. For more information and to register go to speedwitchmedia.com/product/hindsight-20-20-5-0-registration.

MICHIGAN, BLISSFIELD, December 12th, 19th. Blissfield Model Railroad Club Holiday Tour. Hosted by the Blissfield Model Railroad Club. 109 E Adrian St. For more information visit www.facebook.com/events/363704138055106.

PENNSYLVANIA, ROCHESTER, December 5-6, 12-13, 19-20, 26-27, 5th Annual Holiday Model Railroad Open House, 350 Adams St. Five different displays in five different scales. For more information see www.facebook.com/events/629161987779721.

January 2021

ONLINE, Zoom, January 9th, Hindsight 20/20 6.0 – A Virtual RPM. Registration required and will open approximately 2 weeks prior to the event. For more information visit speedwitchmedia.com at that time.

ONLINE, Zoom and Slack, January 30-31. 2021 Bay Area Virtual PCR/LDSIG Meet. Sponsored by the Pacific Coast Region NMRA and the Layout Design SIG. Clinics, Layout ops consultations, track planning consultations, virtual layout visits. For more information visit www.pcrnmra.org/sigs/index2021DEV.html.

Future 2021-2022

CALIFORNIA, SANTA CLARA, July 4-11, 2021, Rails By the Bay, 2021 NMRA National Convention and National Train Show. Santa Clara Marriott Hotel. For more information visit <https://www.nmra2021.com/>

CONNECTICUT, WEST SPRINGFIELD, Cancelled – 2021 Railroad Hobby Show. For more information visit www.railroadhobbyshow.com.

TEXAS, PLANO, January 16-17, Dallas Area Train Show, hosted by the North Texas Council of Railroad Clubs, Plano Event Center, 2000 E. Spring Creek Pkwy. For more information see dfwtrainshows.com/#clients.

INDIANA, NOBELSVILLE, January 31, Noblesville Train Show, presented by the Central Indiana Division of the NMRA. 2003 Pleasant Street. For more information visit www.cidnmra.org/services.

INDIANA, FRANKLIN, May 15, Franklin Train Show, presented by the Central Indiana Division of the NMRA. Johnson County Fairgrounds. For more information visit www.cidnmra.org/services.

MISSOURI, St. LOUIS, tentatively September 2022, NMRA National Convention and National Train Show. ■



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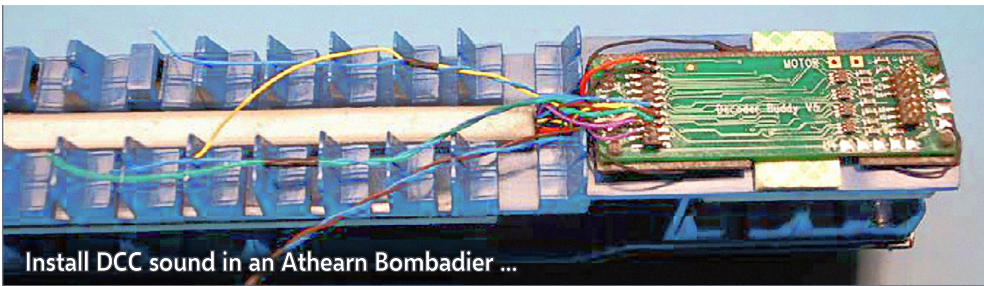
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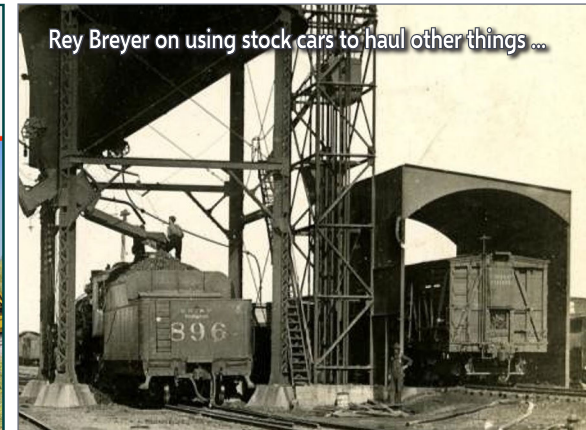
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