



RUNNING #####**EXTRA**

More modeling every month



Eric Miller

Kitbashes a C39-8E

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- Expert detail casting secrets
- Create a "modular kit" helix
- Eliminate decoder burnout from shorts
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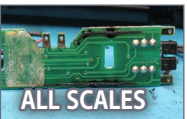
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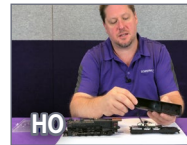
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PUBLISHER'S WELCOME

introduction



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JOE FUGATE: OPEN TOP CAR WEIGHTING CHALLENGES AND MORE ...



ONE OF THE CHALLENGES OF MAINTAINING A consistent weight for your rolling stock is open-top cars: hoppers, gondolas, and flat cars.

The worst of the lot seems to be adding weight to flat cars. One trick for any open-top car is to add a load. Personally, I prefer to add or remove loads as needed, so I don't like depending on loads for weight.

This is where your orientation toward ops or not will come out. As an ops guy first of all, I don't care what the underside of the car looks like – as long as it looks about right from the aisle, I'm good.

So when it comes to the debate of form versus function, I prefer good function over perfect form (i.e., the looks of the model).

If you're willing to gut the underframe to add weight, you can completely replace it with lead sheets and make most any flat weigh what you need it to weigh.

In [1] is an example from my book, [Run like a Dream, Rolling Stock](#).

RUNNING EXTRA: WE NEED ARTICLES

With issue two of *Running Extra* we hope you're starting to see what makes this new magazine special. We're pulling some very interesting in-depth articles from our article archive.

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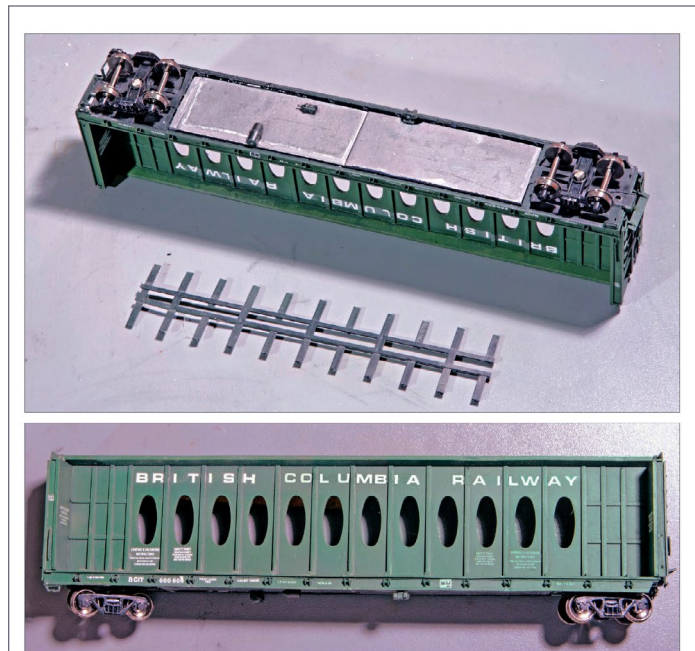
Because of *Running Extra*, our need for more article submissions is also greater than ever. If we don't get fresh article submissions, we risk burning through our backlog and running low on articles for the new magazine.

So sharpen your pencils, limber up your smartphone camera, and warm up your computer keyboard! We need new article submissions.

Please tell us what you think of the new magazine. We depend on your feedback to help guide us as we plan out the coming issues.

Please click the rating/comments button and let us know your thoughts and desires. ☒

1. By replacing this flat car's underframe with lead sheet, I could add plenty of weight to this flat car. I glued on the brake detail, so from the aisle, the car still looks correct.



safe because cadmium fumes don't form until you get well over 200°F. That said, filing these metals is not advised because accidentally ingesting cadmium metal filings may be hazardous.

You can also get the non-toxic Fields Metal, which melts at 144°F. But it's 20 times the cost!

I have used Cerrobend and the fusible bismuth alloy [6-16, 6-17], but I've moved to using Tungsten power instead because it's about the same density and tungsten is a non-toxic metal.

6-15. I added extra weight to this centerbeam flat car using 1/16" lead sheet. I removed the floor beams and glued the lead sheet in its place. I glued the brake detail to the lead sheet so when viewing the car at eye level from the side, the car underbody detail still looks correct.

It can also be helpful to replace the standard steel weight that comes with most cars with lead sheet since lead is 40% heavier than steel.

When using lead sheet on a car underbody, make sure the wheels cannot touch it or you will get a short.

THE LIMITED MODELER

column



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JIM SIX PERSONALIZES THE
"GOOD ENOUGH" PHILOSOPHY ...



MOST HAVE HEARD THE TERM "GOOD ENOUGH"
used countless times in this hobby.

It's either good enough or it is not good enough. I think the first time I heard the term used for model railroading was in *Railroad Model Craftsman* articles about Allen McClelland's Virginian and Ohio layout. I loved that layout in its day and loved Allen's philosophies about the hobby. He was a true trendsetter.

Today, I think the term "good enough" gets most often used when somebody chooses not to take their work to a higher level. Why not kick it up a notch? It's good enough, so why bother? This makes perfect sense to me.

For me, this application of good enough is akin to the *Law of Diminishing Returns*. That is, something is good enough when the results of more investment (into a model) are not worth the added investment.

When you get to that point, what you are doing is good enough. What we all need to remember is that this will naturally be

► **DOING MORE WITH LESS**

THE LIMITED MODELER | 2

different for each of us. Our available cash, resources, skills, etc. are all different.

For me, adding weathering is low cost. I do it all the time, have done so for decades, and the results are – at least to me – impressive. Because of this, a model is not good enough until it is weathered.

On the other hand, a significant number of modelers who are not experienced with weathering lack confidence at applying weathering. While they may like a model better that has been weathered well, the model may be good enough for them when it is not weathered.

So, who is right and who is wrong? Simple answer – both are right and neither is wrong.

When my modeling pleases me, then it is good enough. Never mind that it may not be up to, or above someone else's standard. It only has to please me.

As human beings, no two of us are alike. So why should anyone expect that their "good enough" is the same as that of someone else? We shouldn't.

Honestly, I have seen many models and plenty of layouts that would not work for me. But for the modeler who built them, they are pleasing and certainly good enough. I am sure that my layout would not work for many of you.

Just the other day, I shared some of my model photos with friends and was promptly provided a list of the things that were wrong with my model. Yo! Talk about being stung!

How could that model please me so much yet appear to have so many errors to someone else? Obviously my modeling standard was not the same as that of this other person. When this happens to some folks, they just blow it off and move on.

Not me. I consider each of the supposed “errors” and think about it.

Did I overlook something that I could easily have accounted for, or did I overlook things that are beyond my point of diminishing returns? That is, would making the corrections not be worth the effort to me?

The point is, don’t expect what is good enough for you will be good enough for others.

YOU GOTTA BE KIDDING ...

Take this model for instance [1]. When I backdated to modeling 1927 I already had this model in my freight car roster. I have had it for several years and am fond of it. It is a double-sheathed wood boxcar built in 8-19, so it would be just fine in my 1927 setting. Right? ...

NOT! What’s wrong with it? Turns out that the *ROUTE OF The 400* lettering was not applied until the 1940s – way too new for me. *Sigh* ...

OK. Back to the workbench to remove the offending lettering. The next image [2] shows the model after the *ROUTE OF The 400* lettering has been removed. All *right*, now the model is ready. I showed it to the same friends, only to find out that I had *more work* to do!

The bearing REPACK date on the model said 10-41. I could barely read it, but they could!

Not only that, they also told me that the lines above and below the reporting marks were not applied until 1929 or later. Hmmm ...

When I asked about the repack date (bottom left side, next to the LT WT. data) I was told that in 1927 the bearings probably would



1. This model is a factory painted Accurail model. I added a pair of running board grabs, coupler cut levers, and Kadee #153 short-shank scale couplers, then weathered it.

not have been repacked yet. Not old enough. So, back to the workbench I went to remove that date stencil and the two lines.

I know. You are thinking “You gotta be kidding me.” I wish that I was!

At this point, I was getting smart enough to stop assuming the model was finally “right” – so I again sent photos to my buddies for critique. And as you might suspect, one of them found more that was wrong.

I am not kidding – turns out the CMO identification was not used until well after 1927. Also, the CStPM&O lettering needed to be moved to where the CMO was located. Not only that, but the CStPM&O needed to have a period after each letter. The periods were not eliminated until 1929. *Big sigh* ...

Finally my photo [4] passed the review of my prototype modeler friends. Fortunately for me, all the changes pictured here and



2. ROUTE OF The 400 lettering has been removed.

showed to my buddies were done in Photoshop instead of on the model itself.

Now I can modify the model one time and be done with it!

BE CAREFUL WHAT YOU ASK FOR

A point of this exercise is that no matter how “right” you may think your model is, there are those who know more about the model and the prototype than you. If asked, they will find fault with your model.

Be very careful what you ask, as you might not like the answers you get!

So then, what is good enough? Is it when nobody finds fault with your model, or is it when you personally are pleased with it? I hope that it is more the latter and less the former.

Me? I am somewhere in between. I could not care any less about what most people think of my models. However, there are quite



3. The repack date and the two lines over and under the reporting marks are now gone.

a few model railroaders who I greatly respect and I do care what they think.

While I don't let them dictate what I do, I do want to know their thoughts so that I can merge them with my own before making modeling decisions. I am proficient with Photoshop and can take photos and modify the photos to see what I want before beginning work on a model!

ANOTHER EXAMPLE

Here is another example of what it may take to get a model to be good enough.

When I was modeling 1943, this Pennsy hopper car only needed metal wheels, Kadee couplers, and some weathering before placing it in service. Backdating to 1927 changed this.

It didn't take much research to find out that the *COAL GOES TO WAR* slogan was for WWII and not WWI as I had hoped.

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Never mind that the Pennsy had precious few of the USRA cars on its roster.

Closely looking over the model I noted the 11-43 repack date that would need to be eliminated or changed. What was a heartbreak for me was when my friends informed me that the circle key-stone would have to go!

The Pennsy didn't start adding this until 1932, some five years after my 1927 setting.

Think about this. Would you have put in a coal load, left the model alone, and used it as is? I have a few friends who would do just that.

On the other hand, I have friends who would remove the graphics that were not right for 1927, then carve off all the grabs and end braces to replace them all with formed-wire versions. They would also add formed-wire coupler cut levers – which I may do.



4. Here is the model apparently correctly lettered for my 1927 setting.

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5. Here is a factory painted Accurail model. I love the Pennsy and its circle keystone paint scheme. I fitted the model with metal wheelsets and Kadee #153 short-shank scale couplers.

Each of us should determine what our standard is for freight cars and other aspects of the hobby. I have two overriding standards from my freight cars.

One is that the total cost per car shall not exceed \$20. This rules out all those high end RTR models. I make exceptions, but precious few.

The other standard is that I do not want to spend more than an hour of time on any one piece of rolling stock. These two standards severely limit what I can do – thankfully so.

The time and dollar figures I just stated are “averages” and not hard, fixed numbers.

What about cabooses? Since I need many fewer of these, I have increased my standard numbers to three hours and \$50. No more. Period.

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I do not know a lot about cabooses, so there is a lot to learn there. Let's consider the caboose pictured here [7]. It is a Walthers model with only two changes.

I installed Kadee #153 couplers and then weathered the model. After showing it to my proto friends, I was promptly told that the side window frames should not be there and that the grabs were body color and not yellow in 1927.

I had suspected that the yellow grabs were incorrect for 1927 but I had no idea about the window frames. They looked good to me!

So, we are back to our question of what's good enough. Repainting the grab irons is not a problem. However, removing the window frames has no easy fix that fits into my three-hour window.



6. Here is the model after removing the war slogan, the circle keystone, and the repack stencil. Blemishes will be hidden when the model is weathered. Isopropyl alcohol, 1600-grit wet/dry sand paper, and cotton swabs were used to remove the unwanted graphics.

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7. Here is my caboose model as it exists today. The window frames were not on the prototype, Also, the yellow grab irons were not yellow, but the same color as the body.

I photographed the model and headed to Photoshop to make the changes and determine if I should do the same with the actual model.

There is another solution for the unwanted window frames. Walthers has re-released this PRR N6a caboose with a center cupola. With the new model they corrected the windows by eliminating the surrounding frames.

This new body is identical to that of the offset cupola caboose and interchangeable. One could buy another caboose with the center cupola and swap bodies. That's a thought, but not one that I will make because the about-\$40 per caboose cost would raise the total price to more than \$80 for one caboose. Again, it's not going to happen.

So *WHAT IS GOOD ENOUGH?*

There is a lot to consider when setting standards for your modeling. This is not easy or simple. Before I started my layout, my “good enough” was set to a higher standard.



8. As you see here, I Photoshopped out the window frames. IMO this makes a big difference, but is it enough to start carving on the model? The brown grab irons are a nice change that I will make for sure.

And why not?

All I was doing was building freight cars and locomotives, but not a layout. At that time, all my freight cars had to have formed-wire grab irons, formed-wire coupler cut levers, ladders that

had individual rungs, scale Kadee couplers with the trip pins removed, separate train line air hoses installed, separate formed metal stirrup steps, and more.

Maintaining such a standard was reasonable when nothing else needed my attention. Now that I am building a layout, I simply do not have time to build freight cars to such a level of detail, nor do I have as much available hobby cash.

Now that I am building my layout, my old standards for good enough are out the window! There is much more to “good enough” than just freight cars. What about our track, bench work, structures, and scenery?

For that matter, what is good enough for the overall effect the layout portrays?

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This may boil down to what your interests are. If you are freight car-oriented then I will wager the layout's level for good enough is somewhat low.

On the other hand, if the layout is your primary interest then good enough for your rolling stock may be somewhat low. I know many operators whose primary interest is operating the



9. This is a scene on my layout. The three hopper cars are factory painted Bowser models. They have a few detail upgrades, Kadee #153 couplers, and weathering applied. I removed circle keystone logos from the cars in the middle and at the right to make them correct for my 1927 setting.

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layout, and their layout quality and that of the locomotives and freight cars suffers.

I factor all three of these aspects of our hobby into how I conduct the hobby.

Here is a scene on my layout [9]. I would like to believe that the layout, buildings, and scenery along with the three freight cars are all about the same good enough standard.

Arranged together they clearly show what is good enough to me. ☒



GETTING REAL

column



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NICK MUFF MODELS AN ART DECO METROPOLITAN RAILROAD STATION PART 2 ...



IN PART 2, LET'S BEGIN WITH CREATING THE roof detail. I laser-cut the skylights from 1/64" plywood, and the curved vent ducts from 0.020" styrene sheet. I built up the waiting room seats from parts cut from 0.040" styrene sheet.



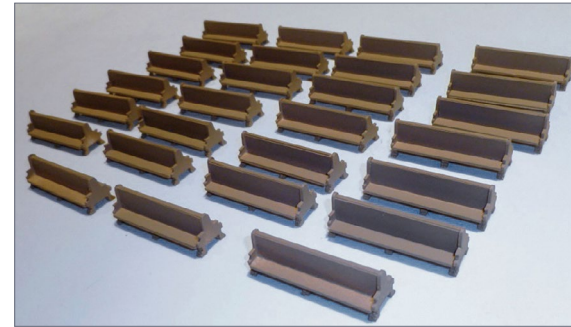
41. The assembled skylights are painted dark brown and glazed with clear styrene sheet.

► MODELING REAL RAILROADS AND WHAT THEY DO

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I created the large and small mushroom-shaped vents from masters made from plastic tube with aluminum centers that I turned on my Unimat lathe. I then created a model for one large and four small roof vents. I poured them using Joel Bragdon's two-

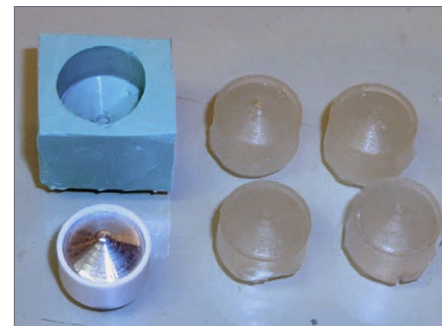
part "Cast Satin" casting resin and used flat gray primer sprayed in the molds as a mold release.



42. The assembled waiting room seats, painted Testors Dark Tan.



43. The masters for the mushroom-shaped roof vents, with turned aluminum centers inside plastic tube.



44. I need four times as many small vents as large ones. So, my next step is to create a mold for the small vents and make four copies using dental acrylic.

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45. The masters and four copies are glued to a sheet of glass. I use 0.040" styrene to create a temporary box around the parts and seal the lower edge with blue tape to contain leaks.

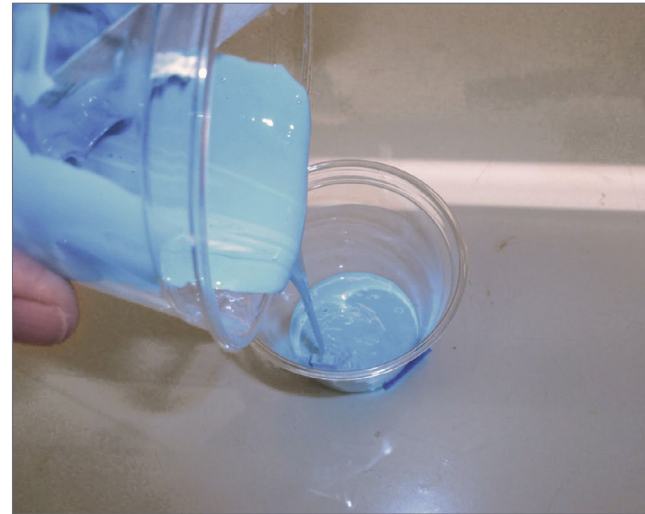


46. The next step is to create a mold of these parts using RTV rubber material from Bragdon Enterprises. The thick tan color rubber is mixed with the blue catalyst in a ratio of 10:1 by weight. I use a postal scale to measure this.

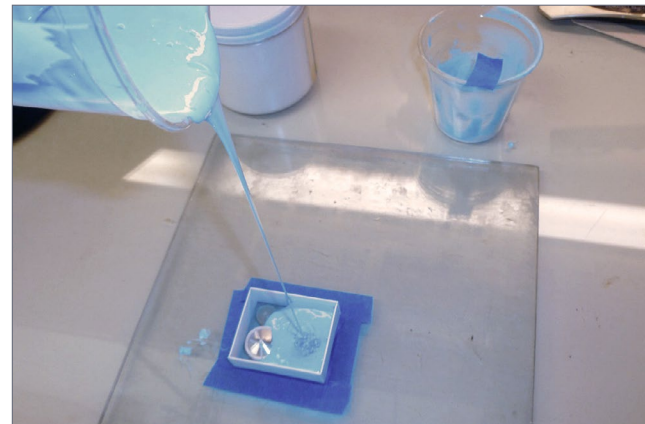


47. Next, stir the mixture for about 60 seconds. The blue color will gradually become evenly distributed.

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48. No matter how careful you are, some of the mold material sticks to the sides or bottom and will not mix completely. This will create areas in the mold that do not set up well. So, pour it into a second cup *and mix again*.



49. Pour the mold material into the mold in a thin stream. The thin stream helps to minimize bubbles.



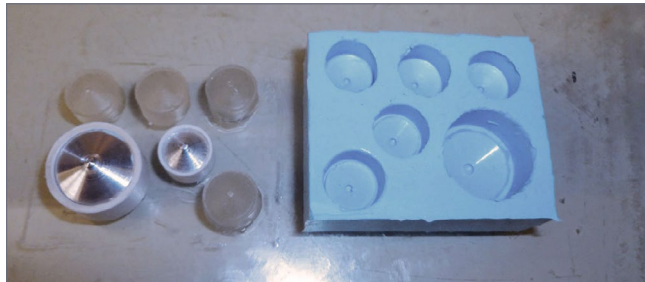
50. Some bubbles will inevitably rise to the surface. Get rid of them by spraying gently in an oblique angle across the surface. Be careful not to tip the can so some of the liquid propellant comes out in the spray. It can temporarily freeze part of the mold material and interfere with setting.



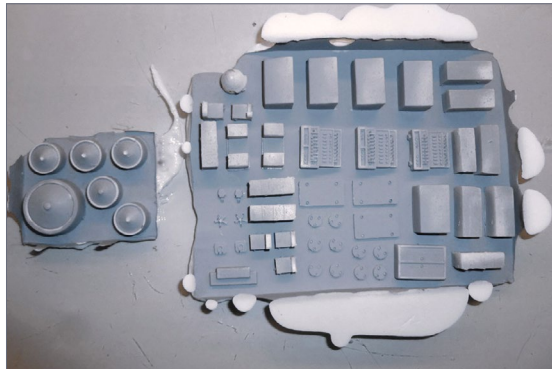
J. Fugate

CASTING TIPS

Nick presents some *excellent* casting tips here that are seldom mentioned anywhere else. Nick obviously has done a lot of casting, so he knows what he's talking about and he has perfected getting flawless castings. Make sure you read and use these superb tips!



51. When the mold has set overnight, it can be gently stripped from the masters, the styrene, and the glass.



52. The mold for the vents is quite small. I mixed casting resin in a large amount and poured the extra into a mold that produces desk, chairs, and cabinets for interior detail. I used the same mold for Kansas City Union Station. I would guess I have used it over 100

times! There are two pounds of office furniture in the Kansas City station and $\frac{3}{4}$ of a pound of furniture in this Houston Station. Buying that many detail parts on the commercial market would be cost-prohibitive.

The roofs of the station were of the composition-built up type. To simulate this, I used 120 grit sandpaper.

The paper I had on hand was a kind of orange color. I intended to paint it but I needed more sheets than I had. When I went to the hardware store, I found a brand that was a perfect buff color.

I used the same drawing files that created the roof piece to laser-cut the sandpaper pieces. First, I sprayed the top of the roofs flat black to try to minimize light leaks and then glued the sandpaper sheets using Walther's "Goo," a long-time veteran in the hobby and a personal favorite.

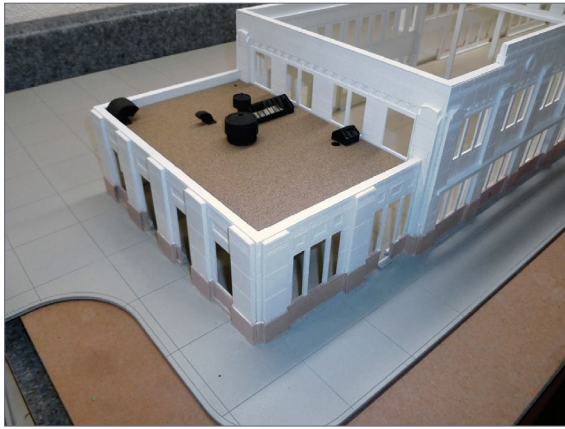


I glued the roof vents and skylight in place using the same glue.

53. The interior detail parts are cut apart and the edges trimmed.



54. Using masking tape with the sticky side up, the parts are attached to pieces of scrap wood and I spray them with Testors Olive Drab, Hull Gray and Light Brown.



55. The left end roof with laser cut sandpaper, vents, and skylights glued in place.



56. They say to keep the hobby alive and growing we need to introduce it to "young" people. Perhaps I took the young part too far! Three-year-old Kaylee loved helping Grandpa with the masking. And there was lots of it! She also cried when

"Uncle Jon" and "Aunt Cheryl" came and picked up "her" station. She has a lifetime pass to visit it in Texas.

Exterior weathering

With the building completely assembled and detailed, it was time for weathering. Having done this for my own Union Station I had some confidence, but the light limestone color was something new.

The first step was a wash of India ink diluted in rubbing alcohol. My usual mixture is 2 tsp of ink in a pint of alcohol. I used that on the sidewalk and platform areas. To be cautious, I used just 1 tsp. in a pint for the shell including the limestone areas.

When dry, that looked just right, enough to highlight the detail but not to look dirty.

The next step would be weathering with chalk. I use Joel Bragdon's chalk, which is mixed with powdered glue that is activated by the heat of rubbing the brush during application.

Previously I stayed away from chalk because it would rub off with handling. Of course, spraying with a clear coat just ruined the effect. I find the Bragdon Enterprises product to be very durable.

There is one catch. If you get too much material on, I do not know a good way to get it all off. I waited for a nice sunny day and took



57. The station as it appeared outdoors after chalk weathering.

the station outside where I could clearly see what I was doing (or so I thought) in bright sunlight.

I started with light ash on the limestone parts but found it almost invisible. I went to a darker gray and weathered the shell with that using Dust Bowl Brown around the base.

It looked just great outdoors!

Then I brought the station indoors and woe is me! It looked filthy! My heart went down to my toes. My daughter looked at it as she passed by and thought it best to say nothing! My beloved wife always knows the best way to handle these things.

“It’s such a nice station, it’s a shame to see it so dirty but I guess that’s realistic!”



58. The main façade after chalk weathering. It looks convincing.



59. The results, as seen INDOORS, after over-weathering and de-weathering!

I didn’t need an interpreter to know that meant it was too much. I already knew that. So after I got my heart started again I had what I believe was inspiration!

I saw visions of the old “Fantastik” ads, same as “409”, where they spray it on a dirty surface and the dirt just rolls off!

I took the station back outside and sprayed it with straight “409”! Well, the dirt just rolled right off the station! I blotted the excess at the base with paper towels and then sprayed it again. I blotted again and sprayed a third time, blotting off the final excess at the base.

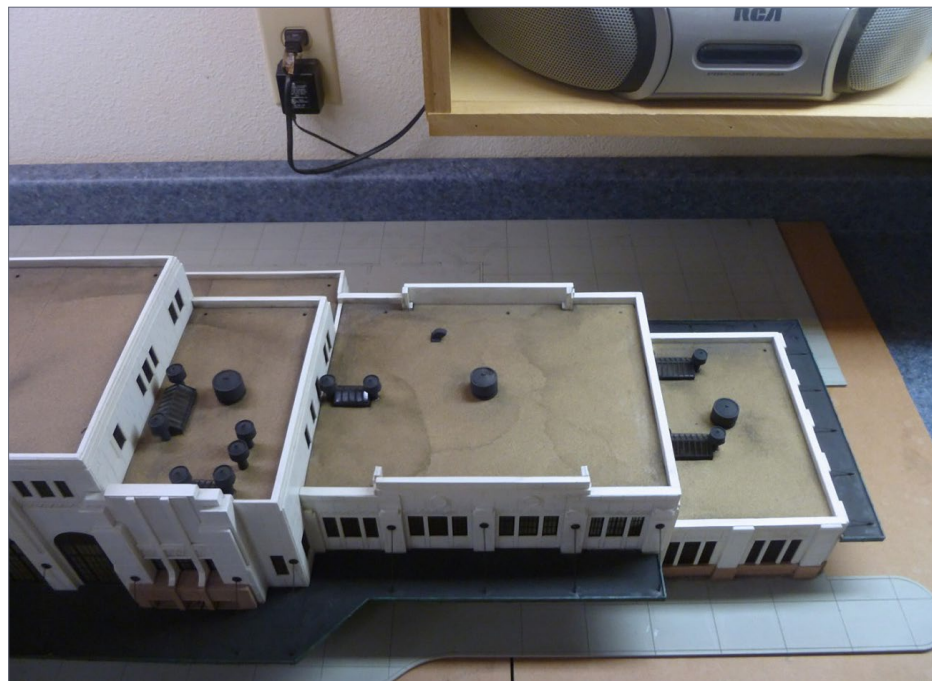
The end result was that the mixture worked its way into places where you wanted it to be but left the limestone looking like it was “in service” but not smeared with grime!

The next part was pure serendipity. I was so distraught over this disaster, so far along in the project, and so anxious to see if it

could be reversed, that I did all the spraying and wiping with 409 WITHOUT removing the roofs.

As I washed the station walls down, the sandpaper roofs with their dark gray chalk weathering got sprayed down as well. The end result was amazing. It looked like you could see where rain water had stood on the roofs and been blown this way or that depending on which way the storm was coming from.

All in all, an excellent result and a great weathering technique provided you have a defibrillator nearby and someone to operate it for you!



60. Note the water and weathering patterns created on the roof by the wash down with "409," my new favorite weathering technique for roofs!



61. The right end of the station after over-weathering and de-weathering.

Outdoor lighting

With weathering back under control, I created the wall light sconces for the front of the station, both the square and tall narrow versions following the original architectural plans of the actual building. I used the same technique I used for the ceiling star: a card stock master, rubber mold, and clear dental acrylic copies. Light fixtures are backed with 0.015" black styrene plastic cut to the same base shape. I drill a hole from the back to accept one of the 0.2 mm x 0.3 mm Golden White surface mount LEDs with 6" leads, from Richmond Controls.

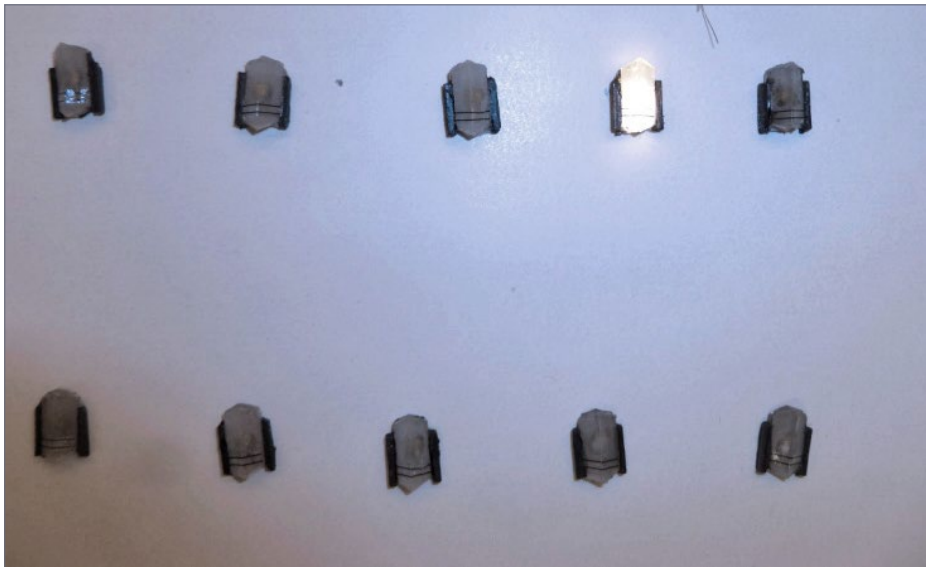
I glue the LED into the back using canopy cement. I then place them all on a piece of cardboard with the leads pulled

through holes to the back and taped to hold them for final painting and finishing.

The side metal brackets are painted dark brown. The thin metal strips across the glass face of the fixture are created with thin black decal striping sealed with clear gloss. They are then individually tested and ready for mounting on the station.

Before final installation of the canopies, I drilled two holes through the canopy mounting strip to the inside of the station for each canopy lighting LED.

After attaching the canopies to the mounting strips with Goo, I bend the leads of each LED at a ninety-degree angle, slide them back through the holes, and glue the LED to the underside of the canopy. The wall mount lighting fixture are glued to the front wall and the leads passed through to the interior of the station.



62. The square wall mounted light fixtures painted. One is lighted for testing before it is ready to install.



63. The positive and negative brass wire bus can be seen running across the far side of the station, supported by acrylic plastic blocks attached to the inside wall with Goo.

Now, with all the exterior lighting in place and the wires pulled through it was time to start wiring the station.

Power supply

To wire this structure, I used the same heavy brass wire I used on my Kansas City Union Station, one wire each for positive and negative leads. I use 0.060" acrylic plastic blocks with holes cut through them to mount the brass buses to the inside wall of the station.

The beauty of heavy brass wire is that it supports itself, supports lights and can be soldered anywhere with no stripping of insulation.

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For the LEDs to “live long and prosper” you must use a resistor to limit the current flowing through them. Without the resistor, they will consume an unlimited amount of current and disappear in a brief blaze of glory. The size of the resistor will depend on your supply voltage, the voltage requirement, and the specified current for the LED.

For this application I used a 12 vdc power supply. The LEDs use three volts and current should be 0.003A (3 milliamps). From there we go to Ohm’s Law where E =voltage in volts, I =current in amps and R =resistance in ohms.



64. A close-up view of the wall shows the negative lead from under the canopy LED bent up and soldered to the bottom bus. The positive lead has been cut short and soldered to the current limiting resistor which connects to the top bus. The body of the resistor doubles as an insulator where it crosses the negative buss.

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65. Here are the lighting buses across the ceiling of the outdoor concourse with resistors, and the LEDs attached and lighted.



66. The completed outdoor concourse set in place. A thin styrene sheet with styrene strip curbs was landscaped to represent a similar but larger area on the prototype.

$E=IR$ — or in this case where we are solving for R , $R=E/I$. Since the LED uses three volts we will need to burn up 12 volts minus 3volts, giving us 9 volts in the resistor.

$R=9 \text{ volts}/.003 \text{ amps} = 3000 \text{ ohms}$. The watts of power burned up in the resistor follows the formula:

$W \text{ (watts)} = V \text{ (volts)} \times I \text{ (amps)}$ for this application watts of power $= 9 \times .003 = .027 \text{ Watt!}$ So a small 1/4 watt or 1/8 watt resistor will be suitable.

Shining a light on acrylic

At this point I must digress to discuss a very important topic that gradually came to my attention as I was building and lighting the station. As I mentioned before, this is the first time I have worked with acrylic. It cuts easily with the laser, is strong, rigid, and glues readily, but the white acrylic is very translucent.

I came to realize that this was going to be a big problem. Paint on the outside and inside of the wall would not block interior light from showing through the wall. Even flat black paint on the inside of the wall was not sufficient. Besides, I didn't want all the interior walls to be painted black!

What to do now? My first thought was to cut black 0.010" styrene sheet to fit the inside of the wall with the wall and door openings cut out.

Even in the 0.010" thickness the black styrene is lightproof, a very good thing. But the inside walls would be black, and they would show when viewed through the windows. So, the next step was to purchase a roll of almond shelf contact paper. Almond is a nice neutral off-white color.

I cut a piece of contact paper 18" x 12", the size of the laser cutter bed. Then I stripped the backing from the contact paper while it was face down. Then I arranged the smaller sheets of black styrene sheet to cover the back of the contact paper.

This helped to solve the problem presented by the fact that the styrene sheets individually are not large enough to cover many of the walls. Then I laser cut the sheets to fit behind all the inside walls. I glued them in place using Goo.



67. This is the appearance of the front of the station with the under-canopy and wall-mounted fixtures wired and illuminated. Note the sprinkler standpipe connection under the window. A small detail, but that is what helps to further the illusion of realism. Initially I thought the exposed LEDs under the canopy would be fine, but I later covered the front side with half a piece of styrene tubing painted flat black so that they don't shine in your eyes and look like "dangling LEDs."

So, in the end, the outer walls consisted of five layers glued together:

1. The outermost layer is 0.060" white acrylic sheet with the detail engraved into it and the door and window openings cut out.
 2. Inside this is another layer of 0.060" white acrylic sheet with the window and door openings cut 1/8" larger so that the doors and windows will recess into this opening. This layer was glued to the front layer with dichloromethane.
 3. Behind the acrylic walls, I placed the combined layer of black styrene sheet plastic and almond contact paper, with the contact paper facing the interior. The door and window opening were cut only 0.060 larger than those in the outside wall, to cover the joint between the laminated plywood windows and doors and the white acrylic. I used Goo to attach this layer to the inside of the walls.
 4. The innermost layer is 0.060" clear acrylic cut to the same size as the contact paper but without the door and window openings. I did not use individual pieces for the windows and doors, simply a single large sheet of clear acrylic behind the entire wall. This was glued in place by a bead of canopy cement around the edges. This is a great place not to use cyanoacrylate because of its tendency to spread a whitish haze over the clear window material as it cures.
- I cut and added the laminated black styrene/almond contact paper pieces to the underside of all the roofs and canopies to make them opaque. Even after all of this, light tended to leak out through the joint where the roofs sat in place, causing the parapets to glow unrealistically.

This was cured by using photographers black masking tape. Finally, the building was realistically illuminated without the "glowing walls" of the old Plasticville days!

Interior details

With the station shell completed, wired, and lighted it was time to paint, detail and light the interior modules. This is easier than it might appear and as a real bonus, it's fun to do! First, I sprayed all the modules Krylon "Satin River Rock" including all surfaces, floor and walls. No masking or fussy work required.

Then comes the fun part. Go to Google Images and search for items like "Railroad Posters," "Vintage Calendars," "Desktop Pads," "Doors," "Linoleum Flooring," "WWII Posters," "Blueprints," etc. Right-click anything that looks useful, download, and save.

Next, import the files into Photoshop or whatever software you use (I use my CAD program). Position and size the images. I will often paste them in small, medium, and large size. I will repeat the "linoleum" image to create a large section.

Once I have created a sheet of these items I print them on Avery White Full Label Sheet with TrueBlock Technology (No. 8165). Then I cut them out, peel off the backing, and stick them on! I use large sizes of "linoleum" in different colors to cover the floors. Interior doors are a sticker.

Put calendars, posters and pictures where you want them on the wall. Desktop pads go on the desks. Blueprints go on the desks of the drafting room etc. Don't like what you did? Peel it off and stick on a different one.

This is a simple technique and when viewed through the exterior windows, it's very effective.



68. This is the room for the seamstress. The counter is styrene square tube with a stick on top surface. Note the flooring, and railroad and war posters. The gizmo to the back left is from the scrap box. Is

it some kind of sewing machine or thread holder? Actually, it's part of a CTC machine from a European kit. The main thing is that it fills the space and adds interest.

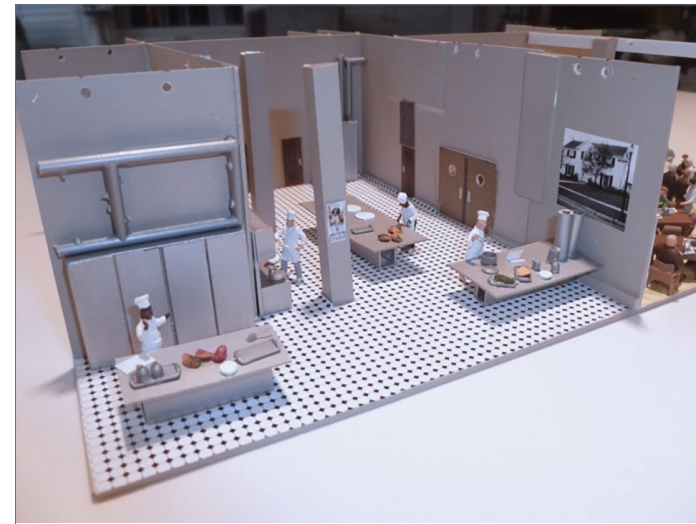


69. This is the same module with the brass bus wires, LEDs and resistors installed. The bus wires are run through and supported by holes drill in the top of the walls. The shelves hold wrapped dining car lin-

ens. In the middle are bins for soiled linens. The Dining Car Superintendent's office is to the lower right.



70. The module for the lunch room. The flooring, counter surface, tile walls, vents, and doors are all peel and stick. The food is bits of variously colored Fimo clay. The lunch counter stools are fabricated from styrene bits and pieces.



71. The kitchen for the lunch room. I drew the flooring in the CAD program and printed it. The equipment is styrene pieces sprayed aluminum, and more stick-on doors, posters, and Fimo food.

★★★★★
RATE THIS ARTICLE



72. Here is the module for the second floor of the right wing (no political implications!). It houses the office of the Division Engineer, drafting room, and blueprint storage. See all the blueprints on the tables! Note how the brass wires are

suspended in space over the drafting room. You can also see the almond contact paper/black styrene sheet surround in the window openings and the black masking tape that sealed the final persistent light leaks.



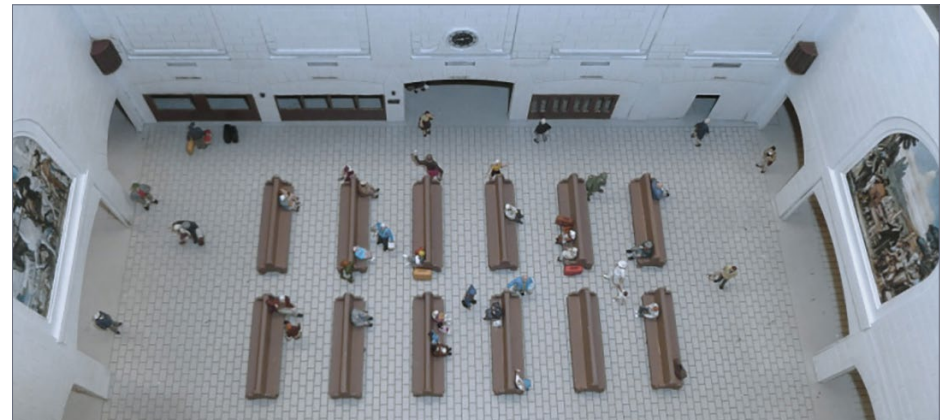
73. Here is the station with both exterior and interior lighting and no light leaks. See how the lighted interior modules create the impression of a fully detailed interior.

With all the interior modules completed and wired, the next step was to add details to the main waiting room and outdoor concourse. There are hundreds of details in and about the station.

The wrought iron fencing for the outdoor concourse is etched stainless steel. Also, it's time to install all of those prefabricated waiting room benches so folks can sit down. They seem so stiff!



74. The outdoor concourse with wrought iron fences, benches, and figures.



75. The main waiting room with benches and figures. Note the end murals, clock, and corner mounted speakers fabricated from styrene bits and pieces.



76. The completed outdoor concourse detailed and lighted.

It's amazing, but we are finally coming to the end of construction. Jon was concerned from images that I sent him that the lighting may be too bright. That is always a judgment call and really is best determined when the station is on the layout in the room in which it will be displayed.

To make the lighting level adjustable, I added an LM2596 DC Power Supply Adjustable Converter Step Down Module that I purchased on eBay. It is a DC to DC converter. That is electronic magic!

You can connect any DC power supply up to 18vdc to the inputs and then, using a small screw, adjust the output voltage from 18 volts anywhere down to 0 volts.

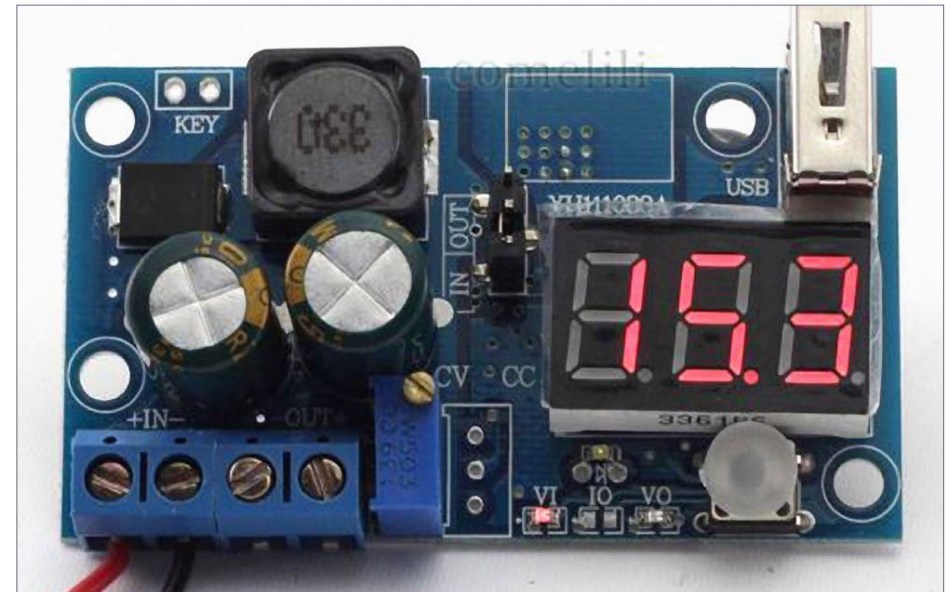
A push button allows you to display input voltage, output voltage, and output current. I use these on my layout where the main lighting buses are 12 vdc but some structures require 9 or 6 volts.

The board on eBay will cost you a whopping \$4.64 plus \$1.00 shipping!

I added sound to the station, having found it so effective for my Union Station. I used an amplifier board that I learned about in an *MRH* article.

It comes with a power supply and remote control! It has a volume adjustment potentiometer and tiny push buttons on the front. It will play whatever sound file you have on the SD card you purchase and insert.

In this case, I used the same sound track I use in Kansas City. The sounds were recorded in Kansas City Union Station when it was still in operation. It includes great echo effects and muffled train announcements!



77. A DC to DC converter will allow the depot's new owner to adjust the lighting level to his heart's content.

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The small speaker is mounted on the underside of the roof of the outdoor concourse. I have found it best that the sound come from the back and be reflected out at you. It sounds more



78. MP3 player sound board with remote control.



79. The track side of the completed station with exterior and interior lighting. Looks like someone is home! Below the lower edge of the station you can see the cable bundle that carries the main lighting power, separate third and fourth floor lighting power, and sound into the station building.

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realistic and makes it very hard to identify exactly where the sound is coming from.

On eBay these boards run \$35.04 and shipping (from China, of course!) is free.



80. Now it's time for small final details such as a pigeon to the far left and a ladder to the fourth-floor roof. The ladder is removable so that the roof below it can also be removed for access.



81. The ticket counter includes vases of yellow roses (remember this is Texas!) and a vintage SP Sunbeam ad.



82. This tiny sign seen in one of the prototype photographs reminds passengers that the "New Streamlined Sunset Limited" is an extra fare train. A few small details like this give the impression that the entire structure is more detailed than it really is.



83. In front of the right main entrance I placed a young Jon Fleming in shorts about to enter the station with his parents for a trip up to Dallas on the Sunbeam to visit his grandparents.



84. Jon wanted my wife Sue and me present, so that's the two of us stealing a kiss in front of the left entrance.

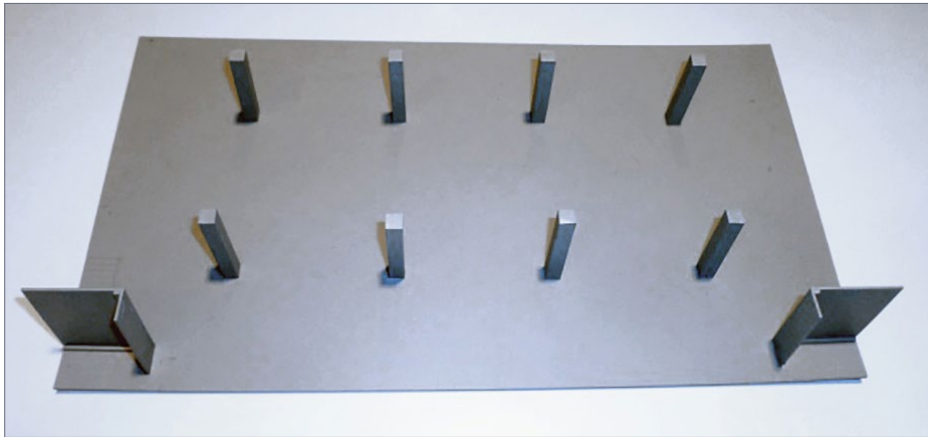


85. Now the station sits in my shop waiting for transport to Texas. It was my beloved wife's idea to put a section of mirror behind the station so that visitors can see the back side which is just as detailed as the front side. On Jon's

layout he plans to use video cameras and monitors for the same purpose. Set at track level, they should provide a unique and impressive view of the station from the platforms as the trains arrive and depart!



86. How will the station get to Texas? Jon came to take it there in the back of a brand new Ford Expedition they picked up in Seattle. It is much too fragile to be shipped. The photo shows the shipping base that I created for it. The base is $\frac{3}{4}$ " plywood to provide rigid and stable support. Two outer rings of $\frac{1}{8}$ " Masonite hold the station down to this base by even pressure all around the perimeter. Screw eyes at the corners provide attachment points for rope or bungee cords.



87. The fourth floor as shown in the original blueprints.

The fourth floor

Well it's almost the end, but not quite. I told you I would get back to the subject of the fourth floor situated over the main waiting room and marked "Records Storage" on the plans.

Jon informed me that when he was a young boy and visited, there was a space filled with an amazing "O" gauge model railroad built by the Houston Model Railroad Club with the SP's encouragement. It was very much an adult "do not touch world" but Jon remembers visiting with his dad.

There were trains running everywhere and the smell of ozone and warm oil! An article on this layout was published in the August 1957 issue of *Model Railroader* magazine, page 23.



88. The "HO Scale - O Scale Layout" under construction. The "track plan" was washed with dilute India ink to make it more visible.



89. The tiny 1/4300 scale Houston Grand Central Station is in the lower part of the photo. It has its own LED suspended overhead to illuminate it. There are tiny train sheds, and there is a steam locomotive on the turntable. I'm not sure of the wheel arrangement. The Sunset Limited is making a station stop on her daily cross-country trip from New Orleans Union Passenger Terminal to Los Angeles Union Passenger Terminal. I can't get the little HO people to run the throttles and my own fingers are too big!



90. The finished station sits on Jon's layout, ready for track, trains and an "all aboard!"

I decided that since this station is a recreation of Jon's fond memories I needed to add an O scale model railroad to the fourth floor.

Could that be done? I would be working in 1/4300 scale, a fun but challenging project.

Passenger cars would be 0.030" wide, 0.040" tall and 0.25" long, which also would be about the size of an E unit. Freight cars would be 0.125" long which would also be the size of an F unit.

What can be done in that scale? I did not know about the MR article when I began this project, so I designed my own imaginary track plan. I even added a scaled down version of Houston Grand Central Station on the front of the layout inside of Houston Grand Central Station!

I engraved the base benchwork from the layout and the track plan and cut it from 0.060" acrylic sheet. I added base supports from the same material.

I created the mountains using air dry clay. No, the clay did not stick to the acrylic, so when the mountain pieces were dry, I

glued them down with Goo. Then I sprayed the whole thing an earthy color.

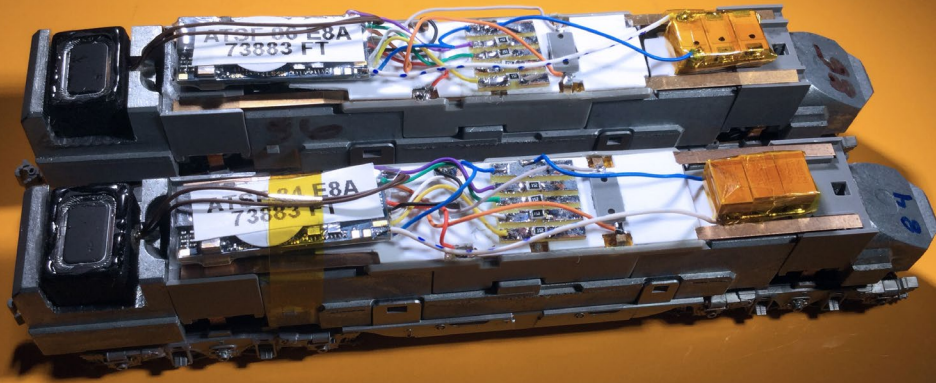
I painted the rivers with blue acrylic and the grassy areas with dilute green acrylic. I used white glue to add ground foam "trees" to the mountains. I made "rolling stock" from cut pieces of 0.030" x 0.040" styrene strip painted various "prototype" colors.

The recreation of the Houston Station, the round house, and freight house I laser cut from 0.060" acrylic. The layout module just drops into the fourth floor and that is the end of the project!

You may never build a Grand Central Station, but you see how one was painstakingly researched and accurately built!

Hopefully some of the comments, triumphs, and disasters will aid you in creating your own project! So what do you think of the finished station [90]? Post your thoughts in the reader comments! ☒





Stay-alive capacitors

FOR N SCALE

Running Extra | December 2018

RICK BRODZINSKY shows how he adds stay-alive to N scale LokSound decoder installations ...

OVER THE PAST FEW YEARS, SOUND IN N SCALE HAS started to boom. Major improvements in sound decoders and miniaturized speakers have increased the interest in sound for many modelers. But with sound, a number of DCC layout issues become amplified (pun intended).

Power dropouts can wreak havoc with a sound decoder, whether caused by dirty track, dirty wheels, isolation gaps, or dead rails. It's one thing to see a loco stall and then start up, but quite another to hear the sound cut out and resume, potentially with a full start-up sequence.



Bruce Petrarca covered this subject well in the DCC Impulses column, "Stayin' Alive," in the March 2013 issue of *Model Railroad Hobbyist* (mrhmag.com/magazine/mrh-2013-03-mar/di_stay-ing-alive). He details the installation of a Train Control Systems Keep-Alive module into an HO Proto 2000 RS27 with a SoundTraxx Tsunami. HO and larger scales have an advantage over N scale – most notably more space under the hood.

This article focuses on installing small capacitors to provide at least some amount of stay-alive power in smaller scales. There are numerous videos of locomotives continuing to run after being removed from the track (e.g. the video from Bruce's article, www.youtube.com/watch?v=EkcPBqrRX_Y, or in this video from Scale Model Trains & Colorado's Joint Line, www.youtube.com/watch?v=ntX57WRhCyQ).

Unfortunately in N scale, with the exception of large steam engines with large tenders (GS4, Big Boy, Challenger, etc.), there isn't space to add the capacitors necessary to produce such prolonged running. Narrow-hood diesels become exceptionally tricky.

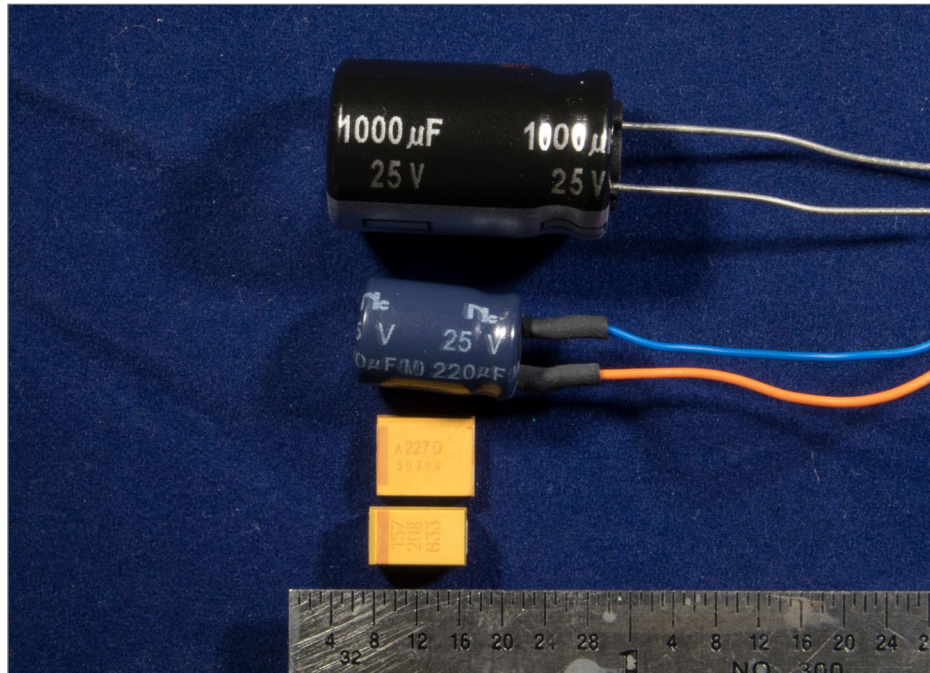
But not to worry! We don't need six to 10 seconds of continuous power. In most cases all we need is a few tenths of a second – just enough to carry the loco past dead spots.

Although the concepts are valid for any decoder, my examples focus on using the LokSound decoder family from ESU.

CAPACITORS

Capacitors are a way to store energy in a circuit. The basic unit of measurement for capacitance is the farad, named for Michael Faraday. A farad stores is a lot of energy, and for our purposes, we'll be discussing capacitances that are in the hundreds of microfarads.

A microfarad is one-millionth of a farad, abbreviated μF . [we use μF in MRH – ed.]



1. Examples of capacitors typically used in model railroad-ing. From top: a 1000uF 25V electrolytic capacitor; a 220uF 25V electrolytic capacitor; a 220uF 20V AVX polymer-Ta capacitor; and, a 150uF 20V KEMET solid-Ta capacitor.

There are many types of capacitors. Most of the HO or larger scale capacitors are electrolytic super-capacitors, but usually these are too big to fit in N scale.

However, newer types of capacitors have the voltage and capacitance ratings necessary to provide the energy storage needed: Solid Tantalum (Ta) and Polymer-Tantalum (poly-Ta).

Ta and Poly-Ta capacitors come in very small surface mounted device (SMD) packages perfect for N scale use, with voltage ratings in the 16-25V DC range, and individual capacitances of 150-330uF. There are links at the end of this article to Wikipedia pages for more detailed information on the different types of capacitors.

In [1] I show examples of capacitors typically used in model railroad-ing. Two electrolytic capacitors are at the top. The large black one is 1000uF and 25V, while the smaller blue is 220uF and 25V.

The larger has a diameter of .05" and is 0.8" in length without the leads. The smaller is 0.32" diameter and 0.46" in length. For N scale, these are huge.

The next two are SMD packages. The third one down is a poly-Ta capacitor manufactured by AVX, rated at 220uF and 20V, while the final one is a KEMET 20V 150uF capacitor. The AVX measures 0.287" x 0.24" x 0.079" (length x width x height), the KEMET is 0.287" x 0.169" x 0.169".

Unlike the electrolytic capacitors, where the negative terminal is marked, for SMD capacitors it is the positive terminal that is marked.

Table 1 shows the manufacturer, distributor, part number, and specs for the SMD capacitors suggested in this article. Other manufacturers' capacitors with similar specs are usable, too.

Type	Capacitance	Voltage	Mfg	Distributor	Part Number	Price
Ta	220μF	16V	KEMET	DigiKey	399-10429-1-ND	\$1.60
Ta	150μF	20V	KEMET	DigiKey	399-4794-1-ND	\$2.15
poly-Ta	220μF	20V	AVX	Mouser	581-TCN4227M020R0100	\$3.98
poly-Ta	330μF	20V	AVX	Mouser	581-TCN4337M020R0100	\$6.04
poly-Ta	150μF	25V	AVX	Mouser	581-TCN4157M025R0070	\$4.16
poly-Ta	220μF	25V	AVX	Mouser	581-TCN4227M025R0100	\$4.60

Table 1. Listing of suggested SMD Ta and poly-Ta capacitors. Prices shown are from July 2018, when purchased in quantities of 10 or more.

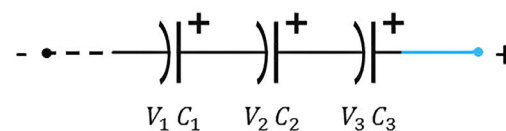
CONNECTING CAPACITORS: SERIES VS. PARALLEL

Now, let's remind ourselves of the differences between wiring capacitors in series versus in parallel. As shown in the top of [2], wiring in series connects the positive terminal of a capacitor to the negative terminal of the next capacitor. The total capacitance is calculated by the formula to the right, and the maximum voltage is the sum of the voltage ratings for each capacitor.

The lower portion of [2] shows wiring in parallel. Here, the capacitances add together, but the maximum voltage the circuit can see is limited to the lowest voltage rating of the capacitors. Of course, if you use identical capacitors, the voltage doesn't change.

A quick note about voltages: while the NMRA standard states that N scale decoders must be capable of handling inputs as high as 22V, most N scale modelers run their layouts with DCC voltages

Capacitors in Series

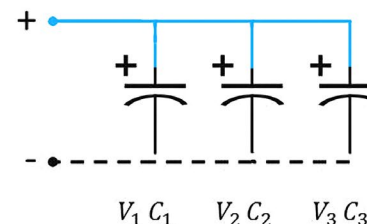


Calculations

$$\frac{1}{C_{total}} = \frac{1}{C_1} + \frac{1}{C_2} + \frac{1}{C_3} + \dots$$

$$V_{max} = V_1 + V_2 + V_3 + \dots$$

Capacitors in Parallel



$$C_{total} = C_1 + C_2 + C_3 + \dots$$

$$V_{max} = \text{Minimum}(V_1, V_2, V_3, \dots)$$

2. Capacitors in series and parallel. Equations show how to calculate the capacitance and maximum voltage for the circuit. The blue lines represent the connection to a decoder's common (+) blue wire, and the black/white dashed represent the connection to a decoder's negative ground.

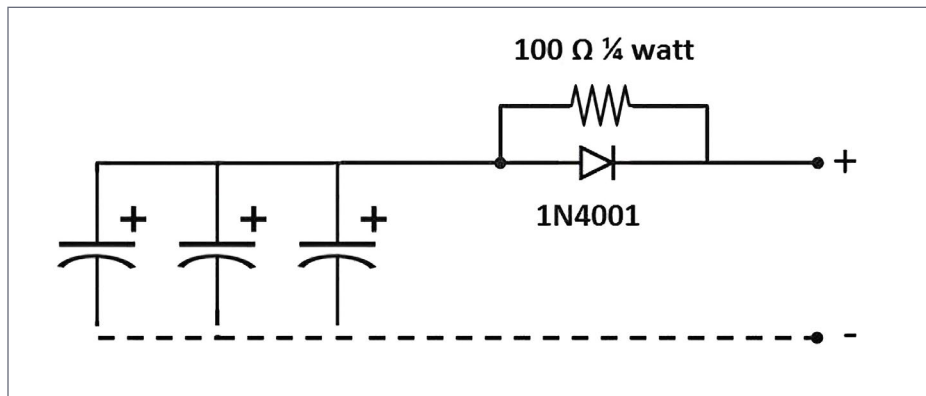
N SCALE STAY-ALIVE CAPACITORS | 7

between about 11.5V to 13.5V. So, could you use 16V capacitors? In theory, yes, but we should always leave a margin for error.

A good rule of thumb is to allow a 50% (or greater) margin. A 20V capacitor provides this margin ($13.5\text{V} \times 1.5 = 20.25\text{V}$), and a 25V capacitor has an 85% margin. What happens if we exceed the rated voltage? Here is a YouTube example. youtu.be/XgKLivEII4U.

Clearly we don't want this happening inside our locomotives. Wrapping the capacitors in Kapton tape, as shown later, can help prevent damage to other components and the loco if disaster should strike.

Some DCC command stations and boosters see the increased current as capacitors charge when power is turned on as a short-circuit. This will shut down the system until the loco is removed from the track. Newer DCC circuit breakers, such as the PSx series, can be configured to prevent this.



3. Capacitor in-rush protection circuit. The capacitor and diode can be standard components with leads or SMD devices. Be sure to check the polarity of the diode.

N SCALE STAY-ALIVE CAPACITORS | 8

One way to prevent this from happening is to add a simple resistor-diode combination to your circuit, as shown in [3]. If the total capacitance is greater than 2200uF, then increase the resistor to 470 ohms. The diode should be rated for at least 30V, but other diodes such as a 1N4001 (50V) or 1N4002 (100V) work fine, and don't cost extra.

The resistor limits the in-rush current as the capacitors charge, while the diode bypasses the resistor when the capacitors are feeding power back to the decoder.

HOW MUCH CAPACITANCE?

After all the technical details above, the real crux of the matter is to decide "how much" to add. Honestly, the more, the better, but the reason we're discussing SMD capacitors is that N scale engines have limited space.

If there was space, then a TCS Keep-Alive™, Soundtraxx Current-Keeper, or ESU Micro-PowerPak (to name a few) would be the preferred solution. After much trial-and-error by many modelers, the consensus opinion is to add at least 440uF, and if there is space, go larger.

There is a caveat, however. For ESU LokSound decoders, I have found that if the capacitor is larger than about 700uF, the ability to use the ESU LokProgrammer to read the decoder, update the decoder's firmware and write sound files is degraded.

Since the LokProgrammer uses a proprietary method to read and write the extensive memory on the LokSound decoders, the continuous on/off power cycling on the programming track and the charging of the capacitors interfere with each other. ESU recommends disconnecting the external capacitors in these instances. The ESU PowerPak is designed to avoid this issue.

N SCALE STAY-ALIVE CAPACITORS | 9

I typically stay between 440uF and 660uF, and with these values, I don't experience stalling or dropouts. How I choose which capacitors to use is based on the space in the loco and the cost.

Table 1 includes the prices of the capacitors purchased in lots of 10 or more, as of summer 2018. It can be less expensive to use three of the 150uF 20V Ta capacitors, but they take up more space than two of the 220uF 20V poly-Ta capacitors.

Eagle-eyed readers will also note that I included a 220uF 16V Ta capacitor in Table 1. At a 16V rating, it fails the 50% margin test, so why is it there? When I first began installing LokSound decoders into my fleet, these were the only SMD Ta capacitors readily available.

I and others were using them (or similar from other manufacturers) until higher-rated Ta capacitors and the poly-Ta capacitors became common and affordable in-stock items. I have about a half-dozen locos with these still installed and have never had an issue. I'll probably change them out at some point, but it isn't a high priority.

CLOSER LOOK AT CAPACITORS

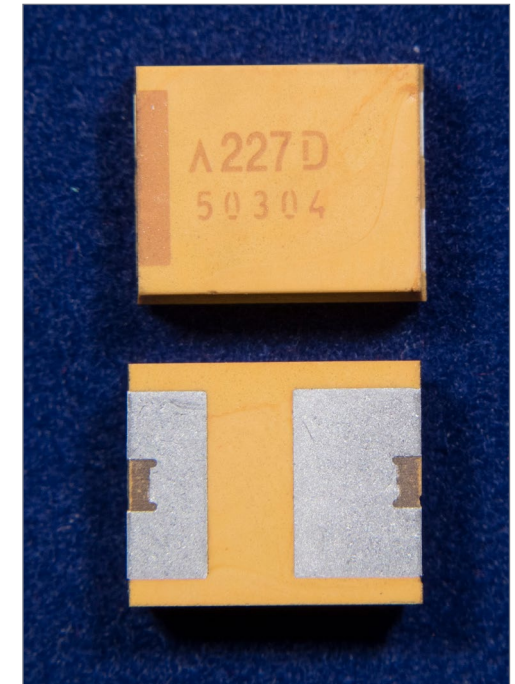
Let's take a closer look at the KEMET Ta capacitors. [4] The positive terminal marking is the dark band on the printed side. There is also a bevel on that edge, but I also like to place a small blue dot on the bottom, next to the solder pad, to remind myself that "the blue wire goes here." The solder pads extend up from the bottom onto the respective ends of the capacitor.

The first two digits of the first row of printing indicate the capacitance, and the first two digits of the second row indicate the voltage rating.

N SCALE STAY-ALIVE CAPACITORS | 10



4. KEMET 150uF 20V Ta Capacitors, Showing top, side, and bottom. The solder pads wrap around from the bottom of the capacitor partway up the ends.



5. AVX 220uF 20V poly-Ta Capacitor. Top and bottom views. On this style of capacitor, the solder pads are only on one side.

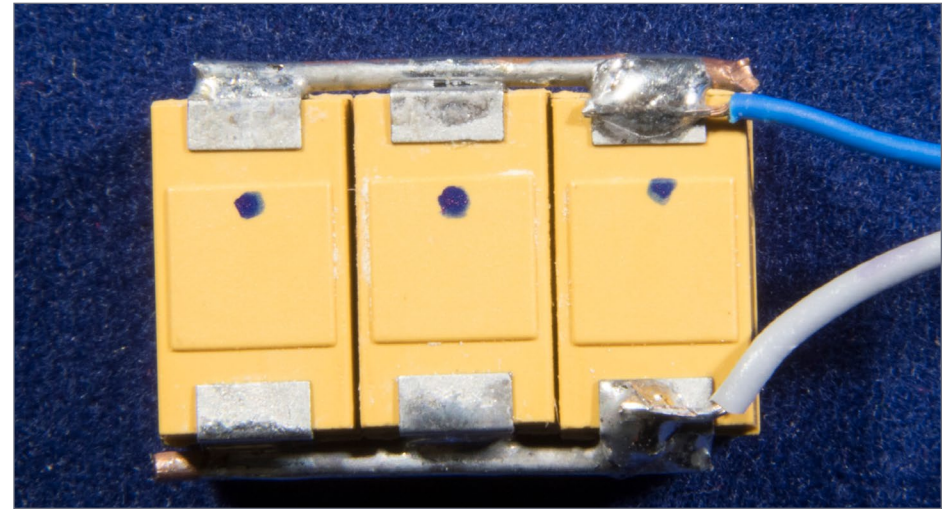
[8] shows AVX poly-Ta capacitors. As with the Ta capacitors, above, the positive marking is the dark band on the printed side. As can be seen on the underside, the positive solder pad is significantly smaller than for the negative pad, which allows easy identification.

The solder pads for these capacitors don't extend up onto the ends, so all connections must be made on the sides.

The capacitance rating is the first two digits of the first row of printing, but unlike the KEMET capacitors, the voltage rating is encoded in the letter "D" marking at the end of the first row. You must refer to the component manufacturer's datasheet to fully decode these markings.



6. 450uF Ta capacitor "package." Three capacitors are glued together and wired in parallel, as seen from the top.



7. A three 450uF Ta capacitor "package" glued together and wired in parallel, as seen from the bottom. Here, the 20AWG wire soldered to the end pads can be clearly seen, along with the wires that connect to the decoder.

PREPARING THE CAPACITORS TO INSTALL

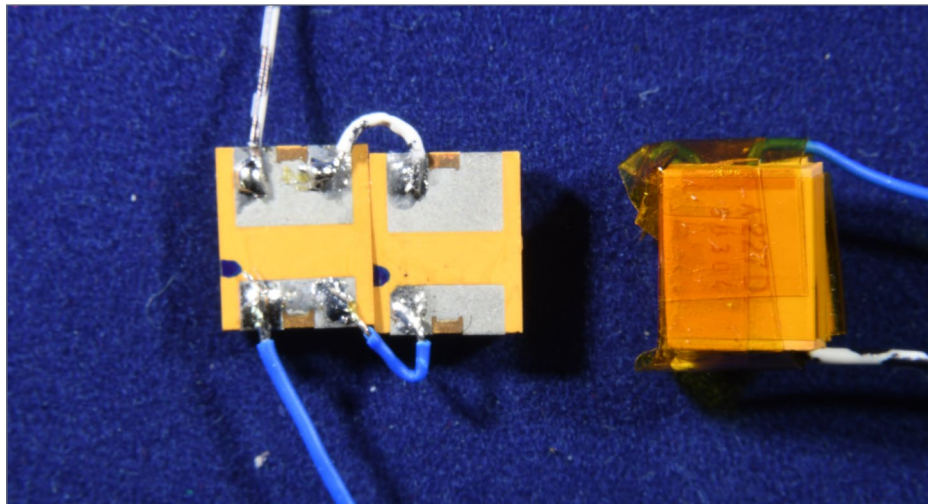
Preparing the capacitors for installation can be as easy as soldering wires to the solder pads. The positive side connects to the decoder's blue wire and the negative terminal to the decoder ground. But, before we start soldering wires, it is usually a good idea to figure out where to place the capacitors and how to interconnect them. Each installation is going to be different, and remember, they all don't need to be next to each other.

When there is space, I like to make a small capacitor "package," as shown in [6]. I gently sand the mold seams off the edges, then glue them together with CA. I solder a stripped portion of 20AWG solid wire to the pads on each end, and solder 36AWG stranded wire, properly color-coded, to the pads on the bottoms.

Choosing the wire color for the positive side is easy: the NMRA and NEM standards for DCC decoders call for the decoder's positive common to be blue. I've never seen a wired decoder that deviates from this.

But when it comes to the decoder's ground, the NMRA standard calls black with white stripe while the NEM leaves it blank. TCS follows the NMRA standard for their decoders that make this wire available (not all do). SoundTraxx uses a green wire with yellow stripe.

I haven't seen a ground wire on any other manufacturer's N scale decoders, but ESU makes a solder pad available on their wired decoders. At the left-hand side of [6], you can see my attempt to "stripe" the white wire, using a black Sharpie marker.



8. 440uF poly-Ta capacitor "packages." On the left are two 220uF 20V poly-Ta capacitors soldered together, with leads, as seen from the underside. On the right is the finished package folded closed wrapped in Kapton tape.

The underside of this package is shown in [7]. Once the soldering is complete, the package is wrapped with Kapton tape, both to insulate the wiring and pads from contact with the frame, decoder, or other conductive items inside the loco, as well as to contain any potential damage should one of the capacitors fail during operation.

Preparing the poly-Ta capacitors is slightly different. Since there are solder pads only on the bottom, I solder two very short pieces of color-coded 36AWG wire to pads of two capacitors, plus a longer length to each pad on one capacitor, as shown in [8]. I then fold the capacitors together with their solder pads facing in, and wrap in Kapton tape.

These aren't the only ways to wire the capacitors. Some modelers have created small printed circuit boards to mount them on; others have simply run wires from one capacitor to another. There is no "right" way to do this; it all really depends on where you plan to place them and the space available.

ESU LokSound MICRO DECODERS

ESU LokSound Micro decoders are appropriate for installation in N scale equipment. ESU divides their current sound decoders into two major categories: the V4.0, and the Select. The difference between these two lines is the configurability of the sound projects.

The V4.0 gives users the ability to program their own custom sound files or to use a pre-created project which can be subsequently modified. The Select can use only sound projects created by ESU, which contain many options for personalizing the sound.

You can choose from hundreds of pre-created projects to load to the decoder, using the ESU LokProgrammer, for either the

N SCALE STAY-ALIVE CAPACITORS | 15

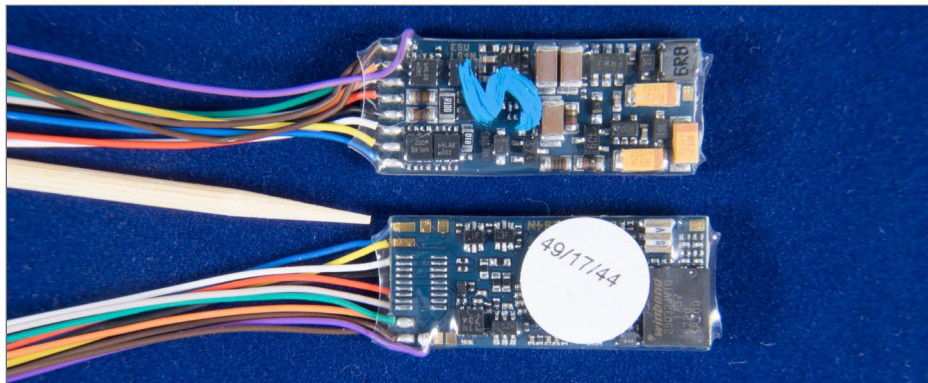
V4.0 or Select, and ESU posts all the projects on their website for free download.

[9] shows a closeup of two ESU LokSound Micro Select decoders. Of key interest is the solder pad in the upper-left corner of the bottom decoder. This is the decoder's ground solder pad, and is exactly opposite the blue wire on the opposite side of the board.

You must cut away a small section of the heat-dissipating shrink-wrap to access this pad. I use a new X-Acto #11 blade, and cut along the outlines of the pad.

Recently, ESU has come out with two new decoders for N scale: their LokSound Select Direct Micro models 73100 and 73199. These have all the same features as the wired decoders, but are "drop-in" boards.

The model 73100 is for use in generic and older diesel locomotives, while the model 73199 is the decoder now being used by manufacturers such as Intermountain and Atlas in their new sound-equipped offerings.

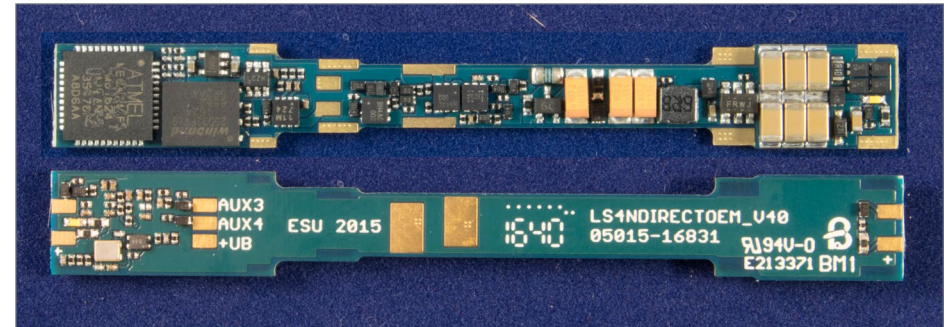


9. An ESU LokSound Micro Select decoder, top and bottom. The decoder ground solder pad is in lower-right of the upper decoder, with toothpick pointing to it.

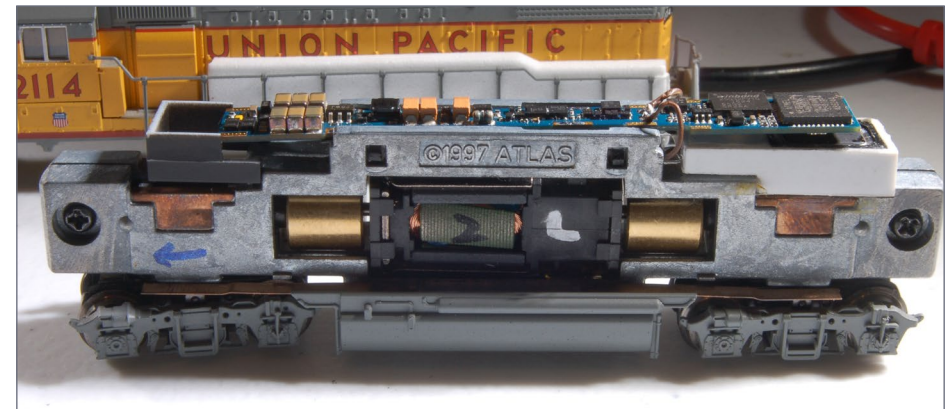
N SCALE STAY-ALIVE CAPACITORS | 16

Neither of these decoders has a ground solder pad. See [10] for a top and bottom view of the model 73100 board.

All is not lost, however, since the capacitors on the board already connect to the decoder's ground, so we can connect the ground wire to the negative side of one of the large capacitors at the front of the board (the negatives are on the outside of the board).



10. The new ESU LokSound Select Direct Micro decoder 73100. This is a "drop-in" decoder for many narrow-hood diesels. The front of the board is to the right.



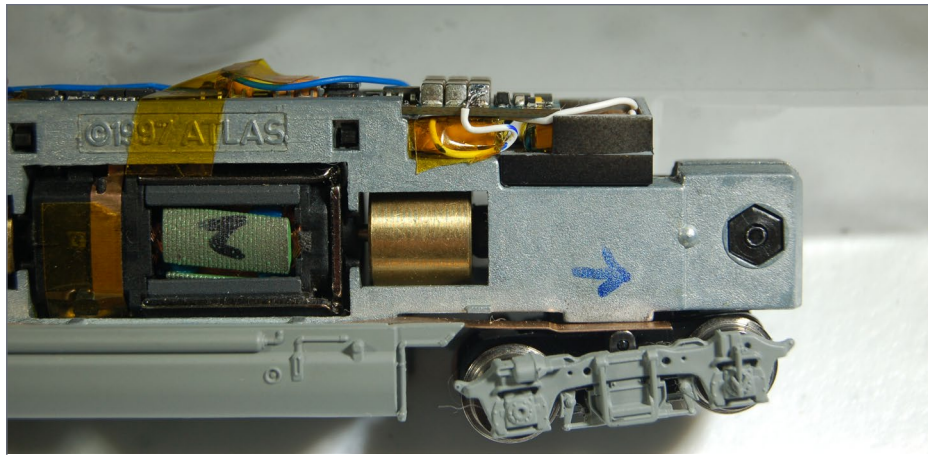
11. ESU LokSound Select Direct Micro 73100 installed in an Atlas GP38-2.

These Direct decoders are not true “drop-in” boards; you must, at minimum, still connect a speaker to the decoder.

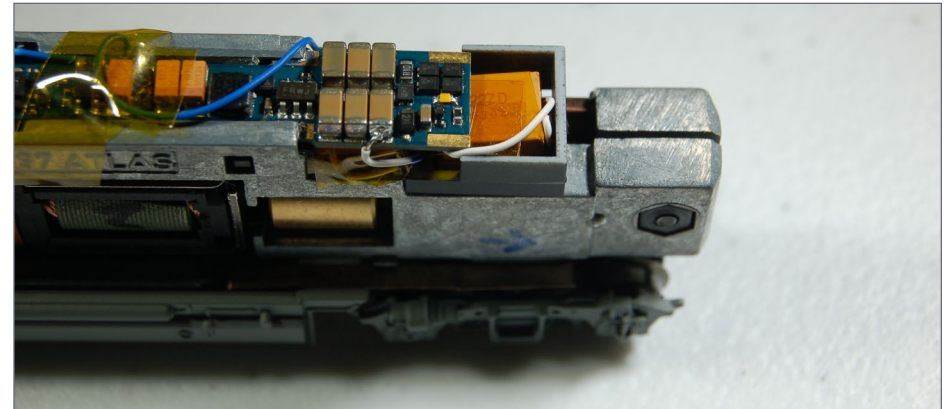
INSTALLING POLY-TA CAPACITORS WITH A SELECT MICRO DIRECT DECODER

It's time to install the capacitors in our locomotives! As I mentioned, each installation will be different, as the space available within any given model will change, sometimes even among releases of the same model from the same manufacturer. Changes to the frame or shell can affect the space available. Installing sound will inevitably require frame modifications to make space for the speaker, so that is also a good time to plan for the capacitors.

The first example is the installation of a Select Direct Micro 73100 board in an Atlas GP38-2. [11] shows the installation prior to the addition of any external capacitors.



12. Overhead view of three poly-Ta capacitors installed in Atlas GP38-2.



13. Poly-Ta capacitors installed under the front of the decoder.

The decoder board fits nicely into the frame and the speaker, with a custom enclosure, sits above the rear truck. This was my first 73100 installation, so I had delayed installing any capacitors until I could evaluate the available space. I immediately noted the large area at the front of the chassis, enclosed by the cab-window light shield and under the overhang of the board.

Looking at [12] you see a closeup view of three 220uF 20V poly-Ta capacitors installed. One is directly under the board overhang; the other two are folded together and fit nicely within the cab window light shield.

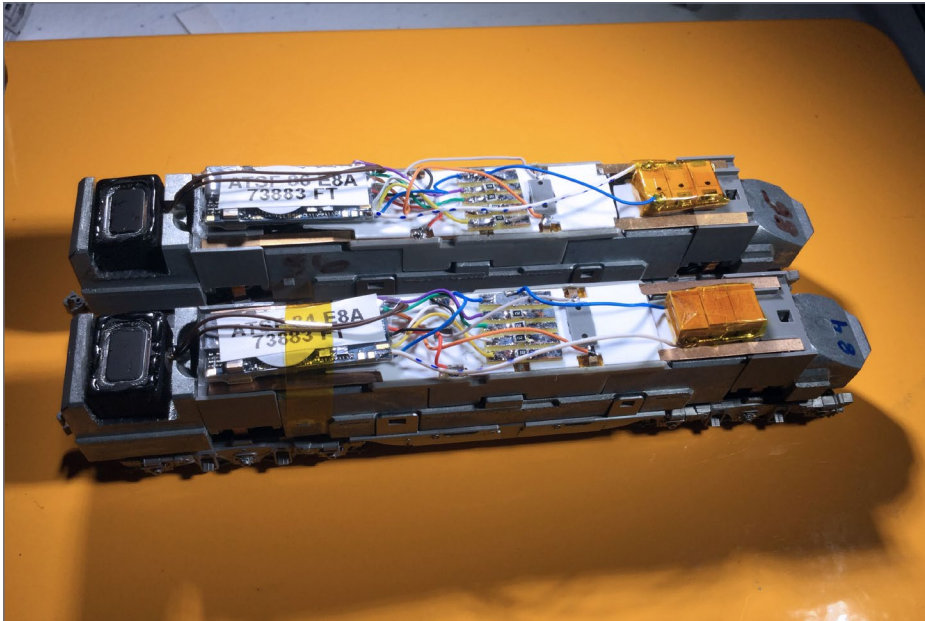
This is an example of the capacitors not physically glued to each other, but spaced apart (albeit, in this case, only slightly). The ground wire (white with blue dashes) is soldered to the negative terminals of one of the board's capacitors.

See [13] for a side view of this same installation. The blue wire from the added capacitors connects to the “+UB” solder pad on the underside of the board (refer back to [10]).

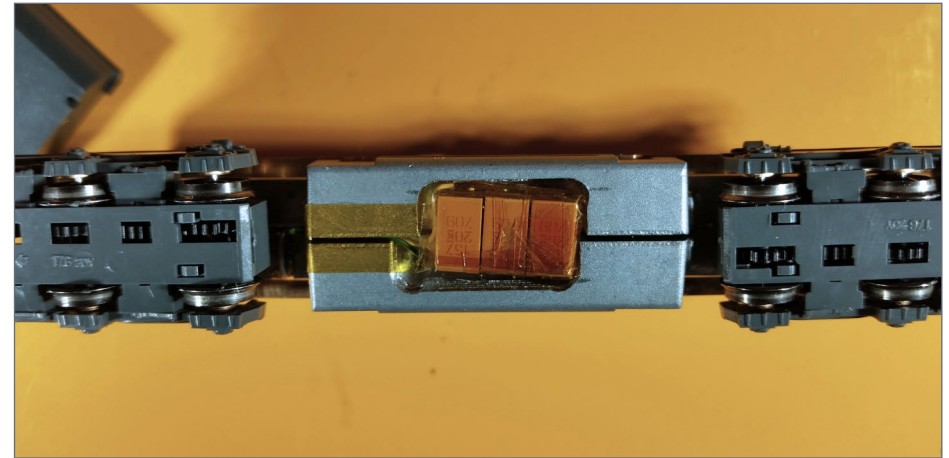
INSTALLING CAPACITORS WITH SELECT MICRO DECODERS

Full-body Kato diesels, such as their E8/9s, are almost the easiest units in which to add wired LokSound decoders. Just mill a pocket for the speaker and enclosure at the back of the frame. There is plenty of space for the decoder and capacitors as seen in [14]. The photo shows a pair of E8 A-units undergoing sound and custom light installation. For these units, a “three-pack” of Ta capacitors is used.

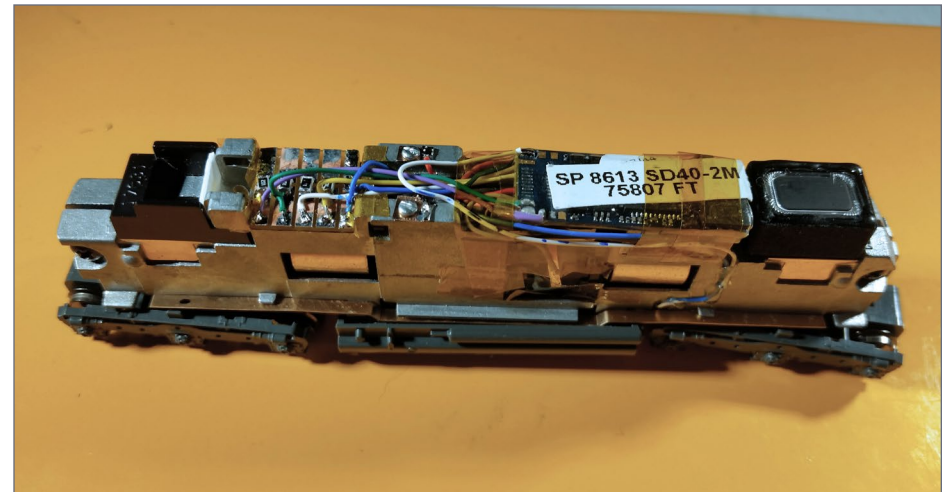
The ground wire from the capacitors is soldered to the Select Micro decoder, while the blue wire connects to the small printed circuit board I use for soldering wires from the lighting LEDs. You can see the current-limiting resistors for the LEDs in this photo.



14. A pair of Kato E8As during LokSound installation.



15. A Kato SD45's fuel tank has been milled-out. A package of three 150uF 20V Ta capacitors sits in the pocket. Yes, my milling wasn't too great ... let's just say I now measure and mark multiple times!



16. A Kato SD45 with an ESU LokSound Select Micro decoder installed. Capacitors are located in the fuel tank, and speaker is above the rear truck.

Another possible location for capacitors in narrow-hood diesels is the fuel tank. This is an excellent location, as it also isolates damage should a capacitor fail, because it's shielded by the frame. The installation of a LokSound Select Micro in a Kato SD45, which included custom ditch lights, became a real space-utilization puzzle.

[15] shows how I milled (poorly) a pocket in the fuel tank for the capacitors. The wires from the capacitor package run up the side of the frame to the decoder. This is seen in [16], along with a similar LED wiring board, with surface-mount resistors.

CONCLUSION

Preventing power drop-outs from in N scale sound decoders is a relatively simple process: install 440uF to 660uF of additional capacitance to the power being supplied to the decoder. Tantalum and polymer-Tantalum surface-mount capacitors provide an affordable solution with components small enough to be used in N scale. ✓

REFERENCES

The following *Wikipedia* articles on capacitors may be of interest:

- Super Capacitors: en.wikipedia.org/wiki/super-capacitor
- Tantalum Capacitors: en.wikipedia.org/wiki/Tantalum_capacitor
- Polymer Capacitors: en.wikipedia.org/wiki/Polymer_capacitor

RICK BRODZINSKY



Rick started modelling in N scale nine years ago, after seeing a Kato GS-4 and Morning Daylight set in a local hobby store and “getting the

bug.” Prior to that, he and his daughters enjoyed setting up a G-scale Playmobile western train set in their family room.

Rick is active with the Silicon Valley FreeMo-N group and also has his own home layout, the freelanced JACALAR, in a dedicated train shed in the backyard.

Rick and his wife live in the San Francisco Bay Area. He recently retired from a 35-year career at IBM, and is fully enjoying the freedom to spend as much, or as little, time as he wants on the layouts. They have two grown daughters; one in Sacramento and the other in Denver. ■



1. My steam cab in the middle of the room as used with my prior layout. The padded seat and armrest provided a comfortable place to sit and run trains using the one-fourth full-size controls on the scale steam cab backhead.



recent St. Louis RPM meet in Collinsville in July and I was very impressed.

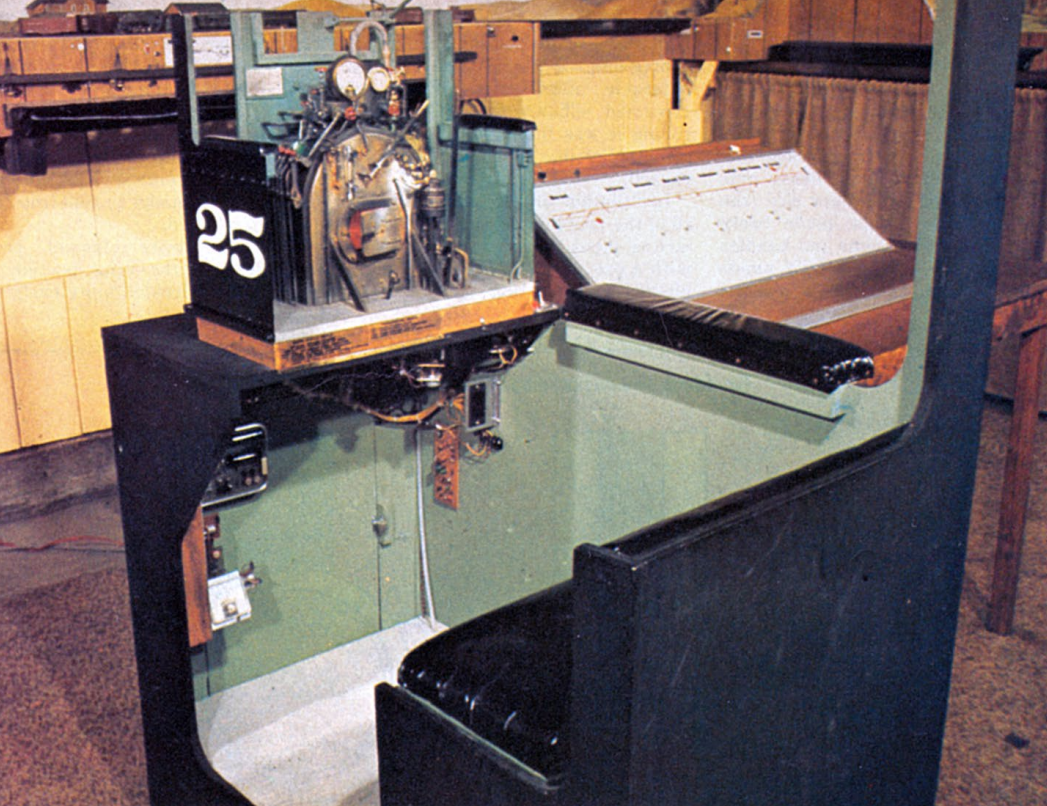
If I operated diesels on my layout, I would have already ordered some but my Yosemite Valley Railroad was steam-powered until it was abandoned in 1945.

The new DCC throttle includes function controls which replicate the look and feel of the controls on a modern diesel control stand. The release of this new walkaround throttle did not take long to start a discussion on a MRH forum about how practical a steam version of this throttle might be.

I built just such a throttle back in the early 1970s. It was not a handheld walk-around DCC throttle, but a one-fourth full-size steam cab backhead that the engineer sat in front of to operate. [1]

The prototype for my backhead is a narrow-gauge Baldwin Locomotive Works 2-4-2 used on the Hawaii Railway Co. in Hawaii. It was purchased and restored to operation in the late 1960s. I was a novice pipefitter for my boilermaker friend who was in charge of getting the replacement boiler piped and back in operation.

It was a real learning experience and led me to want to duplicate the prototype functional controls operating an HO locomotive on my layout.



MODELING A STEAM THROTTLE

Running Extra | December 2018

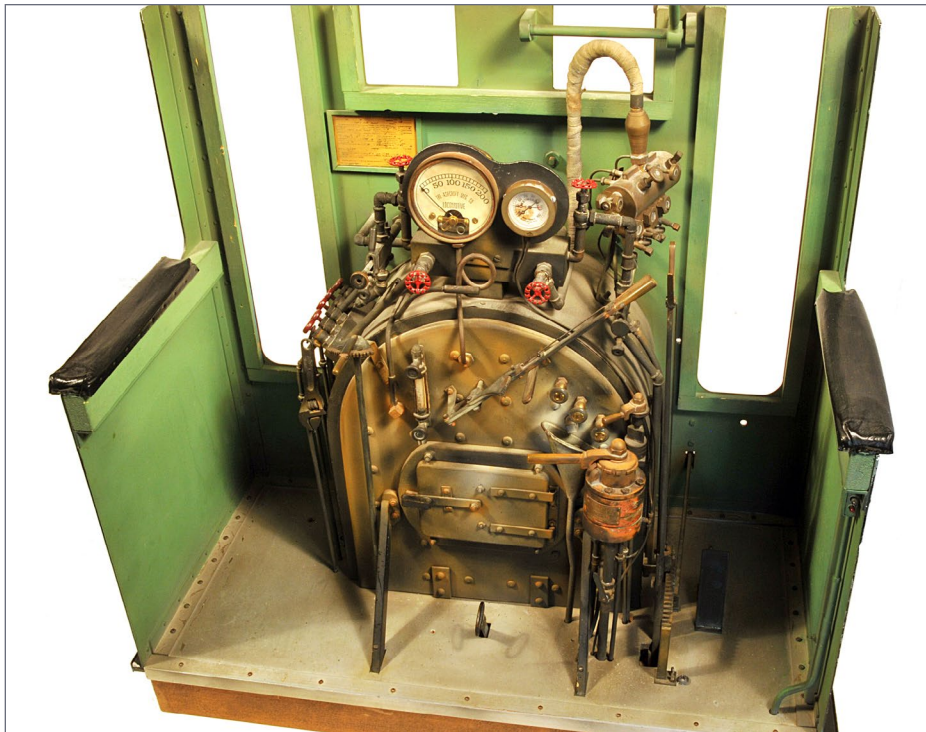
JACK BURGESS wonders about a handheld ProtoThrottle for steam ...

THE AUGUST 2018 ISSUE OF *MODEL RAILROAD HOBBYIST* had an exciting article on the ProtoThrottle just introduced by Iowa Scaled Engineering. I saw it demonstrated at the

MODELING A STEAM THROTTLE | 3

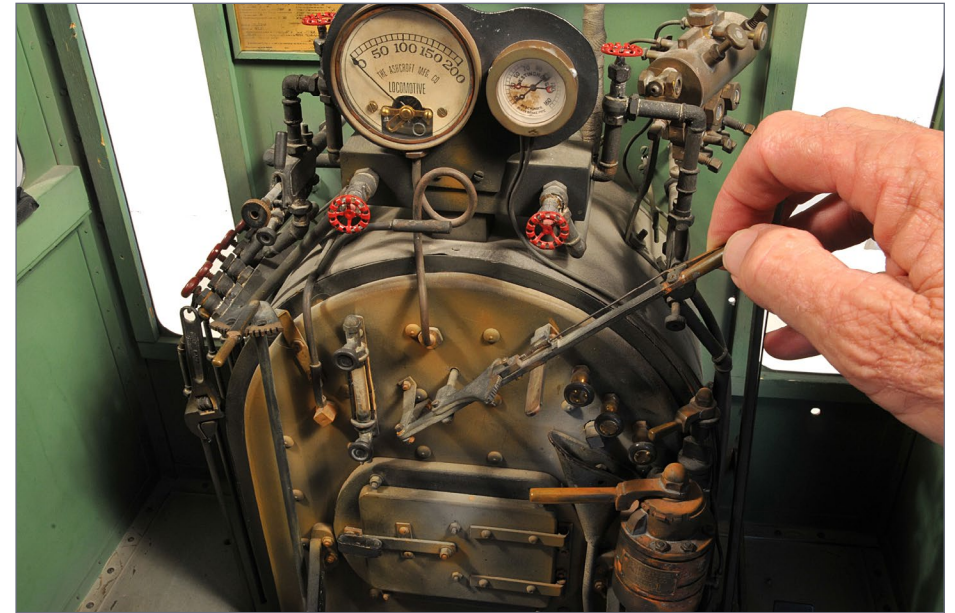
The throttle was scratchbuilt with a few live steam parts—the throttle, brake stand, reverse lever, and all other controls were all hand-formed. The throttle controls were connected to a modified TAT IV hand-built transistor throttle operating on my DC block-controlled previous layout. Back in the 1970s, *Model Railroader* magazine had several articles on building your own throttles, each more feature-loaded than the previous one.

The working controls in the cab included the throttle, reverse lever, independent and automatic air brakes, oil burner valve, cylinder cock lever, water injector, water gage, damper



2. The model steam cab is about 18 inches wide.

MODELING A STEAM THROTTLE | 4



3. This view of the throttle gives an idea of the size of the controls. Above the boiler are the steam pressure gauge (volt meter) and a dummy air brake pressure gauge.

regulator lever, and an opening firebox door with a red light simulating a fire.

I (and visitors) used this steam cab to run trains for several years before dismantling that layout to start construction of my current layout. Only the backhead was saved and put on display. [2]

THE CONTROLS

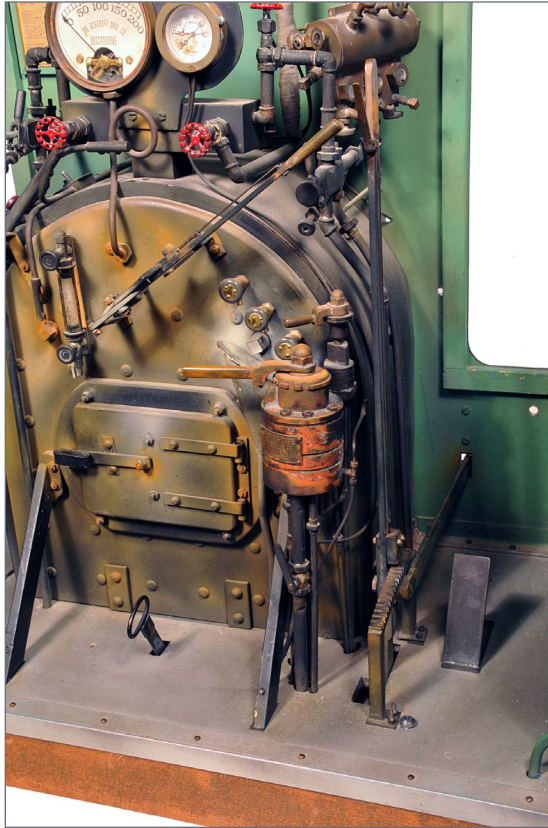
A simple discussion of the controls that I incorporated in my cab might help provide some ideas for moving my efforts toward today's dreams.

Throttle, reverse lever, and air brakes – These are the minimal controls needed to operate a steam locomotive. On my

MODELING A STEAM THROTTLE | 5

backhead, the throttle was directly connected to the potentiometer on the transistor throttle. [3] The reverse lever not only sets the direction of the locomotive, but also functions somewhat like an automatic transmission. [4]

When set all the way forward (called the “corner”), steam at boiler pressure enters the cylinders for the entire stroke. This provides more power at the expense of more water and fuel usage and is used for starting a heavy train. As the train gets moving, the reverse lever is moved up toward the center/neutral position (the “company notch”).



4. The reverse lever is the long lever to the right of the boiler. Both the reverse lever and the throttle had quadrants and working dogs to engage the teeth on the quadrants. Since the prototype engine being replicated did not have a power reverse, a foot brace was bolted to the floor to provide leverage when pulling the reverse lever back to the reverse position.

MODELING A STEAM THROTTLE | 6



5. The automatic air brake stand is in front of the smaller independent air brake stand. To the upper left, above the automatic air brake stand, are the tricocks. In the event of a broken water gage, the tricocks can be used to check the water level in the boiler. If the water level is correct, steam should come out of the top tricock and water out of the bottom one.

This position lets steam enter the cylinder only for a portion of the stroke, but the steam continues to expand which means somewhat less power but uses less fuel. It also increases the speed of the locomotive slightly without moving the throttle. Notching the reverse lever up to the company notch makes the fireman's job a whole lot easier (See sidebar).

If the model locomotive's direction is opposite the setting on the reverse lever, the damper regulation lever on the floor of the cab operates a DPDT switch to reset the direction.

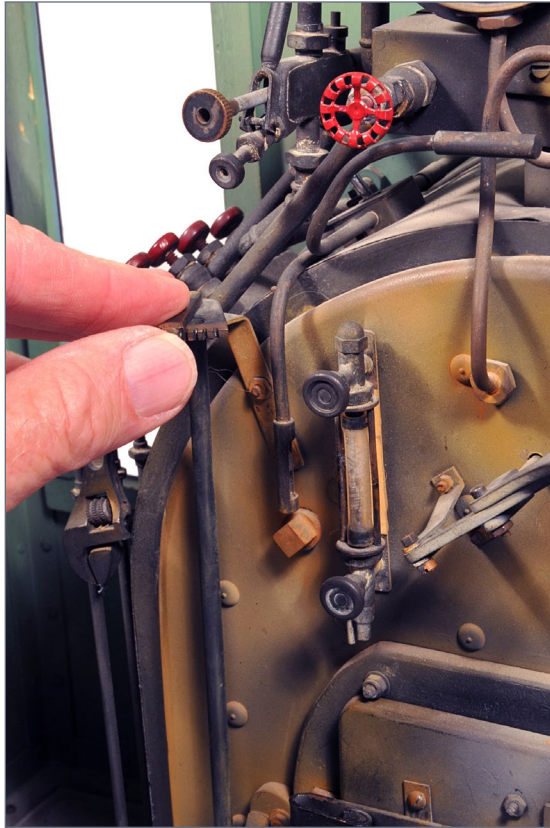
I incorporated a pair of potentiometers into the reverse lever which set the acceleration rate on the TAT IV transistor throttle

MODELING A STEAM THROTTLE | 7

so that when in the corner the acceleration rate was slow, and higher when near the company notch.

The slow acceleration rate was perfect for getting a train moving realistically, while the higher range was appropriate for general running and switching.

The automatic air brake includes five positions, which are positions on a selector switch under the floor of the cab. [5] Incorporating a selector switch means that the engineer can feel when the air brake is set for the Release, Run, Lap, Service, or Emergency positions.



6. The functional water gage, with a light to the left of it for night running. My finger is on the oil burner valve.

MODELING A STEAM THROTTLE | 8

Lap holds the brake at the setting set by a Service brake application. Service sets the brakes at certain reduction, such as a 5-pound reduction to slow the train, or higher to stop the train. Emergency is obvious but rarely needed. Unlike the independent brakes, the automatic brakes incorporate a slight delay before they engage as air is released to apply the brakes on the cars. The independent brake on a steam locomotive operates the locomotive brakes and has the same stops although the one on my cab simply moves from the Run to Full brakes.

On the prototype, the independent brakes would be used while switching before the air hoses are connected between the cars. It might also be used with very long trains to bring the train to a complete stop with no slack between the freight cars.

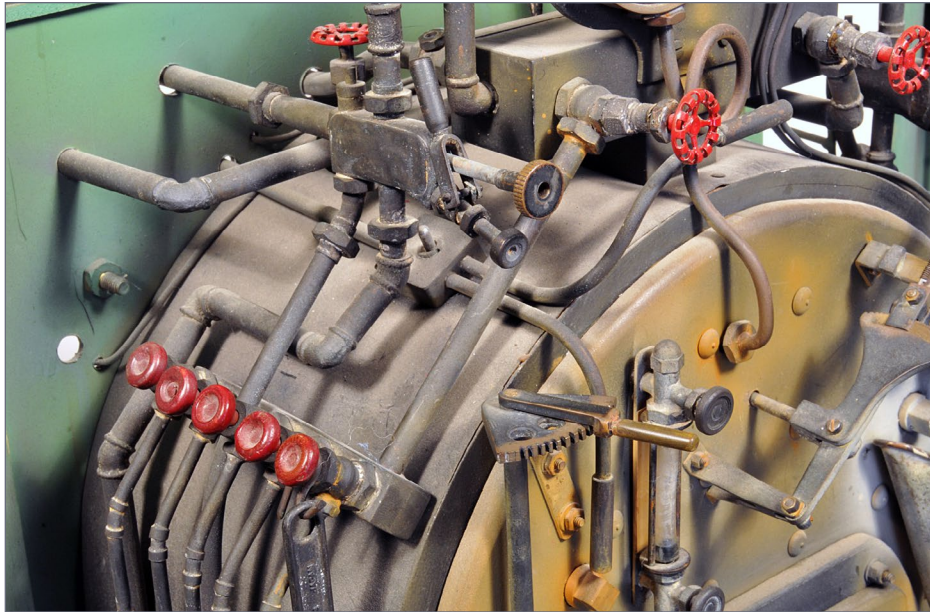
When starting up again, the lack of slack makes it easier to get the train moving. The opposite procedure is used when stopping a passenger train. Using just the automatic brakes will keep the train stretched out and eliminate jarring the passengers when the train leaves the station.

Water usage – Water usage controls on my cab backhead used by the engineer (by the fireman on the prototype) included the water gage (the correct term, not a water gauge), injector, oil burner valve, and cylinder cock lever. Out of view of the engineer is a brass tank functioning as the “tender,” a brass tube representing the “boiler,” and a third “water tank” for water draining from the “boiler.”

The water in the boiler is shown by the functional water gage [6]. When the water in the boiler needs to be filled, turning the knob on the injector will feed water from the tender into the boiler [7]. The tender capacity was enough for about 30 minutes of running time.

MODELING A STEAM THROTTLE | 9

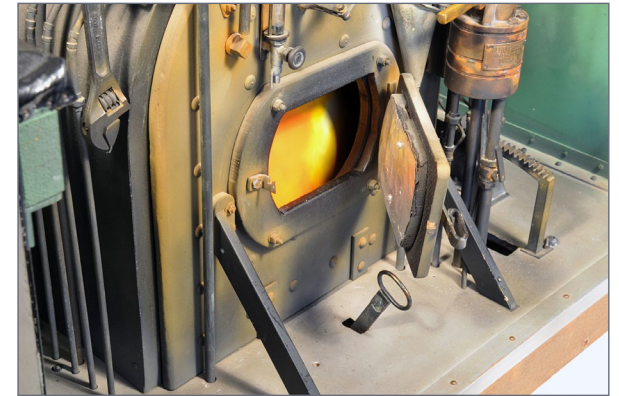
To refill the tender, the locomotive must be stopped under a water tank and the spout swung out over the locomotive tender. That turns on the pump which refills the tender from the overflow water tank.



7. The fireman's functional water injector is at the 11 o'clock position above the boiler. On the prototype, the valve on the end of the injector is turned on while the lever diverts water from the tender down the overflow pipe on the injector. When water can be seen flowing from the overflow pipe, the level is moved to inject the water into the boiler. On my backhead, just turning the valve will refill the "boiler". The manifold with the five valves is non-functional but includes the atomizer which controls the amount of steam used to atomize the oil being fed to the firebox plus the blower and other controls. There is another (non-functional) injector on the engineer's side of the boiler.

MODELING A STEAM THROTTLE | 10

8. The open firebox door and, below it, the damper regulator lever. On the prototype, this lever controlled the amount of air being fed to the firebox from under the locomotive. On the model, it reverses the direction of the locomotive to match the position of the reverse lever if needed.



Because the throttle is mechanical, I could not have the throttle position control the amount of water usage. However, I did use the cylinder cock lever to provide some control over the use of water. When a steam engine is stopped for any time, the cylinder cocks on the steam cylinders are opened so that condensed steam will be exhausted from the cylinders when the locomotive starts moving again.

Opening them on my steam cab stops water from flowing out of the boiler since less water would be used while stopped. Closing them after moving opens the valve on the boiler to again start the usage of water.

All Yosemite Valley Railroad locomotives were oil burners and the fireman used the oil burner valve to control the amount of oil being fed into the firebox. The oil burner valve on my backhead turns on the entire system and lights a flickering light bulb in the firebox [8].

Sounds – Onboard locomotive sounds were not available when I built my cab, but I knew that they were coming, so I included a whistle lever but never did figure out a way to add a rope for a bell.

The very first, very simple onboard sound modules by Modeltronics were released after I had finished my cab. Several months before that release, the owners of Modeltronics brought a “cab box” to my layout which only provided a steam whistle and bell. But that was a huge enhancement for the time.

I knew that additional sounds would be available in the future and wanted to add the sound of the safety valves popping off. My idea was that if you were stopped at a station (as indicated by the reverse lever in the neutral position), you would need to lower the oil burner valve to avoid increasing the boiler pressure to the point that the safety valves released.

If you did lower the oil burner valve but forgot to turn it up after dropping the reverse lever and pulling back on the throttle, the steam pressure would slowly drop and your speed would also eventually drop.

I was never able to add that feature but I did add onboard sound to my steam locomotives which really complemented the use of my steam cab.

A STEAM PROTOThrottle?

Reducing the scale of the controls on my steam backhead to build a walk-around throttle would be difficult. The electronics would be relatively simple although a new DCC digital sound decoder might be needed. The difficult part would be reproducing the controls with the tactile feedback that comes from the actual use of the controls on my steam backhead.

The throttle on a steam locomotive is not a switch or button or even a lever-type switch, but a lever that the engineer pulls out and sets with a “dog” engaging the teeth on the quadrant. Likewise, the reverse lever needs to be vertical and be capable of being set from full forward to full reverse.

The air brakes need to have the feel of the handle moving between the different brake positions. Water and fuel controls would be easier.

Are steam-era modelers ready for such a realistic steam back-head controller? I don’t have a regular operating crew, only visiting operators. Most are so intent on staying on schedule, making meets, and arriving on time for meets that some first-time operators rarely whistle before starting their train or when approaching grade crossing.

I did have one engineer who not only whistled at all the needed times but was once stopped at Incline for no apparent reason with train of loaded log cars ready to head downhill to the lumber mill.

When I gave him a questioning look, he simply answered “Setting up the retainers”. But he was a professional railroad engineer. ✓



RUNNING STEAM ON THE SIERRA RAILROAD

A friend who is an engineer on the Sierra Railroad at Railtown 1897 in Jamestown, CA relayed this story of a recent trip with the fireman taking over for the engineer. The engineer (normally the fireman) kept the reverse lever in the “corner” during the entire trip. My friend explained how the day went.

“Running the locomotive in the corner, especially on a saturated type locomotive such as the Sierra #3, quickly depletes the steam supply stored in the boiler. The steam pressure tends to drop, forcing the fireman to increase heat in the firebox by using more steam to atomize the increased amount of fuel now being forced into the firebox to maintain steam pressure.

“At the same time, the fireman has to increase his water intake to the boiler to keep up with the increased demand for steam. This again lowers the boiler pressure, causing the fireman to juggle between operating pressure and making steam. As with my case this past Saturday, when we were ready to start uphill I had my boiler pressure at maximum operating pressure (which is 150 psi on the #3) and a quarter glass of water allowing plenty of room for steam to be formed in the boiler. When the engineer pulled out the throttle, I (as the fireman), had to adjust my firing valve accordingly to match his steam usage. The only problem was, when he left it in the corner, he took all my steam and pressure quicker than I could make it up.

“I had to really open up the firing valve to keep up with the loss of pressure. Then really monitor the water glass

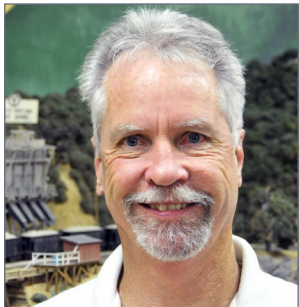
to make sure I had sufficient water in the boiler to not only make steam, but to cover the crown sheet. You never want to drop your boiler pressure more than say 5 psi at a time by adding water, due to the water being added is colder which can shock the boiler. So, it was a constant battle to add water to make steam and maintain the pressure to keep the locomotive running. When you're used to adjusting your firing valve once and running against the gun (opening the injector and leaving it on the whole trip to keep water flowing into the boiler), the added work isn't much fun!

“Normally we use between 200 and 250 gallons of water per trip and burn about 35-40 gallons of oil per 5-mile roundtrip. Water and oil use on that trip was right around 290 and 50. While not a huge difference, over the long run it would add up substantially. This is why company officials frowned upon running in anything other than the “company notch”.

“This trip was brutal on both the engine and me! Needless to say, we had a long talk when we got back into town.” ■



JACK BURGESS



Jack retired in 2004 as a civil engineer for the city of Newark, CA.

For five decades he has pursued his passion, the Yosemite Valley Railroad.

His model of this railroad is known around the world for its dedication to following its prototype as exactly as possible in the confines of his (ex)garage.

Jack's knowledge of the YVRR is deferred to by the National Park Service. His railroad attracts record crowds during open houses. With his YVRR nearing completion, Jack's interests have turned toward prototype operations.

He has also written a book about the Yosemite Valley titled "Trains to Yosemite."

Jack is also one of the regular rotating cast of prototype rail-roading columnists who write for MRH's Getting Real column.

Check out Jack's website at www.yosemitevalleyrr.com. ■



DID YOU SEE THIS ON THE MRH WEBSITE?

Modeling Asphalt roads

Sun, 2014-03-30 12:28 — Steven S Scenery and structures

I've been working on a small mockup to test some ideas for asphalt and street trackage.



I used 1mm black craft foam on code 100 track. You can go the full width of the rails and not interfere with the flanges, as long as they aren't pizza cutters. The stuff at Michael's is 2mm (Hobby Lobby's is even thicker), which is fine for roads without track, but for street trackage you'll need to order some 1mm. An eBay seller named Wandy-Foam sells it.

The paint is water-based craft paint from Michael's or Walmart. You can buy shades of gray paint, but if you want to mix your own, mixing black with white will result in a blueish tint. I mixed black with a light tan (suede) to remove any tint. I dabbed it on using a damp kitchen sponge. Look for a sponge that doesn't have any sort of pattern embossed into it. I also cut the sponge in half, using one half to apply the paint. The other was kept clean and damp and was used to remove paint if needed, such as the dark areas down the middle of the lanes. You want to dab the sponge on something else first, such as a piece of cardboard, to remove some paint (sort of like dry brushing.)





This coaling tower did not take me long to build once I figured out the design. I started with pictures I could find on the web.

I made my coaling tower in 10 different sub-assemblies, so I have organized this article following this approach.

Dimensions and materials:

Height : 26" (67cm)

Width: 14" (35cm)

Length: 14" (35cm)

Final weight: 10 lbs. (4.5kg)

Stripwood:

1/8" x 3/8" (4mm x 9mm)

3/8" x 3/8" (9mm x 9mm)

1/8" x 1/2" (4mm x 13mm)

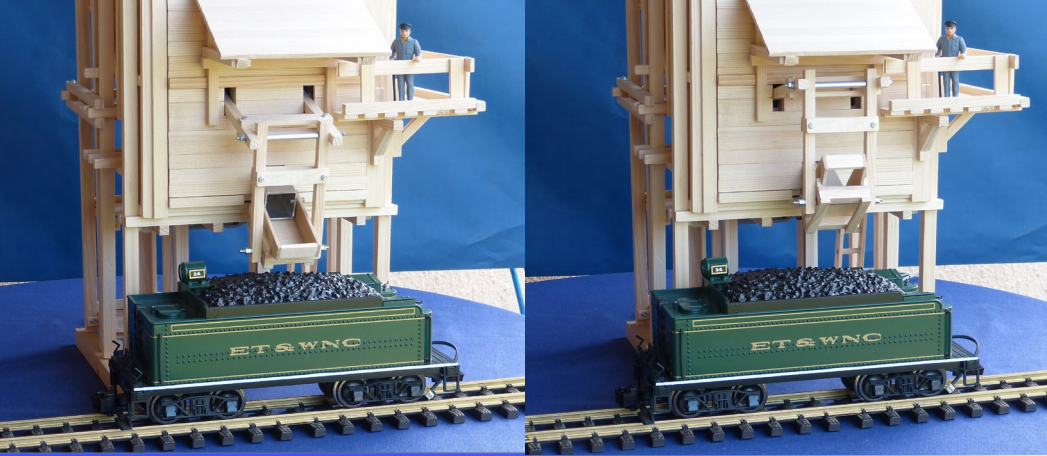
1/2" x 1/2" (13mm x 13mm)

In addition, I used a 5/32" plywood panel : 18" x 36" (0.5m x 1.0m) and pieces of 1/8" board I had in my scrap box.

Total wood cost is about \$80.

For the animation, I used:

- Two actuators used for car locking, bought on Amazon, around \$10 each.
(Amazon: a.co/d/3ORPM1s)
- One Playmobil electrical drive for the winch, around \$40 including control box.
(Amazon: a.co/d/iNjswLh)



BUILD A Working coaling tower

Running Extra | December 2018

JEAN-YVES MAZZOLENI shows how he animated a coaling tower ...

I BECAME INTRIGUED BY THE IDEA OF DOING A western-style coaling tower on my G Scale indoor railroad. I also wanted to explore if I could animate it as well..

The best commercial coaling tower in G was one made by Pola, but it's no longer available. Since it seems I can find this Pola tower on almost all the existing garden railroads I've seen, it may be a while before there is enough demand to justify making it again!

So, I decided to fashion my own coaling tower inspired by the Pola one, and to see if I could add some animation.



ANIMATION IN SMALLER SCALES

You can take the basic ideas JY presents here and adapt them to smaller scales by using small servos to do the activation movement. Some MRH sponsors such as ...

Berrett Hill

[MODEL-TRAINS-UNIVERSE.COM/ADSERVER/WWW/DELIVERY/CK.PHP?BANNERID=213],

Iowa Scaled Engineering

[MODEL-TRAINS-UNIVERSE.COM/ADSERVER/WWW/DELIVERY/CK.PHP?BANNERID=228],

TAM Valley

[MODEL-TRAINS-UNIVERSE.COM/ADSERVER/WWW/DELIVERY/CK.PHP?BANNERID=252]

... sell small servos.

PART 1 & 3 - COAL RESERVOIR BODY

I built the coal bunker body in two sections using plywood panels cut to size and glued together. I glued reinforcement strips at the corners.

To represent the individual boards on the body, I covered it with 1/8" x 1/2" stripwood. This process makes the construction far easier than building the body with individual boards only.

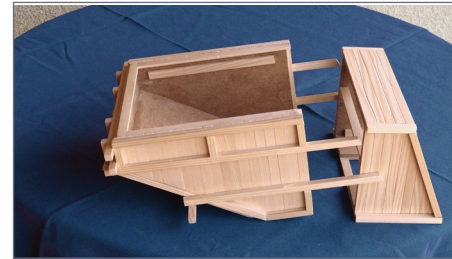
For the main coal reservoir, I started with the rear sloped face and continued to the sides.

When complete, I installed the reinforcement strips of 3/8" x 3/8" square stock on the outside of the reservoir box.

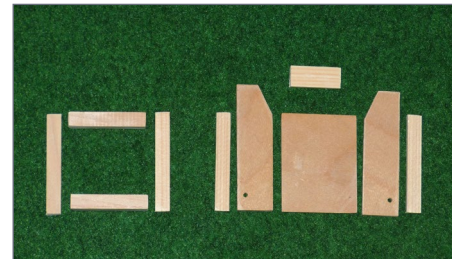
PART 2 - FRONT FACE AND ACTUATION MODULE

I made the chute door using a piece of plywood and added sharp angles on each side to avoid blocking the coal movement. I fixed

a simple vertical screw into the door to create the attachment point for the actuation lever.



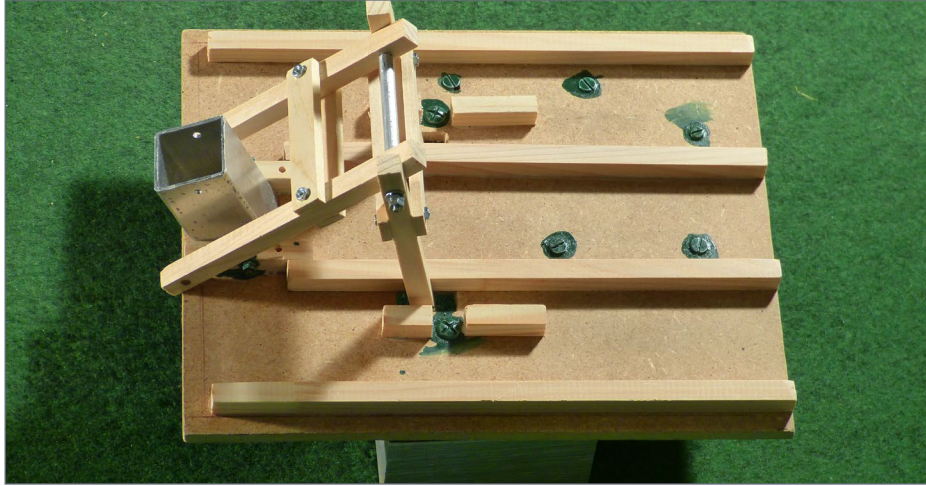
1-4. These four photos show how I built the main coal reservoir body of my coaling tower.



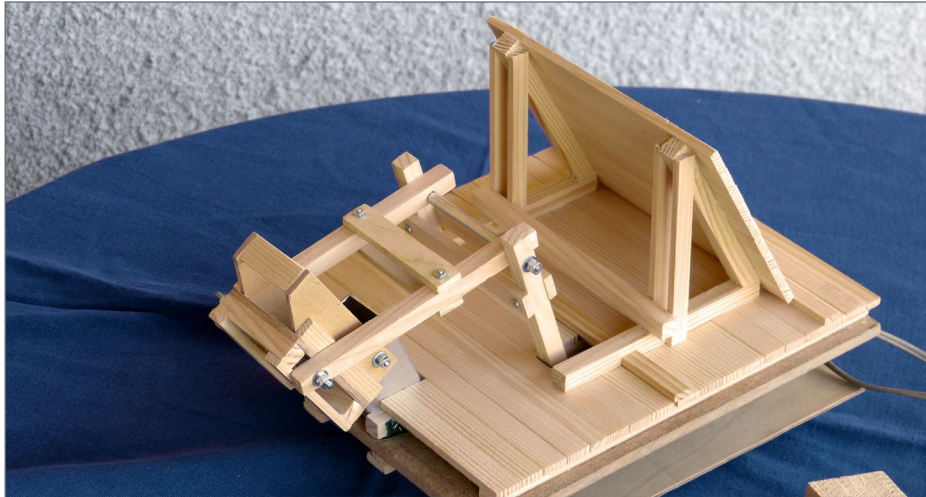
5-7. Building the chute assembly.

BUILD A WORKING COALING TOWER | 5

I made a tray to hold the two electrical actuators used to drive the chute and the door, and made this tray removable by fashioning it to slide in side grooves.



8. Fashioning the front face assembly with the chute motion arms and the square aluminum channel.



9. Finished front face with the chute installed.

BUILD A WORKING COALING TOWER | 6

The electrical actuator has a limited stroke just over half an inch (16mm), while the chute door must move by almost an inch (25 mm). My solution uses a lever and applies more force to the door!

Due to the circular movement of the end on the actuator, I needed to allow for some free play in the two holes of the lever connected to the door and to the screw fitted on the actuator rod end. I made this lever using plywood because the actuator force is high.

I used the second actuator to move the levers supporting the chute.



10, 11. Here is how the front face chute movement works, with the chute up or down.

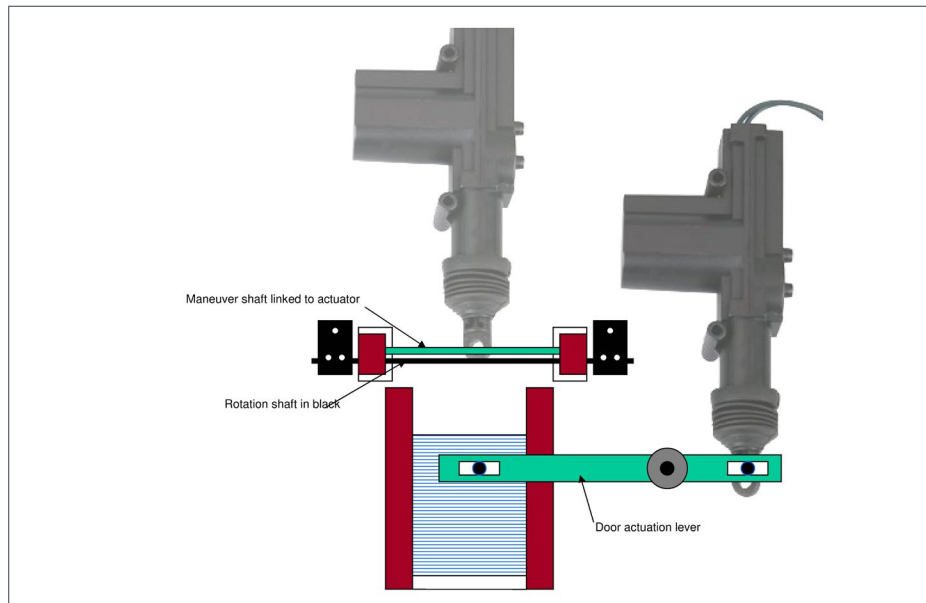
BUILD A WORKING COALING TOWER | 7

For these levers, I used the accessories supplied with the electrical actuators and screwed them to the actuator tray. I slid the hinge shaft into them and fixed them in place with two small screws. Also, I made a shaft from a rod supplied with the actuators kits and cut it to length.

I fashioned two levers to move the coal chute, one on each side. To keep them in position during the movement, I linked the two wood levers together with a wood board glued in a position that leaves space for the actuator rod end.

It is important to keep the levers parallel. To assist with this, I used two boards or crosspieces screwed on each pair of arms.

I built up the chute in two parts: one fixed and one movable.



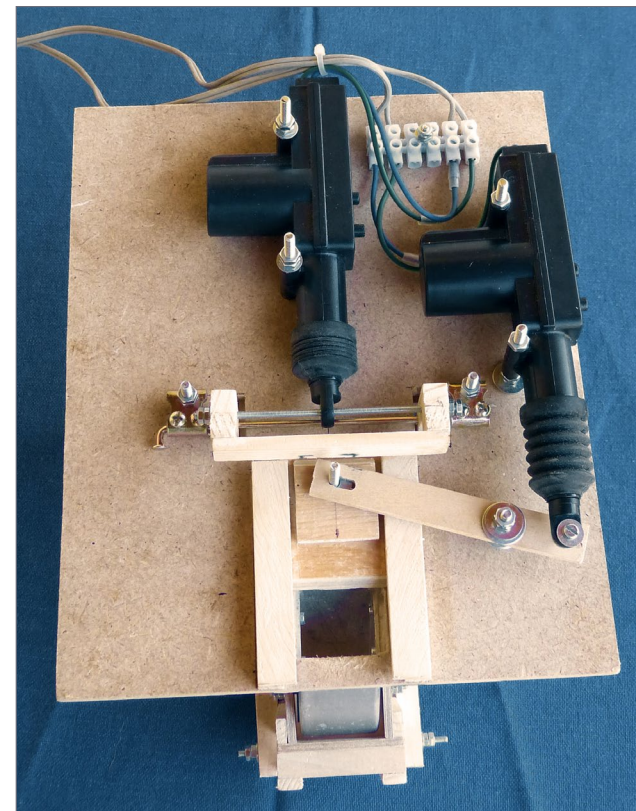
12. Actuator installation drawing. The upper left actuator moves the chute up and down, while the right actuator opens and closes the coal chute door to allow coal to be dispensed.

BUILD A WORKING COALING TOWER | 8

The fixed part I made using a piece of square aluminum tubing. The angle of this fixed part to the front face is 115 degrees. I fixed the aluminum channel onto the front face board through two small pieces of stripwood 3/8" x 3/8" attached by two screws to each side of the aluminum channel.

I created the hinges with 1/8" (3mm) threaded rod. I slid a 15/64" diameter tube onto the hinge to keep the arms properly spaced.

To support and control the movable wood part, I used a tube slid onto some threaded rod moving underneath in two side beams and to keep it bound to the wood chute.



13. Actuator tray arrangement.

All screws need to be appropriately tightened to create some friction force to allow the chute to stay in the upward position and not go down on its own.

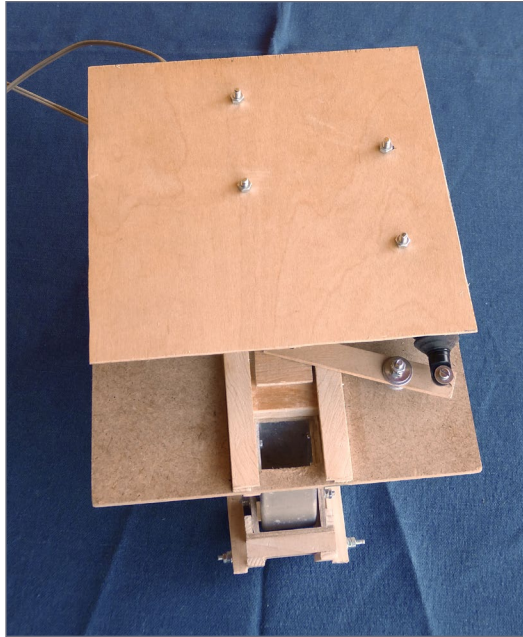
I connected the two actuator electrical supply wires to an electrical terminal block in the tray.

Ideally, we want the chute position controlled to avoid any interference with

BUILD A WORKING COALING TOWER | 9

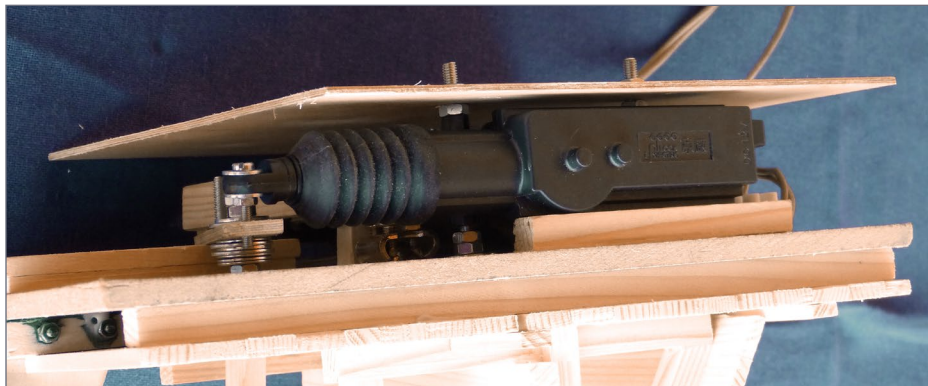
the trains passing just below. For added insurance, I installed two additional devices.

First, I made a locking mechanism using a magnet sticking to a metal piece while in the up position.



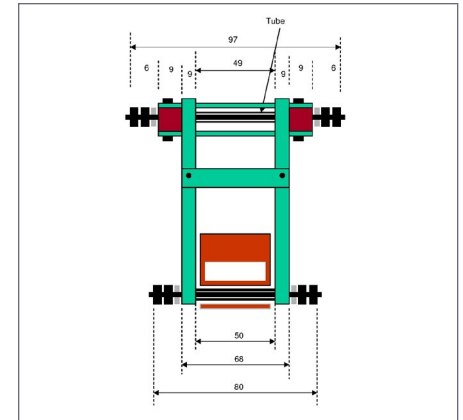
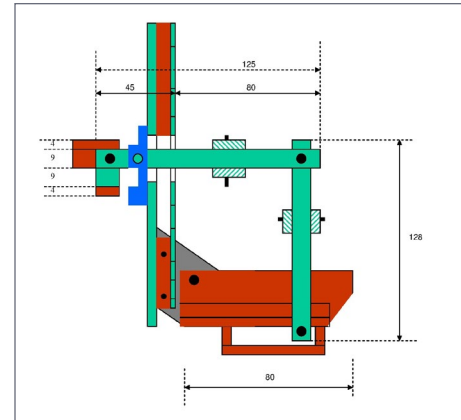
Second, I added a warning device: an electrical low voltage switch is activated when the chute is in the down position. I connected the wires to the terminal block on the tray. This warning circuit gets fed from the railroad's electrical power supply, to be active as soon as the railroad is turned on.

I also added a protecting cover. If everything goes well, the grains of delivered

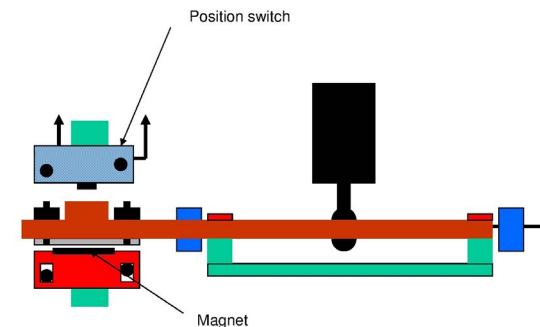


14, 15. Actuator tray with protective cover.

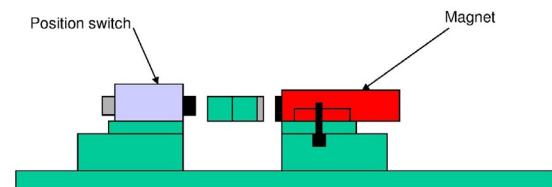
BUILD A WORKING COALING TOWER | 10



Top view device with locking magnet and position switch



Side view with locking magnet and position switch



16-19. Chute drive mechanism drawings.

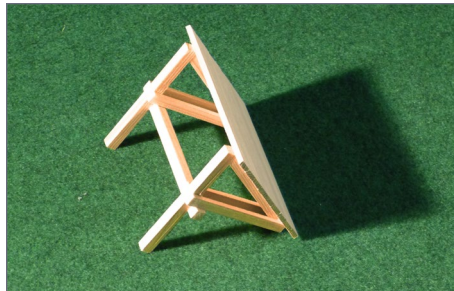
coal first get poured into the coal reservoir. To prevent small grains getting into the actuation mechanism, I installed a thin wood cover (5/64" or 2mm) on top of all the actuation devices. The height of this wood cover is determined by the nuts installed on the actuators' mounting screws.

The screws installed on the tray must be secured with some paint drops (or Loctite) to discourage them from coming loose. These screws do add some thickness above the front face board, making it difficult to glue on the outside finishing boards. I glued small pieces of 3/8" x 3/8" stripwood in place to create a support for these boards. This also makes a better looking joint with the metallic chute.

PART 4 & 5 - MAIN RESERVOIR AND HOIST TOWER ROOF

To fashion the roofs, I used 1/8" (3mm) board. Around all the sides, I glued 3/8" x 3/8" stripwood to keep the board flat. Then I glued a 1/8" x 1/2" finishing board on these wood strips to complete the roof assembly structure. I put a 3/8" x 3/8" stripwood front stop in place underneath to keep the roof in place, to keep it from ever sliding downward.

To improve the looks of the hoist house and bin roof, I added 1/8" x 1/8" stripwood to create a fascia edge that looks better than only a thin piece of wood.



20, 21. Fashioning the roof over the coal chute.



22. Hoist house, bin, and chute roofs in place.

BUILD A WORKING COALING TOWER | 13

To improve the looks of the hoist house and bin roof, I added 1/8" x 1/8" stripwood to create a fascia edge that looks better than only a thin piece of wood.

At first, I made a top hoist housing using plywood glued together to create the body shell. Then I covered this body shell with 1/8" x 3/8" boards.

The hoist cord must stay in the middle of the hoist tower structure to guide the bucket properly. For that I carefully drilled a small hole accurately centered in the floor.

To support the complete hoist tower, I fashioned four 1/2" x 1/2" pillars and glued them at each corner so the entire structure would stand upright on its four legs.

In this coal station design, the bucket is guided by two U-shaped side rails, in which the bucket guiding strip is sliding. As this tower is animated, I needed to hide several electrical wires: four wires for front actuators and two wires for the winch. For this I built two identical U-shaped side rails, but then covered them with a piece of stripwood.

I made these U-shaped rails in wood to fit in with the era of the structure. In this case I glued two strips 1/8" x 3/8" on each side of one 1/8" x 1/2" board, creating the U shape. For the electrical channels, I cut the 1/8" x 3/8" strips to length and covered the U shape rail with another piece to keep the wires in place and to hide them.

These four U-shaped rails can now be glued in place on the hoist tower assembly. I glued them onto the four cross beams – two of which are on the pillars' top and two of which are on the pillar's base. Getting the two guiding rails properly aligned and spaced is important to smooth operation of the animation.

BUILD A WORKING COALING TOWER | 14



23. Hoist tower assembly, with ladders inside.

So we have in the middle of this building the spot where the bucket will move up and down. At the top of this spot we must keep a wider free zone to allow tilting the bucket on its side and to install a guiding shaft here in the U-shaped wood rail.

The bucket must pivot at just the right place to dump the coal down into the coal reservoir. For this to work properly, I inserted one wood piece into each U-shaped side rail at the right location to create an end stop for the bucket guiding rod and to get the bucket to tilt properly.

On each side of the lift area, we have free space that can be used to create floors and ladders to simulate an access to the hoist room or to the footbridge (see Part 9 below).

I made three ladders by first cutting the ladders' sides and then drilling the holes for ladder rungs made from small dowels. Then I soaked the rungs in white glue on both ends and inserted them into the ladder sides. It's easy to adjust the ladder to get everything square before the glue sets up.

Finally, I glued the ladders in place inside the hoist tower assembly.

PART 7 - ELECTRICALLY DRIVEN HOIST

The hoist consists of a home-made winch and a Playmobil electrical actuation set, which I selected for these reasons:

- I get an actuator delivered with a control box, so I don't need to design one.
- The actuator comes fitted with an end stroke torque limiter to avoid breakage.
- The torque is quite acceptable: this hoist lifts 7 ounces (200 grams).

I made the winch of wood using a wood dowel. I drilled the two side wood strips while clamped together to make sure the dowel was perfectly perpendicular.



24. Hoist tower with bucket guides and hoist cable. The hidden wire channels are on each side of the hoist guide.

BUILD A WORKING COALING TOWER | 17

I made a connector to the actuator using a small plastic tube, which also provides some additional torque limitation.

PART 8 - TOWER BUCKET

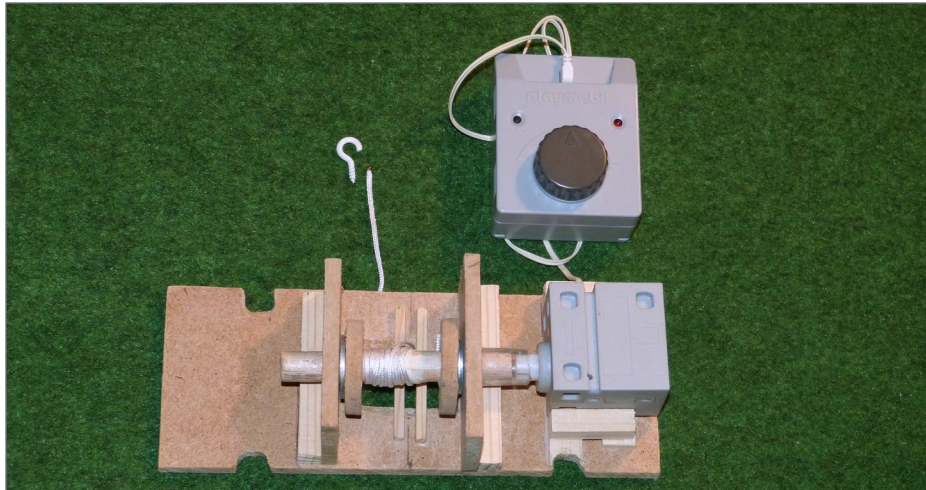
I made the bucket of plywood with stripwood joint reinforcements.

When this bucket is in the upper position and starting to go back down, it must be drawn backward around the lift axis. To ensure the bucket would work well, I added 3/4 ounces (20 grams) of lead weight on the rear side.

Finally, I added an angled board inside the bucket to facilitate emptying at the tumbling stop.

PART 9 - FOOTBRIDGE

The footbridge attaches and detaches to make transport easier. I like the more human aesthetic the footbridge adds to this structure.

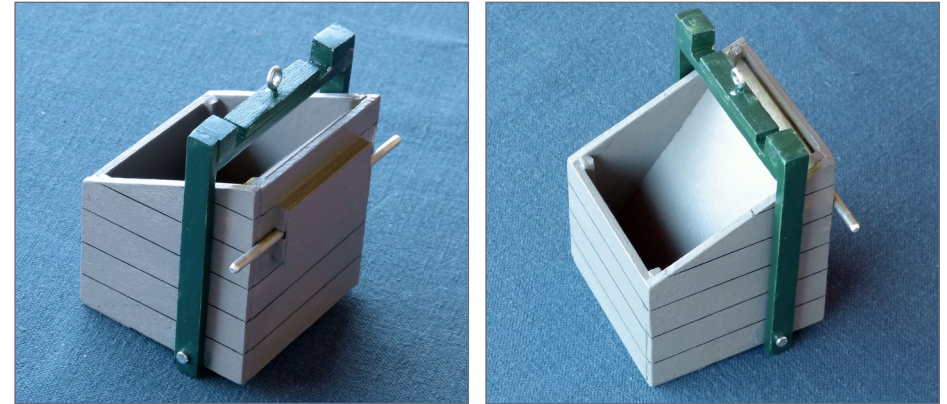


25. Winch assembly details show the Playmobil actuation set, wood dowel drum, and the plastic tube connecting the drum to the actuator shaft.

BUILD A WORKING COALING TOWER | 18

I position the footbridge on three brackets I glued to the main reservoir structure.

As this footbridge is very close to the chute mechanism, I made sure it does not interfere with the chute when installed or removed.



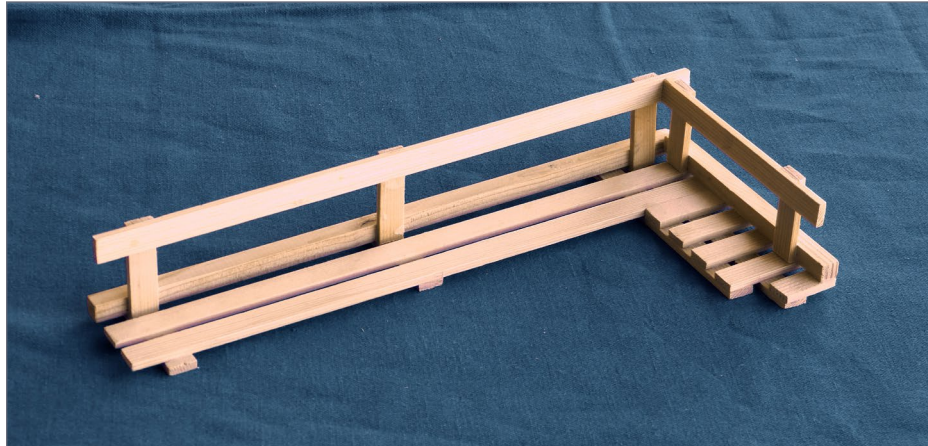
26, 27. Tower bucket assembly.



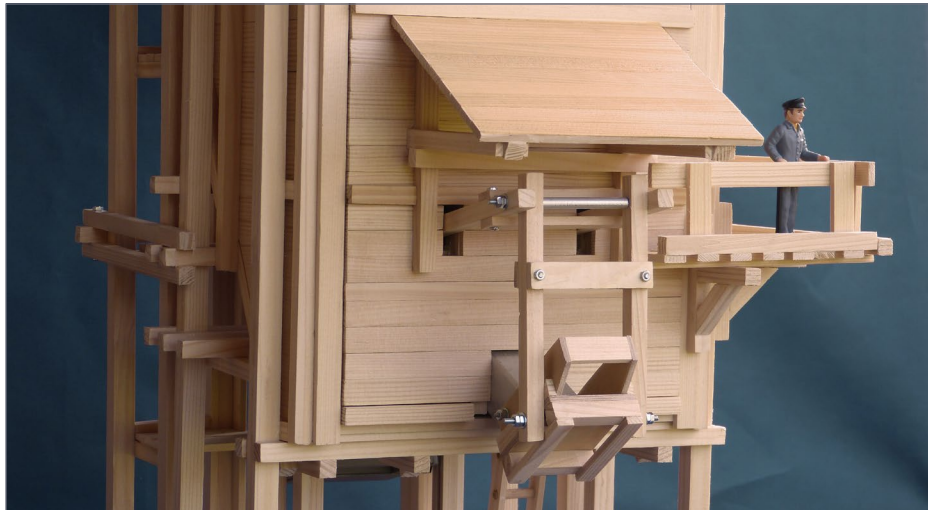
28. Bucket emptying once it reaches the stop at the top of the tower channels.

PART 10 - ELECTRICAL ACTUATION CONTROL BOX & POWER SUPPLY

For the hoist, the connecting electrical cable is very thin and limited in length. I replaced it with a longer, sturdier wire.



29. The footbridge assembly.

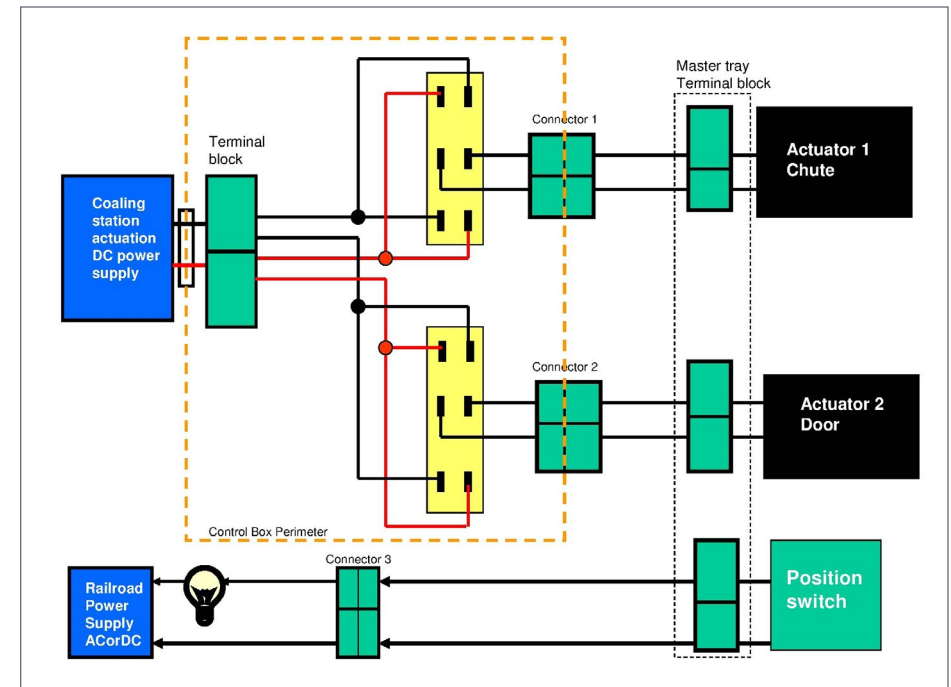


30. The footbridge assembly in place on the structure.

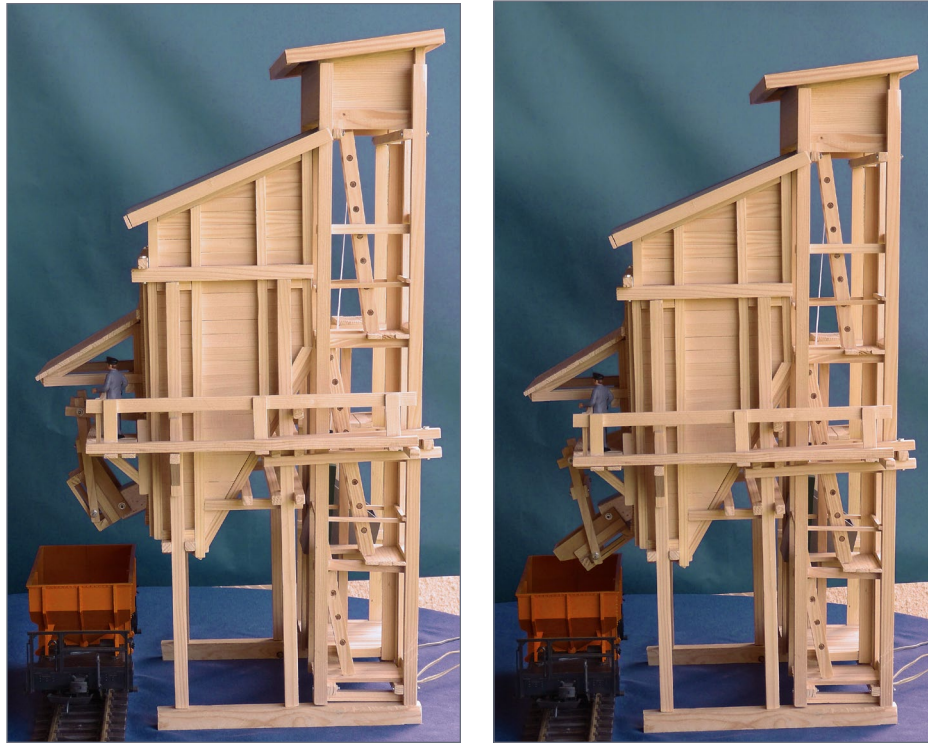
On the front chute actuators, I use two momentary double pole double throw (DPDT) center-off switches for control. I installed them inside a small plastic box with a cover, making the wiring both hidden and protected.

For power, these all need a 12 volt DC power supply. In my case I tried a power supply providing 9 volts DC and found this was also acceptable.

This was a fun project and achieved the desired animated coaling tower I was hoping for. I hope you can benefit from what I learned on this project! ☒



31. Electrical wiring drawing.



32, 33. Side view of the finished coaling tower in operation.

JEAN-YVES MAZZOLENI

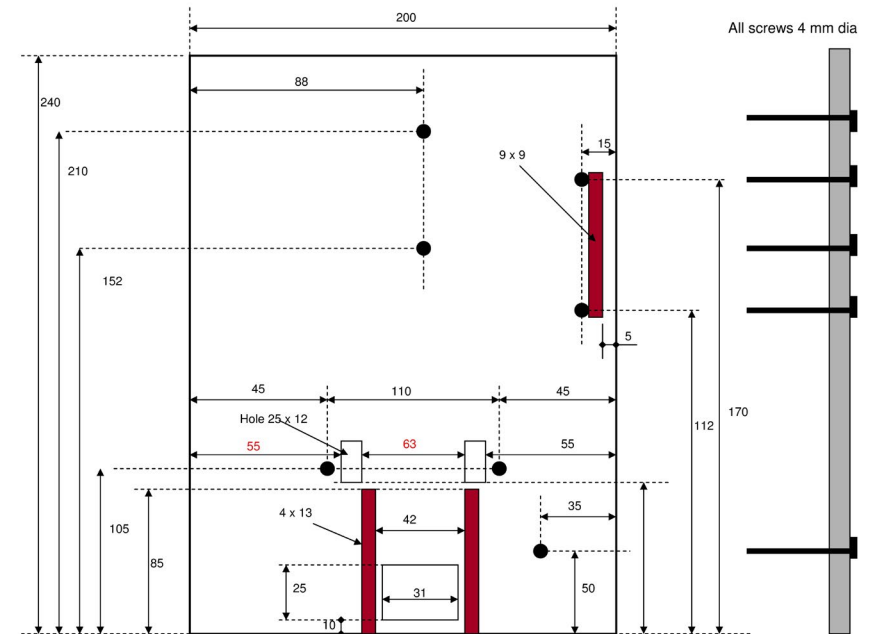


Jean-Yves Mazzoleni lives near Toulouse, France, in the heart of the European aerospace industry where he developed his marketing and sales career, particularly over 25 years in Liebherr Aerospace.

JY discovered G scale railroading during a business trip in Germany many years ago. He is now retired and enjoying his indoor railroad started in 2013. ■

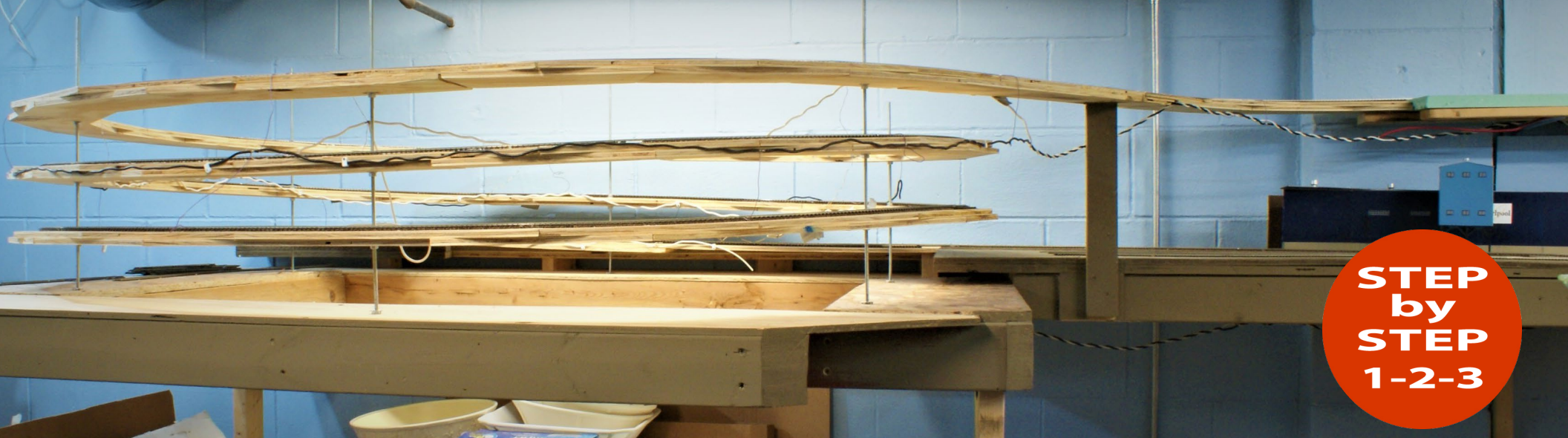
MASTER TRAY DRAWING

If you decide to duplicate what I've done here, I've provided a drawing of the actuator tray with all the dimensions shown. I'm from across the pond, so all dimensions in my drawing are in millimeters. You U.S. guys can use Google to help you convert them to inches! ■



34. Master tray drawing with dimensions.





**STEP
by
STEP
1-2-3**

***BUILDING A* MODULAR HELIX**

Running Extra | December 2018

MICHAEL WOLF'S step-by-step approach to make a helix using a modular approach ...

MY FRIEND, STEVE HIPES, AUTHOR OF *PENNSYLVANIA Railroad Lines West Volume 1-3*, recently moved to a new home and began building a new layout in his basement. Since he had witnessed the creation of the helix on my layout, he asked if I would build one for his layout.

I quickly agreed, but then some serious limitations came to mind – his house was about 45 minutes from mine, his modeling time and mine overlapped sparsely, and he didn't own many of the tools

Follow along with the steps used to create this helix using a custom template and modules that are precise and easy to transport across town to a fellow modeler's basement for assembly.

★★★★★
RATE THIS ARTICLE

I'd need for the job. Since I built my helix in place one layer at a time as I had spare time, we needed a solution to overcome these limited-resource obstacles.

The solution I came up with was to build the helix in easy-to-transport modular sections and to complete the final assembly on-site. Follow along on my step-by-step journey.



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STEP 1: DESIGN

Steve needed a helix to connect two levels of his HO scale layout. An earlier attempt was too steep at a slope of 2.5% – so we decided to use a 2% slope with four inches of elevation gained on each level.

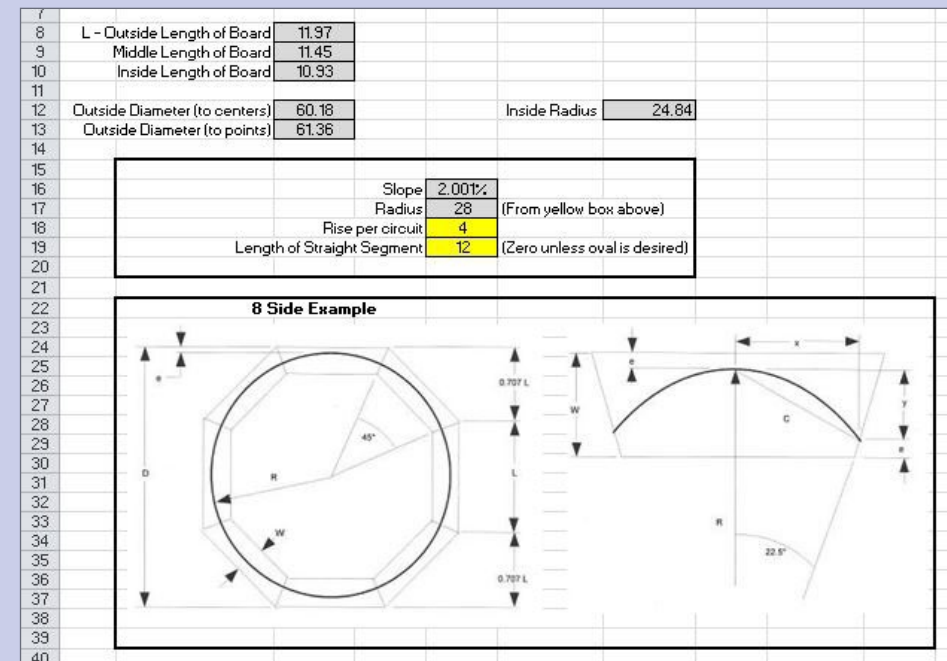
Going back to high school algebra and geometry, slope is rise over run, and the circumference of a circle is $2\pi r$ where r is the radius of the circle. Doing the math, the 2% slope would require a 200" run to achieve 4" of rise. That would require a circle with a radius of 32" – approximately 5½ feet in diameter.

Like many layout designs, space was limited, so a 28" radius was all that would fit. To maintain the 200" run with each circuit, we went with an oval design with a 28" radius and 12" of straight track between the curved ends. The helix would make three circuits to gain the height needed to reach the upper deck.

I designed my original helix and built it using trapezoid-shaped pieces of 3/8" plywood. I overlapped these trapezoids with glue and screws at the joints to produce a very structurally strong design.

The trapezoids also allow efficient use of materials. To assist in the design, I created an Excel spreadsheet to “what-if” the parameters of the trapezoids to efficiently cut and use the plywood sheets [1].

This spreadsheet is available for download in the registered MRH user downloads section for December 2018. Using the spreadsheet, I tweaked the parameters (track radius, number of sides, width of board) to analyze how close to the edge the track might come. I also explored the length of each trapezoid building block, and the angle needed to cut the trapezoid ends.



1. Screenshot of the Excel spreadsheet used to calculate the dimensions of the helix. This spreadsheet is available for download.

The spreadsheet has a section that does the math for the slope calculations. A 16-sided helix using 5¼"-wide trapezoids seemed to provide a good compromise between the width of the helix surface and efficient material usage.

Given the kerf of the blade on my table saw, I would be able to get nine 5¼" planks from a sheet of plywood, and each of these 8-foot long planks would produce eight 11.97" trapezoids.

★★★★★
RATE THIS ARTICLE

STEP 2: MATERIAL PREP

Producing the trapezoids used for the bulk of the helix was easy. Approximately 100 trapezoids and a dozen 12" straight pieces (112 linear feet) would be needed. Each plank produced 8 linear feet, so I cut 15 planks on the table saw (just over 1½ sheets of plywood).

After cutting the planks, I set my chop saw to 11.25°, placed a stop block at 11.97" (both dimensions obtained from the spreadsheet), and began making trapezoids. For each new plank, I removed a small triangular wedge from one end [2].



2. The first cut – set cut angle to 11.25° and make the first cut on an 8-foot “plank” of 3/8" plywood and discard the small triangular scrap piece.



3. The “plank” is flipped, pressed against the stop block, set to just under 12 inches, and the opposing angled cut made. Flip and repeat a hundred times (or so) to get the needed trapezoids.



4. Sawdust and a few scraps are the only waste pieces from this approach to making helix roadbed.

After that, I flipped the board and pressed it to the stop, cut the opposite end, flipped the board and repeated [3]. I left several of the end pieces long (approximately 18"), as I planned to use them for the transitions in and out of the straight sections.

There was very little wood wasted in making the trapezoids [4].



STEP 3: MODULE TEMPLATE

With the material cut [5], I needed to create a template (or jig) to produce the individual modules. I obtained a large (free) cardboard box from the shipping area at a local big-box store, flattened it on top of a large, flat work area (sheet of 3/4" MDF on saw horses), and began laying out one-half of the helix.

Using a long straight edge and a carpenter's square, I established the center point of the helix [6]. Using the dimensions from the spreadsheet, I drew two circles using a large compass. I drew the outer line to the *Outside Diameter to Points* dimension from the spreadsheet, and drew the inner line to the track centerline radius



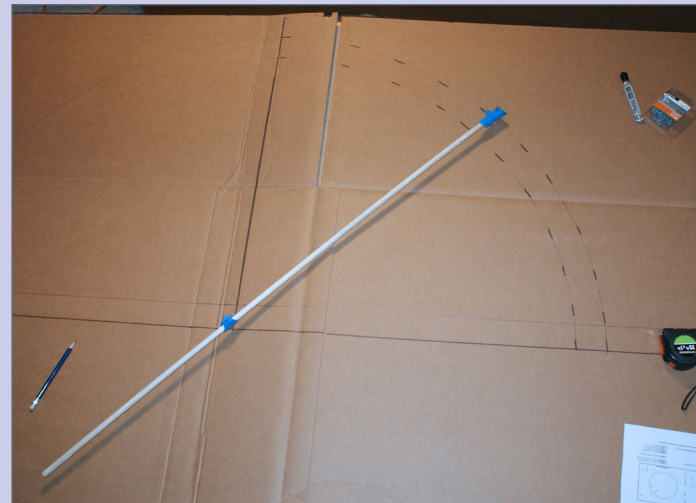
5. The pieces are cut and ready for assembly.



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6. A large sheet of cardboard laid on a 4x8 sheet of MDF is the work area for a module template. A large steel rule and carpenter's square are used to establish the base and center lines of the module.



7. I used a large-diameter compass to mark the track centerline and the outer edge of the helix trapezoid (and then highlighted using a black marker). These numbers came from the spreadsheet.

STEP 3: MODULE TEMPLATE *CONTINUED* ...

[7].

I used a dowel as a compass to draw accurate circles up to 36" in radius [8].

It was important that each segment of the helix be identical so it would assemble smoothly, accurately, and quickly when delivered to Steve's basement. I carefully laid out the trapezoid building blocks and marked the outside corners of each segment on the template [9, 10].

I also laid out the straight transition segments on each end [11].

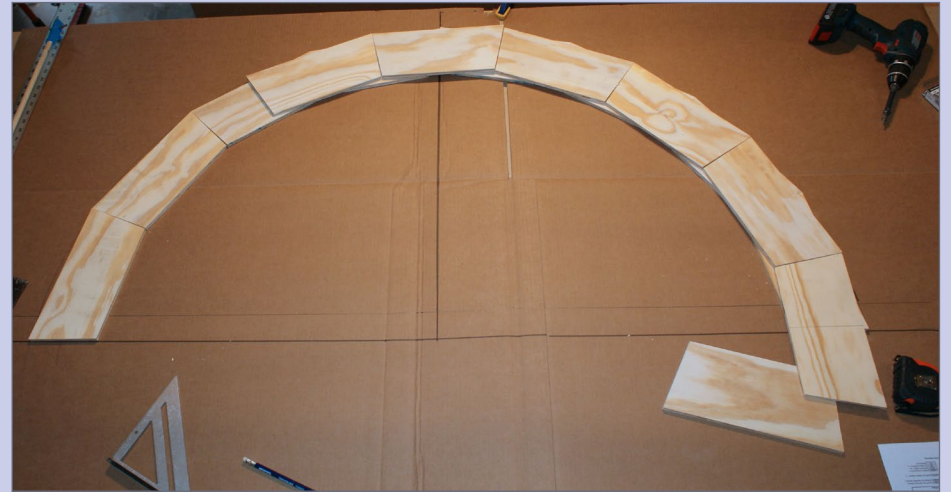


8. I started with a compass like this one, but replaced the 12" fiberglass beam rod with a dowel of the same diameter to draw circles up to 36 inches in radius.

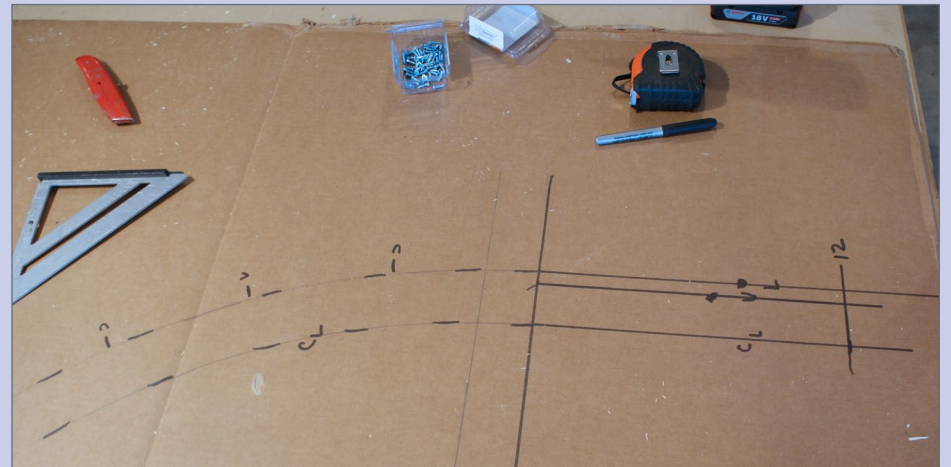
9. I test-fit the upper layer of trapezoids. Once I had checked both layers, I marked the corner points of each trapezoid.



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10. I test-fit the upper layer of trapezoids. Once I had checked both layers, I marked the corner points of each trapezoid.



11. With both layers marked and the straight portions of the helix laid out, I was ready to assemble the first module tier on the template.

STEP 4: MODULE "ASSEMBLY" SET

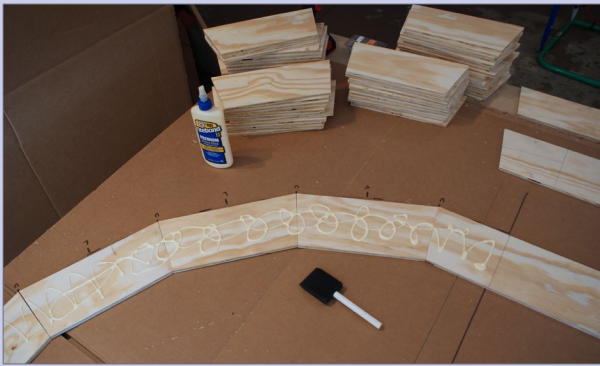
By this point, I had decided I would build the helix in one-quarter-turn segments, and I was ready to start gluing and screwing.

A helix built with trapezoid shaped pieces is basically two layers of overlapped plywood that are glued and screwed together. After laying out the bottom layer [12], I applied wood glue and overlapped a second layer of trapezoid pieces [13].

To hold the plywood firmly in place while the glue dried, I used two #4 wood screws per segment [14]. I intentionally did not glue



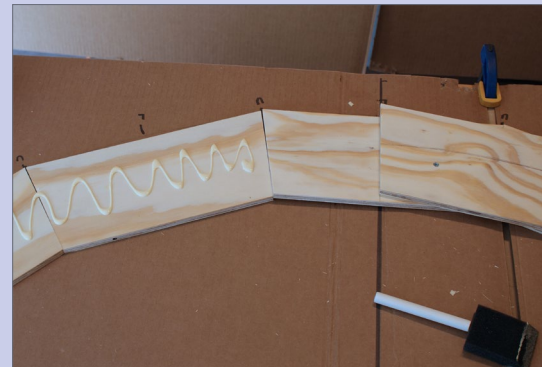
12. Assembly began by aligning the outer edge of the trapezoids on the appropriate marks.



13. I applied wood glue and spread it using a foam brush.



14. I added the upper layer of trapezoids (again using the alignment marks on the outer circle) and used #4 screws to hold the pieces together while the glue cured. In most cases, two screws per trapezoid were sufficient to keep the pieces in place and the joints tight. Although the screws were flush to the surface, I kept them away from the center-line so they wouldn't affect the trackwork later.



15. At the center point, I did not apply glue to the overlap joint between the module tiers.

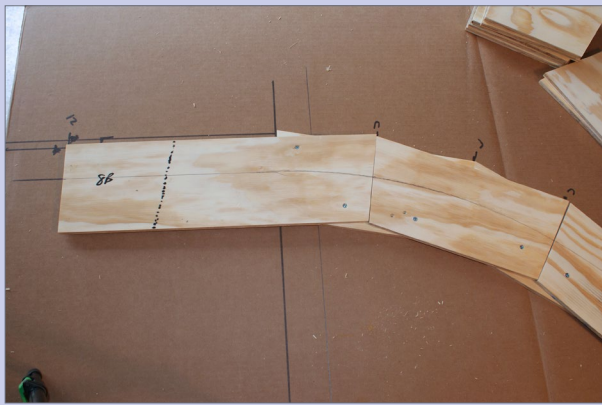
STEP 4: MODULE "ASSEMBLY" SET *CONTINUED...*

or screw the segments at the center of the template, as I would make that connection on-site during the final assembly [15].

Prior to removing each segment from the template, I drew the track centerline on each module piece, and labeled each end of the module tier for easy identification after move across town [16]. Each end included an alternating upper and lower overlap for the straight portion of the oval [17].



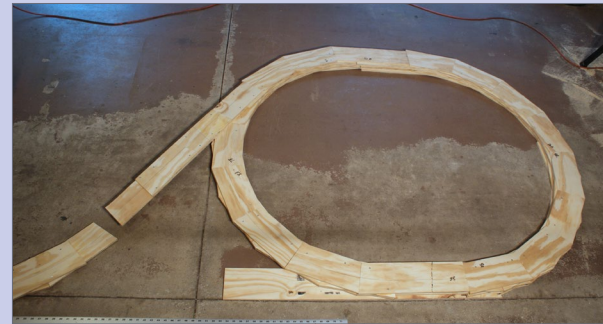
16. Before removing, I drew the track centerline on the top of each module tier.



17. Each end of the module tier includes an upper and lower overlap for the 12-inch straight portions of the oval helix.

The only "custom" pieces would be the ones transitioning to and from the helix. While I had some rough dimensions of where the layout would connect to the helix, I built the straight sections so they could be shortened to fit once the final upper and lower decks were constructed and the helix erected in place. I used the template to align the trapezoids for each of the partial turns required for these module tiers.

I ended up with 10 helix and three transition modules [18]. All the pieces were light and fit easily in the back of my SUV [19].



18. Thirteen module tiers are complete and ready for delivery and final assembly. I designed the upper transition portion of the helix (left side of photo) for flexibility when attaching it to the upper deck. A straight piece of plywood would be cut on-site to fit and fill the gap shown above.



19. All the modules tiers fit easily in the back of my SUV (including the remains of the second sheet of plywood). The module sections are small enough that they would also fit in the back seat of a sedan.

STEP 5: ON-SITE ASSEMBLY

Once progress on the benchwork was far along enough for installation of the helix, I loaded the parts and drove across town. The benchwork supporting the helix was standard open-grid construction with a rectangle approximately 12 inches wide around the perimeter to support the helix.

This will also allow easy access to the helix once the outside perimeter is covered with scenery or fascia. The first four segments



20. I test-fit the first layer of the helix on the benchwork prior to final assembly. I used a straight lead-in board (closest to the wall/ right side) to transition from the lower deck to the helix. With everything properly oriented, I applied glue and screws to connect the first three module tiers.



21. I applied a thin coat of adhesive caulk along the centerline.

(including the straight lead-in track coming from the lower deck of the layout) were put in place and the overlapping pieces glued and screwed [20].

I used adhesive caulk to hold N scale cork roadbed in place along the centerline [21, 22]. I also used adhesive caulk to attach the track to the cork [23].



22. I installed N scale cork roadbed along the track centerline. I chose N scale to reduce noise and maximize vertical clearance in the helix. I took this photo during the completion of the third layer of the helix, and you can see the precise alignment of the lower layers.



23. I applied a second layer of adhesive caulk to hold the track. To ensure smooth operation, I soldered the track joints while the track was straight.

STEP 5: ON-SITE ASSEMBLY *CONTINUED...*

I used track nails and T-pins to hold the track in place while the adhesive set up. I added lead wires to each piece of flex track prior to adding the next layer of the helix. It is much easier to solder to the track while it's still in the open.

Once the caulk had cured, I added the next layer of the helix and another circuit of track [24]. Once we had completed all three layers and the upper level benchwork was in place, it was time to raise the helix! Six rods are sufficient to support a helix of this size.

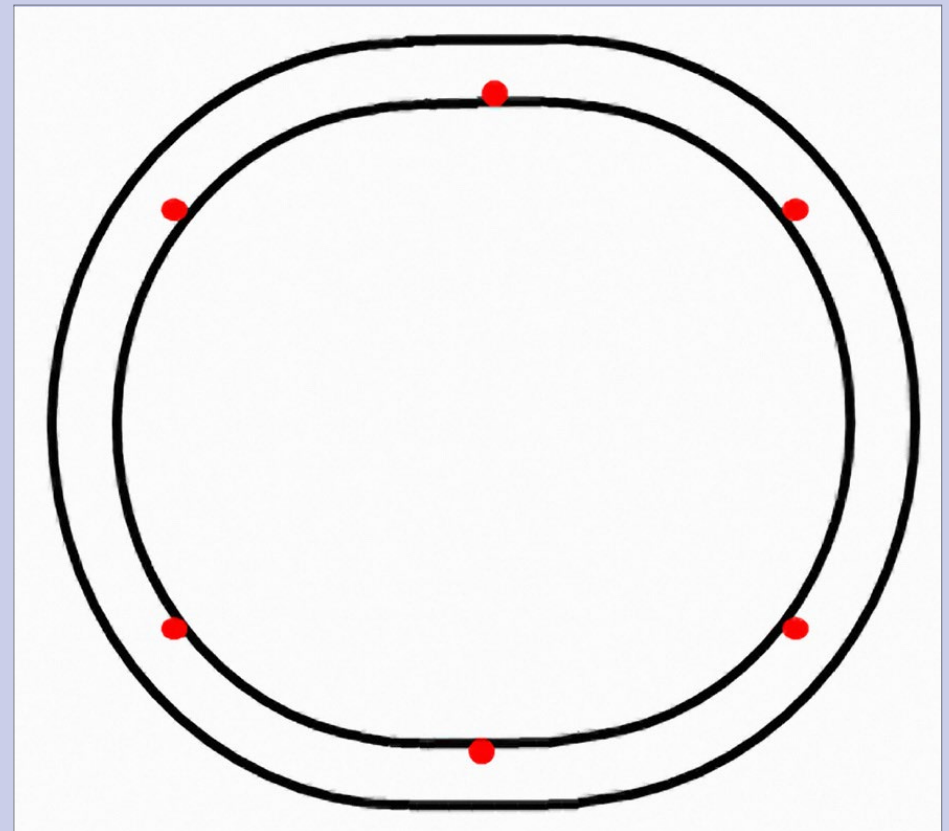


24. Trackwork for the first layer is complete. Once the caulk dries, the next layer can be added and the track attached. Installing power wires to each piece of flex track is easier to do before the next level is installed.



STEP 6: RAISING THE HELIX

Based on my research and experience gained building my earlier helix, I chose ¼" threaded rod to elevate the helix. As shown in [25], I drilled six 3/8" holes through all layers of the helix, including through the benchwork plywood layer. Six rods are more than sufficient.



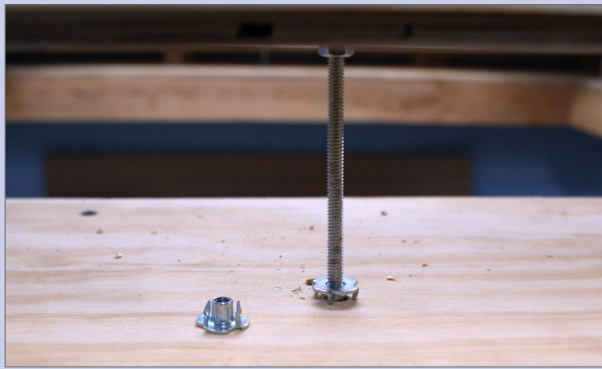
25. The red dots indicate the placement of the six threaded rods used to support the helix.

STEP 6: RAISING THE HELIX *CONTINUED* ...

My original helix has been in place for over five years with no sign of sagging. As the threaded rod was inserted through the layers, I added a nut-and-washer “sandwich” on each layer [26].

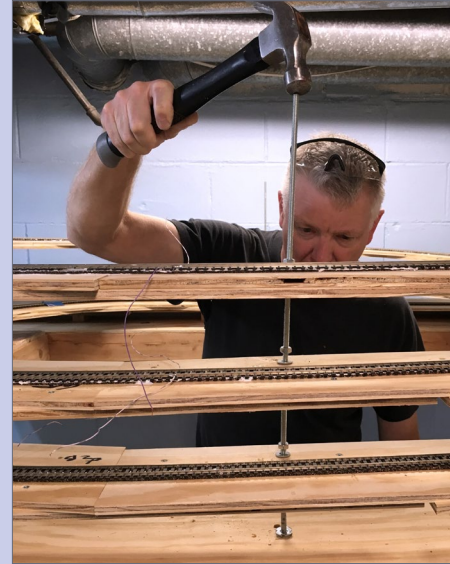


26. Closeup of the nut-and-washer sandwich I used to adjust and secure the helix layers. The nuts allow easy adjustment of the spacing. You can also see the track wires soldered in place.



27. Threaded cleats anchor the helix to the benchwork.

To fasten the rods to the benchwork, I installed 1/4" anchor cleats [27]. These anchors have teeth that are driven into the benchwork with a hammer [28]. I spin the nuts until the helix is close to the right level, and then come back and fine-tune it [29].



28. Steve sets one of the cleats into the benchwork by tapping the top of the threaded rod. Once the slope of the helix is fine-tuned, the upper nuts are tightened to secure it, and the excess threaded rod is cut off.



29. The initial raising of the helix is complete. The helix was adjusted so the track rises 1/4" every 25".

STEP 6: RAISING THE HELIX *CONTINUED* ...

Once we completed the first circuit of the helix, succeeding layers are 4" higher. I made a 3¼" spacer block (4" minus ¾" of roadbed) to quickly adjust the upper layers [30].

Despite careful measurements, I've found the best tool for making sure we get a consistent grade is to roll a freight car down the helix, and watch for it to speed up or slow down.

Once we had the final layer adjusted, we tightened the top nut and cut off the excess threaded rod.



30. Having established the grade of the first layer, we used a 3¼" spacer block to quickly set the second and third layer spacing.

STEP 7: TRANSITION TO THE LOWER AND UPPER DECK

Since Steve built the lower level of his layout using standard plywood and Homasote construction, transitioning from the helix to the trackwork required just a few shims to align the N scale cork with the HO scale cork laid on Homasote [31].



31. We adjusted the transition from HO scale cork to the N scale cork on the helix with shims after attaching to the lower level of the benchwork.



STEP 7: TRANSITION TO THE LOWER AND UPPER DECK CONTINUED ...

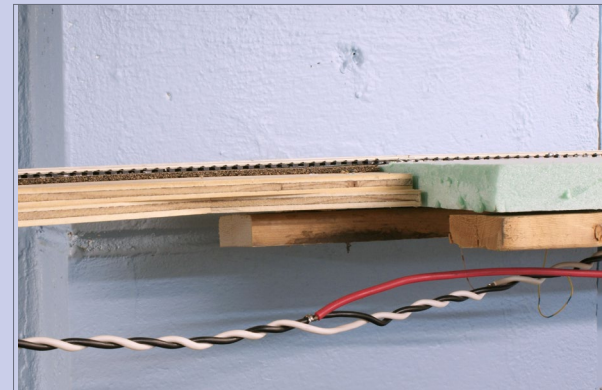
As mentioned in Step 4, I built the transition curves with the ability to adjust to the upper deck. The upper deck of this layout was constructed with foam insulation on a 1x2" frame. We used a wooden transition attached to upper framework to connect the helix [32].



32. The upper deck of the layout is extremely light, with only foam insulation board and 1x2s. We added an attachment point for the helix.

★★★★★
RATE THIS ARTICLE

To get a smooth transition between the helix and upper deck [33], the pieces were glued and screwed together, then we attached a permanent support riser to the benchwork to complete the construction of the helix [34].



33. The helix track is tied into the upper deck track with a smooth transition.



34. Once the helix was tied in to the upper deck, we added a permanent support to the transition portion of the helix.

...
VIEW READER
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STEP 8: ELECTRICAL CONNECTIONS

We soldered all the curved pieces of flex track prior to installation to ensure smooth joints and reliable operation. We attached track feeders to every piece of flex track as the helix was being constructed to ensure solid electrical connectivity.

Once the helix was raised, we connected these feeders to two bus wires routed around the inside and outside edges of the helix [35].



35. I wrapped the 14-gauge bus wires around the inner and outer edges of the helix, and the track feeders connected to them. We used cable clips to attach the bus wires to the plywood.



CONCLUSION

Having built my first helix “in place” one trapezoid and circuit at a time, I would definitely build my next one in the shop following this modular methodology. Construction went very smoothly and accurately using the template for each module tier.

Based on the cure time of the adhesive caulk, we could add a new layer to the helix approximately every hour.

I came back after the upper and lower benchwork was complete and helped raise the helix and build the transitions. Bus wiring was completed during the third visit when the wiring for the rest of the layout was installed.

All-in-all, this modular construction solution worked quite well. ☒



BILL OF MATERIALS

- 3/8" Plywood – 2 sheets
- Wood glue
- #4 wood screws – approx. 100
- 1/4" nuts and washers – approx. 36
- 1/4" threaded rod – three 4' lengths
- Sheet of cardboard – approx. 4'x8'
- Wire cleats – 20
- 14 gauge wire (2 colors) – approx. 35'

SUGGESTED TOOLS

- Table saw
- Large compass
- Radial arm or miter saw
- Electric screwdriver
- Clamps
- Tape measure
- Carpenter and speed squares
- Long straightedge ■

MIKE WOLF



Like most, Mike's interest in trains began at an early age with Lionel trains at Christmas. In junior high, his 4x8 foot "Christmas Tree Empire" expanded to two sheets of plywood, and during his high school years he built his first permanent HO scale layout in a spare bedroom at his grandmother's.

College, 23 years as a pilot in the U.S. Air Force, marriage, and kids derailed his modeling – but Mike's interest in trains remained strong. With military moves behind him, construction of the West Valley Union Railroad began shortly after moving to Ohio. Thanks to assistance from the Tuesday Night Gang, his modeling and operations skills have expanded a lot in the last 10 years.

Mike is a corporate pilot and flies around the world. His wife, Julia, a daughter and son support his hobby, vacation visits to train-related stuff, and the monthly Tuesday night ops sessions in the basement. When traveling on trips with extended ground time, Mike takes a modeling project and tools. If you find styrene scraps in the hotel carpet, Mike was probably there.

Mike is Director in his local NMRA Division and has contributed several articles for MRH. ■



You can get the Excel spreadsheet used to calculate the dimensions of the helix in the registered MRH reader bonus downloads.

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THE AH-HAH MOMENT

column



MRH Running Extra | December 2018

KENNETH FARNHAM:

**SAVING EXPENSIVE DECODERS
IN CASE OF A SHORT ...**

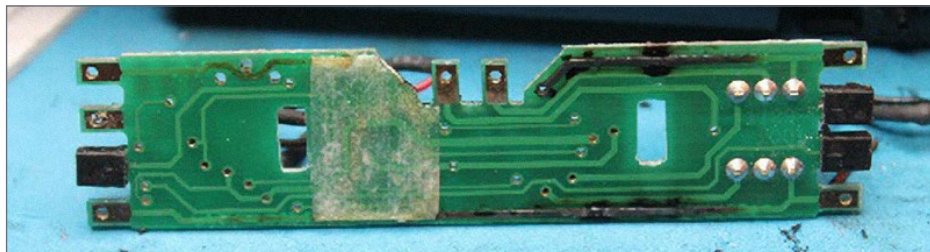


DECODERS CAN BE DAMAGED BY SHORT CIRCUITS,

by a stall over reverse loop gaps and/or across frog gaps. Printed circuit loco motherboards and decoder wiring traces can become a weak spot for short circuits.

Also common now are motherboard replacement decoders, as well as the enhanced motherboards from vendors like TCS with their Keep Alive technology on board.

Most manufacturers state their boards are protected from short circuits, but the interconnect traces which carry the rail power can be small. They're large enough to power the locomotive, but may be damaged by a short circuit, even by a brief one. This damage can happen all at once or be spread over several intermittent incidents.



1. This loco motherboard has trace overload damage from repeated small shorts. The trick shown here can prevent this damage.

THE AH-HAH MOMENT | 2

Even when short protection reacts by shutting the power off, an automatic reset can happen before you can remove an engine from the trouble spot. Overcurrent and overheating damage of circuit board traces can build up, leading to an eventual board failure.

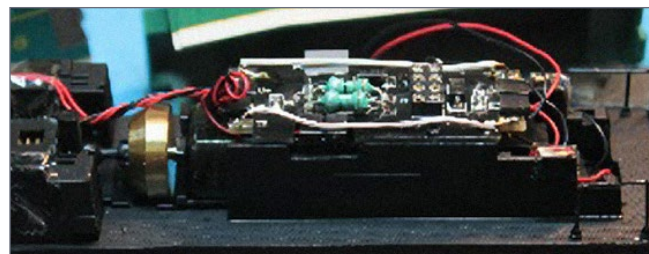
The solution is to install a bridge wire across the length of the board on the track power feeds. This bridge wire will not affect the operation of the decoder, board, or engine, but will allow the increased current to flow safely around the board tracings when a short occurs.

Find the wheel pickup connections for each end of your engine and where they connect to the motherboard. Most boards have the same wheel pickup on the same side of the board, but check to make sure.

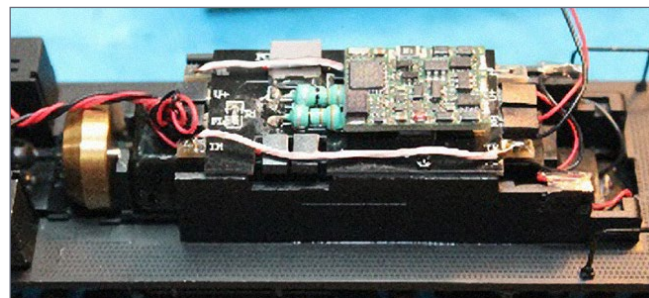
Install the jumper wire from one end of the motherboard/motherboard replacement decoder track power feed to the other for that respective wheel pickup. I recommend soldering these wires in place.

Try this simple trick and make your loco fleet more short-proof! ☒

Ken Farnham, a retired Master Electrician (www.hobbygauge.com) lives in Palm Bay Florida and has an operational layout with monthly ops meets.



2. Install wire jumpers on each track power feed (white wires) as shown here so short current can bypass the circuit board/decoder.



3. With the decoder in place, the white bridge jumpers will not affect the loco operation in any way, but can save board/decoder traces in the event of a short.

Here are all the pages
from the December
issue of
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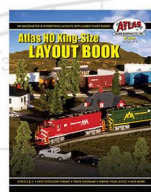
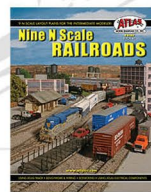
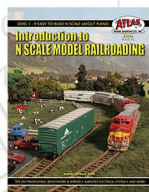
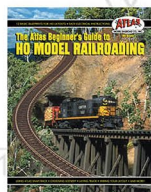
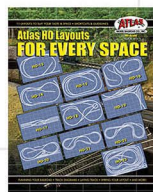
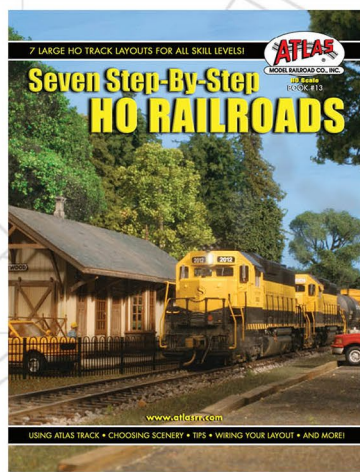
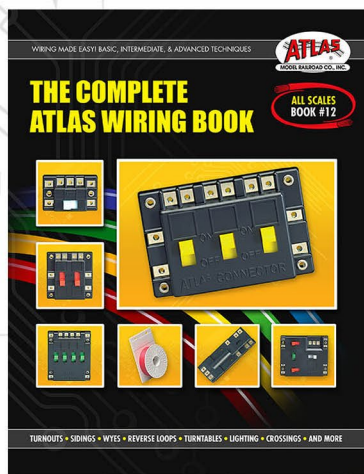
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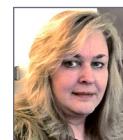
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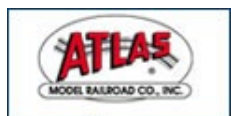
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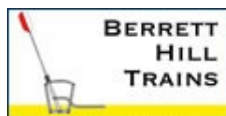
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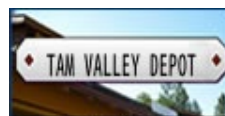
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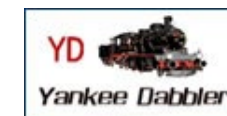
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JOE FUGATE: ALL ABOUT *RUNNING EXTRA* MAGAZINE ... AND THOUGHTS ON BETTER TURNOUT WIRING



WITH THE ROLLOUT OF OUR NEW *RUNNING EXTRA* magazine, we have received many questions. That usually means many other readers *also* have these questions but just didn't bother to email us and ask. So, for the rest of you, here are the *Running Extra* common questions and the answers!

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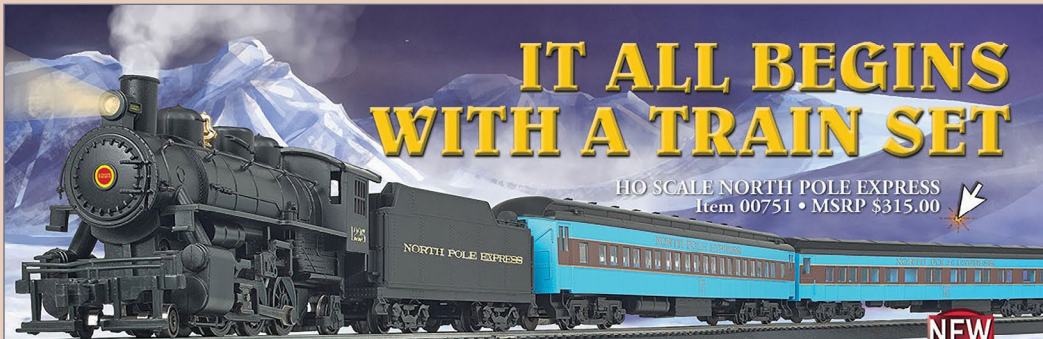


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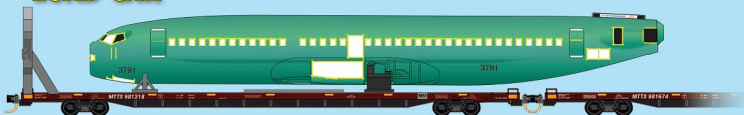
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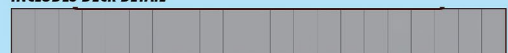
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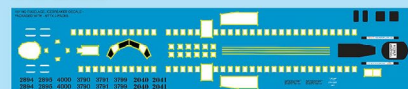
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Q. I'm a *Running Extra* subscriber, but when I click on the grayed out RE table of contents in MRH, it wants me to buy the issue. What gives?

A. MRH magazine is a simple document, it's not a computer program with "smarts." That means as a document, MRH is "dumb" and has no idea you subscribed to *Running Extra*.

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Hopefully, these answers have helped you get a better idea of what *Running Extra* is and if it's something you need to get and read.

Better turnout wiring

If you've read any of my [Run like a Dream book series](#), you know I've become a real believer in preventative measures for flawless ops.

I tend to prefer my home built "poor man's jig turnouts" (see MRH September 2011), but if you prefer commercial turnouts, PECO brand turnouts are a good choice.

With PECO brand turnouts, using some wiring tips can make them electrically bullet-proof. Some of these same tricks work on other turnout brands as well.



HELP TO PRESERVE RAILROAD HISTORY

To help support the effort by the Youngstown Steel Heritage Foundation (YSH) to move and preserve the Erie Lackawanna #3639 EMD SDP45 (SD45M), Athearn will assist in driving a donation per unit reserved to the effort by offering models as Erie Lackawanna #3639 and Conrail #6670. Both DCC-Ready and DCC+Sound configurations are available. The real EL #3639/CR #6670 is the basis for our engineering and measurements for the Athearn Genesis EL/CR models.

Through exhaustive research, including measuring one of the last known real-world survivors, Conrail #6670, to studying thousands of images and drawings, we've captured every unique detail for the Southern Pacific, Great Northern, and Erie Lackawanna/Conrail. Visit www.extra3639north.com to help preserve the 1:1 EL #3639.

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SP and GN long hood end is flat to allow room for steam generator equipment while the EL includes a pointed end. Note the steam generators are road specific.

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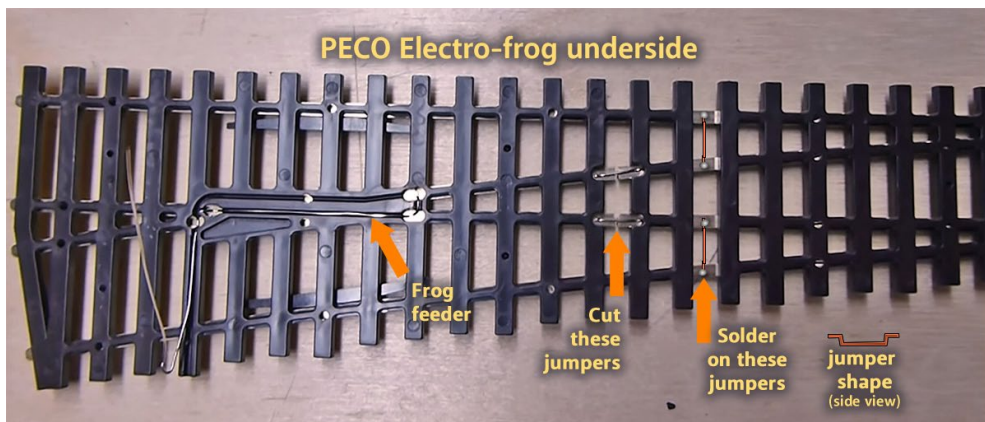
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PUBLISHER'S MUSINGS | 5



1. PECO Electro-frog turnout topside view with recommended wiring enhancements.

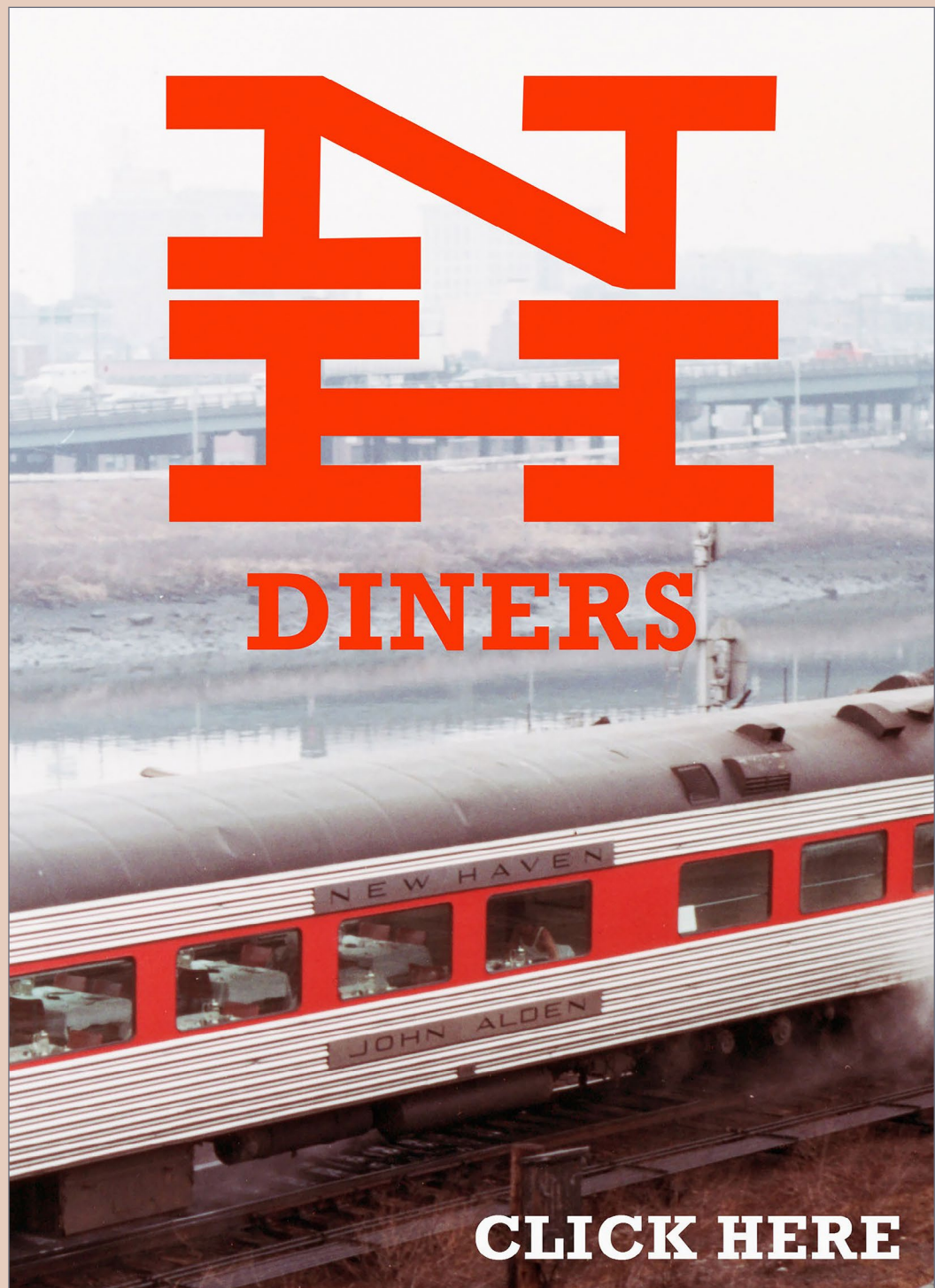


2. PECO Electro-frog turnout underside view with recommended wiring enhancements.

I prefer turnouts that have all-metal frogs and guard rails, and PECO Electro-frog turnouts meet that requirement nicely.

Topside, I cut gaps in the diverging rails a couple ties past the frog wing rails. On the underside, I cut the closure rail jumpers to isolate the frog. Then I power the frog using a frog juicer attached to the frog feeder wire seen in [2].

I also solder jumpers between the stock rails and the closure rails [2], and I solder jumpers between the closure rails and the points [1].



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PUBLISHER'S MUSINGS | 6

As the points age and get track gunk on them, the contact with the stock rails becomes unreliable, so the closure jumpers and the point jumpers ensure they always get power. This prevents stalls on these locations.

I also like to glue styrene into any insulating gaps around the frog area, since I never want those gaps to accidentally close.

With these simple measures, you can get ultra-reliable turnouts that locos will never stall on.

Why wait and then get annoying unplanned stalls during an op session and let it grind everything to a halt? It's all part of getting things to [run like a dream!](#)

Entered our contest yet?

Just a reminder we've got a new design contest going this year. Unlike previous years, this year things are wide open.

One type of layout design we seldom see plans for but we

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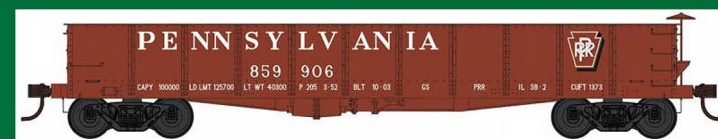
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★ LAST ISSUE'S RATINGS

The three top-rated articles in the [November 2018 issue](#) of *Model Railroad Hobbyist* are:

- 4.6 Electrical Impulses: Signaling my layout, part 2
- 4.5 What's Neat: Central Valley bridge build, ...
- 4.4 Adding LEDs to Blue Box locos

Issue overall: 4.2

Please rate the articles! Click the reader comments button on each article and select the star rating you think each article deserves. We depend on these ratings to help us determine which articles to publish, so your rating matters! ■

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Model Railroad Hobbyist | December 2018 | #105

compiled by JOE BRUGGER



RATE THIS ARTICLE

Tank cars and covered hoppers for a small layout

Q. I'm designing a 60" x 16" HO scale switching layout. I'd like to model an LPG distributor like Walthers' Central Gas & Supply and a cement distributor like their Medusa Cement Co. The time frame is the 1970s into the 1980s. I need some help identifying suitable tank car and covered hopper models for both industries. I'd like the cars to stay around 50 feet long or shorter due to the limited space.

—Mark L.

A. Jeff Shultz: The covered hoppers you need are perfect for a small layout. An appropriate one might be the ACF two-bay Centerflow covered hopper, at just under 3,000 cu. ft. Several hobby manufacturers have produced them. Older two-bay Pullman Standard covered hoppers are also available. On either type of car, check that the unloading gates are of the proper flat sliding type for cement service.

► MRH QUESTIONS, ANSWERS, AND TIPS

As for LPG cars, I think your hunt is going to be more difficult. I'm finding 11,000-gallon ones built in the '50s and very long 33,000-gallon ones from the '90s.

Tim Garland: For your era I would go with Athearn or Intermountain two-bay covered hoppers for cement and Atlas whale belly LPG tank cars.

Some propane dealers are seasonal and buy in bulk. These typically do not get cars on a regular basis. If you like tank cars you might want to consider a general chemical plant that would receive regular shipments. Athearn and Atlas make some good tank cars that would fit this era.

Joe Atkinson: If the propane dealer doesn't work out, another option involving similar cars would be an anhydrous ammonia



1. Atlas produced whale-belly 33,000-gallon tank cars stenciled for liquefied petroleum gas (LPG) service which carry build dates between March 1964 and September 1969. They can be found at swap meets and from online sellers. Walther's offered a "65' LPG Tank Car" lettered with an 11-68 build date. *Graham Line photo*

transload. You can find an article on modeling one in the July 2016 MRH at mrhmag.com/magazine/mrh2016-07-jul/modern-tankcar-transload. Unfortunately, while that Tanner facility was switched regularly, it wasn't switched frequently. Tanner only got about one car a month, but they got them like clockwork.

Unless you're really a fan of the long 33K-gallon tank cars, for a smaller layout I'd suggest going for a chemical or oil distributor, or something similar that uses smaller cars.

Mark L. (the Original Poster): I like both tank cars and the propane tanks and piping of a typical LPG dealer. Can you give me some examples of general chemical plant types that would be good for modeling, what types of inbound and outbound loads they would have, and what tank cars they would utilize?

I'm getting some ideas. Walther's Magic Pan Commercial Bakery says it could be used as a chemical distributor. It has tanks and piping which I like, and it could be combined with Walther's Plastic Pellet Transfer kit to create a more complex, er, complex. I think something like this could generate traffic of both tank cars and covered hoppers.

Barry Karlberg: Most plastics companies don't get tank cars, only plastic resin pellets in large covered hoppers. The holding tanks for pellets aren't the same as those that handle liquids or products like grain and feed.



J. Brugger

PLANNING:

We're sneaking up on a good idea here. In Mark's limited real estate, one large, complex industry may be more plausible than two or three small ones.

Tim mentioned that LPG is seasonal, but that depends on where, and what season. Vacation areas often take more gas in the summer, and cold climates use it in the winter. Many new installations have large storage capacity and store gas when the price is low. New distributor facilities have sprung up in the northern part of the country to take advantage of lower rail rates. There often isn't enough pipeline capacity to handle LPG because they are shipping more crude oil.

Smaller chemical plants I switched received tank cars 40 to 65 feet long depending on the commodity and whether they were set up to receive a gas or a liquid. Food processors take non-hazardous tanks of cooking oils and sweeteners, along with covered hoppers of dry ingredients, and even a few boxcars. I can think of one industry in Illinois that gets oil and sweetener in tanks, and other products in covered hoppers and plain old 50-foot boxcars to make pizza mix.

Walthers makes it easy to simulate a tank car industry with their four loading/unloading/inspection platforms that are small and easy to build. All four platforms can be built as loading/unloading ones because they include extra piping. Add a storage tank or two and you're in business. If a food processor is your wish, then add a low-relief trucking warehouse with boxcar doors. If you place a large cooling unit on the roof it can also handle chilled goods to load in or from reefers.

Ken K.: Modelers can confuse plastic manufacturers where the pellets, plastic sheets, etc. are produced, and raw plastic consumer manufacturers who produce milk jugs and other items. The Dow Chemical, formerly Rohm and Haas plastic plant in Knoxville, Ky. has spots for over a dozen tank cars supplying raw materials (acids, petroleum bases, glycerin, etc.).

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Tim Garland: Tank cars can handle a lot of different products, but users avoid contamination by shipping only the exact same product for the service life of the car. For instance, corn syrup tanks are designed to haul corn syrup and chlorine tanks are designed to haul chlorine.

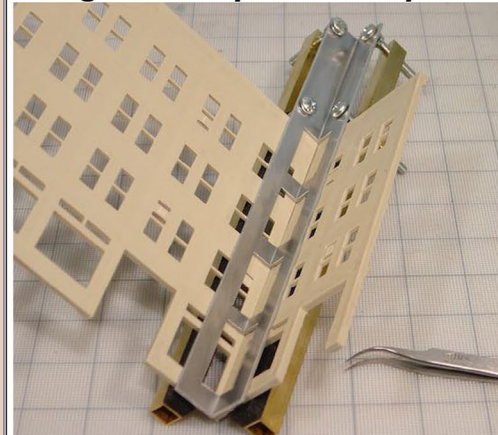
A lot of chemical-related industries will receive tank cars carrying multiple types of products. One example is an industry we switch called Nexio Solutions, which bought out Ashland Chemical. This facility has multiple car spots that require tanks carrying specific commodities to always be unloaded from a specific spot. Pipes carrying the product from each spot go to different storage tanks that can hold the product until they are either transferred to tanker trucks or large drums. Often, these products will go out to various industries that produce things such as cleaning supplies.

Scott Chatfield: Here in America in your time frame propane distributors that are rail-served generally only deal in propane. That's been true since at least 1970. Fuel dealers, formerly known as bulk plants, got liquid fuels like gasoline, kerosene, and diesel. After 1970 most fuel dealers have gotten their deliveries by truck from pipeline terminals, not by rail.

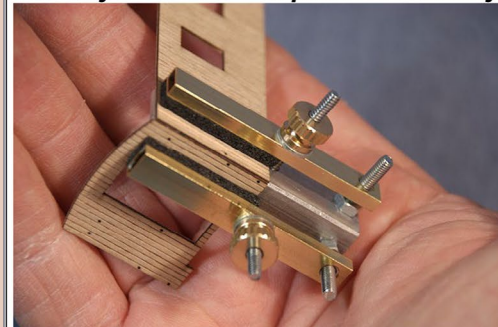
Propane started to be shipped by rail in large quantities around 1940, and the Atlas and Kadee 11,000-gallon tank cars are both propane tanks. They also can be used for anhydrous ammonia, one of the few cases in the modern era where the same car can be used for two different commodities.

However, starting in the mid-'60s, a new generation of 100-ton propane/AA tanks were built. The earliest ones were the "whale-bellies" like the Atlas model. By 1970, after a few accidents, the railroads and government decided whale-belly pressure tanks

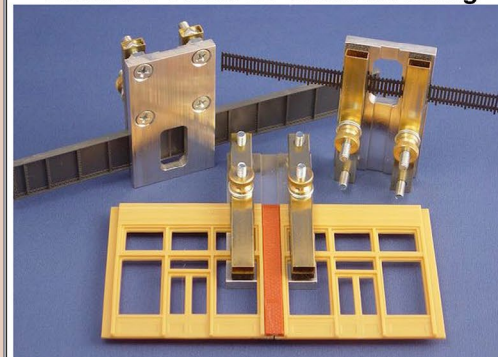
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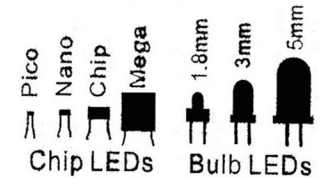
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were not the best idea, and all subsequent pressure tanks built have been straight-body tanks.

The Walthers and Athearn Genesis 33,000-gallon tanks are post-1970 propane/AA tanks. Only a few other commodities ship in these cars. Please note that Athearn also makes some post-2000 versions of these cars. Those have the ladders offset from the man-way, and newer graphics and reflective conspicuity stripes.

Some good-sized bakeries are served by rail, some big enough to have their own Trackmobile. They get flour and sugar in Airslide hoppers (the short one-bay and boxier two-bays – each version has been made by several manufacturers). They could get corn syrup or liquid sugar in tank cars. Before 1995 these were mostly 16,000-gallon insulated tanks (Atlas and Walthers), and vegetable oil in longer insulated tanks, back then mostly 23,500-gallons and again, look at Atlas and Walthers.



2. Covered hopper and Airslide cars for carrying dry commodities have been produced by several model companies. From the left, Kadee 2003 cu.ft. PS-2, Walthers 2600 cu.ft. single-bay Airslide, and Athearn 2900 cu.ft. ACF two-bay. Other makers include Atlas, Eastern Car Works, Kato, Tangent, and Con-Cor. *Graham Line photo*



3. The annual fertilizer train in Stayton, OR., with three cars of phosphoric acid solution and one of anhydrous ammonia. *Jeff Shultz photo*

If you lean toward the '70s use the single-bay Airslide for flour and sugar, and no syrup tanks. For an '80s layout, go with the twin-bay Airslide for flour and some sugar, and add the syrup tanks.

A liquid fertilizer plant is similar in set up to an asphalt terminal, except it doesn't need steam lines. It uses the same size or slightly smaller cars, depending on the chemical. The Atlas and Walthers 23,500-gallon tanks are good. The Athearn "62-foot" tank is a bit too long but can be used as a stand-in.

Cement is a low-margin commodity that's made all over the continent, and the railroads hate to interchange it.

Several railroads bought the two-bay Center Flows starting in the mid-'60s. The earlier ACF 1,958 cu.ft. rib side cars (Bowser and Intermountain), General-American 1,958 cu.ft. (Kato), and Pullman 2,003 cu.ft. PS-2 (Athearn, Atlas, and Kadee) lasted into the '90s on many lines that couldn't afford fancy new cars for a low-margin business.

Clark Propst: Covered hoppers in cement service ping-pong back-and-forth between the manufacturing plant and the distribution facilities. These cars would be owned or leased by the railroad providing service to the plant. If more than one railroad served the plant, the cars would stay on home rails. There are always exceptions. But the basic rule is ALL covered hoppers should be from the same owner.

Note: Of course, on a '70s Burlington Northern layout, this could include cars from the Great Northern, Northern Pacific, Spokane, Portland & Seattle; and the Chicago, Burlington & Quincy.

Jeff Shultz: A local fertilizer plant here in western Oregon used to get one train of liquid fertilizer (four cars) each year. One car of anhydrous ammonia, and three of phosphoric acid solution. After a storm weakened a bridge, the rail line got embargoed.

The interesting thing is that they also brought in, by truck, a "reactor" where they made the fertilizer out of the AA and phosphoric acid, accompanied by billowing clouds of vapor. Once a year. Covered hoppers of dry fertilizer came in a lot more often.

Wilson: I live near a potato chip and snack food manufacturer. They get most of their raw material by rail. They receive tank cars of vegetable oil, ship out waste oil in tank cars. They receive bulk dry corn and flour in covered hoppers, and raw potatoes in box cars and open

gondolas depending on the season. Most of their finished product is shipped by truck.

Find more information, real-world experiences, and photos at mrh-mag.com/node/33406.

Look at the GATX freight car guide at www.gatx.com/wps/wcm/connect/GATX/GATX_SITE/Home/Rail+North+America/Products/Equipment+Types.

Swapping out N couplers

Q. I have a very small N scale 0-4-0 dockside switcher that has the old style Rapido couplers. I'd like to swap them out for a newer knuckle style coupler. Not sure if it's possible, but if so, how difficult is it?

—Tim S.

A. Fishnmack: Try a Micro-Trains 1133 Coupler conversion kit. The package specifically mentions Bachmann locomotives and cars . The 1130 will work, but it has a long shank coupler that would look odd on your little locomotive – unless you really need it for tight curves. Just take your time and carefully read the instructions. Even the package advises you to read through the instructions at least once before you begin!

Detailed instructions for converting N scale rolling stock to use Micro-Trains knuckle couplers are at www.micro-trains.com/index.php?route=information/information&information_id=10.





TIPS

Use 3M Scotch-Brite scrub pads to make scenery mats

Make your own homemade static grass mats using 6x9-inch 3M Scotch-Brite scrub pads. First, split or rip the pad in half, then spray paint it lightly with camo brown spray paint. Depending on the soil color in the area you are modeling, you could choose a sandstone or earthy gray color. Add some ground foam from Woodland Scenics, Heki, or Scenery Express to make an understory of vegetation, and finish it with appropriate static grass.

The pads can be trimmed on the edges with scissors and have holes cut in them. [*Some people recommend boiling the pads for an hour to soften them for stretching - ed.*].

—Bernard Hellen



4. Scotch-Brite scrub pads can be trimmed and painted to form the backing for a homemade scenic mat.

Bernard Hellen photos



5. Adding ground foam and static grass can represent anything from desert scrub to lush woodland meadows.



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IN PART 1, I EXPLORED PLANNING LAYOUT SIGNALING.
I also reviewed early considerations needed to ensure the signaling installation would go smoothly.

In Part 2, I covered the installation of the hardware components discussed in Part 1.

Now in Part 3, I look at the computer software and signal logic side, which includes:

- Connecting standalone LocoNet to a computer via a USB interface
- Using a JMRI (Java Model Railroad Interface) software dispatch panel to show the layout and train occupancy
- Operating Panel Pro and the automatic block signals (ABS) system on my layout.

► **ALL-THINGS-ELECTRICAL FOR MODEL RAILROADING**

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ELECTRICAL IMPULSES | 2



J. Fugate

WARNING: THIS PART IS VERY INVOLVED

This third installment of Jason's series is *by far* the most involved. Unless you already have signal system experience, do not expect to completely understand everything discussed here.

Important note: My intention here is to give you the flavor of how signal logic programming works in JMRI, but don't expect to completely understand it all until you've done some of this JMRI Panel Pro programming yourself!

My hardware and JMRI

If you recall, I have a Digitrax LocoNet connected to my NCE DCC system. I use Digitrax BDL168s for occupancy detection and SE8C units to drive the signal heads. An RRCirKits USB LocoBuffer interface connects the standalone LocoNet to my computer. The computer runs JMRI Panel Pro for operation and dispatching.



1. Here are the NCE Power Pro 5-amp Command Station and the RR CirKits LocoBuffer USB. These are connected to a computer computer via high speed USB ports. To ensure optimum transfer of data, use the fastest ports on your computer.

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“The initial signal programming for my railroad has been over a year in the making.”

I can't cover the entire programming of my layout's Panel Pro panel or detail every JMRI feature for signaling. The initial programming for my railroad has been over a year in the making. The panel design itself took a well over a month to get right. The total signaling project has taken four years to complete!

To show everything that had to be implemented and all that's available within JMRI and Panel Pro would be too complex – as well as forcing everyone to become way more familiar with my layout than most have patience for.

The JMRI website has much detail and many helpful tutorials for JMRI and all its features. I recommend you look through the site before you commit to installing a signal system using JMRI.

I show you some of the basic JMRI programming required to get a functional:

- Section of track with several blocks
- Series of turnouts to create a passing siding
- Series of signal heads onto a panel

The LocoNet connections

To get the data from the detection hardware to the computer, we need an interface between it and the LocoNet. In Part 2 I showed the RR Cirkits - LocoBuffer USB that makes this connection between LocoNet and the computer.

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LocoNet needs a power source from the DCC positive bus and a termination to the USB LocoBuffer. These wiring requirements ensure the data path between the LocoNet and the computer running JMRI operates correctly.

To connect LocoNet via LocoBuffer to your computer, start Panel Pro and configure the computer to accept connections to both the NCE DCC System and the LocoNet via the LocoBuffer.

Details on how to connect the DCC System and LocoNet via the LocoBuffer follows below.

Find the LocoBuffer USB connection setup at:
www.rr-cirkits.com/manuals/LB-USB-manual.pdf

Find LocoBuffer USB drivers for Windows 7, 8, or 10 at:
www.rr-cirkits.com/firmware

Find how to connect the NCE DCC system to JMRI at:
jmri.org/help/en/html/hardware/nce/NCE.shtml

I do not go into the setup of the computer ports or other software preferences, as every system will be different. These settings depend on your computer type, operating system, and connection hardware, so refer to manuals for this.

When connecting the LocoBuffer and the NCE System to your computer, refer to the help provided in the links above. The jmriusers@groups.io help page is also a great source for help and troubleshooting.

When the connection has been made successfully and JMRI/Panel Pro is communicating with the standalone LocoNet, the screen will show the following information:

Caveat: Remember the following settings [2] are specific to my computer and layout settings ...

System Manufacturer: Digitrax

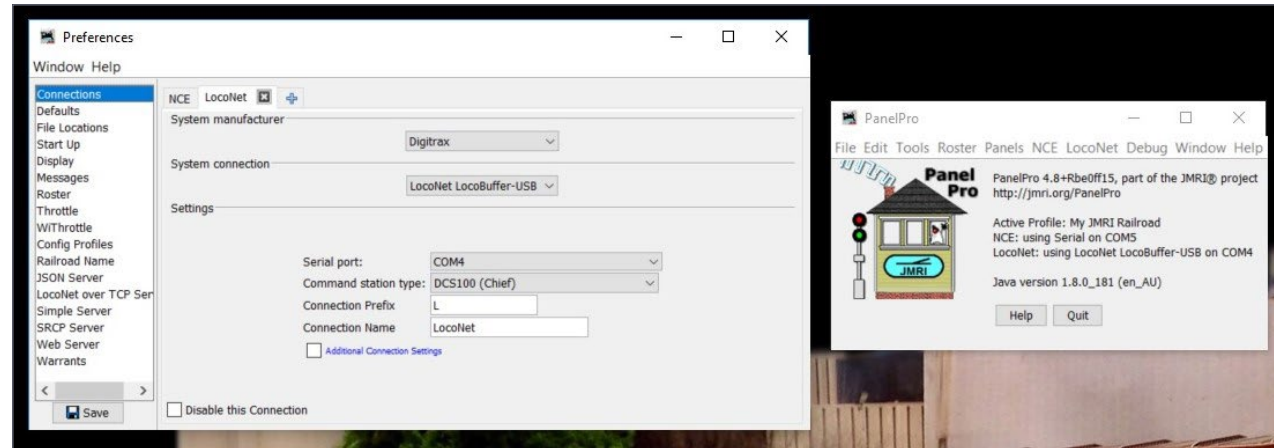
System Connection: LocoNet - LocoBuffer USB

Serial Port: COM4

Command Station Type: DCS100 (chief)

Connection Prefix: L

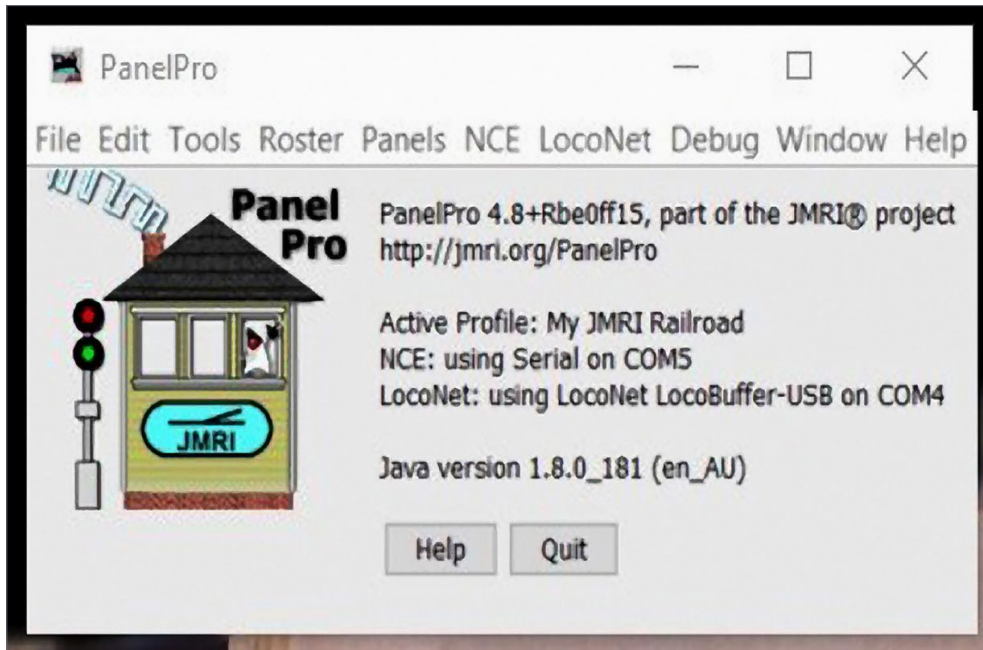
Connection Name: LocoNet



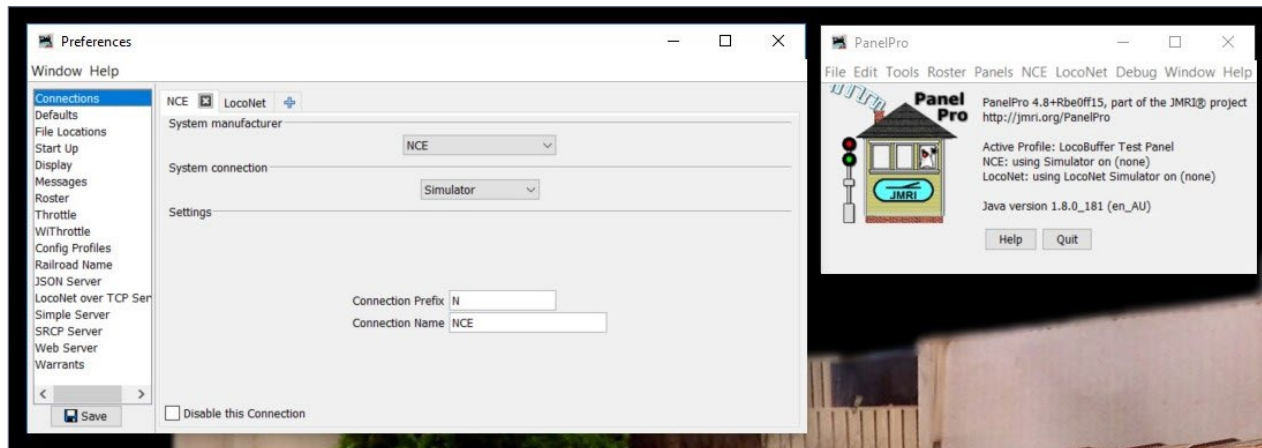
2. The preference screen and Panel Pro main menu screen showing a successful connection to the LocoNet.

Some may ask why I set the System Manufacturer to Digitrax, and the Command Station Type to a Digitrax DCS100 when my DCC System is a NCE Power Pro. The simple answer is, to JMRI the standalone LocoNet is a Digitrax-based system with Digitrax hardware.

In other words, JMRI needs to “see” everything from the LocoNet data as coming from a Digitrax system. My NCE DCC system itself doesn’t interact with the LocoNet data sent to JMRI.



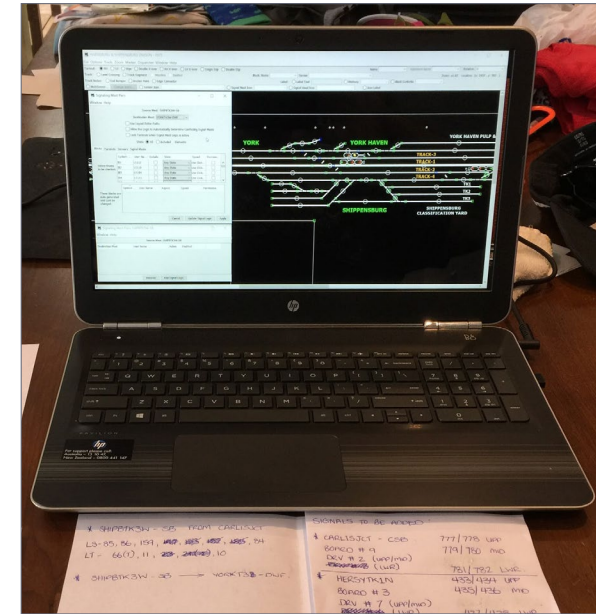
3. The Panel Pro menu screen when connected to the layout and operating correctly.



4. The Panel Pro menu screen when connected to the LocoNet simulator.

5. Because the railroad is built in a structure outside my home, being able to program the system remotely is very convenient.

Also note that on the Panel Pro - Startup screen [3] is reference to an “Active Profile,” which I set to “My JMRI Railroad”. This is the profile you use when connected to your layout.



JMRI has a LocoNet simulator mode [4]. This creates a simulated layout environment that allows you to work on your layout panel and simulate track occupancy and signal logic without being connected to your layout.

The LocoNet simulator means you do not need to be connected to your layout to make additions and/or changes to your Panel and are able to check the changes in before connecting to the real layout.

I created 90% of my signal logic and panels from the comfort of my dining room [5]. The only time I needed to be connected to the layout was to check

that the signal heads on the layout actually displayed the correct signal aspect color.

Sensors

File View Defaults Window Help

Turnouts
Sensors
Lights
Signal Heads
Signal Masts
Signal Groups
Signal Mast Logic
Reporters
Memory Variables
Routes
LRoutes
Logix
Blocks
Sections
Transits
Audio
ID Tags
RailCom IDs

All	Internal	NCE	LocoNet
Syste...	User Name	State	Comment
LS82		Inactive	Delete ☐ Edit
LS83		Inactive	Delete ☐ Edit
LS84		Inactive	Delete ☐ Edit
LS85		Inactive	Delete ☐ Edit
LS86		Inactive	Delete ☐ Edit
LS87		Inactive	Delete ☐ Edit
LS88		Inactive	Delete ☐ Edit
LS89		Inactive	Delete ☐ Edit
LS90		Inactive	Delete ☐ Edit
LS91		Inactive	Delete ☐ Edit
LS92		Inactive	Delete ☐ Edit
LS93		Inactive	Delete ☐ Edit
LS94		Inactive	Delete ☐ Edit
LS95		Inactive	Delete ☐ Edit
LS96		Inactive	Delete ☐ Edit
LS97		Inactive	Delete ☐ Edit
LS98		Inactive	Delete ☐ Edit
LS99		Inactive	Delete ☐ Edit
LS100		Inactive	Delete ☐ Edit
LS101		Inactive	Delete ☐ Edit
LS102		Inactive	Delete ☐ Edit
LS103		Inactive	Delete ☐ Edit
LS104		Inactive	Delete ☐ Edit
LS105		Inactive	Delete ☐ Edit
LS106		Inactive	Delete ☐ Edit
LS107		Inactive	Delete ☐ Edit
LS108		Inactive	Delete ☐ Edit
LS109		Inactive	Delete ☐ Edit
LS110		Inactive	Delete ☐ Edit
LS111		Inactive	Delete ☐ Edit
LS112		Inactive	Delete ☐ Edit
LS113		Inactive	Delete ☐ Edit
LS114		Inactive	Delete ☐ Edit

< Add... ☐ Show Sensor Debounce Information ☐ Show Sensor Pull Up/Down Information

6. Sensors table in Panel Pro.

Sensors, signal heads, and signal masts

Before we move on to programming the Panel Pro panel, I need to explain a few things relating to signals within JMRI – we must first add the sensors, signal heads, and signal masts into tables for Panel Pro to be able to work properly. Once these are available, Panel Pro lets you place these onto the panel and to build the signal logic for the signals.

A sensor in JMRI is the same as a detection block on the LocoNet. They can be automatically populated into the Sensor Table in Panel Pro based on the number assigned to each BDL168 on your layout. The LS prefix stands for LocoNet Sensor.

I needed to create a signal head in the Signal Head table for each signal on my layout. A triple-head mast, for instance, needs three separate heads for it in the table.

To assign a signal head to a signal, I added switch addresses of my Digitrax SE8C - Signal Driver boards. The Digitrax website has a full list of expanded switch addresses for Board IDs:

www.digitrax.com/SE8chome.htm

Text continues on page 12 ...

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ELECTRICAL IMPULSES | 10

SE8C Driver Socket	Lighting aspect	"A" Orientation Signals				"B/C" Orientation Signals				SE8C Driver Socket	Lighting aspect	"A" Orientation Signals				"B/C" Orientation Signals																			
		A1 Main		A2 Diverging		B Main		C Siding				A1 Main		A2 Diverging		B Main		C Siding																	
		Switch	T/C	Switch	T/C	Switch	T/C	Switch	T/C			Switch	T/C	Switch	T/C	Switch	T/C	Switch	T/C																
BOARD ID - 01																		BOARD ID - 02																	
DRV1	1	RED	257	T	259	T	261	T	263	T	DRV1	1	RED	321	T	323	T	325	T	327	T														
	2	GREEN	257	C	259	C	261	C	263	C		DRV1	2	GREEN	321	C	323	C	325	C	327	C													
	3	YELLOW	258	T	260	T	262	T	264	T			DRV1	3	YELLOW	322	T	324	T	326	T	328	T												
	4	FLYEL	258	C	260	C	262	C	264	C				DRV1	4	FLYEL	322	C	324	C	326	C	328	C											
DRV2	1	RED	265	T	267	T	269	T	271	T	DRV2				1	RED	329	T	331	T	333	T	335	T											
	2	GREEN	265	C	267	C	269	C	271	C		DRV2			2	GREEN	329	C	331	C	333	C	335	C											
	3	YELLOW	266	T	268	T	270	T	272	T			DRV2		3	YELLOW	330	T	332	T	334	T	336	T											
	4	FLYEL	266	C	268	C	270	C	272	C				DRV2	4	FLYEL	330	C	332	C	334	C	336	C											
DRV3	1	RED	273	T	275	T	277	T	279	T	DRV3				1	RED	337	T	339	T	341	T	343	T											
	2	GREEN	273	C	275	C	277	C	279	C		DRV3			2	GREEN	337	C	339	C	341	C	343	C											
	3	YELLOW	274	T	276	T	278	T	280	T			DRV3		3	YELLOW	338	T	340	T	342	T	344	T											
	4	FLYEL	274	C	276	C	278	C	280	C				DRV3	4	FLYEL	338	C	340	C	342	C	344	C											
DRV4	1	RED	281	T	283	T	285	T	287	T	DRV4				1	RED	345	T	347	T	349	T	351	T											
	2	GREEN	281	C	283	C	285	C	287	C		DRV4			2	GREEN	345	C	347	C	349	C	351	C											
	3	YELLOW	282	T	284	T	286	T	288	T			DRV4		3	YELLOW	346	T	348	T	350	T	352	T											
	4	FLYEL	282	C	284	C	286	C	288	C				DRV4	4	FLYEL	346	C	348	C	350	C	352	C											
DRV5	1	RED	289	T	291	T	293	T	295	T	DRV5				1	RED	353	T	355	T	357	T	359	T											
	2	GREEN	289	C	291	C	293	C	295	C		DRV5			2	GREEN	353	C	355	C	357	C	359	C											
	3	YELLOW	290	T	292	T	294	T	296	T			DRV5		3	YELLOW	354	T	356	T	358	T	360	T											
	4	FLYEL	290	C	292	C	294	C	296	C				DRV5	4	FLYEL	354	C	356	C	358	C	360	C											
DRV6	1	RED	297	T	299	T	301	T	303	T	DRV6				1	RED	361	T	363	T	365	T	367	T											
	2	GREEN	297	C	299	C	301	C	303	C		DRV6			2	GREEN	361	C	363	C	365	C	367	C											
	3	YELLOW	298	T	300	T	302	T	304	T			DRV6		3	YELLOW	362	T	364	T	366	T	368	T											
	4	FLYEL	298	C	300	C	302	C	304	C				DRV6	4	FLYEL	362	C	364	C	366	C	368	C											
DRV7	1	RED	305	T	307	T	309	T	311	T	DRV7				1	RED	369	T	371	T	373	T	375	T											
	2	GREEN	305	C	307	C	309	C	311	C		DRV7			2	GREEN	369	C	371	C	373	C	375	C											
	3	YELLOW	306	T	308	T	310	T	312	T			DRV7		3	YELLOW	370	T	372	T	374	T	376	T											
	4	FLYEL	306	C	308	C	310	C	312	C				DRV7	4	FLYEL	370	C	372	C	374	C	376	C											
DRV8	1	RED	313	T	315	T	317	T	319	T	DRV8				1	RED	377	T	379	T	381	T	383	T											
	2	GREEN	313	C	315	C	317	C	319	C		DRV8			2	GREEN	377	C	379	C	381	C	383	C											
	3	YELLOW	314	T	316	T	318	T	320	T			DRV8		3	YELLOW	378	T	380	T	382	T	384	T											
	4	FLYEL	314	C	316	C	318	C	320	C				DRV8	4	FLYEL	378	C	380	C	382	C	384	C											

7. I made an Excel spreadsheet with the signal drivers and signal information in one place.

Signal Heads									
File View Window Help									
Turnouts	System Name	User Name	Appearance	Comment	Lit	Held	Edit		
Sensors	IH:SE8C:"LT781";"LT782"	CARLSJCTTK1N-SB-LWR	Red		Delete	☒	☐	Edit	
Lights	IH:SE8C:"LT779";"LT780"	CARLSJCTTK1N-SB-MID	Red		Delete	☒	☐	Edit	
Signal Heads	IH:SE8C:"LT777";"LT778"	CARLSJCTTK1N-SB-UPP	Green		Delete	☒	☐	Edit	
Signal Masts	IH:SE8C:"LT787";"LT788"	CARLSJCTTK3E-LWR-DWF	Red		Delete	☒	☐	Edit	
Signal Groups	IH:SE8C:"LT785";"LT786"	CARLSJCTTK3E-UPP-DWF	Red		Delete	☒	☐	Edit	
Signal Mast Logic	IH:SE8C:"LT789";"LT790"	CARLSJCTTK5E-DWF	Red		Delete	☒	☐	Edit	
Reporters	IH:SE8C:"LT797";"LT798"	GETTYSBTK1N-LWR-MAST	Red		Delete	☒	☐	Edit	
Memory Variables	IH:SE8C:"LT795";"LT796"	GETTYSBTK1N-MID-MAST	Red		Delete	☒	☐	Edit	
Routes	IH:SE8C:"LT793";"LT794"	GETTYSBTK1N-UPP-MAST	Red		Delete	☒	☐	Edit	
LRoutes	IH:SE8C:"LT733";"LT734"	HARRISBTK1E-LWR-MAST	Red		Delete	☒	☐	Edit	
Logix	IH:SE8C:"LT731";"LT732"	HARRISBTK1E-MID-MAST	Red		Delete	☒	☐	Edit	
Blocks	IH:SE8C:"LT729";"LT730"	HARRISBTK1E-UPP-MAST	Flashing Yellow		Delete	☒	☐	Edit	
Sections	IH:SE8C:"LT645";"LT646"	HBT1E-SB-LWR	Red		Delete	☒	☐	Edit	
Transits									
Audio									
ID Tags									
RailCom IDs									

9. When the signal heads are completed, they show in the Signal Heads Table.

ELECTRICAL IMPULSES | 11

SIGNAL USERNAME	SE8C BOARD No	SE8C DRIVE No	DWF/MAST LT #s	POSITION	ORIENTATION
					A1,A2,B,C
SHIPBTK1W-SB	2	1	321/322	UPP	A1
			323/324	MID	A2
			325/326	LWR	B
SHIPBTK3W-MAST	2	2	329/330	UPP	A1
YHAVENTK5-INT-DWF	2	2	333/334	SINGLE	B
YHAVENTK3E-DWF	2	4	345/346	UPP	A1
			347/348	LWR	A2
YORKTK4W-DWF	2	4	349/350	SINGLE	B
YHAVENTK5W-DWF	2	5	353/354	SINGLE	A1
SHIPBTK2W-DWF	2	6	361/362	UPP	A1
			363/364	LWR	A2
SHIPBTK2E-DWF	2	7	369/370	UPP	A1
			371/372	LWR	A2
SHIPBTK4E-DWF	2	7	373/374	SINGLE	B
HERSYTK1N	3	7	433/434	UPP	A1
			435/436	MID	A2
			437/438	LWR	B
HERSYTK3N-DWF	3	8	441/442	SINGLE	A1
S/SPRINGSTK1W-SB	4	3	465/466	UPP	A1
			467/468	MID	A2
			469/470	LWR	B
		3	471/472	LWR	C
S/SPRINGSTK3W-SB	4	4	473/474	UPP	A1
			475/476	MID	A2
RDGTK1W-MAST	4	5	481/482	SINGLE	A1
LEBNONTK3-MAST	4	5	483/484	SINGLE	A2
HBTk3W-DWF	6	4	601/602	UPP	A1
HBTk2E-SB	7	1	647/648	LWR	C
HBTk2E-SB	7	4	665/666	UPP	A1
			667/668	MID	A2
HBTk3E-DWF	7	5	673/674	SINGLE	A1
HBTk4E-DWF	7	6	681/682	SINGLE	A1

8. As mentioned in the previous two parts of this series, keeping a good record of information is essential.

Depending on the Board ID of the SE8C, there can be four individual switch addresses for each signal head. This allows red, yellow, green, and flashing yellow to be programmed for each signal head. These will change the aspects depending on if a board “switch address” is either thrown or closed.

For all Digitrax SE8C configurations and programming please refer to the following Digitrax manual: www.digitrax.com/media/apps/products/detection-signaling/se8c/documents/SE8C.pdf

The signal heads then are added to the Signal Mast Table and assigned a username and the aspect. The “username” comes from a drop-down list in the layout editor, and lets you add that signal mast to the Panel Pro Panel.

The highlighted signal mast and separate signal heads in the above examples are the

Text continues on page 16 ...

Signal Masts

FileViewToolsWindowHelp

Turnouts

Sensors

Lights

Signal Heads

Signal Masts

Signal Groups

Signal Mast Logic

Reporters

Memory Variables

Routes

LRoutes

Logix

Blocks

Sections

Transits

Audio

ID Tags

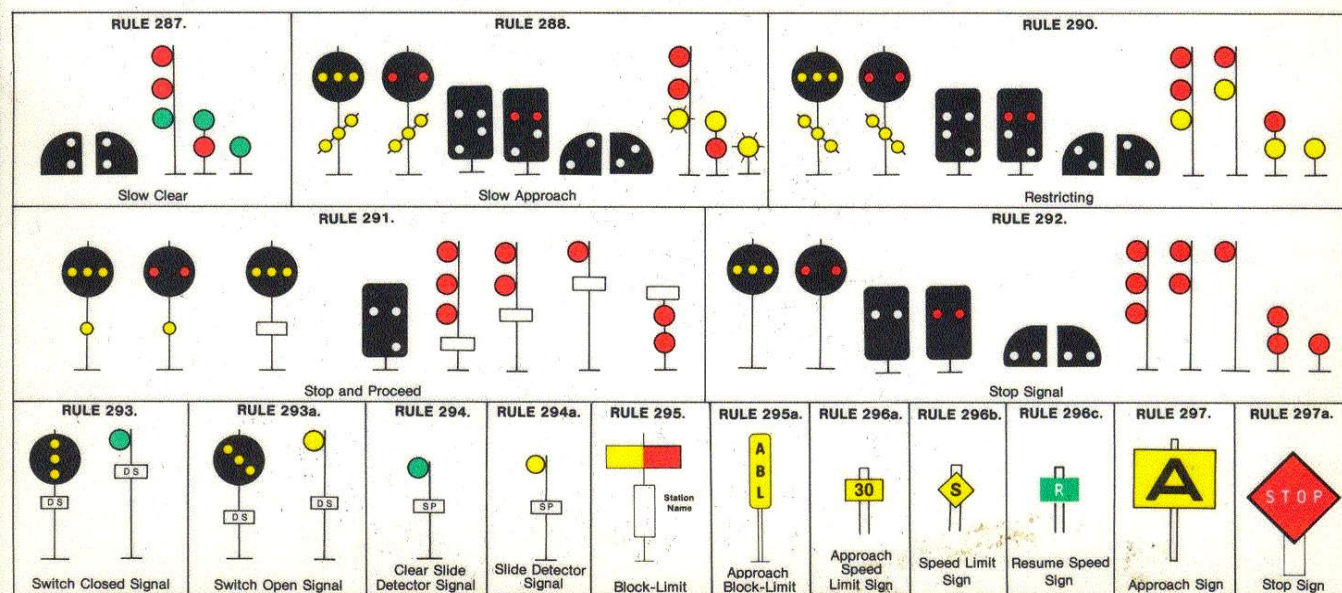
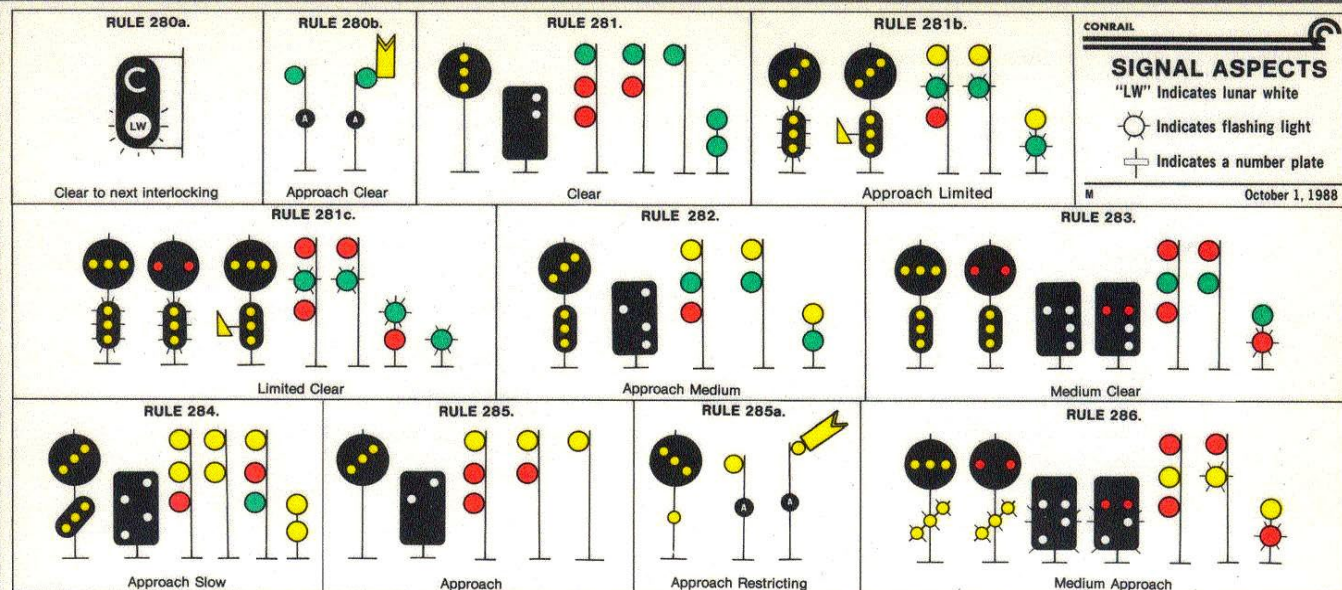
RailCom IDs

System Name	User Name	Aspect	Comment				Lit	Held
IF\$shsm:NS-2008:CLS-3-3-3-hi(CARLISJCTTK1N-SB-UPP)(CARLISJCTTK1N-SB-MID)(CARLISJCTTK1N-SB-LWR)	CARLISJCTTK1N-CSB	Clear		Delete	Edit	Edit Logic	☒	☐
IF\$shsm:NS-2008:CLS-3-3-3-lo(CARLISJCTTK3E-UPP-DWF)(CARLISJCTTK3E-LWR-DWF)	CARLISJCTTK3E-DWF	Stop Signal		Delete	Edit	Edit Logic	☒	☐
IF\$shsm:NS-2008:CLS-3-3-3-lo(CARLISJCTTK5E-DWF)	CARLISJCTTK5E-DWF	Stop Signal		Delete	Edit	Edit Logic	☒	☐
IF\$shsm:NS-2008:CLS-3-3-3-hi(GETTYSBTK1N-UPP-MAST)(GETTYSBTK1N-MID-MAST)(GETTYSBTK1N-LWR-MAST)	GETTYSBTK1N-MAST	Stop Signal		Delete	Edit	Edit Logic	☒	☐
IF\$shsm:NS-2008:CLS-3-3-3-hi(HARRISBTK1E-UPP-MAST)(HARRISBTK1E-MID-MAST)(HARRISBTK1E-LWR-MAST)	HARRISBTK1E-MAST	Advance Approach		Delete	Edit	Edit Logic	☒	☐
IF\$shsm:NS-2008:CLS-3-3-3-hi(HBTK1E-SB-UPP)(HBTK1E-SB-MID)(HBTK1E-SB-LWR)	HBTK1E-SB	Approach		Delete	Edit	Edit Logic	☒	☐
IF\$shsm:NS-2008:CLS-3-3-3-hi(HBTK1W-SB-UPP)(HBTK1W-SB-MID)(HBTK1W-SB-LWR)	HBTK1W-SB	Approach		Delete	Edit	Edit Logic	☒	☐
IF\$shsm:NS-2008:CLS-3-3-3-hi(HBTK2E-SB-UPP)(HBTK2E-SB-MID)(HBTK2E-SB-LWR)	HBTK2E-SB	Stop Signal		Delete	Edit	Edit Logic	☒	☐
IF\$shsm:NS-2008:CLS-3-3-3-hi(HBTK2W-SB-UPP)(HBTK2W-SB-LWR)	HBTK2W-SB	Stop Signal		Delete	Edit	Edit Logic	☒	☐
IF\$shsm:NS-2008:CLS-3-3-3-lo(HBTK3E-DWF)	HBTK3E-DWF	Stop Signal		Delete	Edit	Edit Logic	☒	☐
IF\$shsm:NS-2008:CLS-3-3-3-lo(HBTK3W-DWF)	HBTK3W-DWF	Limited Clear		Delete	Edit	Edit Logic	☒	☐
IF\$shsm:NS-2008:CLS-3-3-3-lo(HERSHYTK2N-DWF)	HERSHYTK2N-DWF	Slow Approach		Delete	Edit	Edit Logic	☒	☐
IF\$shsm:NS-2008:CLS-3-3-3-hi(HERSYTK1S-SB-UPP)(HERSYTK1S-SB-MID)(HERSYTK1S-SB-LWR)	HERSYTK1S-SB	Approach Limited		Delete	Edit	Edit Logic	☒	☐
IF\$shsm:NS-2008:CLS-3-3-3-hi(HERSYTK1N-UPP)(HERSYTK1N-MID)(HERSYTK1N-LWR)	HERSYTK1N-CSB	Clear		Delete	Edit	Edit Logic	☒	☐
IF\$shsm:NS-2008:CLS-3-3-3-hi(HERSYTK2S-SB-UPP)(HERSYTK2S-SB-LWR)	HERSYTK2S-SB	Approach		Delete	Edit	Edit Logic	☒	☐
IF\$shsm:NS-2008:CLS-3-3-3-lo(HUMLTWNTK1W-DWF-UPP)(HUMLTWNTK1W-DWF-LWR)	HUMLTWNTK1W-DWF	Approach Slow		Delete	Edit	Edit Logic	☒	☐
IF\$shsm:NS-2008:CLS-3-3-3-hi(HUMLTWNTK1W-UPP-SB)(HUMLTWNTK1W-MID-SB)(HUMLTWNTK1W-LWR-SB)	HUMLTWNTK1W-SB	Stop Signal		Delete	Edit	Edit Logic	☒	☐
IF\$shsm:NS-2008:CLS-3-3-3-lo(HUMLTWNTK3W-DWF-UPP)(HUMLTWNTK3W-DWF-LWR)	HUMLTWNTK3W-DWF	Clear		Delete	Edit	Edit Logic	☒	☐
IF\$shsm:NS-2008:CLS-3-3-3-hi(HUMLTWNTK3W-UPP-SB)(HUMLTWNTK3W-LWR-SB)	HUMLTWNTK3W-SB	Limited Clear		Delete	Edit	Edit Logic	☒	☐
IF\$shsm:NS-2008:CLS-3-3-3-hi(LBNTK1-SB-UPP)(LBNTK1-SB-MID)(LBNTK1-SB-LWR)	LBNTK1-SB	Advance Approach		Delete	Edit	Edit Logic	☒	☐
IF\$shsm:NS-2008:CLS-3-3-3-hi(LBNTK3-SB-UPP)(LBNTK3-SB-LWR)	LBNTK3-SB	Approach		Delete	Edit	Edit Logic	☒	☐
IF\$shsm:NS-2008:CLS-3-3-3-lo(LBNONTK3-DWF)	LBNONTK3-DWF	Slow Approach		Delete	Edit	Edit Logic	☒	☐
IF\$shsm:NS-2008:CLS-3-3-3-lo(RDGTK1E-DWF)	RDGTK1E-DWF	Slow Approach		Delete	Edit	Edit Logic	☒	☐
IF\$shsm:NS-2008:CLS-3-3-3-lo(RDGTK1W-DWF)	RDGTK1W-DWF	Stop Signal		Delete	Edit	Edit Logic	☒	☐
IF\$shsm:NS-2008:CLS-3-3-3-lo(RDGTK3E-DWF)	RDGTK3E-DWF	Slow Clear		Delete	Edit	Edit Logic	☒	☐
IF\$shsm:NS-2008:CLS-3-3-3-hi(RUTHTK1E(N)-SB-UPP)(RUTHTK1E(N)-SB-MID)(RUTHTK1E(N)-SB-LWR)	RUTHTK1E(N)-SB	Stop Signal		Delete	Edit	Edit Logic	☒	☐
IF\$shsm:NS-2008:CLS-3-3-3-hi(RUTHTK1E(S)-SB-UPP)(RUTHTK1E(S)-SB-MID)(RUTHTK1E(S)-SB-LWR)	RUTHTK1E(S)-SB	Limited Clear		Delete	Edit	Edit Logic	☒	☐
IF\$shsm:NS-2008:CLS-3-3-3-hi(S/SPRINGSTK1W-SB-UPP)(S/SPRINGSTK1W-SB-MID)(S/SPRINGSTK1W-SB-LWR)	S/SPRINGSTK1W-SB	Stop Signal		Delete	Edit	Edit Logic	☒	☐
IF\$shsm:NS-2008:CLS-3-3-3-hi(S/SPRINGSTK3W-SB-UPP)(S/SPRINGSTK3W-SB-MID)(S/SPRINGSTK3W-SB-LWR)	S/SPRINGSTK3W-SB	Stop Signal		Delete	Edit	Edit Logic	☒	☐
IF\$shsm:NS-2008:CLS-3-3-3-hi(SHIPBTK1E-SB-UPP)(SHIPBTK1E-SB-MID)(SHIPBTK1E-SB-LWR)	SHIPBTK1E-SB	Approach Limited		Delete	Edit	Edit Logic	☒	☐
IF\$shsm:NS-2008:CLS-3-3-3-hi(SHIPBTK1W-SB-UPP)(SHIPBTK1W-SB-MID)(SHIPBTK1W-SB-LWR)	SHIPBTK1W-SB	Clear		Delete	Edit	Edit Logic	☒	☐
IF\$shsm:NS-2008:CLS-3-3-3-lo(SHIPBTK2E-UPP-D/DWF)(SHIPBTK2E-LWR-D/DWF)	SHIPBTK2E-D/DWF	Stop Signal		Delete	Edit	Edit Logic	☒	☐
IF\$shsm:NS-2008:CLS-3-3-3-lo(SHIPBTK2W-DWF)	SHIPBTK2W-DWF	Slow Approach		Delete	Edit	Edit Logic	☒	☐
IF\$shsm:NS-2008:CLS-3-3-3-lo(SHIPBTK3W-DWF-UPP)(SHIPBTK3W-DWF-LWR)	SHIPBTK3W-DWF	Medium Approach		Delete	Edit	Edit Logic	☒	☐
IF\$shsm:NS-2008:CLS-3-3-3-lo(SHIPBTK4E-DWF)	SHIPBTK4E-DWF			Delete	Edit	Edit Logic	☒	☐
IF\$shsm:NS-2008:CLS-3-3-3-lo(YHAVENTK3E-DWF)	YHAVENTK3E-DWF	Slow Approach		Delete	Edit	Edit Logic	☒	☐

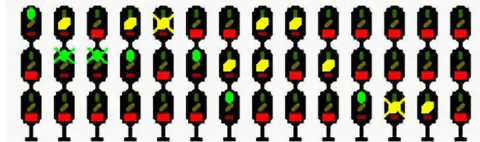
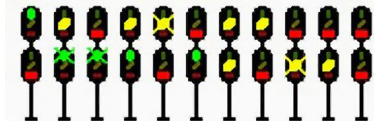
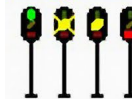
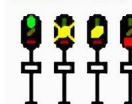
10. Table of signal masts and individual signal aspects.

IH:SE8C:"LT733","LT734"	HARRISBTK1E-LWR-MAST	Red		Delete	☒	☐	Edit
IH:SE8C:"LT731","LT732"	HARRISBTK1E-MID-MAST	Red		Delete	☒	☐	Edit
IH:SE8C:"LT729","LT730"	HARRISBTK1E-UPP-MAST	Flashing Yellow		Delete	☒	☐	Edit

11. The naming convention includes the position of the signal head within the mast, either upper, middle, or lower.



Signal Mast Definition Files

[Triple head 3 color light high signal](#)[Double head 3-3 color light high signal](#)[Double head 3-3 color light dwarf signal](#)[Single head 3 color light high signal](#)[Single head 3 color light permissive high signal with number plate](#)[Single head 3 color light low signal](#)[171 Territory](#)

12. Conrail 1986 Signal Definitions and NS (Norfolk Southern) 2008 - Signal Definitions in JMRL.

Harrisburg, track 1, east, triple-head mast. As mentioned in Part 1, I adopted a common and consistent naming convention. [11] shows this naming convention for the separate signal heads.

My JMRI signal system follows the NS 2008 definitions. These closely track with the Reading Lines and later Conrail. Therefore, the signal indication system for my layout follows the “NS (Norfolk Southern) 2008 - Signal Definitions” that are part of the JMRI signal program. See:

jmri.org/xml/signals/NS-2008/index.shtml

The username for a signal can be anything you choose as long as it is consistent across all the software. I use an abbreviated name based on the location of the signal, track number, direction, and the type of signal.

Here is a video describing how to add switch addresses to signal heads, and then add signal heads to signal masts.

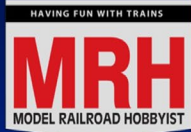
Watch on





JMRI Panel Pro tutorials

1: Adding signal heads and masts to Panel Pro tables



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Please see the Dec 2018 Model Railroad Hobbyist magazine to understand how this video fits into the full Panel Pro how-to

13. Video: Adding signal head masts to JMRI Panel Pro tables.

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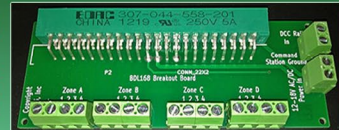
BDL168
Multi-zone
breakout board



SE8C
breakout
board



BDL168
Single-zone
breakout board



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The Panel Pro panel

We need a panel to display the occupancy of blocks on the layout, the position of turnouts, and the needed aspects on our signals

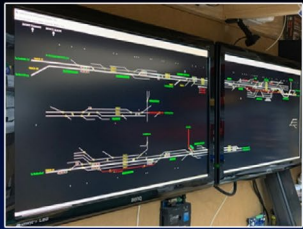
I have two 23-inch side-by-side LED monitors to display the layout in full. The panel, named the Harrisburg & Shippensburg Division – 1975, has three track sections, one above another [15, 16].

The top section is the outer loop of the layout from Rutherford back around to Carlisle Junction. The middle section is the inner loop from Manheim Junction through to Harrisburg, and the bottom section is from Sinking Springs to Reading.

There are layout sections not visible in the main layout diagram here: Rutherford Yard, engine service facility, and under-deck staging.

This video shows adding track and turnouts to Panel Pro.

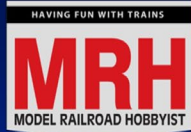
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JMRI

Panel Pro tutorials

2: Adding turnouts and track to Panel Pro



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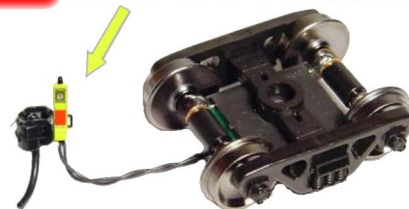
Please see the Dec 2018 Model Railroad Hobbyist magazine to understand how this video fits into the full Panel Pro how-to

14. Video: Adding turnouts and track to JMRI Panel Pro.

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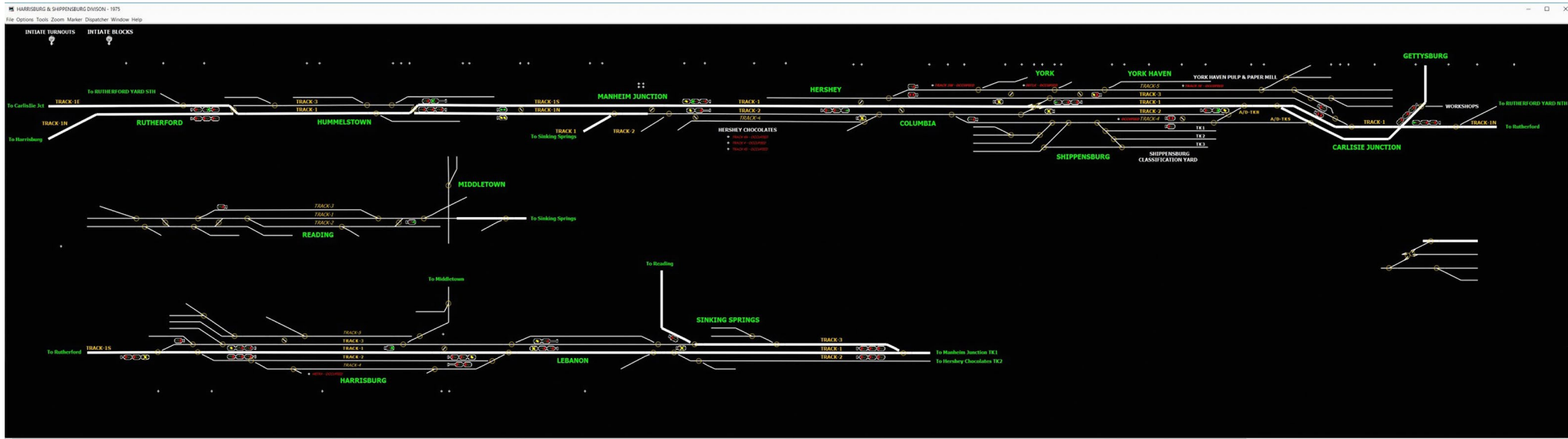
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15. The Harrisburg & Shippensburg Division panel. (Zoom in for a closer look ...)

Digitrax board ID configurations

The switch addresses come from the board number programmed into each SE8C. [17a] is directly from the Digitrax SE8C manual.

When programming the switch addresses for turnouts and sensors, take care to avoid duplicate names. The table in [17b] shows the programmed board numbers to achieve non-duplicate switch names between the SE8C and BDL168.

You can see all this illustrated in the next spread.



16. Here are the twin 23" monitors I use to display my panel.



Go to the next spread ...

17a→. Setting the SE8C board ID table from the Digitrax manual.

Setting the Board ID

1. Press the ID button down and hold it until the Green LED starts blinking, then release the button.
2. Using your Throttle or PC train control software, select the switch address that will become the Board ID Number and issue a switch command.
3. The Green LED will stop blinking when the slow motion turnout address and signal control address ranges have been updated.
4. The following table details the slow motion turnout and signal switch address ranges associated with each SE8C Board ID Number:

Board ID (Press ID Button, set Sw# for Board ID number)	Slow Motion Turnout Machine Switch Address Range 8 Per SE8C	Signal Control Switch Address Range 4 Aspects Per Head 64 Per SE8C	Signal Control Switch Address Range 2 Aspects Per Head 32 Per SE8C
01 (factory setting)	Sw01-Sw08	Sw257-Sw320	Sw257-Sw288
02	Sw09-Sw16	Sw321-Sw384	Sw289-Sw320
03	Sw17-Sw24	Sw385-Sw448	Sw321-Sw352
04	Sw25-Sw32	Sw449-Sw512	Sw353-Sw384
05	Sw33-Sw40	Sw513-Sw576	Sw385-Sw416
06	Sw41-Sw48	Sw577-Sw640	Sw417-Sw448
07	Sw49-Sw56	Sw641-Sw704	Sw449-Sw480
08	Sw57-Sw64	Sw705-Sw768	Sw481-Sw512
09	Sw65-Sw72	Sw769-Sw832	Sw513-Sw544
10	Sw73-Sw80	Sw833-Sw896	Sw545-Sw576
11	Sw81-Sw88	Sw897-Sw960	Sw577-Sw608
12	Sw89-Sw96	Sw961-Sw1024*	Sw609-Sw640

*A Board IDs above 12 require a computer train control program to access the switch address ranges above Sw1000. See www.digitrax.com/SE8chome.htm for expanded Board ID table with slow motion turnout switch address ranges available for use.

17b↓. A table of available switch and sensor identifiers helps avoid duplicating switch names.

	Input and output								Spare		Spare		Input only..				
Config number	Se8C	Se8C	Se8C	Se8C	Se8C	Se8C	Se8C	Se8C	Se8C	Se8C	BDL168	BDL168	BDL168	BDL168	BDL168	BDL168	BDL168
Board number	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5		
Ports to be configured on the boards	1	9	17	25	33	41	49	57	65	73	81	97	113	129	145		
	2	10	18	26	34	42	50	58	66	74	82	98	114	130	146		
	3	11	19	27	35	43	51	59	67	75	83	99	115	131	147		
	4	12	20	28	36	44	52	60	68	76	84	100	116	132	148		
	5	13	21	29	37	45	53	61	69	77	85	101	117	133	149		
	6	14	22	30	38	46	54	62	70	78	86	102	118	134	150		
	7	15	23	31	39	47	55	63	71	79	87	103	119	135	151		
	8	16	24	32	40	48	56	64	72	80	88	104	120	136	152		
											89	105	121	137	153		
											90	106	122	138	154		
											91	107	123	139	155		
											92	108	124	140	156		
											93	109	125	141	157		
											94	110	126	142	158		
											95	111	127	143	159		
											96	112	128	144	160		



RATE THIS ARTICLE



J. Fugate

IMPORTANT: WATCH THE VIDEOS!

To better understand how the JMRI programming of Panel Pro works, you *must* watch the videos associated with this article. If you only read the text, you're missing a lot ...

Feeling lost? *Watch the videos!*

Adding block sensors to track segments and turnouts

To show occupancy on track segments and turnouts, we need to add layout block sensors to them. The sensors are associated with the Digitrax - BDL168 blocks and derived from the sensor table within Panel Pro.

To add sensors to detected track segments, right-click on the track segment and add the appropriate sensor.

Once the sensor LS1 has been added to the track segment, we can add a sensor icon above the track segment on the panel. See the video [18] for more.

This two-step process results in two advantages.

When the track is occupied, the sensor icon will be lit, giving you a strong visual indicator of that track's status. Using the sensor icon, you can also mark the track segment as occupied by just clicking it.

When using the LocoNet simulator Mode to program signal logic, you can manually activate the individual track segments and turnouts to test your signal logic as you go.

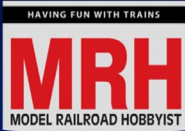
This saves having to do all your signal logic programming while connected to the layout.

Watch on 



JMRI Panel Pro tutorials

3: Adding sensors to track segments in Panel Pro

 *Please see the Dec 2018 Model Railroad Hobbyist magazine to understand how this video fits into the full Panel Pro how-to*

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18. Video: Using Panel Pro to add sensors to track segments/blocks and turnouts.

To add the sensor icons we use the quick menu drop-down box. Click on the sensor icon – in this case LS1 – and while holding down the shift key, left click on the panel where you want the sensor icon placed.

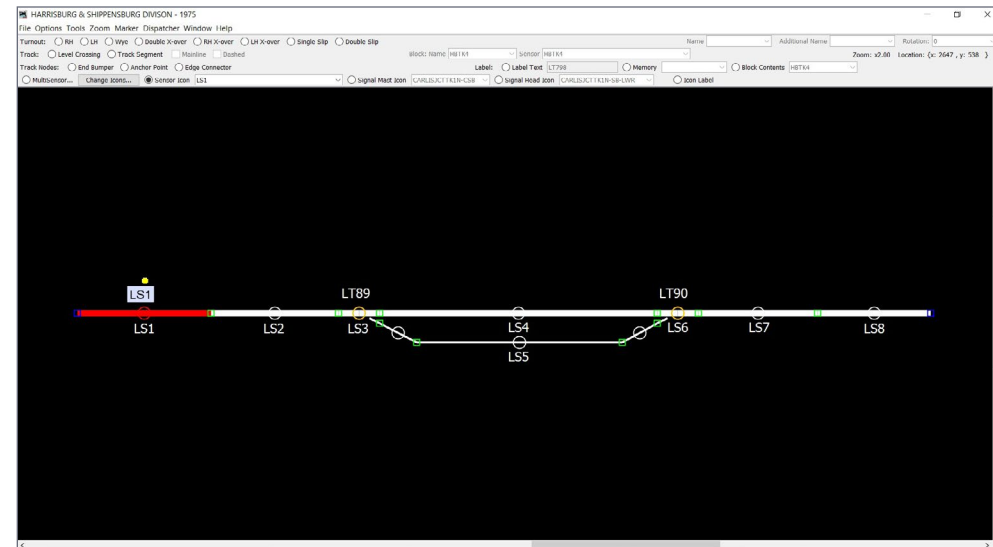


J. Miller

ADDING INTERNAL SENSORS

We can also create “internal sensors” within Panel Pro to allow a dispatcher to manually tag a location as an occupied track segment. This track segment isn’t connected to a BDL168, and so is undetected track.

Some of my larger industries have undetected sidings, so being able to manually toggle them as “occupied” in Panel Pro helps the dispatcher and avoids accidents.



19. When the track segment is occupied, the sensor indicator will light along with the track segment. You can also manually activate the sensor by clicking on it.

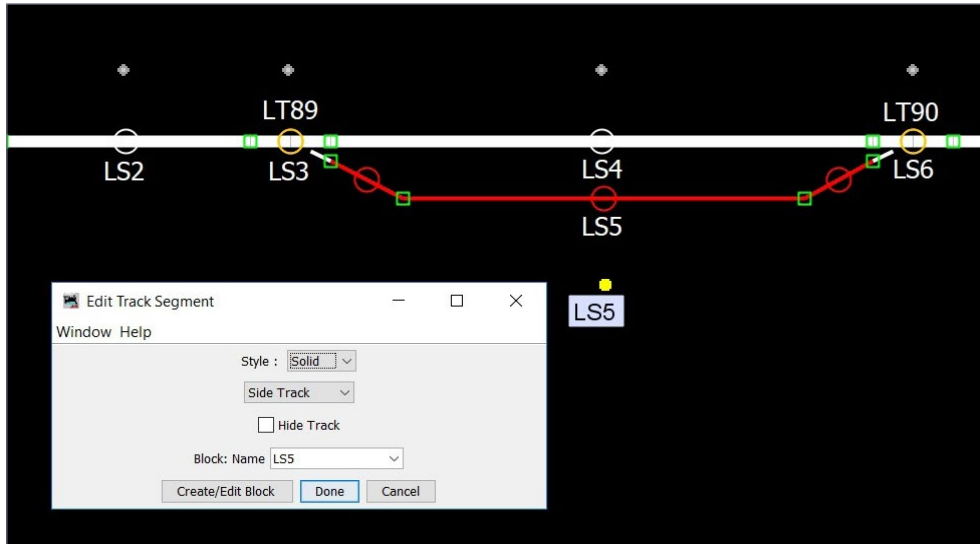
Adding one sensor to multiple track segments

There will be occasions when you need to have multiple track segments connected together, but only require one sensor to detect them as a single block.

On our example of a passing siding [20, next page], the three track segments of the siding get detected as one signal block on the BDL168. In Panel Pro, we assign the same sensor number to each track segment, which groups them together as a single unit.



Go to the next page ...



20a, b. To combine multiple track segments, we program each segment in the passing siding with the same sensor number, in this case LS5.

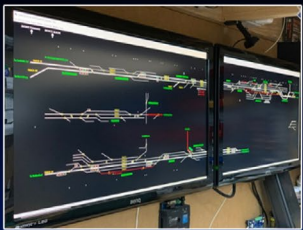
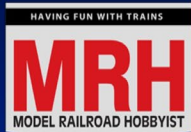
★★★★★
RATE THIS ARTICLE

Adding a switch address to turnouts in Panel Pro

When turnouts are added to the panel, we need to configure them so we can operate the switch machines. I use Tortoise slow-motion switch machines.

I operate these Tortoise switch machines with a momentary push button on my fascia panels, or directly via the Panel Pro panel. The turnout requires a designated switch address from one of the Digitrax SE8C's connected to the standalone LocoNet.

I explain the process for adding switch addresses and sensors to turnouts in a video [21].

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Watch on


JMRI Panel Pro tutorials

4: Adding switch addresses and sensors to turnouts in Panel Pro

Please see the Dec 2018 Model Railroad Hobbyist magazine to understand how this video fits into the full Panel Pro how-to

21. Video: Using Panel Pro to add switch and sensor addresses.



Adding signal masts and dwarf signals to the panel

On my Panel Pro screen, I use two methods to place the signal masts and dwarf signals. The two placing methods I use are:

- Placing a signal mast at a turnout, and
- Placing a signal via the “shift down/add” feature.

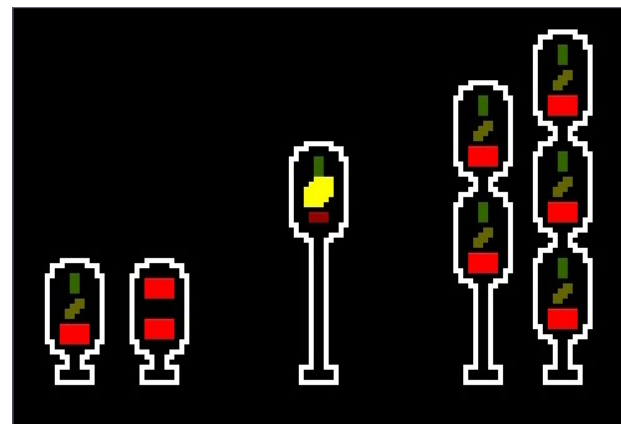
The symbol is defined when setting up the signal mast table. The dwarf signals are either single or double. The masts have the longer single-head, and the signal bridges have either double and/or triple-heads.

The following video [24] explains how to add a triple-head mast to the turnout LT89 on our Panel Pro panel and test section of track.



22. The “set a signal mast” at a turnout feature allows you to add a signal to the throat for the continuing and/or diverging routes of a turnout.

23. As discussed in Part 2, I use a combination of dwarf, mast, and signal bridges on the layout. When displaying these on the panel they are represented by these JMRI symbols.



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JMRI

Panel Pro tutorials

5: Adding signal masts to the track layout in Panel Pro

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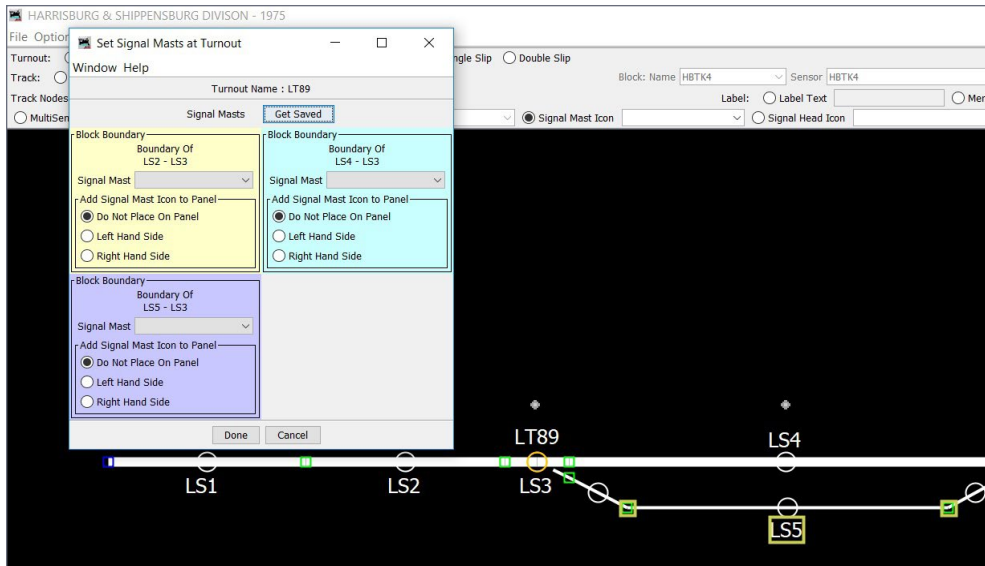
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Please see the Dec 2018 Model Railroad Hobbyist magazine to understand how this video fits into the full Panel Pro how-to

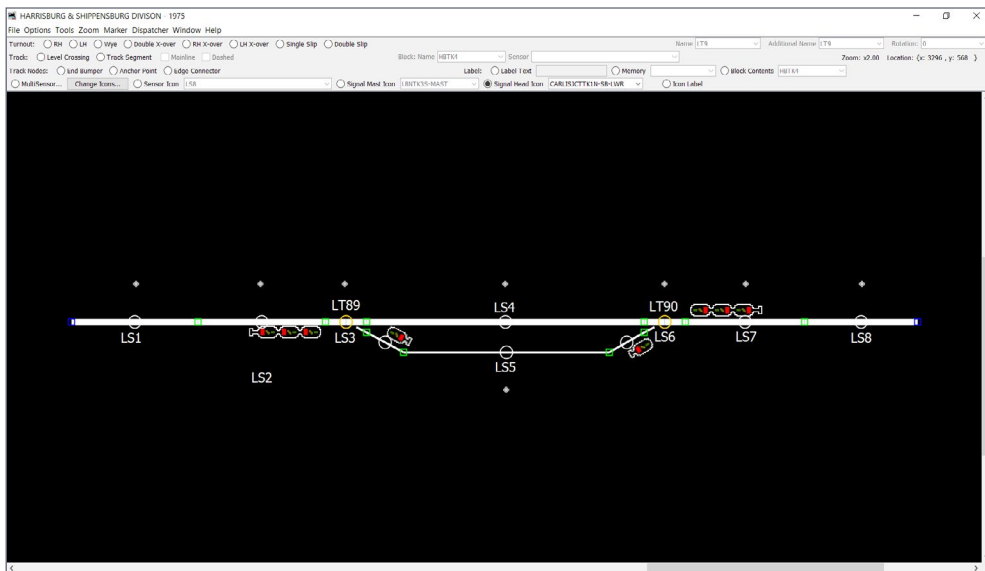
24. Video: Adding signal masts to Panel Pro.



More illustrations on the next page ...

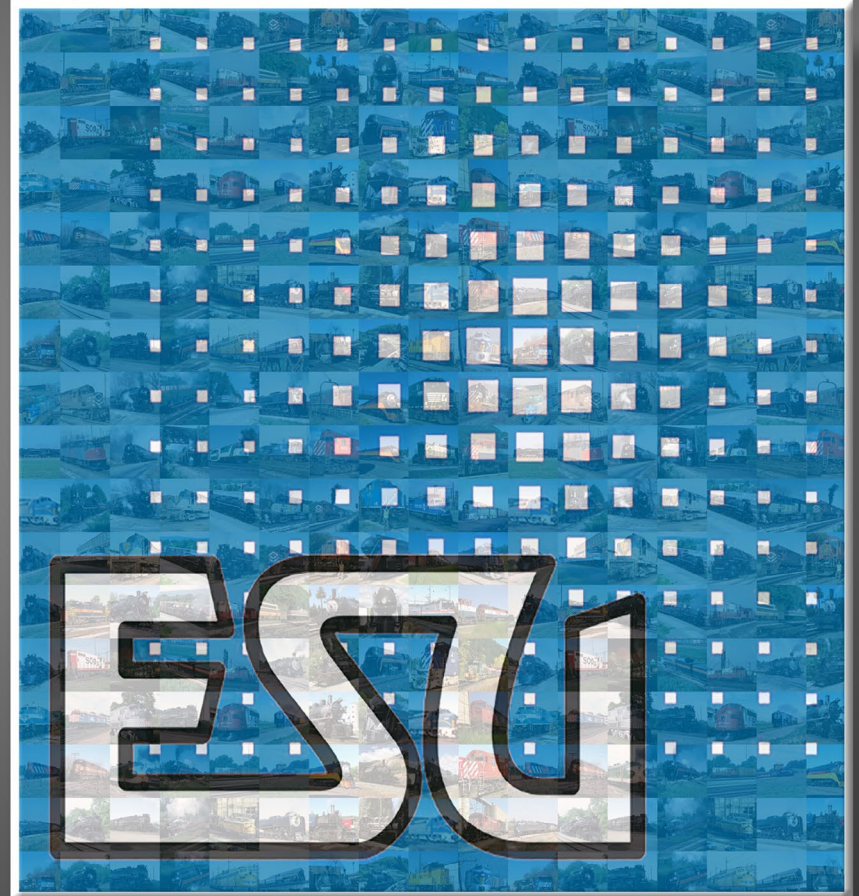


25. When adding signal masts to Panel Pro, each block boundary has options for placing or not placing a signal there.



26. Once triple-head masts and single-head dwarf signals are placed onto the panel, it should look like this.

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Programming signal logic

The signal mast configuration example shown in [25] is not particularly prototypical. It is shown purely to explain how we program the signal logic within JMRI - Panel Pro. There are many variations for signal placement, and they all depend on what signal system you decide to model on *your* layout.

Within Panel Pro there are various methods for placing signals on your panels. Read the following guides before embarking on the programming of your system's signal logic.

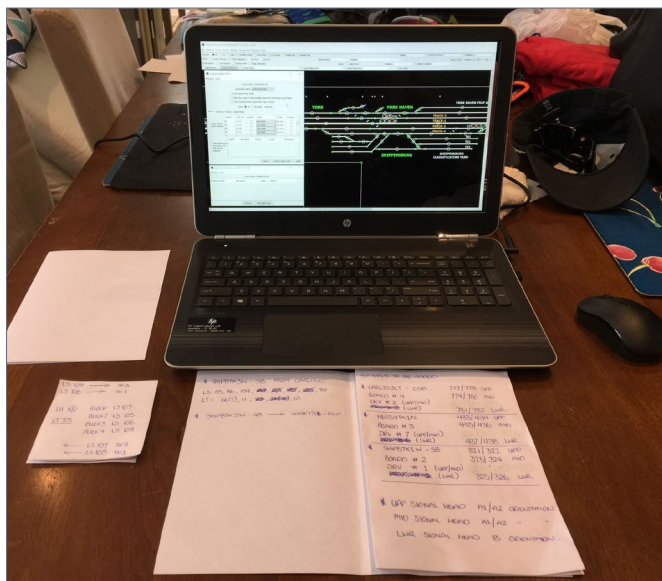
jmri.org/help/en/html/tools/signaling/SignalingSetup.shtml

jmri.org/help/en/html/tools/signaling/AspectSignaling.shtml

jmri.org/help/en/html/tools/signaling/SignalMastLogic.shtml

I could write another two or three parts on just programming signal logic within JMRI and Panel Pro! (*Oh boy ... - ed.*)

27. When working out paths for signal logic, I record them on paper first.



With Panel Pro, we start with a source signal and finish with a destination signal. A source signal can have multiple paths to destination signals. We just need to program the logic for each path. A signal can be a dwarf or on a mast or a signal bridge.

All the programming for signal logic on my layout has been achieved manually. There is a automatic function in Panel Pro so that signals can be automatically placed onto your layout, but I wanted to program all the logic manually because some of my trackage is complex.

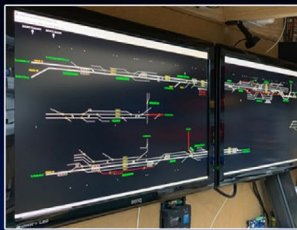
We need to know a few basic things to get started:

- Blocks a train passes through when enroute between two signals.
- Position of any turnouts in that path.

With this recorded, we can begin programming the signal logic.

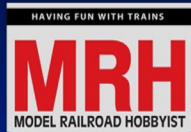
All of the programming involves drop-down menus and selecting options. Video [28] runs through installing the sensors/blocks and turnouts into the signal logic between two signal masts.

Watch on

JMRI Panel Pro tutorials

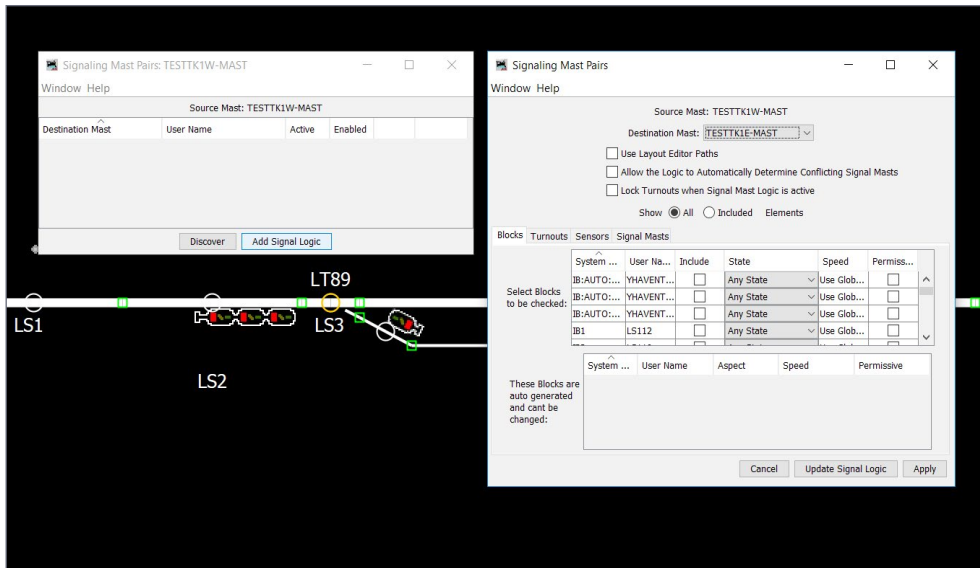
6: Adding signal logic to the signals and track in Panel Pro



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Please see the Dec 2018 Model Railroad Hobbyist magazine to understand how this video fits into the full Panel Pro how-to

28. Video: Adding signal logic in Panel Pro.

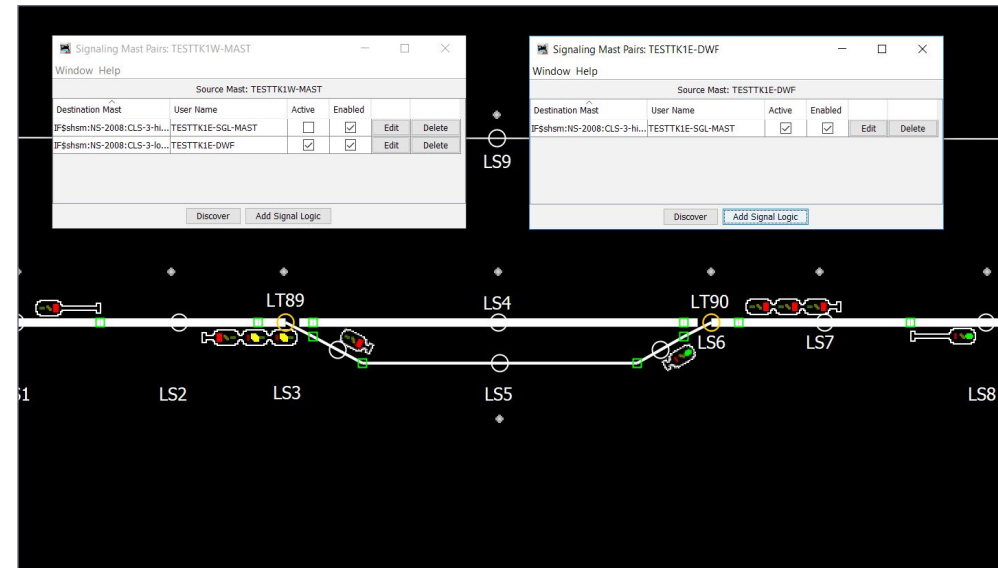


29. These menus are the signal logic input windows that allow the paths to be set, along with linking the blocks and turnouts.

Once the signal logic is added, the signals begin to show the status of the blocks ahead of the programmed signal mast. Remember that the indication and aspect are dictated by the signal definitions you program into each signal mast.

The signal logic for the remaining masts and dwarfs is added in the same manner. If more than one path is available, the signal logic for each path needs to be added separately.

When the signal logic is working correctly, the masts and dwarfs will display the correct aspect as defined. In [30] notice that the triple-head mast is displaying a double yellow-over-red (Slow Approach) aspect. This happens when the LT89 and LT90 turnouts get aligned into the passing siding, and linked to the single-head mast at the far end of the siding displaying a green clear aspect.



30. This screenshot shows the signal logic now functioning from the triple-head mast on the left to the single-head mast on the right, through the passing siding.

Rule N284: Approach Slow

Indication: Proceed, approaching next signal at Slow Speed.

Trains exceeding Medium Speed must at once reduce to that speed.



Speed: Medium

Speed2: Slow

Route: Normal

Default DCC Aspect: 19

31a. The NS 2008 - signal definition in JMRI for a triple-head mast displaying a double yellow-over-red aspect.

Signaling Mast Pairs: TESTTK1W-SGL-MAST

Window Help

Source Mast: TESTTK1W-SGL-MAST

Destination Mast	User Name	Active	Enabled		
IF\$shsm:NS-2008:CLS-3-3...	TESTTK1E-MAST	☒	☒	Edit	Delete

Discover Add Signal Logic

Signaling Mast Pairs: TESTTK1W-MAST

Window Help

Source Mast: TESTTK1W-MAST

Destination Mast	User Name	Active	Enabled		
IF\$shsm:NS-2008:CLS-3-hi...	TESTTK1E-SGL-MAST	☐	☒	Edit	Delete
IF\$shsm:NS-2008:CLS-3-lo...	TESTTK1E-DWF	☒	☒	Edit	Delete

Discover Add Signal Logic

Signaling Mast Pairs: TESTTK1W-DWF

Window Help

Source Mast: TESTTK1W-DWF

Destination Mast	User Name	Active	Enabled		
IF\$shsm:NS-2008:CLS-3-hi...	TESTTK1W-SGL-MAST	☒	☒	Edit	Delete

Discover Add Signal Logic

31b: What this signal logic looks like in Panel Pro.

If we look at the specific signal definition in JMRI, we can see Rule N284 and the explanation for the indication [31a]. Remember the “aspect” is what color or combination of colors is displayed on the signal heads. The “indication” tells the engineer what they must do to the train’s speed based on the aspect.

When all of the signal logic is completed for the masts and dwarfs on our test section of track, it should look like this [31b].

Signaling Mast Pairs: TESTTK1E-SGL-MAST

Window Help

Source Mast: TESTTK1E-SGL-MAST

Destination Mast	User Name	Active	Enabled		
IF\$shsm:NS-2008:CLS-3-3...	TESTTK1W-MAST	☒	☒	Edit	Delete

Discover Add Signal Logic

Signaling Mast Pairs: TESTTK1E-MAST

Window Help

Source Mast: TESTTK1E-MAST

Destination Mast	User Name	Active	Enabled		
IF\$shsm:NS-2008:CLS-3-hi...	TESTTK1W-SGL-MAST	☐	☒	Edit	Delete
IF\$shsm:NS-2008:CLS-3-lo...	TESTTK1W-DWF	☒	☒	Edit	Delete

Discover Add Signal Logic

Signaling Mast Pairs: TESTTK1E-DWF

Window Help

Source Mast: TESTTK1E-DWF

Destination Mast	User Name	Active	Enabled		
IF\$shsm:NS-2008:CLS-3-hi...	TESTTK1E-SGL-MAST	☒	☒	Edit	Delete

Discover Add Signal Logic

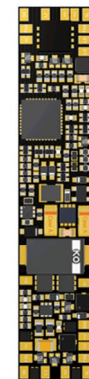
And the panel looks like this [32], with both turnouts allowing for travel through the passing siding.

Looking at one specific triple-head signal on my panel, we see the signal logic when multiple routes exist.

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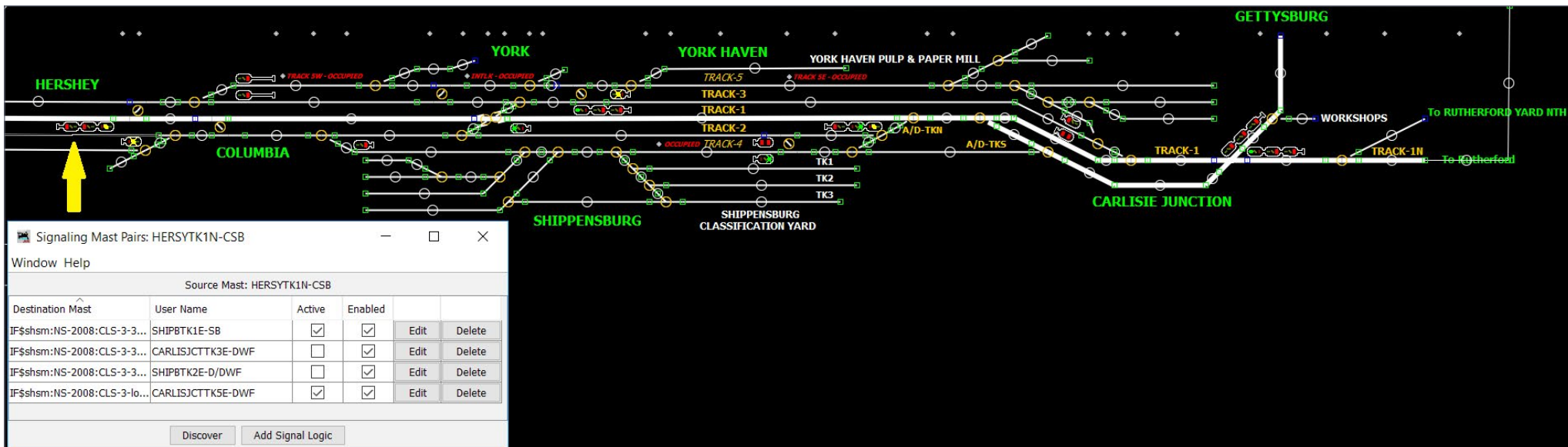
Click here for more details...





32↑. Screenshot showing the completed signal logic now operating on all signals.

33↓. The triple-head mast signal to the top left corner of the signal logic window requires four sets of signal logic in Panel Pro to operate correctly.



The signal mast in [33] is HERSYTK1N-CSB (Hershey, Track 1, north, cantilevered signal bridge). It has four routes that require signal logic to another mast and/or dwarf signal.

When we expand the information contained in the Signal Logic window in [34] this can be seen in the highlighted section.



AutoSave Off SE8C Signal Drivers Jason Miller

File Home Insert Draw Page Layout Formulas Data Review View Help Tell me Share

Clipboard Font Alignment Number Styles Cells Editing

A3 HERSYK1N-CSB

	A	B	C	D	E	F	G
1	SOURCE MAST	DESTINATION MAST	LOCONET	SPEED	LOCONET	THROWN/	
2			SENSOR		TURNOUT	CLOSED	
3	HERSYK1N-CSB	CARLISJCTK3E-DWF	LS86	GLOBAL	LT10	CLOSED	
4			LS147	GLOBAL	LT11	CLOSED	
5			LS149	GLOBAL	LT14	CLOSED	
6			LS153	GLOBAL	LT21	THROWN	
7			LS159	GLOBAL	LT23	CLOSED	
8	HERSYK1N-CSB	SHIPBTK1E-SB	LS93	GLOBAL	LT18	CLOSED	
9			LS146	GLOBAL	LT21	CLOSED	
10			LS150	GLOBAL	LT177	CLOSED	
11			LS152	GLOBAL	LT178	CLOSED	
12	CARLISJCTK1N-CSB	SHIPBTK2E-D/DWF	LS96	GLOBAL	LT18	THROWN	
13			LS145	GLOBAL	LT19	CLOSED	
14			LS151	GLOBAL	LT179	CLOSED	
15			LS152	GLOBAL			
16	HERSYK1N-CSB	CARLISJCTK5E-DWF	YHAVENTK5-E	GLOBAL	LT9	CLOSED	
17			YHAVENTK5W-W	GLOBAL	LT10	CLOSED	
18			YHAVENTK5-INTLK	GLOBAL	LT13	CLOSED	
19					LT14	CLOSED	
20					LT15	CLOSED	
21	HERSHYK2N-DWF	SHIPBTK1E-SB	LS93	GLOBAL	LT18	CLOSED	
22			LS145	GLOBAL	LT19	CLOSED	
23			LS151	GLOBAL	LT20	CLOSED	
24			LS160	GLOBAL	LT177	CLOSED	
25					LT178	THROWN	
26	HERSHYK2N-DWF	CARLISJCTK3E-DWF	LS86	GLOBAL	LT10	CLOSED	
27			LS145	GLOBAL	LT11	THROWN	
28			LS151	GLOBAL	LT18	CLOSED	
29			LS159	GLOBAL	LT19	CLOSED	
30			LS160	GLOBAL	LT20	CLOSED	

Signal Head Numbers Signal Logic

Ready Count: 74

34. This again shows the importance of good record-keeping. The four routes and signal logic contain: 1) Sixteen LocoNet Sensors; 2) Twelve LocoNet Turnouts. This has to be programmed into Panel Pro for each signal and each route on the layout.

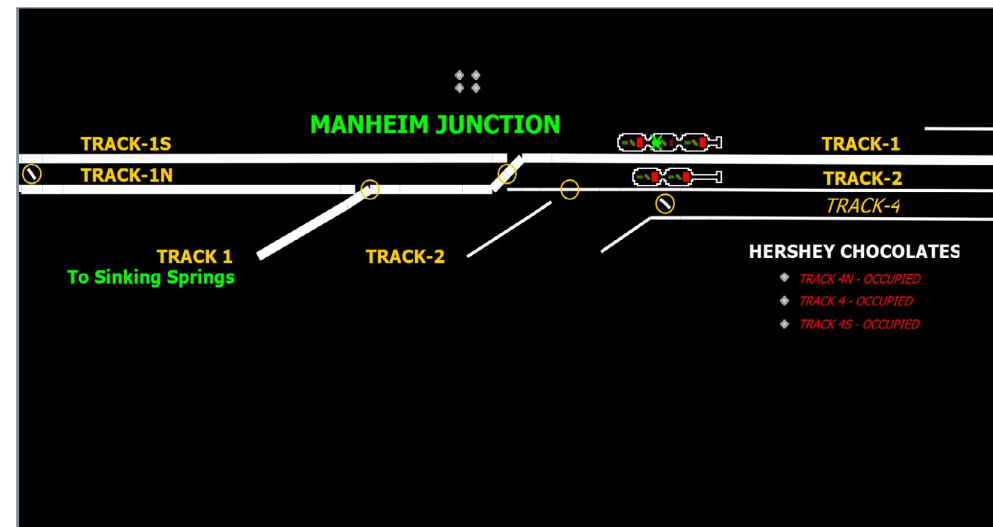
Operating with Panel Pro

Now that we have all the signals and the signal logic/routes programmed, we can show how the Automatic Block System works and how the layout's train operation can be managed.

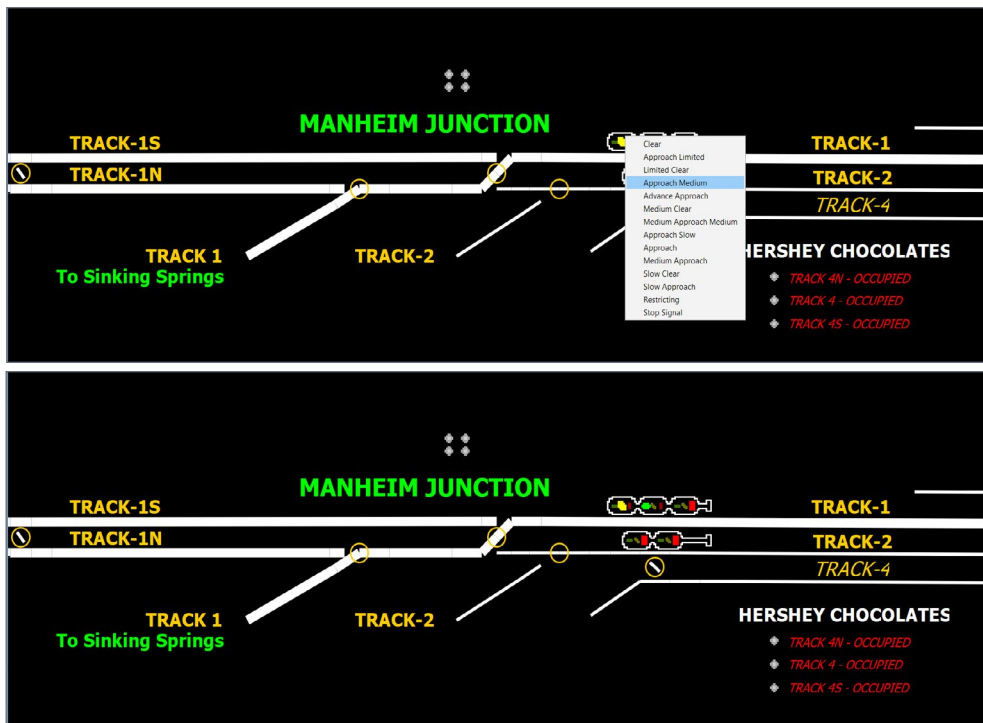
The beauty of ABS is that for most operating sessions it is automatic, but it can also be manually controlled by the dispatcher.

For most ops sessions, an operator can control the turnouts from the fascia, and the ABS will route the train properly. The detection and signal system through the programmed logic provides the correct aspect based on the speed setting for the "track ahead and the two blocks clear ahead" principle.

The dispatcher also has the ability to intervene and change the aspect to a different aspect.



35. The triple-head mast allowing Track 1 at Manheim Junction to proceed to Sinking Springs, is automatically set to a flashing green (middle head) aspect, which is "Limited Clear."



36, 37. By right-clicking on the mast we can select a more restrictive speed through this junction. In this case an “Approach Medium” aspect has been selected over the normal “Limited Clear” aspect.

In the photos here [35-37], the dispatcher has routed an east-bound train (moving to the left) from Track 1 at Manheim Junction through the crossover heading toward Sinking Springs. Normally the ABS using the NS-2008 Signal Definitions in Panel Pro would set this mast to a “Limited Clear - Flashing Green”

In Panel Pro we also have the ability to right-click on the mast and change the aspect.

For example, our train might be hauling a long piece of rolling stock that requires a restrictive/slower speed ahead. We

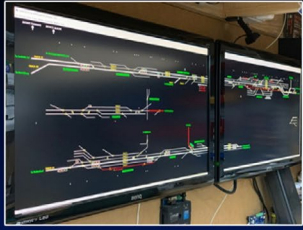
can scroll down and select a more restrictive speed ahead. In this case we want the train to approach the next signal at “Medium Speed.”

If the train speed is higher than this, the crew must reduce speed upon seeing this mast/aspect.

JMRI and Panel Pro also have the ability to provide routes so the dispatcher can set up a path for a train to take. This will set the required turnouts to either thrown or closed and set the appropriate aspects on the signals too.

In this short video [38] we will see the RDG-LCL (Reading Local) departing Reading and heading onto Hershey. This is my actual layout panel operating with the detection and signals/signal logic functioning.

Watch on

JMRI Panel Pro tutorials

7: Signals in operation on the layout with Panel Pro



mrhmag.com

Please see the Dec 2018 Model Railroad Hobbyist magazine to understand how this video fits into the full Panel Pro how-to

38. Programmed signal system in operation with an actual scenario on my layout.

Conclusion

I hope this series has been enjoyable, and has given those contemplating a signaling system a good idea what is needed to tackle a signal system on your layout.

As I emphasized in all three articles, this is just one method. There are many other signal system methods out there that work just as well.

You can see there is a lot to consider, gather, and install to get a working signal system. But when it is finally running, it adds a new dimension to your operating sessions and notches the layout realism up to a whole new level.

I have slowed my operating sessions, and locomotive speeds too. Even operating on my own has become more exciting and fun because of the added interest when running with operating signals.

Realistic signaling is a mammoth task – mine took me four years to complete. It's not one of the easier aspects of a layout build, but it adds so much more enjoyment when you see the aspects changing realistically as you run the layout.

Thank you for following along with this series. I always enjoy sharing my layout build and look forward to sharing some more in the future. ✓

Special thanks: Let me give special thanks for the help and mentoring in getting this series together. Josef Brugger of the *MRH* Staff has been guiding me throughout with great advice on the format, proofreading, and tweaking of the content.

So Joe Brugger, thank you for all of your help! ■



39, 40. Running trains with realistic signaling in place takes the fun to a whole new level!

JASON MILLER



Jason lives in Diamond Creek, Victoria in Australia. He has been building his HO scale layout for the past eight years and attributes his start to his wife Linden, who said that he needed to get a hobby! What a wonderful wife....

Jason is a professional fire-fighter and has been doing this for 15 years. When not at work he enjoys spending time with his family and working on the layout. Jason and Linden have two boys Lachlan, 11, and Toby, 7, who are both showing a keen interest in the hobby.

When not working on the layout and spending time with the family, Jason likes to work in the garden of the family home, and also enjoys having a coffee with the family at one of the local coffee shops.

The layout is HO scale and is based on the Reading Lines between the early to late '70s and the Conrail merger era. ■



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WHAT'S NEAT



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KEN PATTERSON VIDEOS A MASSIVE COLORADO LAYOUT, **JOE HUDSON** CREATES MUSEUM-QUALITY FIGURES, WE SEE A SOUNDTRAXX STEAM SOUND INSTALLATION, AND MORE ...

THIS MONTH, WE LOOK AT BRAD JOSEPH'S beautiful HO scale Union Pacific layout. We watch Joe Hudson explain how he makes figures, starting with paper clips and finishing with a perfect museum quality figure. Steven M. Conroy takes us above dry Southern California to witness a BNSF business train in "Modeling Ideas from Above." Jeff Meyer shows a fantastic weathering job on a box car. We visit the magnificent masterpiece of David Trussell, the Colorado Model Railroad Museum with an account of his efforts to build his life's dream in his home town of Greeley, CO. George Bogatiuk from SoundTraxx shows us how to install sound in a steam locomotive. All that, and more, in this month's What's Neat video. ✓

► PHOTOS AND VIDEO OF SUPERB MODELING

The Colorado Model Railroad Museum



1-4. David G. Trussell, founder of the Colorado Model Railroad Museum in Greeley, has a passion for trains. [1, top left] A model railroader since his childhood, he built many home layouts before building on his experience to form the Greeley and Tahoe modular layout. [2, bottom left] I remember this layout well. When I brought the Midwest Valley Modelers layout to the Kansas City NMRA National Convention in 1998, Dave's group set up its modular layout just two layouts away. With realistic scenery, brown skirting, and a model ship and port, I will never forget it.

Dave started working on his life's masterpiece, the Greeley Freight Station Museum layout, by planning a very detailed



track design. [3, top right] & [4, bottom right] The museum later changed its name to the Colorado Model Railroad Museum. This layout's principal railroad is called the Oregon, California & Eastern Railway. It took more than 10 years to plan and construct, including the 10,000-square foot building to house it. The building is filled with a life's collection of over 1100 railroad artifacts and memorabilia. The 5,500 square foot double deck layout measures 60 by 98 feet.

WHAT'S NEAT | 4



5. In one corner of the building is Colorado & Southern Caboose #10583, fully restored to its original condition. This caboose will turn 100 years old in July 2019, with a birthday party sure to draw a crowd.



WHAT'S NEAT | 5



6. The layout is an engineering marvel with over 21 scale miles of track and a mainline run of more than 1,300 feet. It is a double-deck point to point railroad designed for operation with a fully functional CTC panel and a dispatcher directing train movements on the layout. The layout has an array of scale trestles and bridges, all hand-built with thousands of pieces of scale lumber.



Also see the new "What's neat this week" weekly video podcast!





7. Minimum radius on the mainline is 48 inches. The route brings the trains through the 2.5 percent grades smoothly between levels, with a track height between 40 and 98 inches from the floor.

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8. The lumber industry is one of the main industries represented on the layout, from the forest to the lumber mills, to the ocean ports. The lumber industry, from tree to finished product, is modeled in its entirety. During a normal session, operators run 14 freight trains with eight or so locals in both directions on the single track mainline, Multiple passing sidings easily allow the 80-car freight trains to pass each other on their way to their destinations.



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WHAT'S NEAT | 8



9. An elevated viewing platform runs the entire length of the building and the birds' eye view of the layout is quite interesting. There is a 95-foot-long staging yard under the full-length viewing platform. This area is a beehive of activity as train crews depart and arrive with their long freight drags.



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Have you seen this?



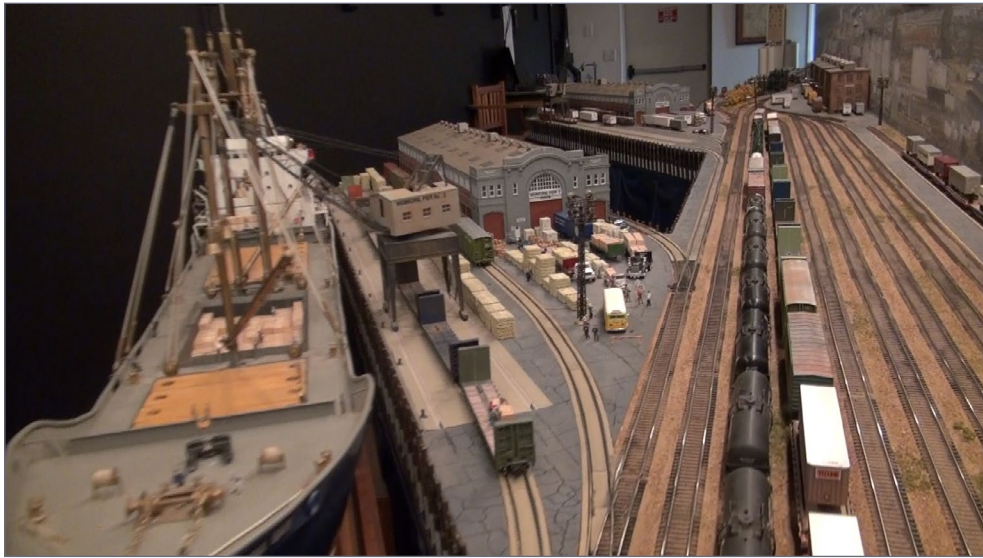
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10. (Left top) The port is complete with petroleum transfer facilities, along with lumber and general freight. The ships are simply magnificent. They are fully functional with full lighting and radio-controlled propulsion when floating in real water. They are displayed on rolling platforms next to the dock. The scale model of the SS Edmund Fitzgerald is a work of art, complete with a full crew, hatches, cranes, and highly detailed superstructure. An equally impressive ore dock runs the length of the ore freighter. I spent two days at the layout and never really saw all of it, or even grabbed a throttle to try my hand. What I did get was a great interview with Michelle Kempema, the executive director of the museum. Thank you, Ed Dressel and Killian Ruble, for great camera work.

11. (Left bottom) Michelle Kempema, executive director of the Colorado Model Railroad Museum, describes how the museum works with the community to share the joy of model railroading and teach youth about the transportation of goods by rail. Other programs include summer camps, after-school activities, Boy's and Girl's Clubs, and special hands-on building clinics for the youths to teach the history of model railroading and the basics of model building and scenery. Hundreds of volunteers include clubs visiting from around the country to operate the layout and give their time to share the hobby with museum visitors. Michelle describes it as a national base of volunteers that helps share and promote the hobby.

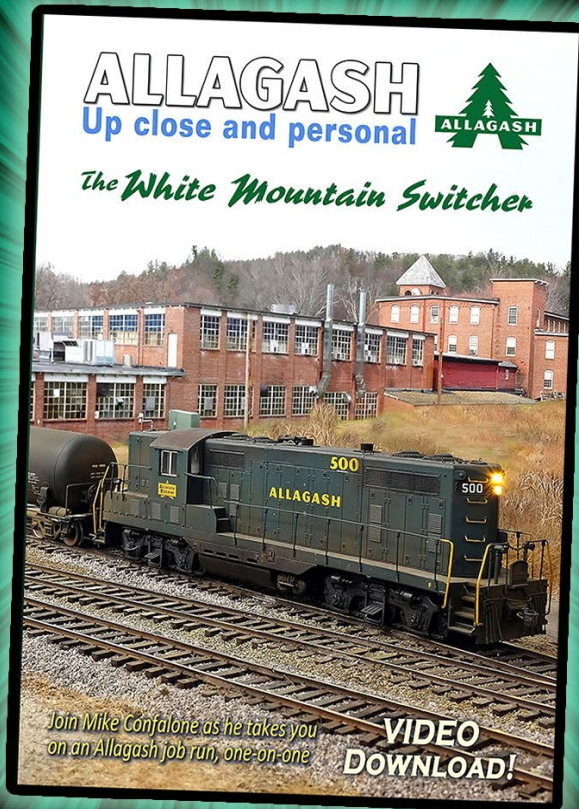


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WHAT'S NEAT | 11



12. The layout is covered with over 28,000 hand-built trees. The layout is cleaned every Monday. A three-page checklist itemizes every step of cleaning track, buildings, trees, and all the rock surfaces. The mountains are cast with rock molds and some extend from the floor to over 12 feet high.



13. The museum is in Greeley CO 80631 at 680 10th St. Hours of operation are: Winter hours, September 2018-May 2019, Friday and Saturday 10am-4pm, Sundays 1-4pm. Summer hours: June 2019-August 2019, Wednesday through Saturday 10am-4pm, and Sundays 1-4pm. Their website is www.cmrn.org.

WHAT'S NEAT | 12

Brad Joseph's UP layout



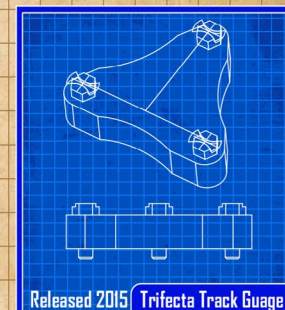
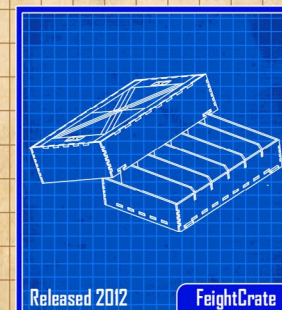
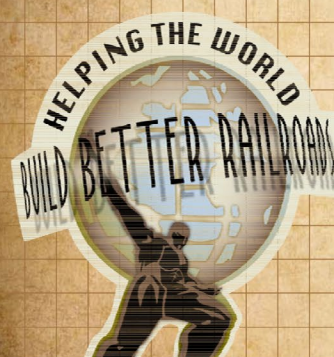
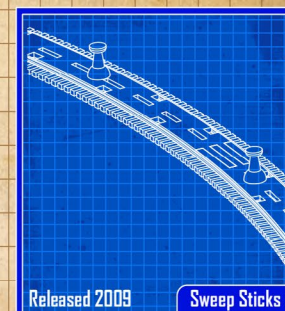
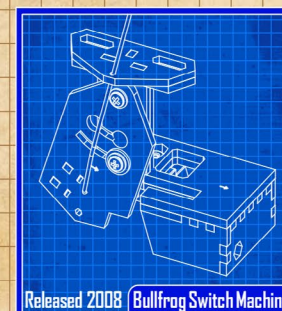
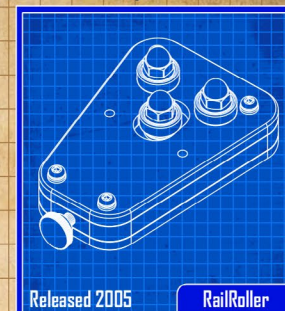
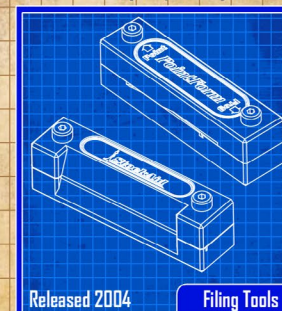
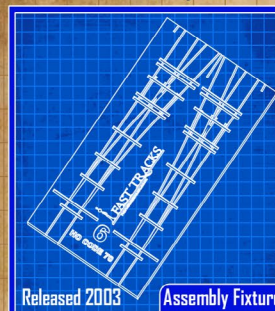
14-15. Brad Joseph is a true artist with scenery on his beautiful HO scale Union Pacific railroad. The 1958-era layout is built in a walk-around design with a linear track flow. The double deck layout uses train order and time table dispatching with a fast clock. Brad enjoys the railfanning aspect of modeling too, and is modeling specific areas down to the rock and bridge placement as per photographs.

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16, 17. Brad creates his backdrops for each area by projecting slides on to the Masonite backdrops and tracing the scenery to match the foreground perfectly. His Cheyenne roundhouse was built from photos and measurements he took himself. He said it was the hardest scratchbuilding project he has ever tackled, as the building was so large and had so many varying wall patterns. He modeled a cool winter scene depicting the Wasatch Mountains and Devil's Slide in Utah with the paired bridges and red rock high bluffs in the area.

He supports model railroading through National Model Railroad Association and national train shows, along with a train show/display every Christmas at his place of work. A prototype passenger car is built into the building, with an exact replica of the Dearborn Station platform in Chicago as a major draw.

Jeff Meyer weathers a box car



18. This month, Jeff Meyer shares how he weathered this freight car, an Evans plug door box of the Oregon, California and Eastern Railway. The car was furnished by the Colorado Model Railroad Museum, and is from the railroad modeled on the layout. Jeff weathered the car in about 10 hours. He masked the reporting marks so they would look patch-painted and updated them. He started by airbrushing a light mist of white to fade the blue paint. He followed this up with white oil paints to further enhance the fade. He then painted the roof with acrylics, using Burnt Umber to represent old rust. Jeff finished the sides of the car with oil paint spots pulled down with a dry brush to create the appearance of leaching rust washed down by rain and gravity. A little airbrushed dust and a few decals, including yellow reflective stripes, and the car was finished.

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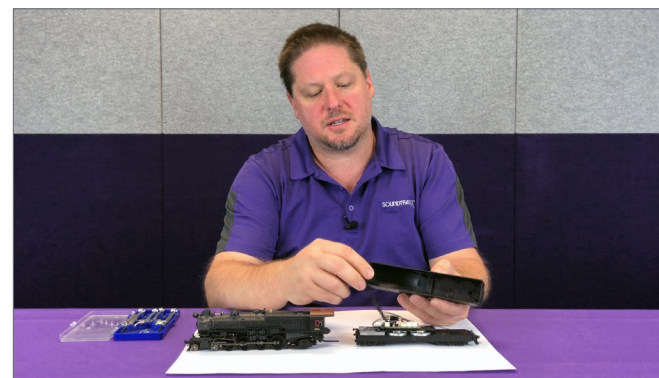
Joe Hudson scratchbuilds figures



19-23. (Top, bottom left, and top right) I met Joe Hudson at Mark Twain Hobby during a visit to the store. I learned of his talent of figure scratchbuilding and immediately pulled out my video camera and asked him to describe the process. He uses paper clips as the basic form and posture, then covers the metal wires with clay or putty that hardens when dry. He carves and shapes the figure's details with simple toothpicks. After painting with acrylics, he has museum quality figures, as seen in these photos. The store displays an entire glass case of characters, many of which have been featured in the model press in how-to articles over the years.



George Bogatiuk installs a Tsunami2 steam decoder

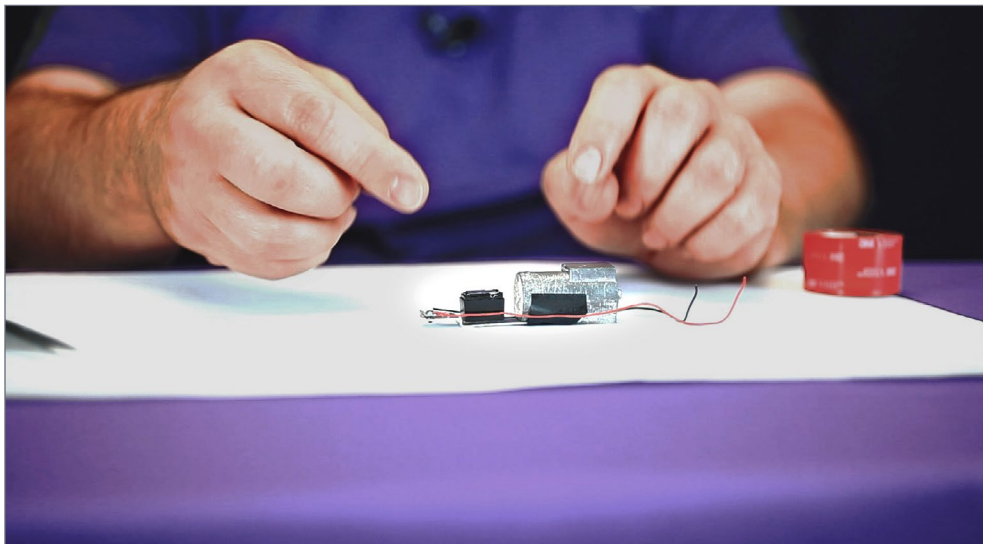


24. This month, George Bogatiuk of SoundTraxx shows us step by step how to install a Tsunami2 steam decoder and current keeper in a Broadway Limited M1a steam locomotive.

George starts by removing the shell from the tender to access the insides. He then pulls the boiler from the locomotive's drive train, unplugging the wiring harness inside the locomotive.



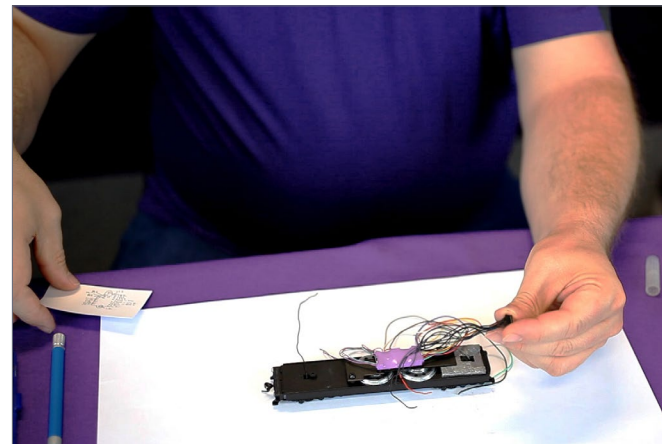
25. He removes the weight and smoke unit, which will not be reinstalled.



26. In the smoke unit space, George installs a small speaker in a plastic enclosure to add sound to the boiler. He reinstalls the weight and the smokebox front, with the light wires pulled through the boiler. To connect the wires from the locomotive to the tender, he uses the factory-installed plugs.



27. He makes a map of the wires, power positive and negative, the light wire feeds and speaker feeds, by drawing a diagram of the existing wires on a piece of paper. Following this chart, George solders the wires through the plug. He then reattaches the boiler to the power assembly.



28. In the tender, he removes the factory circuit boards and attaches the Tsunami2 decoder and two speakers to the back with double-sided tape. He wires the two speakers in the tender in series

to work without overloading the decoder's amplifier. The next step is to simply wire the decoder as per the colored wires and the decoder's instructions.

He wires the decoder directly to the tender's plug, referring to his paper diagram and the decoder's color-coding instructions. The current keeper plugs into the decoder's two-prong jack.

WHAT'S NEAT | 19



29. This current keeper will power the locomotive for up to 20 seconds on dead track. George installs the tender shell and test-ran the locomotive. The decoder installation takes 30 minutes in this month's video, with every step shown with three camera angles.



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30. Time for a runby.



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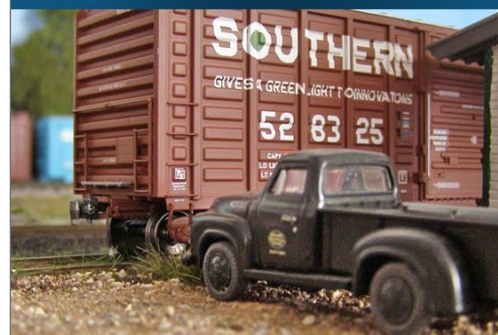


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SPSF C39-8E:

Custom detail and paint project



ERIC MILLER *builds a modern diesel for a
proto-freelance railroad ...*


RATE THIS ARTICLE

FOR THIS PROJECT, I STARTED WITH A NORFOLK Southern Atlas C40-8 [1]. The C39-8E is essentially a C40-8 with an older fuel tank. The Atlas model runs well and is easy to add DCC and sound to. The NS version works well for me because it comes with the black chassis. However, the NS version has the newer phase C40-8 shell, so I couldn't use the entire shell.

I had a number of Atlas Dash 8 parts, which would work for the correct style of long hood, including part of an older-phase C40-8 shell.

As with every locomotive project, I came up with a strategic plan on the order of the steps. I like to add the sound decoder first so I can test the functions and make sure it works. With this project, I would need to mill some metal off the chassis to fit the older fuel tank and needed to do that before working on the sound installation.

In order to mill the chassis, I need to kitbash the fuel tank so I know how much metal to cut away. I planned to modify one truck assembly. I need to make sure I do that before installing the sound, since I need the electrical pickup from the trucks to power the decoder. See how these jobs stack up?

Therefore, the plan is to start with the fuel tank and trucks, then work on the chassis, and finish up the sound installation. After that, detail and paint the shell, apply decals, weather the locomotive, then finish the assembly.



1. The Atlas C40-8 in Norfolk Southern purchased for the project. This was like-new with minimal running time, and the detail parts were still wrapped in the box.

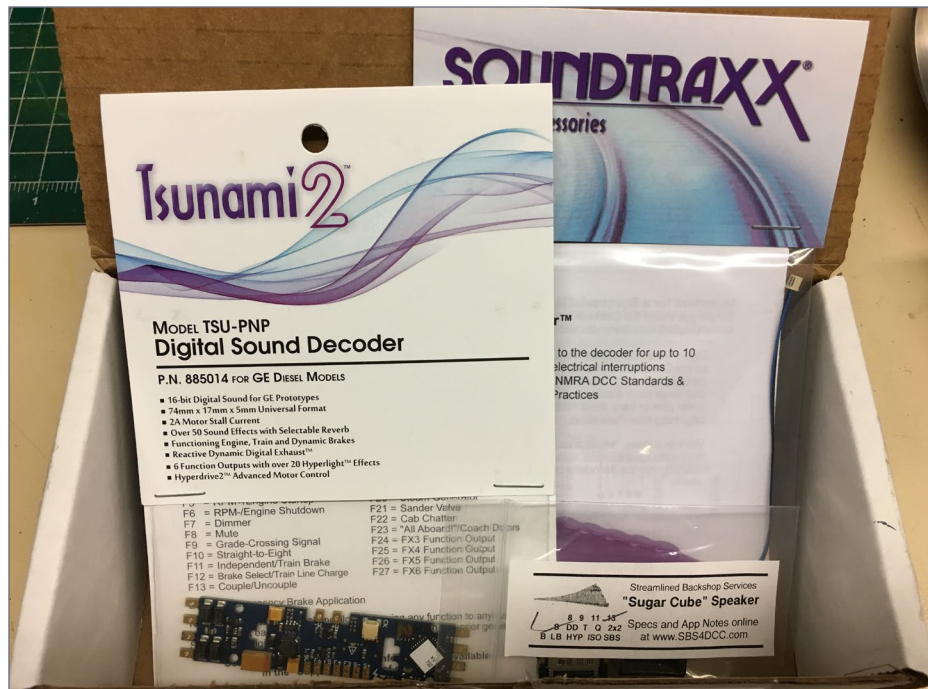
I used a SoundTraxx Tsunami2 PNP GE Diesel sound decoder (885014), a Streamlined Backshop Services sugar cube speaker, and a SoundTraxx CurrentKeeper. I already had Tsunami2 units in a GP35 and an SW1500, so I had experience with this type of decoder.

I like the improved sound, especially the air horn, and momentum is something I use in my operating sessions. CurrentKeepers in all of my powered locomotives help keep the locomotive running and sound on.

The Atlas C40-8 has a space for a round speaker, but I like to position a square speaker in the rear of the long hood, facing down for the sound to go through the truck opening. This way, the shell acts as a box for the speaker and makes the sound better. The factory speaker area gets in the way of adding the longer DCC/sound circuit board, so I cut it back a little. I have used a few of the sugar

cube speakers [2] made by Streamlined Backshop Services, and decided to use one with this project.

I ordered some detail parts before I started working on the locomotive. The Atlas shell comes with a lot of detail, so I didn't need to add generic things like grab irons and MU hoses. I will be adding a Details West air conditioner (#158) and five-chime Leslie air horn (#327).



2. The sound equipment I purchased for the project: Tsunami2 decoder, CurrentKeeper, and a sugar cube speaker. I always like to test this as soon as possible to make sure everything works well while it is still under warranty.



3. The model completely disassembled and ready to start work.

Disassembly

Now that I have the materials for the project, and a working plan, it's time to tackle construction. Take apart the entire locomotive, including taking the shell off the frame and removing all the details like the window glazing, number boards, and MU hoses.

Then separate the metal chassis from the motor, driveshafts, worm gear, and factory circuit board [3]. This way, work can be done on milling the frame to accept the older Dash 7 style fuel tank. Take off the trucks and disassemble them completely, to paint the sides of the wheelsets.

For the shell, strip the paint off the sill, long hood, cab, and nose using 91% isopropyl alcohol.

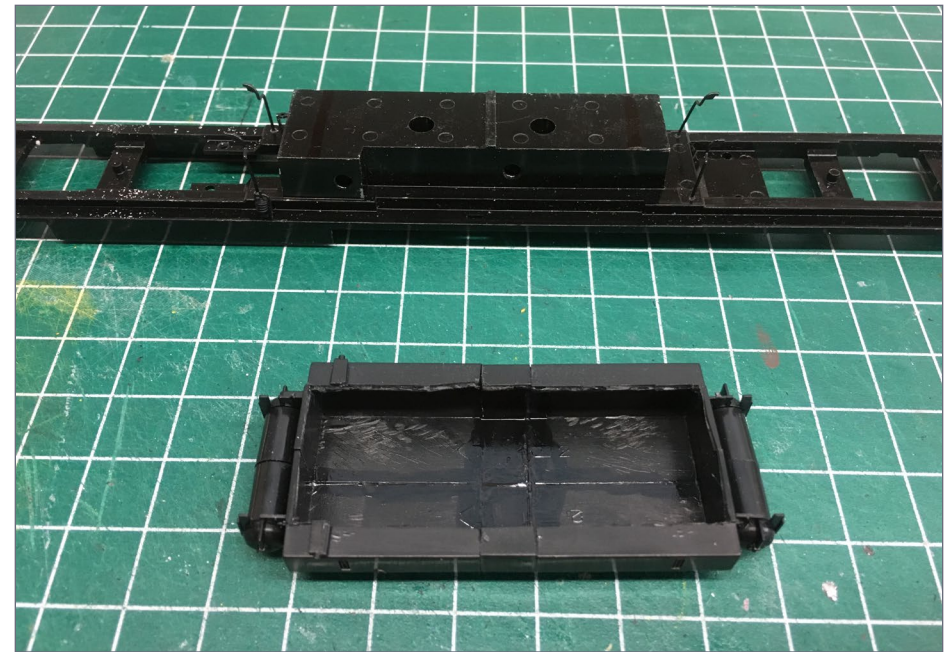
After soaking the shell parts in a tub filled with 91% isopropyl alcohol for a few hours, strip off the paint using a very soft toothbrush, and rinse everything with warm water. A trick to speed up this process is to place the plastic tub with the alcohol in a sink filled with hot water. The higher temperature helps remove the paint faster.

Fuel tank

To finish the chassis so I can test out the DCC and sound, I need to paint and weather the truck side frames and finish the fuel



4. Comparison of the C40-8 and C30-7 fuel tanks next to the underside of the chassis. The C30-7 fuel tank will need to be "stretched" to the same length of the C40-8 tank.



5. The C30-7 fuel tank has been cut in half and a section of the spare C30-7 tank has been spliced in the middle. After this, I added some modeling putty and filed it smooth for a straighter appearance.

tank. Two C30-7 fuel tanks on hand will be kitbashed to make a longer fuel tank for the C39-8E frame [4].

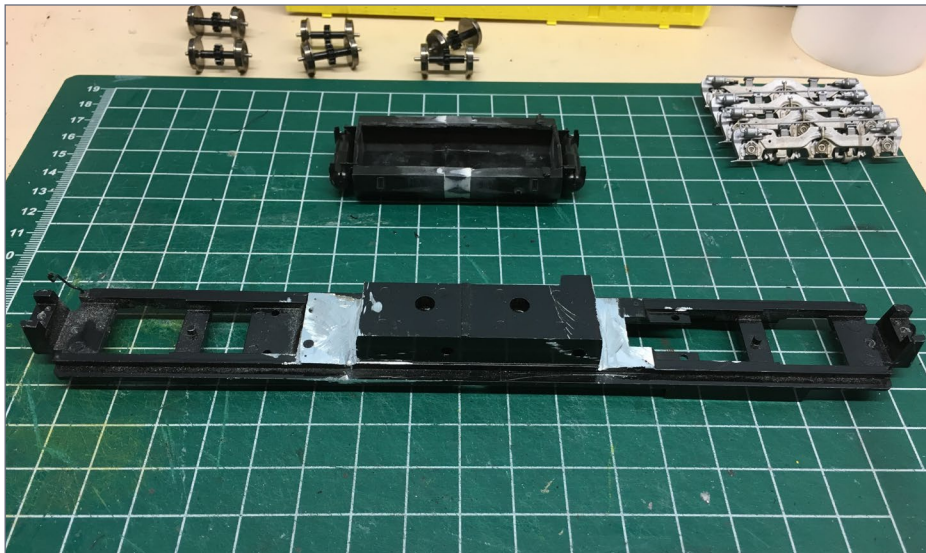
Cut one tank in half, then measure the rough amount of extra tank length needed to fill in this space and cut that out of the middle of the second tank [5]. I just eyeballed everything and didn't use exact measurements. A simple X-Acto precision razor saw will cut the tank. File everything to fit smoothly. I used Micro-Mark Same Stuff plastic welder to join the parts. After gluing the pieces together, fill the cracks with modeling putty and file it smooth after that dries.

With the tank kitbash completed, use it as a guide for milling the chassis [6]. The fuel tanks fits around a metal bulge. Since the older-style fuel tank has a space for the air reservoirs on the end, use a Dremel motor tool to cut off about a half inch of metal on each end of this metal bulge.

After milling the chassis, clean up the metal edges with a file, and touch up as needed with black paint. Wait until later to add the tank, after it is painted and weathered.

Trucks

While researching late-phase C39-8s and early-phase C40-8s, I learned that trade-in trucks from older General Electric



6. I had to mill down the ends of the metal block on the bottom of the chassis so the extended C30-7 fuel tank would fit. This was made easy work thanks to my Dremel motor tool. This also shows the fuel tank before painting, and the trucks after painting.



7. Compare the older Adirondack truck side frame and the newer GSC truck side frame. The Adirondack side frame is on the left and the GSC side frame is on the right.



8. Test-fitting the older Adirondack side frame on one of the C40-8 truck assemblies. Again, the older Adirondack truck is on the left, and the newer GSC truck is on the right.

“U-Boats” were sometimes used. For example, Union Pacific traded-in some U30Cs when they ordered their C40-8s, and the trucks were reused after being rebuilt to more modern standards. The U30Cs had older Adirondack trucks. It was fairly common to see the C40-8s with mismatched trucks. I wanted to replicate this look with my project – what made this decision easy was a spare set of older Atlas Adirondack sideframes in my spare parts bin, and they fit the C40-8 trucks.

Rebuilt Adirondack trucks have air brake cylinders added on the ends, and a single shock strut in the center, so they look similar to the GSC truck. The main spotting difference is the hole in the

side frame between the axles. The GSC has a center hole, while the Adirondack's are closer to the outside axles. [7] To replicate the rebuilt truck, I removed the outer shock struts, added one in the center, and added the air brake cylinders on the ends. [8] I got these parts from the other GSC truck side frames that came with the C40-8. [9]

What makes the mismatched truck idea even more appealing is that Southern Pacific, at the time of the merger, had a lot of U33Cs on its roster and many had Adirondack trucks. I have read that the SPSF may have added these to the SF30C rebuild program, and I think it's plausible that the rejects may have been traded-in for the C39-8Es with the trucks reused, similar to what the UP did.

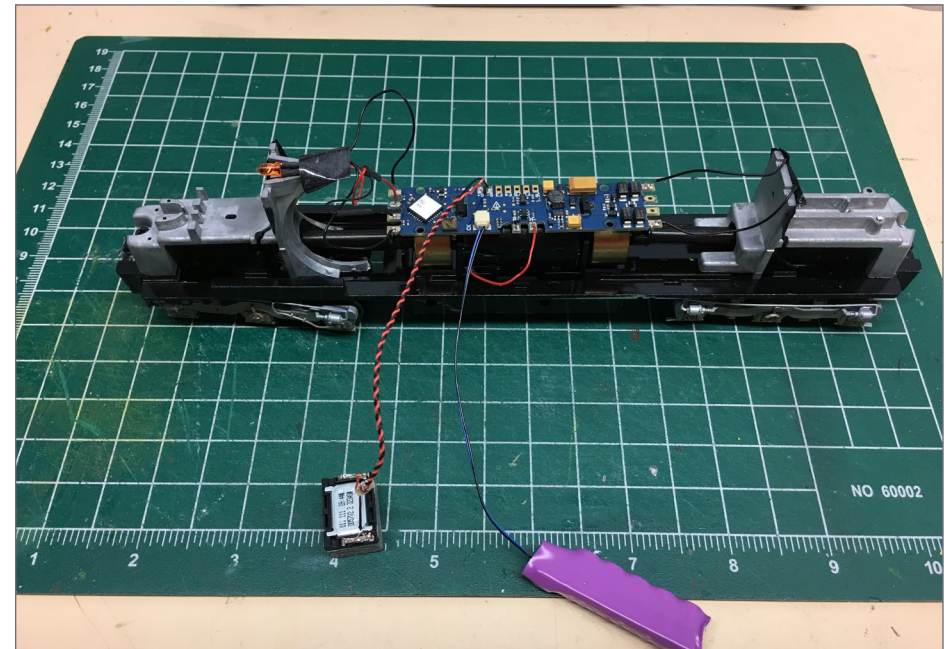
After working on the trucks, paint them ATSF Silver, and weather them lightly with a dirt-brown color. Give them a coat of Dullcote so they are ready to install on the locomotive.



9. The Adirondack side frames after “rebuilding” (on the left), next to the newer GSC side frames. I used parts from the other pair of GSC side frames to update the Adirondack side frames. Now they look very similar, except for the placement of the holes.

Work on the chassis

With that work out of the way, start putting the chassis back together. Put the trucks in first, then the drive with the drive-shafts. After this I add the new sound decoder, which snaps in above the drive. Then connect everything to the PNP board – the motor wires, truck wires, lights (I keep only the front headlight for running a pair of locomotives short-hood out), speaker, and plug-in the CurrentKeeper. With all of that connected, test the locomotive for functionality and then program it. I use JMRI Decoder Pro. First I program the locomotive number on the main track with my NCE system, then program all the details on JMRI. [10]



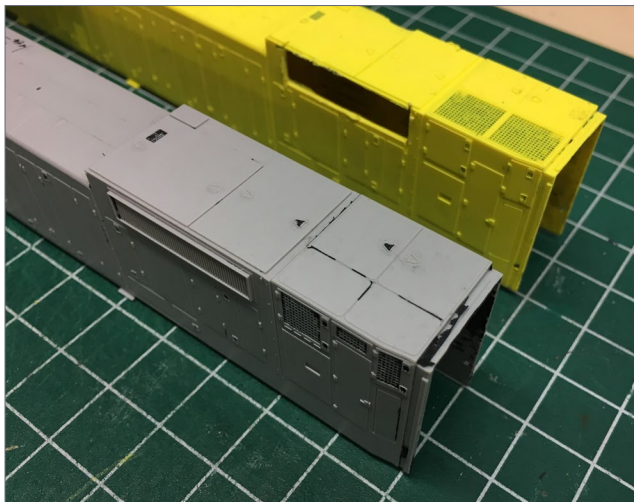
10. When everything is installed on the chassis, the locomotive is ready to test and program.

The speaker will need to be placed up in the shell after the body is painted, decaled, and weathered. I will find a more permanent spot for the CurrentKeeper, so we will work on these later.

Shell preparation

As I mentioned, the C39-8E uses an earlier phase C40-8 hood. I have one of these older hoods but unfortunately, I cut out one of the grilles for another project. So I cut the shells and combined the two. The difference in phases is on the front of the long hood just behind the cab. The early phase has grilles on top of the hood, while the later phase has the grilles on the side. [11, 12]

On the older-phase hood section, I made cuts on each shell with a little extra room left, again using the X-Acto saw. I chose to cut along a band on the hood that wraps around the entire body where I would glue the two pieces together – piecing the parts together at this seam will make the cut unnoticeable. Then I filed



11. Comparison of the different C40-8 phases – the yellow shell is older phase; the gray shell is the newer phase.

the plastic off until I got close to that line, and started fitting the pieces together, using the sill as a guide for how long it should be.

I glued it using Plastic Weld and added styrene strips inside to keep it strong [13].



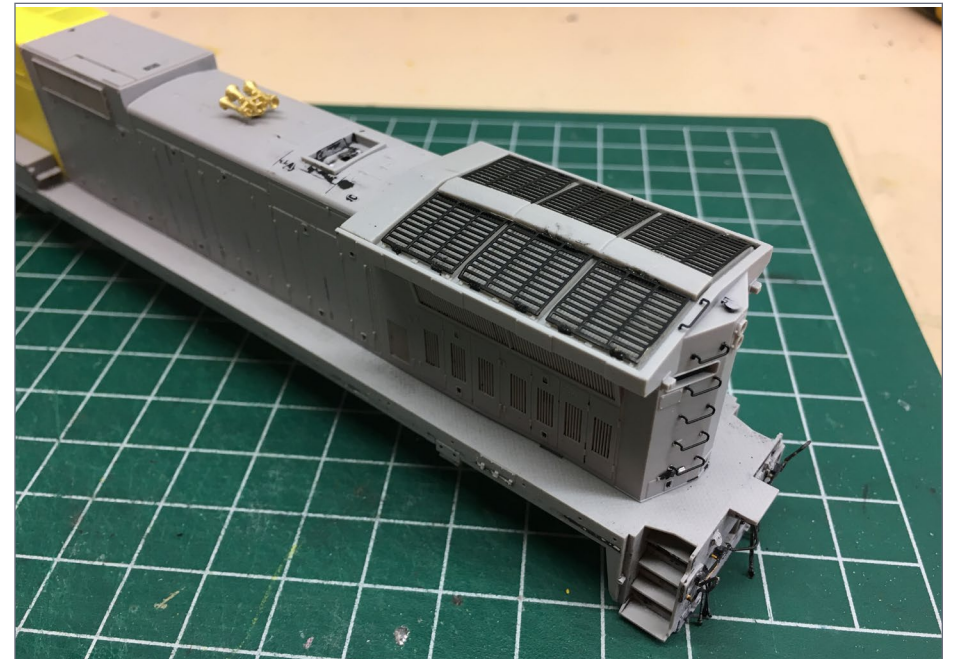
12. I could have used the yellow shell if I hadn't cut out the grilles for another project. Instead, I will cut off the very front of the older-phase shell and connect it to the rest of the newer-phase shell.



13. Test-fit the parts on the sill to make sure they have been filed down appropriately. The air conditioner is added to the top of the cab and the new five-chime brass air horn is attached to the center of the long hood. I will wait to add the exhaust stack so I don't have to repaint it silver.



14, 15. Different angles showing the details before painting the shell.



16. I added the new radiator since I had the extra part on hand, and it is hard to strip the paint beneath the radiator grilles without taking everything apart.

Next I added the detail parts (air horn and air conditioner). Wait to apply details like the MU hoses and plow until after painting. At this point, I decided to remove the radiator section and replace it with a new, undecorated radiator section I had on hand, since there is a lot of loose paint under the radiators after stripping the paint off the factory model. With these last steps, the shell is ready to paint. [14, 15]

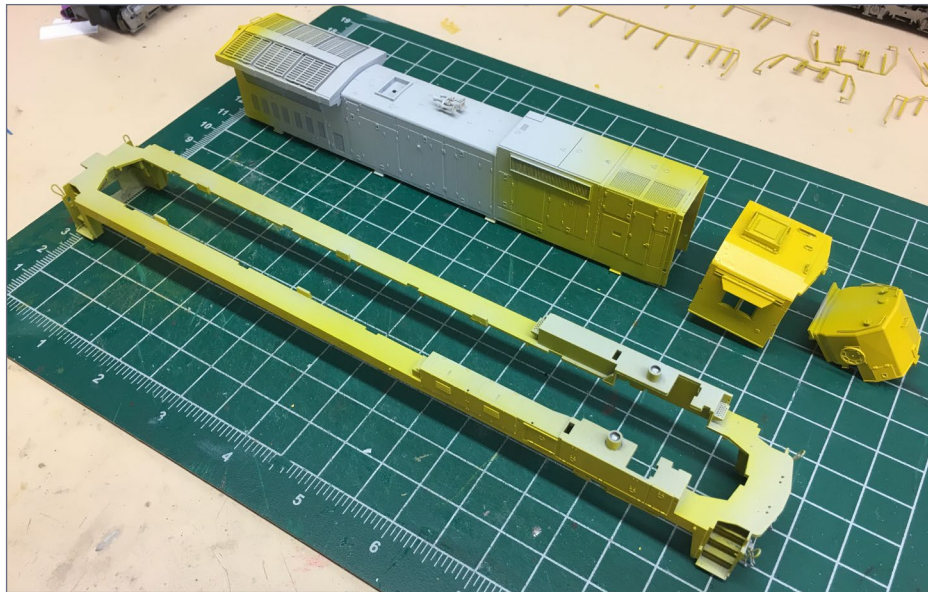
Paint, decals, weathering, and assembly

I use Badger ModelFlex acrylic paints when I can. They make the colors I need for the Kodachrome paint scheme, including ATSF

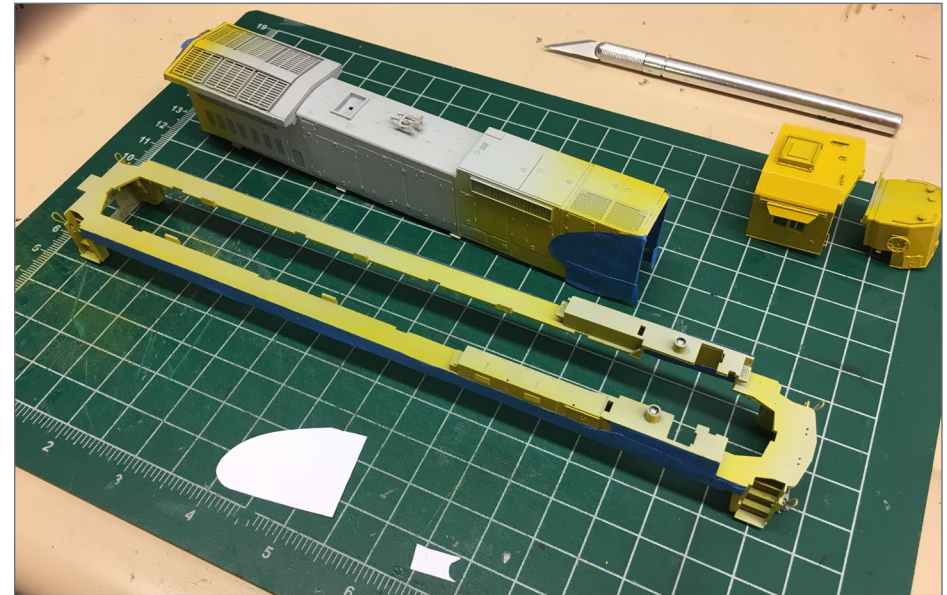
Yellow and SP Scarlet, and a basic black, like Engine Black. I start with SP Letter Gray as a primer with light colors like yellow and red.

Paint the sill, long hood, cab, nose, and handrails SP Letter Gray, then clean the airbrush and switch to ATSF Yellow for the nose and cab, and front and rear of the long hood, side of the sill, and handrails. Paint the handrails while the airbrush is filled with yellow [17]. Then I tape off the yellow colors, including the warbonnet curve.

To mask the curve, I use paper templates cut from copies of a Microscale decal set (87-476). I use the templates to draw the



17. SP Lettering Gray is the primer, followed by ATSF Yellow. I paint the entire nose and cab, then aim for the parts on the long hood and sill that will be yellow. Paint the handrails at this time.



18. Make the warbonnet curve masks by cutting out the curves on blue painter's tape, using paper templates. After applying the first masks, spray the exposed yellow areas with SP Lettering Gray so the red coat goes on evenly. Then apply a coat of SP Scarlet.

curve on blue painter's tape and cut the tape with a sharp X-Acto knife. Carefully place the curves on the shell and tape the other parts of the long hood, like the rear, and side sill.

Apply another coat of SP Letter Gray over the yellow where the red will go. If this isn't done, the red will look lighter where the yellow overspray was. Trust me, from experience. Then paint the SP Scarlet on the long hood, let it set up, tape off the red, and paint the top of the long hood and the rest of the sill black. [18] Once the black is done, remove all the tape and see how everything looks. I usually do a small amount of touch-up painting

with a brush, including the yellow step edges and any grab irons, such as the rear grabs that are red in this paint scheme. I find it is important to paint the entire Kodachrome scheme in one day so the tape isn't left on the model too long.

This is a good time to add some details that don't need to be painted, like MU hoses and the plow, so they are on for weathering. [19]

With the painting done, it's time for decals. Assemble the shell parts and apply a clear gloss coat to the entire shell. After it dries, cut out the decals and apply them. I used Microscale 87-496 for the SPSF decals, and 87-925 for the diesel data.



19. After masking for and painting the black area, the tape comes off to reveal the Kodachrome scheme. There is always some touch-up painting by hand, including some details. The glossy coat works best for applying decals.



20. A more realistic shell after some weathering. A dull clear coat tones down the model, and pastels add grime to specific areas.

I used my C40-8W as an example of where to locate all the decals. For the diesel data, find an example of a similar locomotive, like a real Santa Fe C40-8W, to figure out which labels to apply and where to put them. I use Walthers Solvaset to adhere the decals and help get the larger hood decals to settle into the cracks and crevices.

After the decals dry, add the handrails so they are on for weathering. Then apply another coat of clear gloss to the shell, and it is time to start weathering. I start with some Rustoleum Frosted Glass to dull the shell and slightly fade it.

Since this will be one of my oldest six-axles, I want it to look used and a little worn. I use pastels to weather my locomotives, and

fade the black areas with a little cool gray. Then add some dirt brown to the bottom part of the shell and finish it off with black on the grilles and top of the locomotive.

Build the weathering up slowly and check between layers. After that, apply a final matte coat, like Testors Dullcote. [20]

With weathering done, the locomotive is ready for final assembly. Put the window glazing and number boards in and glue the fuel tank to the bottom of the chassis. I use a small amount of super glue like Loctite Gel to affix the fuel tank to the chassis.

At this time, I glue the speaker into the shell with silicone adhesive so the speaker is very easy to take out if needed. Let the adhesive dry overnight before continuing the rest of the

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21. The locomotive poses at the Bellevue Station after final assembly. Of course, the local railfan heard about the locomotive running on the Meadow Sub and came to check it out.

assembly. Use a small piece of tape to place the CurrentKeeper above the decoder board so it stays in place and still leaves room for the shell.

Test-fit the shell on the locomotive and if that works, finish it by adding coupler boxes. Now the C39-8E is ready for service on the Meadow Sub.

Operations

The C39-8E is the fourth six-axle in my locomotive fleet. These locomotives fill two roles for the Meadow Sub. They operate the manifest trains between South Omaha (where my layout is located) and Kansas City, which is a major hub for the SPSF

and the SPSF uses trackage rights on the Union Pacific to reach the Meadow Sub. They also power the grain shuttles from South Omaha to the grain elevators in Meadow at the end of the branch line.

A pair of SPSF six-axle locomotives pull the manifest from Kansas City to South Omaha, and while the locomotives lay over in South Omaha before returning to KC, they are used to run empty grain hoppers to Meadow and bring loaded hoppers back.

On my layout, only the run between South Omaha and Meadow is visible, and also is used in operating sessions – the manifest is a behind-the-scenes or “beyond-the-layout” move. However, these locomotives come from Kansas City, and anything from the



22. Crossing Washington Street next to the South Omaha Terminal bridge.



23. The C39-8 laying over at the Chuck Shell Diesel Shops in South Omaha, waiting to lead the unit grain shuttle or take the manifest train to Kansas City.

diesel yard there could be used. I need a little variety in the six-axle fleet, so I have four locomotives to rotate. My other jobs get the same locomotives almost all the time. Of course, sometimes I think I should add even more to the fleet! The locomotives stage at the diesel shops on the layout, showing that they are between runs to and from Kansas City.

I use a combination of powered and dummy locomotives, and the six-axes are no exception. I have two powered units, a C44-9W and the C39-8E plus two dummy units, a C40-8W and a KCS SD60. The two powered units have DCC and sound.

The SD60 also has sound, so when it is consisted with the C44-9W or C39-8E, you can hear different prime movers. I

currently don't have sound in the C40-8W, since it would be the same as the other GEs, but I might add it later.

With this arrangement, I mix or match the powered and dummy units, and don't have to worry about speed-matching, which is a big reason I like using dummies. I don't need the extra power for the relatively short trains on my light grades.

In this arrangement, the C39-8E will be used with either the C40-8W or SD60 to power the unit grain shuttles. It looks nice with the slightly newer wide cab as well as the SD60, which is from the same era of locomotive production. I am going to try letting crews pick their own six-axle power, since the units are very easy to MU and set up for operations, so that will be fun for future operating sessions.

The C39-8E adds an interesting locomotive to my fleet, helps fill a gap in the chronology, has awesome sound, and is a great runner for my grain trains. I look forward to using it in many operating sessions to come!



24. Side view at the Bellevue Statio.



25. The C39-8 at the Meadow Siding.

ERIC MILLER



Eric got into model railroading with a Bachmann HO scale Santa Fe train set just before high school. He started working on a prototype-freelanced concept after that and never looked back.

Following a brief hiatus from modeling during college, Eric started developing the Meadow Sub about 10 years ago with construction starting in 2010 thanks to help from the local Tuesday Night Conspiracy modelers.

He has since changed his layout to a small switching layout, and currently models the UP-operated Stockyard Industrial Lead, which is based in the same South Omaha area as the SPSF Meadow Sub was. His new website is www.stockyardlead.com.

Eric lives in the Denver, CO area with his wife Heather and two daughters, Lindsay (6) and Courtney (3). He works at an engineering consulting firm and does rail operations planning and simulation for passenger rail clients. ■

BACKGROUND AND PROTOTYPE INFORMATION



27. CSXT GE C39-8 7484, former CR 6009, built in 1986. *Photo from Wikipedia*

When deciding what motive power to run on my proto-freelanced late '90s SPSF Railway, I adhere to what the ATSF and SP really purchased. This is easy to do because both railroads bought similar locomotives, like GP60s, B40-8s, and C44-9Ws. It makes my fictional railroad more believable because I'm not out on a limb saying the railroad really bought some random locomotive(s).

However, this project is a little different. I wanted to add a fourth six-axle locomotive to my fleet, and I wanted something that wasn't yet in my roster for the Meadow Subdivision.

I also wanted a locomotive that was older than the B40-8W I have, but newer than an SF30C or C30-7, which had essentially

left the BNSF roster in my era. The problem is that there is a gap in Santa Fe and the Southern Pacific six-axle orders in the 1980s – so there is no prototype to follow in this case.

Both railroads had large rebuild programs at the time. Both railroads held-off purchasing new motive power while the merger proceedings were going on – Santa Fe's last order of new power was in April 1985 with GP50s. Their next new power was not until the GP60s in May 1988.

Therefore, I decided the SPSF would have purchased some new power before this time, if the merger was approved in mid-1986. The combined companies would have a greater ability to purchase new power and modern power would draw attention to the new company.

Another goal would be replacing some of the older power on the combined roster, like some of the U33/36Cs and SD45s – locomotives that might be beyond a rebuild program.

Using my rule of limiting my roster to what the ATSF and SP really had, I decided to go with an earlier model than the C40-8Ws of the ATSF, as well as something similar to the B39-8Es of the SP. So I came up with the C39-8/C40-8. Then I had to decide on the specific phase.

I thought about what the SPSF would have done in real life, so I created a rare bit of alternate history for this. Say the merger is approved by the ICC on July 24, 1986, instead of being denied. That would make a merger in January 1987 possible, given the coordination efforts that were underway since 1983.

I would think that the chief mechanical officer would undertake a survey of motive power in August 1986 and come up with a few

BACKGROUND AND PROTOTYPE INFO *CONT...*

options for management to approve. His proposal would include various options of rebuilding power, both in-house at San Bernardino and at contracting places like Morrison-Knudsen, and buying new power from GE and EMD.

Orders for new power could be finalized by September or October 1986 (preceded by a letter of intent to get production line space) for delivery by the second quarter of 1987. That fit with the desire to have new power for the newly merged company shortly after the merger took place.

That timeline brought me to March 1987 when the NS C39-8Es were built, so I would follow that as the phase to use. Union Pacific got the first C40-8 units later in 1987 and NS/Conrail bought the last C39-8 Phase III models (the humpback style) in late 1986, so those don't fit my timeline.

Next, I wanted to figure out why they got the C39-8E as opposed to other locomotives available at the time. I created a backstory that would assist my goal to create a full SPSF late '90s diesel roster, to satisfy my curiosity on the subject.

Every proto-freelance modeler should have a complete roster of their fictional locomotive fleet. I decided that the brand-new SPSF would order four types of new power: C39-8Es and B39-8Es from GE, and SD60s and GP60s from EMD.

The C39-8Es would be used on daily double-stack intermodal service between Chicago and LA, taking advantage of the combined transcontinental routes of ATSF and SP. Six-axle power would be used on these new double-stack container trains just

coming into use more at this time. UP's APL double-stack container train debuted in 1984, for example.

SD60s would replace aging SP equipment and stick primarily to the I-5 corridor between Los Angeles and Seattle. B39-8Es and GP60s would be used for the increasing amount of intermodal traffic, largely for TOFC and COFC, lighter trains than the double-stacks, and replicate exactly what the ATSF and SP did buy after the merger was denied.

I picked the C39-8E over the SD60 because I already have a KCS SD60 on my roster and I really like GE power – it will be interesting to show the progression of motive power and I already have models of the C40-8W and C44-9W.

More: Read Eric's "Downsizing My Empire: How I Shrank from a Midsize to a Small Switching Layout in the Same Basement" at mrhmag.com/node/34490. 

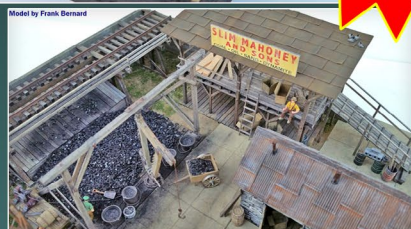


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compiled by **JOE FUGATE****RATE THIS ARTICLE**

1. The usual back-to-back pair of EMD F40PH locomotives rumble by on the point of Train 13, Amtrak's westbound Coast Starlight, on the Southern Pacific's Coast Route in 1982.

Brian Moore weathered and renumbered these Kato locos and installed after-market Soundtraxx Tsunami decoders. Brian took the picture on his developing HO scale home layout, which will eventually feature an operational chunk of the Guadalupe Subdivision and reasonably accurate depictions of Guadalupe and Oceano as they were in 1954.

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2. A hard-working Frisco SD45 leads a diesel lashup through Tulsa yard on a dreary November day in 1975. Steve Hurt acquired this Athearn ready-to-run SD45 from a friend on the Frisco.org site. Steve then added a few Frisco-specific details to it including a five-chime horn, speed recorder, and sun shades. He faded the model finish with a wash of thinned acrylics, then added weathering using primarily oils with some pastels for the soot and grime. Steve photographed the model outside on a small simple yard diorama.



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LOOK

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Model Railroad Hobbyist | December 2018 | #106

JEFF SHULTZ looks at Jacksonville Terminal Company N scale containers ...

THE JACKSONVILLE TERMINAL COMPANY (JTC) IS A NEW producer of N scale intermodal containers that are designed to stack using magnets and steel plates inside the bodies to hold them together.



1. 40-foot high-cube container magnetically connected to two 20-foot containers, held suspended.

FIRST LOOK | 2

★★★★★
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Container types that have been released include 20- and 40-foot standard-height corrugated-side containers with multiple door types, 40-foot high-cube corrugated side containers, 53-foot corrugated-side high-cube containers, 40-foot canvas/open top “rib-style” corrugated containers, and 20- and 40-foot “flatrack” containers with collapsible bulkheads. These were announced at the 2018 National Train Show in Kansas City, and I was able to take photos of them there.

The models provided to *Model Railroad Hobbyist* include 40-foot high-cube corrugated containers decorated for APL, CP Ships, CAI Interasia, and CMA CGM, and 20-foot standard-height containers decorated for GE “CLINIC IN A CAN,” APL, and Tiphook. All the containers included the manufacturer’s magnetic connecting system and IBC (Inter-Box Connecting pins), and as can be seen from the photos, they hold together, including stacking a 40-foot container on top of two 20-foot containers.



JTC has produced retro-fit kits for assorted Atlas, Micro-Trains, and ScaleTrains.com

2. 20-foot corrugated container, 3/4 high view, GE “CLINIC IN A CAN”.

FIRST LOOK | 3

containers to make them compatible with the JTC magnetic and IBC connections.

One special container available from JTC is the Harrison's Heart fundraiser 40-foot high-cube container, which helps to pay the expenses incurred by Harrison Gaudynski's medical treatments for congenital heart defects.

Harrison is the young son of Fox Valley Models' owner, Matt Gaudynski. They can be seen here: jtcmodeltrains.com/products/harrison-s-heart-40-high-cube-containers-with-magnetic-system-corrugated-side-jtc-chd-harrison-s-heart.



3. 20-foot corrugated container, end view, APL.



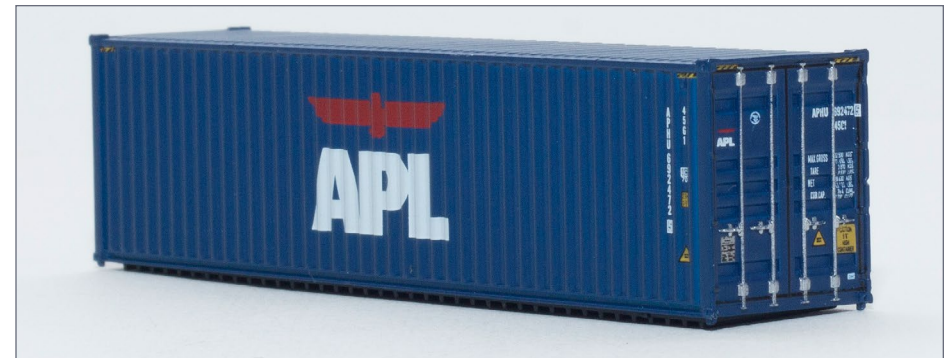
4. 20-foot corrugated container, side view, TIPHOOK.

FIRST LOOK | 4

Two containers are included in each package, and retail for \$29.95, with the Harrison's Heart Fundraiser going for \$35. Check with your local retailer or *MRH* advertiser for availability.

JTC products and announcements can be found at jtcmodeltrains.com.

More photos of the containers, including the "flatracks," can be seen on the *MRH* website in the comment thread for this article. ☒



5. 40-foot high-cube corrugated container, $\frac{3}{4}$ rear view, APL.



6. 40-foot high-cube corrugated container, front view, CP SHIPS.

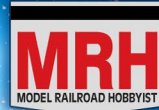


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DECEMBER NEWS

column



Model Railroad Hobbyist | December 2018 | #106

RICHARD BALE and
JEFF SHULTZ report the
latest hobby industry news



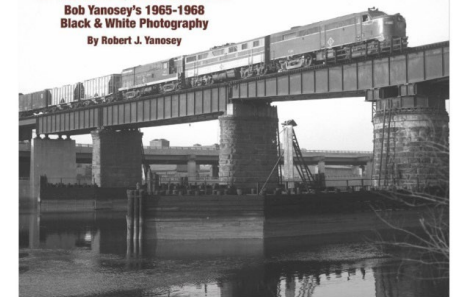
NEW PRODUCTS FOR ALL SCALES

Open Top Loads Flatcar and Gondola Color Portfolio Volume 3



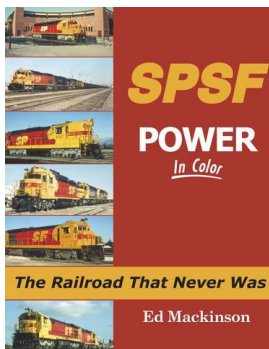
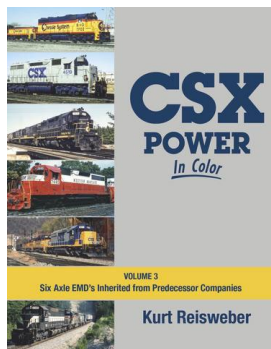
by Robert J. Yanosey

ERIE LACKAWANNA In Pursuit of the Cab Unit Bob Yanosey's 1965-1968 Black & White Photography By Robert J. Yanosey



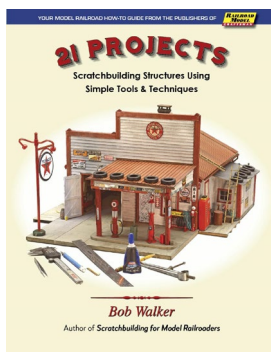
New publications from **Morning Sun Books** include two soft-cover books by Robert J. Yanosey: *Open Top Loads, Flatcar and Gondola Color Portfolio, Volume 3*, and *Erie Lackawanna, in Pursuit of the Cab Unit 1965-1968*.

► THE LATEST MODEL RAILROAD PRODUCTS, NEWS & EVENTS



New hardcover books released just in time for the holiday season include a photo collection edited by Kurt Reisweber titled *CSX Power in Color, Volume 3, Six Axle EMD's Inherited from Predecessor*

Companies. Also new is *SPSF Power in Color: The Railroad That Never Was*, by Ed Mackinson. For additional information contact a dealer or visit morningsunbooks.com.



White River Productions has released "*21 Projects – Scratchbuilding Structures Using Simple Tools and Techniques*," by Bob Walker. The 120-page softcover book offers inspiration and guidance for building structures in HO, S, O, and F scales. The book includes scale drawings for five of the projects. For additional information contact a dealer or visit shop.whiteriverproductions.com.

CLUB CARS



The Burlington Route Historical Society is selling a limited run of HO scale custom painted and lettered Accurail outside braced 40'

single door boxcar kits representing the XM25/XM26 class of cars from the CB&Q, Fort Worth & Denver, and Colorado & Southern railroads. Four cars are available, two CB&Q (XM25 & XM26), one FW&D (XM25), and one C&S (XM26). The cars are equipped with Andrews or Bettendorf trucks as appropriate as well as Accumate couplers. For more information and to order, go to [www.burlingtonroute.org/store/purchase by mail/XM25XM26Flyer.pdf](http://www.burlingtonroute.org/store/purchase_by_mail/XM25XM26Flyer.pdf).

MULTIPLE SCALES



Atlas has announced the re-release of its All Scales Signal System, which features the new Universal Signal Control Board. The board supports both common anode and common cathode signals, and maintains compatibility with Atlas' existing boards and cabling. The system

supports Stand Alone Operation, Integrated ABS Block Signaling, Approach Only Signaling, Flashing Aspects, Complex and Interlocking Signaling, and Manual Control, for integration into CTC systems. In addition to the Universal Signal Control Board, several N, HO, and O scale signals have been announced and an Interlock Control Module is forthcoming. For more information on this and other Atlas products, download the [Atlas Signal Guide](http://atlasrr.com) and visit atlasrr.com or your local dealer.

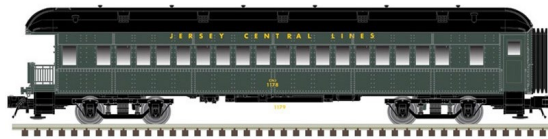
O SCALE PRODUCT NEWS

3rd Rail Division of Sunset Models is soliciting reservations for an O scale Krauss Maffei ML-4000 diesel locomotive.



Road names will be Southern Pacific and Denver & Rio Grande Western. The O scale model will be crafted in

Korea using an ABS body and a metal underframe. The diecast trucks will be sprung with ball bearing axles. Features include a fully detailed cab interior and numerous brass details applied to the body. Operating capability will include ERR CRUISE in 3-rail TMCC with new Railsounds, or QSI "Titan" DCC Sound for 2-rail applications. The minimum radius for 2-rail operation is 48 inches. Availability is TBA. For more information contact a dealer or visit 3rdrail.com.



for release during the second quarter of 2019.



Atlas O is accepting advance reservations for a group of 60-foot passenger cars scheduled



detailed interior with LED lighting. Trucks will be either four or six wheel depending on the car body type.

Body types in this release will be a baggage car, RPO, combine, coach, and an observation car.

Features of the Trainman series models include working diaphragms, separate grab irons, and



Road names will be Seaboard, Rio Grande, Santa Fe, Lackawanna, Norfolk & Western,

Central of New Jersey, Chicago Great Western, and Monon. Undecorated models are also planned for this release. A video of Atlas 60-foot O scale passenger equipment can be viewed at youtu.be/XJpQqngcOwU.



Atlas O also plans to release a Trainman series 52-foot 6-inch gondola

during the second quarter of next year. The gondola is based on a car built by American Car & Foundry. The model will feature separately applied ladders, brake wheel and brake lines.



Road names will be Canadian National, Burlington Northern,

Chicago & North Western, Lehigh Valley, Delaware & Hudson, Erie Lackawanna, Union Pacific, and Pennsylvania Railroad. An undecorated version will be included in the run. All Atlas O rolling stock is available with a choice of 2-rail or 3-rail couplers and trucks. For additional information contact a dealer or visit atlaso.com.

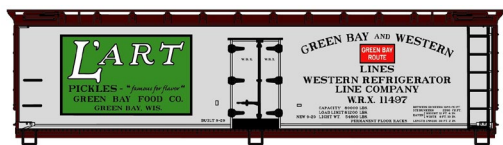


Rusty Rail has released two new O scale cast resin figures. They are identified as Nick (left #RRPR-O-13) and Bob (right #RRPR-O-14). The resin cast figures come unpainted. For additional information visit rustyrail.com.

HO SCALE PRODUCT NEWS



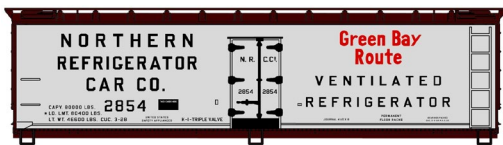
single-sheathed wood car built in 1916.



represent lines operating in and around the Wisconsin area in the 1920s. They included this WRX-Green Bay & Western Lines Western Refrigerator Line Company. The billboard art promotes L'art Pickles. The car is stenciled with a build date of September 1929.



promotes the consumption of butter.



owned by Northern Refrigerator Car Co.



Accurail has released an HO scale kit for a 36-foot Fowler boxcar decorated for the Wabash Railroad. The model represents a

At Trainfest Accurail introduced three new kits for HO scale 40-foot wood reefers decorated to

Somehow the pelican on the side of this FCKX-Farmers' Co-operative Creamery wood reefer

This HO scale model represents an ice refrigerator car built in March 1928. The 40-foot wood car was

For hobbyists at Trainfest who model a more modern period, Accurail offered

this pink HO scale Pullman Standard 4750 cu.ft. covered hopper decorated with a Green Bay & Western patch. All Accurail kits include appropriate trucks and Accumate knuckle couplers. For additional information contact a dealer or visit accurail.com.



of its Genesis EMD GP7/9 diesels next October. The release will include Phase II GP7s, Phase III GP9s, and Phase III cableless GP9Bs.



Athearn has announced plans to deliver an upgraded version

Also scheduled for release next July is a new production run of EMD SD39 diesel locomotives.

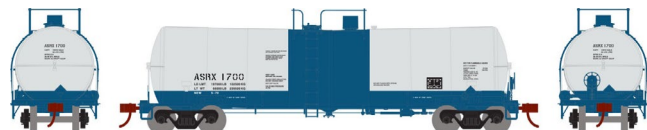


GP7s AND GP9s

Introduced by EMD in 1949, the 1500 hp GP7 positioned the cab behind a short narrow hood rather than an end cab on a cowl body. The full height hood easily accommodated EMD's 16-cylinder 567 diesel engine. Externally, the first 1750 hp GP9s were mostly unchanged from the GP7 but later versions of the GP9 had different louver arrangements. When shopping for new locomotives, many railroads found it more economical to rebuild their reliable GP7s and GP9s than to purchase new equipment.

The Ready-to-Roll series HO scale model will be available decorated for Soo Line Railroad, Lake States (Soo Line Lake States Transportation Division), and Illinois Terminal.

SD39s decorated in Athearn's Primed For Grime weathered paint will be available for N&W, Southern Pacific, BNSF, Great Northern, and Santa Fe. The HO scale model will be available without sound and with Soundtraxx Econami Sound.



A re-run of Athearn's 16,000-gallon tank car is sched-

uled for release in October 2019. Features of the HO scale Ready-to-Roll model include separately applied nozzle fittings, a detailed manway, small safety valve nozzles, full brake plumbing and rigging, metal photo-etched walkways and end platforms, and roller bearing trucks with 36-inch machined metal wheelsets.



Road names will be ASRX-Amstar, GATX-ELCOR Chemical Corp,

TILX-Trinity Industries Leasing, SHPX-Shippers Car Line (ex OMYA), ACFX-American Car & Foundry Leasing, ACFX-Specialty Minerals, and two schemes for UTLX-Union Tank Car Co.



Athearn's October 2019 production schedule includes a group of Thrall

high-side coal gondolas. Road names will be KCLX-Kansas City Power & Light Company, PSCX-Public Service Company of Colorado, SATX-San Antonio Public Service Board, Denver & Rio Grande Western, Burlington Northern, and Union Pacific. The HO

scale Ready-to-Roll models will ride on 100-ton roller bearing trucks with 36-inch machined metal wheelsets.



Roundhouse Brand models coming from Athearn next October include GP40-2 diesel

road switchers. The HO scale models replicate the 3,000 hp prototypes EMD built between 1972 and 1986. Road names will be Alaska Railroad, Burlington Northern, Santa Fe (Primed for Grime paint), Conrail, GATX Locomotive Group, Indiana Harbor Belt, Norfolk Southern (ex-Conrail in Primed for Grime paint), and Union Pacific.



Variations dependent upon which prototype is being modeled include small or large

fuel tanks and Blomberg B or M trucks. The HO scale ready-to-run model will be DCC-ready with 8 and 9 pin plugs to accommodate an aftermarket decoder. For additional information on Athearn or Roundhouse products contact a dealer or visit athearn.com.

.....



New **Atlas HO** scale models coming during the second quarter of 2019 include this Master series

53-foot Evans double plug-door boxcar. The ready-to-run model is based on an insulated RBL prototype from the late 1960s that used two plug doors to cover a 16-foot opening.



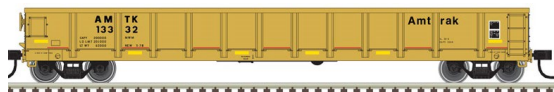
Road names will be Illinois Central, British Columbia, Chicago & North Western, Union Pacific, Wisconsin Central, Wisconsin & Southern, WSOR (ex-Sargento), and undecorated.



The design of Atlas's new Trainman series 4750 cu. ft. covered hopper with triple discharge bays is based on a Thrall-built prototype.



In addition to AACX-State of Alaska, Atlas will offer this HO scale ready-to-run model decorated for CWP&S-Chicago, West Pullman & Southern; First Union Rail, CIT Group, North American Car, Burlington Northern, Kansas City Southern, Texas Gulf, State of Alaska, Union Equity, and undecorated.



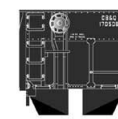
Completing Atlas's second quarter release of HO scale models is a Trainman series steel gondola. The HO scale model follows a 52-foot prototype built by Evans. Features include 100-ton roller bearing trucks with machined metal wheelsets.



Road names will be Amtrak, GE Railcar Services, Union Pacific (CNW patch), Canadian National, Herzog, and Maine Central. For additional information contact a dealer or visit atlasrr.com.

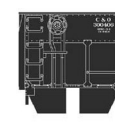


Bachmann Trains is selling an accessory power supply that provides 16 volts DC from dual output terminals at a total load of up to 1 amp. The device is designed to supply power to multiple accessories at the same time. For additional information contact a dealer or visit bachmanntrains.com.



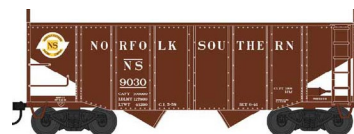
Bowser Trains is accepting reservations through

December 7, 2018 for new production runs of two styles of coal hopper cars. Delivery of both ready-to-run HO scale models is set for next summer. In addition to the CB&Q car shown above, 70-ton triple-bay hopper cars with offset sides will be available decorated for Baltimore & Ohio, Canada Southern, Detroit, Toledo & Ironton; Nickel Plate Road, OL&B, Ontario Northland, Southern Pacific, Toronto, Hamilton & Buffalo; and Seaboard.



HO scale 55-ton coal twin-bay coal hoppers will be available for Baltimore & Ohio, Central Railroad of

New Jersey, Chesapeake & Ohio, Lehigh Valley, Reading Anthracite, and two schemes each for Delaware & Hudson and Western Maryland.



The 55-ton car will be available with peaked ends for Norfolk & Western and Norfolk Southern. Bowser's

ready-to-run models will have knuckle couplers and appropriate trucks with metal wheelsets. For additional information contact a dealer or visit bowser-trains.com.



City Classics has released a new series of Picture Windows kits, which are photo interiors for buildings. Available individually or as a four pack, the new Picture Windows are of a Shoe Store, Appliance Store, Clothing Store

and a Jewelry Store. The Picture Windows are printed on high quality plastic film appropriate for backlighting. Each kit comes with the picture, cardstock strips to build a shadowbox behind the picture for lighting, and instructions. For more information or to purchase, go to cityclassics.biz.



The latest HO structure from **Fos Scale Models** is T & B Wiley Waterproofing, a craftsman kit that combines walls laser-cut from clapboard with Hydrocal brick walls. The kit includes color signs, metal detail parts, Tichy plastic windows and

doors, laser-cut roof material, and detailed assembly instructions. The completed model has a footprint of 6.5 x 8 inches. Figures and scenery items shown are not included. For additional information visit fosscalemodels.com.



InterMountain Railway is taking reservations through the end of December for a group of wood ice refrigerator cars. No delivery date has been announced. Road names

will be Pacific Fruit Express (three schemes including ice service), Western Pacific (two schemes), Northern Pacific, DL&W – Lackawanna Refrigerator Line, MDT, Bangor & Aroostook, and Burlington Refrigerator Express.



Each road name will be available in six numbers. The HO scale ready-to-run models have double sheathed wood ends, Kadee couplers, and

Bettendorf-style solid-bearing trucks with 33-inch machined metal wheelsets. For additional information contact a dealer or visit intermountain-railway.com.



New **Kadee** releases will include an HO scale version of this Canadian National 50-foot PS-1 boxcar. Like the prototype, Kadee's model features a cushion

underframe and 10-foot Youngstown sliding doors. The prototype was built in 1970 and repainted in CN's blue scheme in February 1986.

Kadee has released its 1947 version of Pullman-Standard's 40-foot PS-1 decorated for New York, New Haven & Hartford. Kadee's HO scale rendition features prototypically correct 7-foot seven-panel Superior doors. Both of these new models

will have Kadee #2100 couplers and two-piece self-centering trucks. For additional information contact a dealer or visit kadee.com.



New HO scale automobiles from **Oxford Diecast** include a Mercury and three Buicks. The Mercury is a 1949 two-door model with whitewall tires and fender skirts.



Oxford has released its 1955 Buick four-hole Century two-door decorated as a California Highway Patrol car, and as a New York taxi.



The CHP version works for me but the taxi, not so much. It will look good at a distance but it would be unusual, especially in NYC, to see the real thing as a two-door hardtop with white-wall tires.



Oxford is selling a 1936 Buick convertible coupe decorated in Cardinal Maroon. The classic model features red leather interior, whitewall tires, and dual side-mount spares. For additional information contact a dealer or visit walthers.com.



Rapido Trains continues to raise the bar for commercial scale models. Among the latest projects is an all-new HO scale version of a Pullman Standard lightweight dining car. According to Rapido president Jason Shron, the new car eclipses the model his company introduced a decade ago.



The new version features multi-color interior details with separate chairs, tables and kitchen details, individual place settings on the tables, interior lighting, and factory-installed grab irons.

Additional upgrades worth noting are working diaphragms with internal metal springs, and battery-free, track-powered lighting controlled by a hidden magnet switch in the roof. The lighting system works on DC or DCC systems. Mechanical improvements to ensure smooth tracking include a new rigid underframe, 41-BNO-11 or 41-N-11 trucks with inline brake shoes, and long-shank couplers to improve operation on curves with a radius as tight as 18 inches.



Although the new HO scale model is based on a prototype Pullman built for the Canadian National Railway

in 1954, the design is very much like dining cars used by numerous North American railroads. Depending on the road name being modeled, the interior configuration will replicate dining for 48, 40, or 32 passengers plus a lounge.



Road names under consideration for the initial release include Amtrak (Phase 1), Baltimore & Ohio, Canadian National (1954 and 1961 ver-

sions), Chicago & North Western, Great Northern, Illinois Central, Milwaukee Road (Hiawatha), Milwaukee Road (yellow scheme), Missouri Pacific (Eagle), Missouri Pacific (Jenks Blue), New York Central, Norfolk & Western, Northern Pacific (Loewy design), Ontario Northland, Pennsylvania Railroad, Southern Pacific (Sunset), Union Pacific, and VIA Rail Canada. Orders will be accepted through June 24 with delivery expected in late 2019. Roads that fail to receive a minimum number of orders will not be produced.

A second, equally impressive, HO scale dining car is also under development at Rapido. In collaboration with the New Haven Railroad Historical and Technical Association, Rapido is tooling an HO scale model of the NYNH&H dining car that served on the post-war iterations of the New Haven's Merchant's Limited and Yankee Clipper.

Two versions of the New Haven dining car will be available from Rapido: as delivered with skirts, and in the McGinnis paint scheme without skirts. Delivery is expected in late 2019. For additional information contact a dealer or visit rapido-trains.com.

The McGinnis scheme with skirts will be available exclusively through the New Haven Railroad Historical and Technical Association (www.nhrhta.org).



ScaleTrains.com has announced a second production run of its HO scale GE C39-8 diesel locomotive. Upgrades from the initial release of the ready-to-run model include

operating LED ditch lights. In addition to the GE Demonstrator shown above, road names will be Conrail, Norfolk Southern, CSX ex-Conrail patch, Southern Alberta Railway/Savage (ex-CSX YN3 scheme), and Pennsylvania Northeastern. The Rivet Counter series model will be available with DCC (sound ready) and factory installed ESU-LokSound DCC and Sound with dual cube-type speakers. Availability is planned for summer 2019.



ScaleTrains.com's 2019 summer schedule includes F68AH bulkhead flat cars as built for Trailer Train by Bethlehem Steel beginning in 1969. Scale



F68 BULKHEAD FLAT CARS

Bethlehem's initial production of the F68 cars utilized early jacking pads and measured 62 feet inside the bulkheads.

Subsequent production used redesigned jacking pads and an inside length of 60-foot 6-inches. The builder's final production version used the late jacking pads and measured 62-feet between the bulkheads. These later cars were produced both with and without risers on the wood deck.

Train's Rivet Counter HO version of the TTX cars will be available in four paint schemes: oxide red, yellow, with speed logo, and Pennsylvania Heritage logo. Features of the Rivet Counter model include a laser-cut wood deck, 100-ton trucks with a hydraulic snubber, and rotating bearing caps.



Also scheduled for release next summer is another production run of 53-foot CIMC dry containers.

Spotting features include two vents on each side, seven square nose corrugations with blank panels top and bottom, 8-58-8 side wall corrugations, 1-3-1 beveled door corrugations, and 6-54-6 roof corrugations. Separately applied details on ScaleTrains.com's dry containers include photo-etched hazmat placard holders and four individual door locking rods.



Carrier names on the Operator series model will be JB

Hunt, XPO Logistics, Schneider, COFC Logistics, and Hub Group.



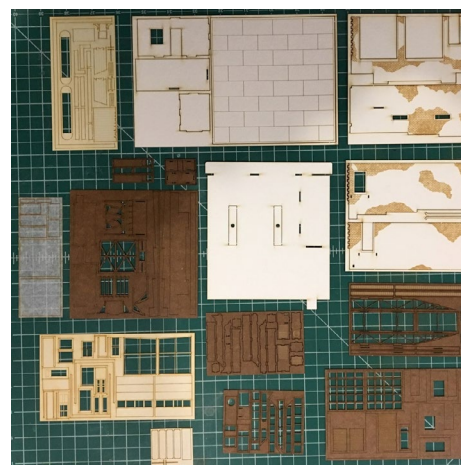
CIMC refrigerator containers are included in the 2019 summer release. The HO scale CIMC 53-foot reefer

cans feature a Thermo-King refrigeration unit in a detailed end cage, a separate fuel tank, photo-etched hazmat placard holders, and individual door locking rods. Carrier names will be Maritime Ontario, Quicktrax, and CR England. The basic containers will be sold in three packs. An individual container with a digitally recorded Thermo-King refrigeration sound unit will also be available. For additional information visit scaletrains.com.



Showcase Miniatures is selling an HO scale craftsman structure kit called Lee King Radiator & Muffler Repair Shop. The illustrated model was built by Jason Jensen. The kit features tab and slot construction using laser-cut

walls and construction components, laser-cut peel-and-stick window material, cast pewter details, appropriate signage, and step-by-step instructions.



The assembled structure has a footprint of 5 x 6 inches. For additional information visit showcaseminatures.net.



During Trainfest at Milwaukee, **Tangent Scale Models** announced its new high side version of the Pullman-Standard PS-2CD

4427 cu. ft. covered hopper.

The HO scale model was developed from Pullman-Standard plans and field verification measurements. Variations in road-specific



details include different stirrup steps, roof hatches, jacking pads, tow loops, discharge gates, side air lines, running board supports,

crossover platforms, end ladders, and brake wheels.



Road names include Missouri Pacific, Milwaukee Road in as-delivered yellow with large lettering, Rock Island, Toledo, Peoria & Western in original

1968 gray; Santa Fe (TP&W re-stencil), TLDX, and TLDX-Louis-Dreyfus. Tangent's HO scale model is loaded with both subtle and obvious details including see-through running boards, etched metal crossover platforms, uncoupling bar, 100-ton trucks with 36-inch machined wheelsets, and Kadee couplers. For more information visit tangentscalemodels.com.



Walthers has announced plans to produce another run of its Mainline series Alco PA and PB diesels. The HO scale models are expected to be ready in

September 2019. The economy priced Mainline model will use the same drive as Walthers top-of-the-line Proto series locomotives. Drill starter points for grab irons will be molded in the body shell. Correctly sized grabs will be sold separately in a PA-PB detail kit. The ready-to-run diesels will be available for DC operation and with factory installed ESU sound for DCC.

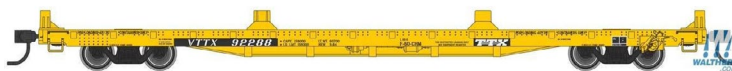
Road names will be New York Central, Delaware & Hudson, Santa Fe (Warbonnet scheme), New Haven (McGinnis scheme), and Southern Railway.



Jordan Spreaders are scheduled for release by Walthers in February 2019. The Proto series ready-to-run model

will have positionable moldboards and wings, glazed cab windows, factory installed grab irons, and solid or roller bearing trucks as appropriate to the prototype being modeled.

Road name details include the type of headlight. BNSF and Soo Line models will have modern horizontal headlights. A vertical headlight will be on spreaders decorated for Canadian National (black), Grand Trunk Western, MOW (orange), MOW (black and red), and an undecorated kit. Chicago & North Western spreaders will have a modern round headlight.



Walthers is preparing to release

a new general service flat car in April. The HO scale Mainline model is based on a 60-foot car Pullman Standard car built in the mid-1960s. The car will be equipped with 70-ton roller bearing trucks with 33-inch turned metal wheelsets. Road names on this release will be Santa Fe, Elgin, Joliet & Eastern; Southern Railway, and VTTX. A car decorated for OTTX will have two center tie-down channels as used for farm machinery. Four Trailer Train versions will also be available: OTTX (two schemes, brown or yellow), VTTX (yellow with white TTX logo), VTTX (rebuilt for 20 and 40-foot container loading).



Announced at Trainfest, Walthers will also be releasing an 85-foot General American G85 flatcar. Part of the Mainline line, it is scheduled for a February 2019 delivery. Featuring a die-cast metal center sill, it will have roadname specific details. 70-ton roller bearing trucks, 33" turned metal wheels, and Proto MAX metal knuckle couplers will be standard. Roadnames available will be Santa Fe, Trailer-Train GTTX-Brown, Trailer-Train GTTX-Yellow, Penn Central, Railway Express Agency, Southern Pacific and TTX VTTX. The recommended minimum radius is 24".



Walthers is selling a SceneMasters kit for a small modern business center. The HO scale model is styled after contemporary tilt-up concrete construction. The rear of the building has four truck docks with weather

bellows/seals and inside loading doors. The finished model is 5.25-inches high and has a footprint of 18.25 x 10.44-inches. Vehicles and figures are not included.

Walthers reports it will have three new HO scale kits for heavy-equipment vehicles available late this month. They include a kit for a Kalmar Intermodal Container-Trailer Crane (next page), and a two-axle off-road crane with a telescoping boom and positionable outriggers.

Completing Walthers release of heavy vehicles is a kit for a Hi-Rail excavator. The model will have an optional bucket, positionable cab, and a boom that can be raised and lowered.



For additional information on all Walthers products contact a dealer or visit walthers.com.



Wheels of Time is offering several versions of an HO scale Allis-Chalmers HD-21 crawler tractor. The basic model is composed of a resin body and crawler treads with a 3-D printed acrylic blade, hydraulic cylinders, and exhaust pipe. The model is available as a

kit without a blade (above), as a kit with a separate dozer blade, and as a fully assembled and painted model. Special decals are also available. For complete details visit wheelsotime.com.



N SCALE PRODUCT NEWS



New N scale models coming from **Athearn** include a group of Thrall high-side coal gondolas. Road names will be KCLX-Kansas City Power & Light Company, PSCX-Public Service Company of Colorado, SATX-San Antonio Public Service Board, Denver & Rio Grande Western, Burlington Northern, and Union Pacific. The N scale model will have screw-mounted 100-ton roller-bearing trucks with machined metal wheelsets. Availability is planned for next October.



COAL GONDOLAS

In the 1960s, railroads began replacing the traditional open hopper car with high-sided gondolas. Using a gondola, the railroads were able to haul more coal per car since gondolas did not devote space and weight to equipment needed for unloading. The savings were enough for major customers to offset the cost of rotary car dumpers.



Athearn's October 2019 production schedule also includes this N scale Pullman-Standard 4427 cu. ft. triple-bay covered hopper. The ready-to-run model will be available decorated for Montana Rail Link, TLDX-Harmon Grain, TLDX-Pillsbury, Santa Fe, Burlington Northern, and Chicago & North Western, UP, and Wisconsin Central. For additional information contact a dealer or visit athearn.com.

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Atlas has scheduled the release of its new GP20 diesel locomotive during the second quarter of 2019.

The N scale Master series model will be available decorated for Union Pacific, Burlington Northern, Conrail, EMD Demonstrator, Santa Fe, and Southern Pacific (red and gray scheme).



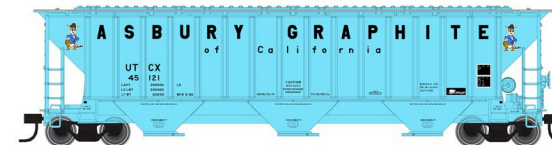
Atlas Master Silver versions of the new locomotive will be available equipped with a speaker to ease conversion to DCC sound. Atlas

Gold locomotives offer a total of six DCC function outputs.



ABOUT THE EMD GP20

Except for the short, square turbo-charger stack and the flared radiator fans, the EMD GP20 is virtually identical in appearance to a GP9. Following successful turbocharging experiments with nine Union Pacific GP9s in 1959, EMD introduced the GP20 in 1962. The turbochargers increased the output rating of EMDs model 567 16-cylinder engine from 1750 to 2000 horse power.

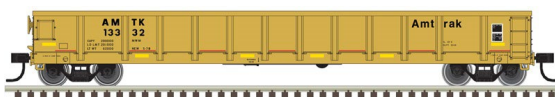


In addition to the UTCX-Union Tank Car scheme shown above, Atlas will offer this N scale covered hopper decorated for

CWP&S-Chicago, CIT Group, First Union Rail, North American Car, Burlington Northern, Kansas City Southern, Texas Gulf, State of Alaska, Union Equity, and undecorated.



Design of the Trainman series model is based on a Thrall 4750 cu. ft. prototype with triple discharge bays.



Completing Atlas's second quarter release of N scale models is a Trainman series steel gondola. The N scale model follows a 52-foot prototype built by Evans. Features include 100-ton roller-bearing trucks with machined metal wheelsets.



Road names will be Amtrak, GE Railcar Services, Union Pacific (CNW patch), Canadian National, Herzog, and Maine Central. For additional information contact a dealer or visit atlasrr.com.



City Classics has released a new series of Picture Windows kits, which are photo interiors for buildings. Available with six pictures to a pack, N scale Picture Windows pack #1250

includes a bookstore, camera store, pharmacy, hardware store, restaurant, and small café. The Picture Windows pack #1251 includes a record shop, barber shop, bakery, small market, and two small stores. The Picture Windows are printed on high quality plastic film appropriate for backlighting. Each kit comes with the picture, cardstock strips to build a shadowbox behind the picture for lighting, and instructions. For more information or to purchase, go to cityclassics.biz.



Jacksonville Terminal Company has scheduled a late December

release for several N scale 53-foot 6-42-6 containers. Carrier names will be CN Intermodal, Hub Group, Pacer, CSX Intermodal, EMP (ex-Pacer patch), and EMP (ex Hub Group patch).



These models feature IBC connecting pins and magnets on the bottom and metal plates on top. They are available in two packs. For additional information contact a dealer or visit jtcmodeltrains.com/blogs/news.



Heading the list of new releases from **Micro-Trains Line** is this Northern Pacific 78-foot paired-window

coach. The ready-to-run N scale model is decorated in NP's two-tone green scheme with white lettering and a centered monograph.

Also new from Micro-Trains is this New York Central 34-foot wood caboose that comes with Bettendorf-style swing motion caboose



trucks. As one of NYC's safety cabooses of the 1960s, the N scale model displays the message *"Life is like a baseball game. It is the number of times you get home safe that counts."*



M-T has released this Chicago & North Western stock car in two numbers. The N scale model is based on a 40-foot prototype that was rebuilt in

the mid-1950s at CNW's shops in Council Bluffs Iowa.



This GATX 56-foot general service tank car was leased to Ozone Waters in the 1970s. Micro-Train's N scale ready-to-run model comes

with Barber roller-bearing trucks. For additional information contact a dealer or visit micro-trains.com.



RailSmith Models has three new lightweight passenger cars scheduled for release in January.

The N scale ready-to-run cars include this Pullman Standard 64-seat coach decorated for Great Northern (three names) and Norfolk Southern. Also a Pullman Standard 10-roomette, 6-double bedroom smooth-side sleeper decorated for Northern Pacific, Southern Pacific (two schemes), Pullman (NYC two-tone gray), and Union Pacific.

Completing RailSmith's January release is an N scale Pullman Standard 10-roomette, 6-double-bedroom sleeper with fluted sides. It will be available for Atlantic Coast Line and Missouri-Kansas-Texas/St. Louis-San Francisco Texas Special. For additional information visit railsmith.net.



ScaleTrains.com plans to release the next run of its N scale GE Tier 4 GEVo diesel locomotive next spring. Road names for the Rivet Counter model will be Canadian National, BNSF, Norfolk

Southern, CSX (two schemes including Spirit of Ravenna), GECX, Navajo Mining, and Union Pacific. The model will be available DCC- ready, with factory installed ESU DCC, and with factory installed ESU-LokSound Select DCC and sound.



Also scheduled for release next summer is another production run of 53-foot CIMC dry containers.

Features of the N scale models include a square nose with seven corrugations with blank panels top and bottom, 8-58-8 side wall corrugations, 1-3-1 beveled door corrugations, and 6-54-6 roof corrugations. Separately applied details include photo-etched hazmat placard holders and four individual door locking rods.



Carrier names on the Operator series model will be JB Hunt, XPO Logistics, Schneider, COFC Logistics, and Hub Group.



CIMC refrigerator containers are also in the summer release. The N scale CIMC 53-foot reefer container

feature a Thermo-King refrigeration unit in a detailed end cage, a fuel tank, photoetched hazmat placard holders and individual door locking rods. The basic containers will be sold in three packs. An individual container with a digitally recorded Thermo-King refrigeration sound unit will also be available. Carrier names will be Maritime Ontario, Quicktrax, and CR England. For additional information visit scaletrains.com.

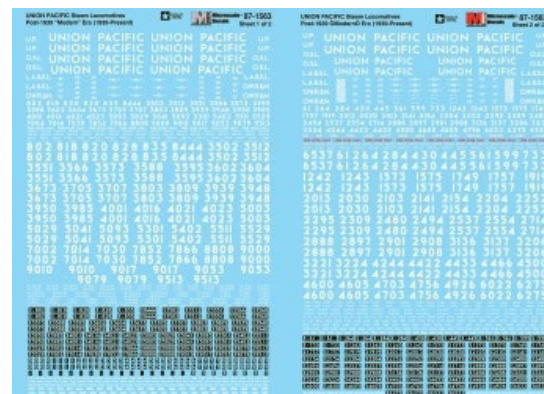


Walthers is selling a plastic kit for an N scale Steel Arched Pratt Truss Bridge. The Cornerstone series single track bridge is 14.14-inches long. The internal height will clear double-stack and other tall

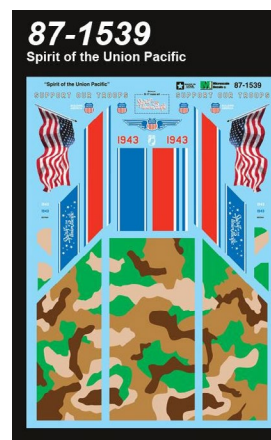
cars. The structure can be used as a single, stand-alone bridge or as a center span for longer bridges. Walthers has also released N scale piers (933-3880) and abutments (933-3881) that are compatible with this model. For additional information contact a dealer or visit walthers.com.

NEW DECALS, SIGNS AND FINISHING PRODUCTS

Microscale is selling HO and N scale waterslide decals for Union Pacific steam locomotives of the post-1939 period. The decals include white lettering and engine numbers as well as



small white-on-black marker numbers.



Microscale is also selling HO and N scale waterslide decals for the Union Pacific's Spirit of Union Pacific locomotive. An EMD SD70ACe, UP 1943 is the 16th commemorative locomotive that UP has presented. Information on UP 1943, including drawings that detail the placement of the symbolic graphics, is available at www.up.com/aboutup/special_trains/commemorative/1943-spirit/index.htm.

Microscale reports that several popular railroad decal sets are back in stock including HO and N scale decals for PFE ice reefers and PRR steam locomotives. O scale decals recently replenished include passenger cars, and diesel locomotives for Northern Pacific, Gulf Mobile & Ohio, New Haven and Reading. Also O scale steam locomotive decals for Canadian National, New Haven, and D&RG narrow gauge equipment. Completing the O scale list are decals for Great Northern and Rio Grande cabooses. For additional information contact a dealer or visit microscale.com.

DISCLAIMER

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! BRIEFLY NOTED AT PRESS TIME ...

Atlas has postponed its warehouse sale scheduled for December 8. Cancellation of the unique event was due to what Atlas called an overwhelming response for available tickets, and a concern for inclement winter weather. When the new date is announced, individuals who ordered tickets for the original date will be contacted and given an opportunity to get tickets first. Any remaining tickets will be offered to folks on Atlas Insiders email list ...

InterMountain has arranged with four new manufacturing sources to replace its former Chinese partner that unexpectedly shut down in 2018. Pre-production samples have already been received from one of the new suppliers. No delivery dates have been announced but InterMountain says the samples look good and actual production quantities are expected soon ...

Resin Car Works has released a mini-kit for a Fruit Growers Express truss-rod reefer. The specialized mini-kit is used to kitbash an Accurail HO scale wood reefer into an accurate replica of a FGEX prototype. Details are available at blog.resincarworks.com/fruit-growers-express-truss-rod-reefer-mini-kit ...

SoundTraxx has a video that offers a step-by-step guide to updating a Blackstone Model K-27 with a Tsunami2 Digital Sound Decoder with CurrentKeeper. Check it out at www.youtube.com/watch?v=MOmtficjkqp& ...



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SELECTED EVENTS



Model Railroad Hobbyist | December 2018 | #106

DECEMBER 2018

(Many events charge a fee. Check individual info website for details.)

CALIFORNIA, ALTADENA, December 8-9, 15-16, 22 and 25, Open House and Operating Sessions, sponsored by Christmas Tree Lane Model Railroad Society, at 2085 Santa Rosa Avenue. Info at www.facebook.com/events/659074071140690.

CALIFORNIA, GARDEN GROVE, December 15-16, Open House at American Model Train Exchange, 11562 Knott Street, Unit 6. Request info from John Engstrom at 714-504-7033.

COLORADO, BOULDER, December 7-9, Train Exposition sponsored by Boulder Model Railroad Club, at Boulder County Fairgrounds, Longmont, Colorado. Info at bouldermodelrailroadclub.org.

CONNECTICUT, ESSEX, Tuesday through Sunday until February 19, 25th Annual Holiday Train Show, at Connecticut River Museum, 67 Main Street. Info at ctrivermuseum.org.

ILLINOIS, CHICAGO, December 1-2, 2018, Lake Shore Model Railroad Association Open House, Calumet Field House, 9801 S. Ave. G, Information at www.lakeshoremodelrr.org. (warning: autoplay sound on website.)

INDIANA, INDIANAPOLIS, December 8, 2018, Naptown and White River Model Train Show and Open House, Manual High School, 2405 S. Madison Ave, Info at www.naptownrr.org.

SELECTED EVENTS | 2

MARYLAND, BALTIMORE, December 9, 16 and 30, Open House at Baltimore Society of Model Engineers, 225 West Saratoga Street, third floor. Info at www.modelengineers.com.

MARYLAND, WESTMINSTER, November 23, 2018 – January 5, 2019, Four County Society of Model Engineers Holiday Train Display, TownMall, 400 N. Center St. Info at www.fcsme.org.

MASSACHUSETTS, MARLBOROUGH, December 1-2, New England Model Train Expo, hosted by NMRA HUB Division, Best Western Royal Plaza Trade Center, 181 Boston Post Road. Info at hubdiv.org.

MASSACHUSETTS, ROSLINDALE (Boston Metro area), December 1-2, Holiday Model Train Show, sponsored by Bay State Model Railroad Museum, at 760 South Street. Info at www.bsmrm.org.

MICHIGAN, HOLLY (metro Detroit), December 9-10, January 13-14 and 27-28. Open House at the Detroit Model Railroad Club, 104 North Saginaw. For additional dates visit website at dmrrc.org.

NEW JERSEY, EGG HARBOR TOWNSHIP, December 8-9, Train Show sponsored by Shoreline Model Railroad Club at Atlantic Christian School, 391 Zion Road. Request info from Dennis Weiss at 609-404-7826.

NEW YORK, ALBANY, December 2, Annual Great Train Extravaganza hosted by NMRA Hudson-Berkshire Division, Empire State Convention Center. Info at gtealbany.com.

OHIO, LIMA, December 15, Train Town Show & Swap Meet, sponsored by NMRA NCR 3 Rivers Division, at Merchants Building at Allen County Fairgrounds, 2750 Harding Highway (St Rt 309). Request info from Chuck White at railcarman@frontier.com.

January 2019, by location

CANADA, ONTARIO, PARIS, January 20, Paris Junction Model Train Show, sponsored by NMRA Western Ontario Division, at Paris Fairgrounds, 139 Silver Street. Request info from Edward Howes at paristrainshow@gmail.com.

FLORIDA, COCOA BEACH, January 10-12, Prototype Rails RPM Meet, hosted by Mike Brock. Info at www.prototype Rails.com.

MASSACHUSETTS, WEST SPRINGFIELD, January 26-27, Amherst Railroad Hobby Show, sponsored by Amherst Railway Society, at Eastern States Exposition Fairgrounds, 1305 Memorial Avenue. Info at www.railroadhobbyshow.com/aboutus.php.

Future 2019, by location

AUSTRALIA, CANBERRA, KALEEN, March 30-31, 31st Annual CMRCI Model Railway Expo, sponsored by Canberra Model Railway Club, at UC High School, Baldwin Drive. For details phone Anthony Hunt at +61 0414 730 824.

CANADA, BRITISH COLUMBIA, BURNABY, May 3-5, Railway Modelers Meet of BC, at Simon Fraser University, Burnaby Campus, West Mall Centre. Info at railwaymodellers-meetofbc.ca.

CANADA, ONTARIO, KINGSTON, March 10, 30th Annual Rail O Rama Model Train Show, sponsored by Canadian Railroad Historical Association, at Ambassador Hotel, 1550 Princess Street. Request info from Graham Oberst at graham.oberst@bell.net.

ILLINOIS, COLLINSVILLE (metro St Louis), July 26-27, St. Louis RPM Meet, at Gateway Convention Centre. Info at icg.home.mindspring.com/rpm/stlrpm.htm.

KENTUCKY, LOUISVILLE, March 29, 29th Annual Train Show & Sale, sponsored by NMRA Division 8 Mid Central Region, at Moose Lodge, 4615 Fegenbush Lane. Info at www.div8-mcr-nmra.org.

OHIO, GREENVILLE, March 3, 38th Annual Model Railroad Swap Meet, sponsored by the Darke County Model Railroad Club at Youth Building, County Fairgrounds, 800 Sweitzer Street. Request info from Joe Worz at josephbw@hughes.net.

OREGON, ELSIE, March 2, 15th Annual Pacific Model Loggers' Congress, at Camp 18 Restaurant & Logging Museum, 42362 Highway 26. Info at www.pacificmodelloggerscongress.com.

OREGON, PORTLAND, February 9, 2nd Annual Portland RPM Meet, Shilo Inn & Suites, 11707 NE Airport Way. Information at www.brpmm.com.

OREGON, PORTLAND, March 9, 34th Annual Swap Meet sponsored by Willamette Model Railroad Club at WD Jackson Armory, 6255 Northeast Cornfoot Road.

PENNSYLVANIA, GREENSBURG, March 22-23, RPM East. Details TBA.

TEXAS, STAFFORD (Metro Houston), February 16, Greater Houston Train Show, sponsored by San Jacinto Model Railroad Club at Stafford Centre, 10505 Cash Road. Info at sanjacmodel-trains.org.

TEXAS, FRISCO, June 27-30, 2019 Texas Special NMRA Lone Star Region Convention, at Drury Inn & Suites, 2880 Dallas Parkway. Info at www.2019TexasSpecial.com.

UTAH, SALT LAKE CITY, July 7-13, 2019 NMRA National Convention and National Train Show. HQ at Little America Hotel. Info at nmra2019slc.org.

VERMONT, ST. ALBANS, March 9, Vermont Rails Model Railroad Show, sponsored by Northwestern Vermont Model Railroad Association, at Collins Perley Sports & fitness Center. Info at nwvrrailroad.org.

SELECTED EVENTS | 5

WISCONSIN, MADISON, February 16-17, Mad City Model Railroad Show & Sale sponsored by NMRA South Central Wisconsin Division, at Exhibition Hall, Alliant Energy Center. Info at nmra-scwd.org.

WISCONSIN, STEVENS POINT, February 2-3, 22nd Arctic Run Model Railroad Show & Sale, sponsored by Central Wisconsin Model Railroaders Ltd, at Stevens Point Holiday Inn and Convention Center, 1001 Amber Avenue. Request info from Jim Miller at jimbro67@gmail.com, or go to www.thecwmrarcic-run.com.

Future 2019, by location

MISSOURI, ST. LOUIS, July 12-18, 2020, NMRA National Convention and National Train Show. HQ at Hilton St. Louis at the Ballpark. Info at gateway2020.org.

CALIFORNIA, SANTA CLARA, 2021, NMRA National Convention and National Train Show.

ENGLAND, BIRMINGHAM, 2022, NMRA National Convention and National Train Show. ■



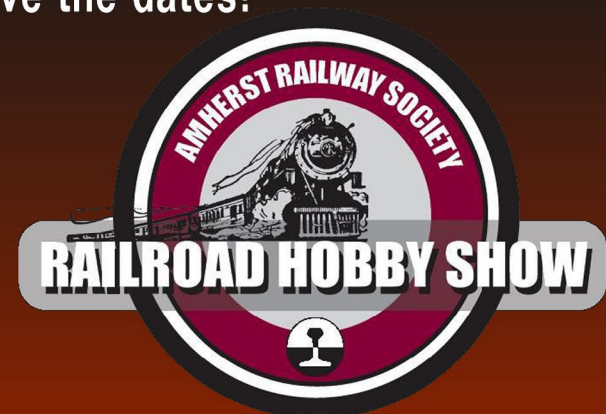
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Time for some Christmas trains!

Jump on board while we chase some Christmas trains. Here is a collection of trains running in the Western U.S. They show the Christmas spirit often with decorations and sometimes even lights. Watching these videos carefully, is that Santa we see? Check it out for yourself ...

Happy Holidays! ■



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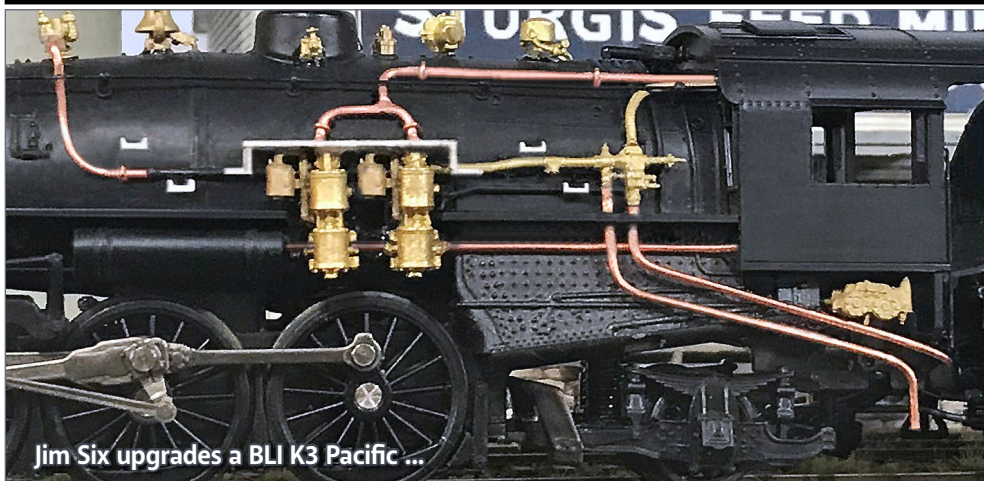
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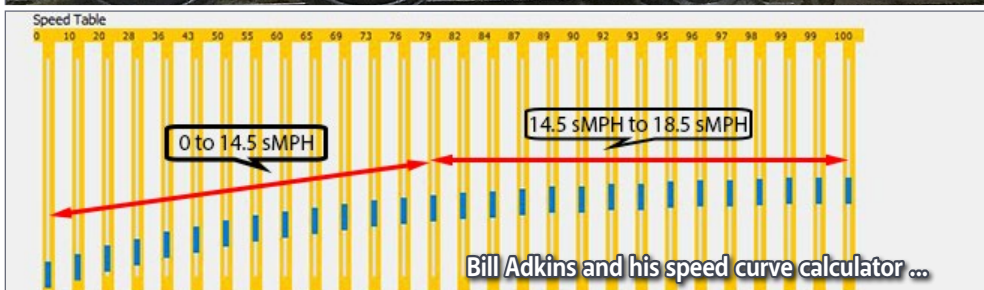
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