

# HUB Headlight

HUB Division Inc., Northeastern Region, National Model Railroad Association - [www.hubdiv.org](http://www.hubdiv.org)  
Volume 37, Number 2, November - December, 2020

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## ONLINE RAILFUN TIMETABLE

*Editor: Due to the Covid-19 pandemic, the HUB is using the Zoom online meeting software. Meeting info will be sent out in advance of each RAILFUN via the Google email list and Constant Contact. Contact Zoom Meeting Coordinator Erich Whitney, [zoomcoordinator@hubdiv.org](mailto:zoomcoordinator@hubdiv.org), with questions.*

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### Presentation: STEAM in the HEADLINES

By Doug Scott

8PM Friday, November 20, 2020

**D**oug Scott is a published photographer who has been riding and photographing trains since the fall of 1977. Doug's work is well known locally.

The year 2019 hosted two special steam engine events that garnered headlines, one of national importance, the other drew northeast regional attention. Nationally, the rebirth of Union Pacific Big Boy #4014 was planned to coincide with the 150th anniversary of the completion of the United States' first transcontinental Railroad. Regionally, the Norfolk & Western J class engine #611 visited the Strasburg Rail Road in what was billed as "N&W Steam Reunion." Doug was able to photograph the 4014 traveling across Wyoming in May 2019, and also the ceremony commemorating the driving of the Golden Spike at Promontory Summit, Utah. He also participated in one of the photo charter days with N&W 611 and 382 in Strasburg, PA. Doug's program will cover modern railroading in Wyoming, the UP 4014 / 844 train to Ogden, along with the SPIKE150 ceremonies in Ogden and Promontory Summit National Historical Park in Utah, and the N&W 611 visit to Pennsylvania, all complemented by a musical soundtrack.

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### Presentation: Modeling Trees

By John Burchnell, Cheryl Sassi and Lou Sassi

8PM Friday, December 18, 2020

**J**ohn Burchnell is a retired Professional Engineer and Research Fellow at Procter & Gamble, and is a founding member of the Eastern Loggers modeling group. He's a lifetime railroad modeler and enthusiast, and is very active in the National Model Railroad Association including the local chapter in Cincinnati. He's an accomplished inventor, modeler, clinician and author with bylines in several model railroad magazines.

Lou Sassi is a Contributing Editor, long-time photographer and author for Model Railroader magazine, as well as a prolific modeler and clinician. Cheryl Sassi is Lou's longtime photographic assistant and the Head Arborist of their highly scenic Maine Narrow Gauge On30 railroad. Cheryl authored several recent Model Railroader articles on trees. They both have a keen eye for details and photogenic modeling.

Their combined clinic is on something all three of them know very well – scenery. More specifically, they'll share their tree-making methods. John will concentrate on quick and cheap methods to make deciduous trees using natural armatures like goldenrod, sagebrush and his favorite, wild hydrangea. Then Cheryl will show her detailed precision tree making methods and examples. Lou may also show us some photographs he's taken encompassing some of the techniques both John and Cheryl share with us.

## My First LCC Network

By Dave Insley

**I** am very slowly making progress on my Colonie Eastern Railway Company layout and working on the Achievement Program at the same time. I was pretty close to completing my Electrical requirements and needed only one more item. Controlling four turnouts from a panel seemed like a good place to start, and when I realized that panel could be a computer panel, I thought I had a project. I had been reading about LCC and figured this was my chance to dive in and give it a try. This would be simple, right? Well, mostly. There is a lot of information out there but you really need to piece it together. Not being an electronics expert made it a little more challenging to figure out.

Some of the resources I used that I found helpful include:

- Clinics on the RR-CirKits Website
- LayoutCommandControl Groups.io List
- Introduction to LCC book referenced above
- Great Northwestern Railway Blog

I stopped by the RR-CirKits booth when I was at Springfield last January and picked up some items to get myself going in LCC. My original plan was to com-

*(Continued on Page 10)*

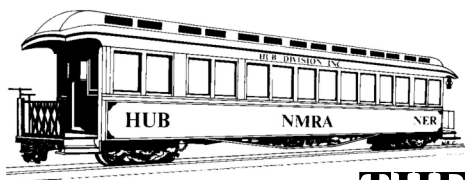
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## THE PRESIDENT'S CAR

By James VanBokkelen

**H**ello, members of the HUB Division and readers outside our group. I'm writing this hoping our Summer/Fall drought will end soon.

With the affects of Covid-19 all across New England, in-person public events are few and far between. Train shows or events we might have attended this modeling season are postponed to 2021 or 2022: Greenberg, Tour de Chooch, the ARS show at the Big E, Nashua Valley, Hooksett, etc. Our own June Murder Mystery Dinner Train, our October Northeastern Region Convention in Westford, MA and our December New England Model Train Expo have been postponed to 2021.

Most area museums and tourist railroads are winding down as winter approaches, but if you need to get out, check the Conway Scenic, Hobo Railroad (Lincoln or Weirs, NH), Seashore Trolley Museum, Berkshire Scenic, Shore Line Trolley Museum, Maine Narrow Gauge RR and other web sites for special holiday events. All prefer you buy tickets in advance online.

On the remote front, the HUB's RAILFUN has successfully transitioned to the Zoom online platform as a regular monthly event. Everyone on the hubdiv@googlegroups.com email list sees notices about the Nutmeg Division's events. The Seacoast Division shows theirs on seacoastnmra.org, the Hudson-Berkshire Div. at hudson-berkshire.org. Our region's NERx online convention will take place each evening December 1-4, 2020.

Our one big in-person event this winter will be the Museum of Science. Several requests for volunteers have been made on 'hubdiv' and our Constant Contact list. You'll find up-to-date details elsewhere in this issue.

Erich Whitney is acting as our Zoom Coordinator, mostly by organizing a calendar listing when our Zoom account is being used. If you have a HUB-related activity you'd like to conduct using our account, let us know and we can see about scheduling it.

NMRA Achievement Program activity is starting to work its way around the virus: It's straightforward to earn Author, Volunteer or Association Official, and the NMRA is putting things in place to review and process paperwork. If you already have the operating hours, Chief Dispatcher might even be earned in self-isolation. The NMRA thinks they can do remote evaluation for Civil and Electrical, but Cars, Locomotives, Structures and Prototype Modeling rely heavily on in-person evaluation. Regardless of how the NMRA's efforts to adapt to Covid-19 play out, many of us are building models or working on layouts in this unexpected free time. Keep the necessary paperwork on the To-Do list as well. I hope we'll see a lot of new AP certificates this winter.

Mill City 2021 will be October 8-11 next year (still Columbus Day Weekend). It's at the Westford Regency Hotel in Westford, MA. We'll carry over many of the 2020 arrangements, including schedule, layouts, and clinics. We'll keep focus on model railroad operations. Inevitably there will be a few changes. If you have a new presentation, or a layout that would make a nice tour or operating session, get in touch. We also need volunteers for the Convention site and activities, so consider getting involved as things come into focus.

Speaking of Volunteers, the HUB is looking for more Board Member candidates in the 2021 election, and down the road we will need help in show management, hosting RAILFUN events to serve members who can't get to Weston on a Friday evening, and model railroad operations for members. Talk to me or another Board Member/Officer to get involved!

Personally, since my last column, I've spent time on my layout, farming at home and elsewhere in town, and at Seashore Trolley Museum being a gandy dancer. We're in the final stages of a long-term project to re-lay much of the yard in front of our Shop. Panel-track turnouts were

built from kits in 2017 and 2019; now we've torn out the worn-out originals and their sand ballast. By the end of October we hope to have everything connected again. Below are a few pictures of the past year's activities.

If there's something on your mind about the HUB or its activities, email me at [president@hubdiv.org](mailto:president@hubdiv.org), call me at (603) 394-7832 or catch me at a HUB online event.

Until next time, High Green!



*Once the crane has done the heavy lifting, there's only room for one person to tighten the point bolts.*



*Rails longer than 39 feet were introduced more than 100 years ago. This 70 foot length of 70 lb/yard rail is flexible, but not so much that it can't be gotten off the ground by a Pettibone Speed Swing.*



*A style of guardrail popular before WWII*





## Shanty Talk: The Ties that Bind

By Rudy Slovacek

In railroad parlance, the ties provide an anchor material for the spikes to hold the rails together at a constant gauge or distance apart. Hence the theme of this column, the ties that bind. In England, I believe the ties are called “sleepers” a piece of timber on the ground to support the rail superstructure. But ties are not just a railroad term for a piece of equipment as we shall see.

On September 23, 1883, the Brotherhood of Railroad Brakemen was formed by eight brakemen in Delaware and Hudson Railway Caboose No. 10 at the Oneonta, New York yard. At the time, wages were just over \$1 a day and the work extremely dangerous, with about 33% of brakemen being injured. The purpose of the Brotherhood was to offer insurance for death coverage of up to \$300. It was the only way members could obtain insurance to compensate for an income loss to their families. The Brotherhood's insurance department itself was established in 1885 and maximum death benefits raised to \$600. This organization later blossomed into the Brotherhood of Railroad Trainmen on October 23, 1889, and covered some 14 trades such as Locomotive Engineers, Conductors, Firemen, Trackmen, Switchmen, Carmen and Telegraphers, just to name a few.

All up and down the D&H mainline, in cities and towns like Scranton, Binghamton, Oneonta, Cobleskill, Schenectady, Mechanicsville, Colonie, Albany, Glens Falls, Fort Edward, Whitehall, Plattsburgh and Rouses Point, where there were facilities, one would see multiple generations in a family become railroaders. From employment on a track gang or train crew, to station agents and telegraphers, the railroad was a way of life in these towns. It was not uncommon to have both fathers and sons on the same railroad that employed their grandfathers.

Other ties that bind included the individual train crews themselves. For example: Jim Lafayette in the September 2020 BLHS (Bridge Line Historical Bulletin) describes what it was like being a part of the crew on the Ticonderoga (Ti job) and “Slate picker” in the days of wooden cabooses. The wooden cabooses built during the teens and twenties were a home away from home for both local and road crews. They were kept clean and warm with a coal stove and lit by a kerosene lamp. The caboose provided the conductor with a place to do his paperwork and a place to ride for some of the crew members. A full crew on the road and locals included the engineer, fireman and head-end brake or trainman. The middleman, conductor, and flagman rode in the rear-end caboose.

On road trips, which might terminate in a city far from home without a hotel room or an open eatery, the crew might eat and sleep in the caboose. This was especially true in earlier times. Jim relates instances where his father-in-law Pat O’Neil was the engineer, Stan Waters the conductor, and Albert Charpentier and Fred Mercer the other trainmen. During slack time the crew liked to play cards, particularly the game of Pitch. The first time Jim went to the old paper mill with his father and they headed into town for lunch, his father proudly proclaimed that Jim was his son, even before the waitresses could speak. Thus the ties might be of a family origin or a crew that often worked together.

Another form of tie was the Sleeping Car Porters Brotherhood that enlisted Eleanor Roosevelt to speak at their convention on September 16, 1940. Eleanor, who was a champion of rights for the downtrodden, also served as a conduit to the President. She passed along their grievances regarding their right to serve in the military as the country ramped up for war.

One might also view the numerous Historical Societies, which bind together numerous individuals with a common interest. I belong to the Bridge Line Historical Society, which

deals with all things concerning the Delaware and Hudson Railroad’s history and operations. In this category, we might also consider the many model railroading publications of which our own HUB Headlight serves to bring us together. It might even be the special interest groups (SIG) sanctioned by the NMRA. The list goes on and on so I will bring it to a close with one last tie; the MU cables between two locomotives enabling them to work tighter in unison.

And now for a quick update on my modeling activities. I just finished rearranging my Saratoga yard to bring a hidden staging track from behind the backboard out into the yard for more visibility during operations. The Saratoga Spring Water company building flat located behind a hill on Spring Road has been completed and just needs a sign. The roof to the engine house needs to be fabricated to replace the old cardboard one. Also, my 4-foot stand-alone yard lead module could use a scenic upgrade. In the meantime, I’ve completed a few hay bales for my hay wagon. Several years ago I purchased a couple of Bachman depressed center flats with the intention of kit-bashing a D&H version of car number 16159, as pictured in the “D&H Color Guide to Freight and Passenger Equipment”, Odell, Martin, Cross and Wright, 1997 Morning Sun Books. The cast-on supports were removed along the sides and replaced with styrene sheet and squadron putty to make smooth sides. This is shown in comparison to the standard car in Figure 1. I look forward to completing some of my yard projects and the flat car this Fall. Hopefully by 2021, we’ll have a vaccine and we can all look forward to seeing one another in person. Until then stay safe and continue with your modeling efforts.

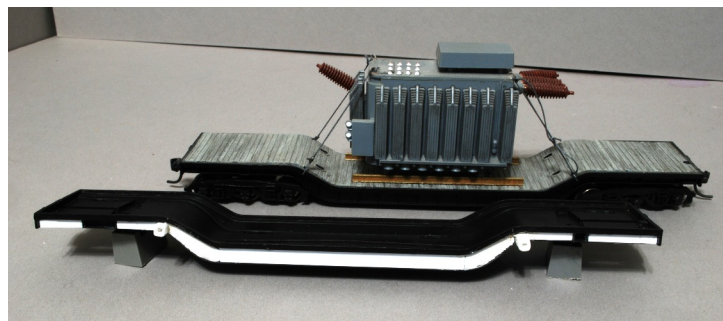


Figure 1: Modified Bachman depressed center flat car as compared to the standard car in the foreground

## HUBHoliday 21 is Canceled!

By the HUB Party Planning Committee

**B**ecause of the ongoing pandemic, the HUB Party Planning Committee has decided to cancel HubHoliday '21, our planned Holiday party. It appears as though gathering restrictions will be with us for some time to come.

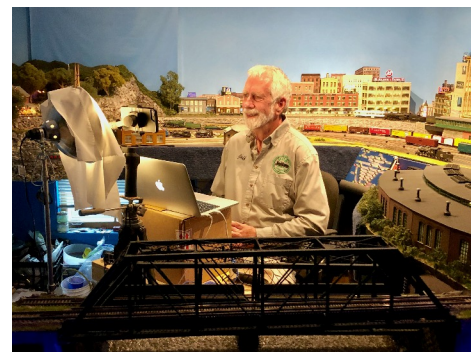
Assuming we return to more normal conditions, we have scheduled HubHoliday 2022 for Saturday January 8, 2022 at Quincy's Common Market Restaurant. We feel confident we can receive dates and pricing similar to what we would have had for January 2021. The Party Planning Committee is also identifying other events for a time when larger groups can safely get together.

Stay safe all.

## NMRax LCC Clinic

By Jeff Gerow

I recently presented my Layout Command Control (LCC) clinic at the September 26<sup>th</sup> NMRax. It was originally to have been presented at the Fall NER convention. The clinic is a beginner's guide to LCC based on getting turnouts to work for Jerome McDonald's Rockland, Canton & Northern layout. On the day of the presentation, I spoke to Gert (Speed) Muller sitting in the middle of his layout's helix in Texas, while Gordy Robinson ran the show from Scotland. It's amazing what can be done these days. There was a good audience on both Facebook and YouTube, and some good questions. I've posted the presentation on my YouTube channel: [www.youtube.com/watch?v=5GcjrLOH1ds](https://www.youtube.com/watch?v=5GcjrLOH1ds). An updated version of the clinic will be given live at MillCity 2021



Jeff answering questions from the middle of his layout during his NMRax presentation.  
Photo by Susan Gerow

## RAILFUN:

(Continued from Page 1)

### How I decided to go for my MMR

By Russ Norris, MMR

8PM Friday, January 15, 2021

**R**uss Norris is the HUB's most recent Master Model Railroader (MMR #638). He will explain how his modeling adventures were jump-started by rejoining at the NMRA at the Amherst Model Train Show back in 2012. Russ will give the audience a retrospective on the process of achieving one's MMR, and convince you that it can be a fun and educational experience.

If you haven't visited Russ's layout on one of our Saturday Cape RAILFUNs or seen his prototype structures at the Cambridge School, you are in for a treat.

## HUB Division Calendar of Events (Subject to Change)

### 2020

Nov 20 (Fri)	HUB RAILFUN Zoom Meeting, 8 PM
Dec 1 (Tue)	Submissions deadline for the HUB <i>Headlight</i> Jan-Feb issue
Dec 1-4 (Tue-Fri)	NERx Online Convention (Evenings) <a href="http://www.millcity2020.org">www.millcity2020.org</a>
Dec 5-6 (Sat-Sun)	<b>CANCELED</b> The HUB-sponsored New England Model Train EXPO at the Best Western Royal Plaza Trade Center, Marlborough, MA
Dec 18 (Fri)	HUB RAILFUN Zoom Meeting, 8 PM

### 2021

Jan 15 (Fri)	HUB RAILFUN Zoom Meeting, 8 PM
Jan 30-31 (Sat-Sun)	<b>CANCELED</b> Amherst Railway Society's Railroad Hobby Show, Big-E Fairgrounds, West Springfield, MA.
Feb 1 (Mon)	Submissions deadline for the HUB <i>Headlight</i> Mar-Apr issue
Feb 19 (Fri)	HUB RAILFUN Zoom Meeting, 8 PM
Mar 19 (Fri)	HUB RAILFUN Zoom Meeting, 8 PM
Apr 1 (Thu)	Submissions deadline for the HUB <i>Headlight</i> May-Jun issue
Apr 16 (Fri)	HUB RAILFUN Zoom Meeting, 8 PM
May 21 (Fri)	HUB RAILFUN Zoom Meeting, 8 PM
Jun 18 (Fri)	HUB RAILFUN Zoom Meeting, 8 PM
Oct 8-11 (Fri-Mon)	HUB-Sponsored NER Convention, Mill City 21, Westford, MA, <a href="http://www.millcity21.org">www.millcity21.org</a>

## Layouts Open for Visits by Appointment

Dwight Sturtevant's N-Scale show layout and fixed home N-Scale layout were going to be open for the Mill City 2020 Convention. With that moved to 2021, he is welcoming folks to visit by appointment. His home layout now has working signals. Dwight was picked by John at AZATRAX to test his new TS-5 Control Point Signaling System.

Please contact Dwight to request a visit via email at [tvman@mapinternet.com](mailto:tvman@mapinternet.com) or call anytime (424) 216-2765 8am to 8pm, 7-days-a-week. The layout is located at 2019 East Street, Three Rivers MA



## Achievements



Andy Reynolds (center) being presented with his AP Author Award by Peter Watson, MMR (left) on September 3, 2020. Russ Norris, MMR (right) helped Peter judge Andy's submissions for Structures, Prototype, and Scenery - See Below.  
Photo by Doug Scott



Peter Watson, MMR (left) presents Andy Reynolds (right) his AP certificates for Scenery, Prototype and Structures on October 14, 2020.  
Photo by Doug Scott



Stan Ames happily shows off his Scenery AP Certificate.  
Photo provided by Stan Ames

## Pulpwood Loads

By Dan Fretz

This is a photo of my current project, making pulpwood loads for my weathered pulpwood cars. I trimmed the ends of dead pine tree branches and hand-cut a couple-thousand scale 14' "tree-trunks" to fit four stacks into each car, like the prototype photos I found. Tedious, but they're coming out pretty well so far! Note that I only have three-stacks per car to give myself room to work.



## Modeling Idea

By Bruce Robinson

D&H flanger #36030 resides at the "caboose village" in Tilton, NH and this photo was taken October 1, 2020. A scratch-built model using a flat car frame, wood decking and a cab built from styrene would make a nice addition to a roundhouse scene.



## New Members

The HUB Division welcomes the following new members:

- Robert & Logan Collins, Wrentham MA
- Daniel Trefrey, Sandown NH
- Stephen Ferris, Abington MA
- John Kelley, Needham MA



## Master Builder - Prototype Models The Milton Crossing

By Andy Reynolds

As you will see in this *Headlight*, I have received four AP Awards during the last few months. Granted, I didn't just create the required modeling techniques during the pandemic. Like many NMRA members, I've been accumulating some fine work over the years. I have even presented some of this at NER conventions and been awarded merit awards, First Places to Honorable Mentions, and a People's Choice Award. The problem I had, as did many hobbyists, is to find the time to *document* what I'd done. In many instances, I had photographed my progress, and turned my accomplishments into PowerPoint presentations. This two-pronged approach made it slightly easier



*Original Caption: The CNR's daily except Sunday wayfreight has departed Milton station in the distance and is about to cross the double-tracked CPR Toronto to London mainline on June 6, 1959. This train operated from Hamilton to Allandale via Milton, Georgetown, Inglewood and Caledon. The signals protecting this crossing were manually operated with long rods stretching from the signal to huge levers located upstairs in the interlocking tower and required much strength to move.*

to show the judges what I did to make a model, and at the same time, it provided documentation for the Statement of Qualification Form (SOQ) required when getting judged. A mistake I made along the way was not reading the SOQ until I thought I had completed the "requirements to qualify for this certificate" from the NMRA website. I found at times there may have been something in the SOQ that eluded me earlier on or, just the opposite, that I may have over-thought the process and done more than I needed to. My advice is to find a mentor such as our AP Chair, Pete Watson, another MMR, or someone who recently may have received an award in your area of achievement. Create a game plan tackling the task at hand. I have found in some cases, interpretations get skewed, and the requirements at times are subject to interpretation. To stay on track, you should run this by someone. For instance, I loosely read the prototype requirements, and my main goal was to find an archived picture of a railway track, where I could add the required engine and cars. I wanted to build a dairy barn scene along the track, and I thought it would look great. Thanks to a few MMRs, I was told quite early on that my picture didn't have a "railroad structure." I said I'd build a pick-up platform for the

milk containers, but was argued out of this as it wasn't in the prototype scenes.

So now that I've passed along what I learned along the way, let me tell you how I was judged on my Prototype Milton Crossing. First, the maximum point score, for a "highly detailed" and "very intricate" model, is 125 points. Keep in mind, this score is "never achievable" with a \$35 craftsman kit, no matter how much effort you put into it. Points are given on a sliding bell curve scale based on the complexity. Not only is it scored on your ability, but scaled down or up based on the scope of the project. So I scored 102 points. I received 30 of 35 for terrain, 33 of 35 for structures, 5 of 15 for background, 3 of 5 for lighting, and 31 of 35 for realism. I felt the scores made sense, and was very pleased that Russ Norris, MMR, and Pete Watson, MMR, granted me these points.



*Robert Sandusky's original photo and caption (left) and my completed prototype scene (right).*

I am adding excerpts from my SOQ parts 3 and 4, and photographs, to show you how this was done. [Editor Note: References to attachments are regarding Andy's original submission and these items are not included here.]

*3. Prepare a written description along with photographs, documented evidence and/or maps which will verify the actual prototype scene used as a basis for the modeled scene.*

My Milton Crossing prototype depicts a bright spring day (60 plus years ago) on June 6, 1959 photographed by Robert Sandusky. The Sunday way freight has departed Milton station and is about to cross the double tracked CPR Toronto to London mainline. These crossings were manually operated with long rods stretching from the signals to the huge levers located upstairs in the interlocking tower. Other reference material comes from a book by Charles Cooper named "Hamilton's Other Railway." The entire railway was researched and prototypically portrayed, right down to the point rodding and extension kits, to the "hand laid" double 60-degree crossing and #6 turnout. I have prepared multiple clinics at the NER level and HUB Division clinics verifying area, size of the buildings, and location. More pictures are attached. The diorama of my Milton Crossing is also in the Canadian Hall of Fame at [www.railwaypages.com/prototype-modelling-ontario-hall-of-fame](http://www.railwaypages.com/prototype-modelling-ontario-hall-of-fame) and also won first place at the Albany NER Convention.

*(Continued on Page 7)*

## Master Builder - Prototype Models The Milton Crossing

(Continued from Page 6)

4. Provide color photos and a written description of materials and methods used to build the scene.

I have created two separate PowerPoint presentations on this subject, and presented the techniques to the HUB Division in 2016 and also presented these techniques on September 17th at the NER Convention. Excerpts from the PowerPoints are attached. Executive Summary – I started with a foam core base and added Bragdon Enterprise foam resin to create the hills. I used two Fast Track 60-degree crossing and #6 turnout templates to make the track work. Northeastern Lumber is my go-to for all my board-by-board construction of the freight house, and lumber panels for the tower. All blueprints took the original dimensions from actual inventory records. I used Presier figures for the fully operational electrified tower with scratch-built levers as well as a fisherman in the stream, which I built with Woodland Scenic Water Effects and Weld-bond glue to create the ripple effects. Interior lighting came from a Radio Shack kit. I modified (kit bashed) Tichy widows to fit my four widow casements in the tower. I used double-headed electrified semaphore for the signals, and Wills for the Point Rodding kits and extensions. For more details go to the attached paperwork.



*This shows the end point of the point rodding systems.*

## Modules For Kids and Those That Want to be Kids Again – Part 2

By James Harter

This is the continuation of the article that ran in the May – June 2020 HUB Headlight. At present I am guessing there will be a third part when the bridge and control table are built. There are also individual write-ups of the initial modules and how they are planned and configured. In this article we are addressing the more technical aspects of the modules.

Children are mainly interested in watching the trains, and pushing any buttons that activate the animation that will be on some of the modules. As adults, our goal has been to make these modules future proof, and fault tolerant. The Legacy system is soft loadable like a PC so it can grow with new functionality via the download route. I believe that Bluetooth is the future for all new equipment, even the Legacy engines can and now have Bluetooth. This gives the user an inexpensive walk-around throttle (old cell phone or tablet). Scenery is meant to be changeable so as not to get stale (not the same for each show but should follow the seasons).

It has been a strange and challenging year with all our displays from March through January having been canceled. We are still planning to go to shows and hope to be at “The Great Scale Model Train Shows” in Timonium, MD, February 6 - 7, 2021.

We had been planning a 9-foot square layout for the Amherst show, which would have been the first time the switching modules would go before the public. As of August 2020, they have been tested for running trains. We are using the additional time between September and January to add some niceties.

We have completed the technical work on the two additional switching modules including additional wiring for an option of making the two loops separate power districts with independent power supplies. With this setup we can simultaneously run two trains under different protocols. At present, all eight track modules with two trains loops only need a single 10-amp power supply. They have been built with wiring for both separate power districts with independent power supplies or a single power supply and have been fully tested with the master power corner (#1), which has all the power connection wiring installed.

What we have done in what's left of this show season is to Poly-Stain the outside boards a satin antique walnut. We have also added Hunter green flame-retardant Module skirts. The top surfaces are painted in an earth tone, to seal them. In addition we will have other material inserts that can be applied depending on the date of the show (snow for December January and February – Grasses for October and any November shows or for Spring Shows, March, April and Early May.) They can also be displayed mixed showing different seasons. The rest of the year is time off. To give you an idea, below is one of the straight modules at an intermediate point, after paint, Poly-Stain, grass mat and fire-retardant skirt have been added. We added some ballast between the tracks to complete the finished look.



*This picture is an aerial view of the hand laid double crossing and turnout from Milton on the CNR to the south bound CP line.*

## HUB Division Nametag, Headlight Subscription and Donation Forms, Module Kit and Branded Merchandise Store Information

Please see the September - October 2020 Headlight for all order forms and module kit information along with details about the online HUB Branded Merchandise store.

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# Erich's Electronics Notebook

By Erich Whitney

## The NMRA DCC Working Group

**T**his edition of my Electronics Notebook is a little different from previous submissions. It is a look at my current work on the NMRA DCC Working Group. So much of my work in this hobby is wrapped up in the details of the electronics we use. I wanted to share with you some insight into what goes on behind the scenes in the NMRA to create and maintain the standards we rely on.

One of the things I really like about the NMRA is attending regional and national conventions in addition to our division activities. At the 2018 NMRA National Convention in Kansas City, I met Mark Juett, who was the clinic chairperson. You might also recognize Mark as the author of “The Pulse of DCC” in the NMRA Magazine. KSC2018 was my first opportunity to give clinics at a national convention and he put me at ease immediately. Mark and I got to chatting in the lobby of the hotel because my clinic topics interested him, and he told me about his involvement with the DCC Working Group, of which he is the manager. I should have known what was going to happen next. When we met again at the 2019 NMRA National Convention in Salt Lake City, he asked me if I would be willing to join the DCC Working Group. Since I’m a techie and I know a fair bit about DCC, I thought it would be a lot of fun to get to work on the standards and see if there was a way I could chip in to help. I can’t tell you how many times I’ve heard someone ask or post online the question, “Why should I join the NMRA?” For me, it’s the opportunity to not only meet people from my own area, but also when I go to conventions, I get to meet people like Mark.

Mark then introduced me to Carl Smeigh, who’s the manager of the NMRA Conformance and Inspection department. Mark’s focus is on the DCC standards, recom-

mended practices, and technical notes that are maintained by the NMRA. Now, some might ask why we need to have people working on the DCC standards when they’ve been around for such a long time? The short answer is that technology evolves, and we need to keep up with what is going on in the industry and provide updated technical information. There was a period of time when the DCC standards were not being actively updated. Today, there is a very active group of volunteers who are working on updates to most, if not all, of the standards. But it’s more than that! In addition to maintaining the standards, NMRA volunteers also perform conformance testing. This is a service to the hobby ensuring that products with the NMRA stamp actually meet all of the requirements set out in the standards! It takes a team of volunteers to perform these tests and work through all of the fine details to make sure everything a manufacturer says that a product does, it actually does (with respect to the published NMRA standards). Every issue of the NMRA magazine has a section on products that have been tested and the results are published. This work is all done by volunteers.

Among these volunteers are HUB Division members Stan Ames and Bruce Stockdale, whose work goes back to the early days of DCC. I don’t feel qualified to do their efforts justice in this forum, but suffice it to say that we owe a huge debt of gratitude to them for their work (and many others) nearly 30 years ago to bring DCC to the hobby. When Mark and Carl asked me if I would be willing to tackle the job of reviving the DCC Command Station Testing program, I jumped at the chance. This was Bruce’s area of expertise back in the day, so I recruited him to help. I also reached out to Stan, who has given me a tremendous leg up by providing me with a great deal of the historical information I needed to understand how to tackle this challenge. I should point out that there is an ongoing DCC Decoder Testing program. There are so many more DCC decoders introduced into the market than there are command stations.

In order for a product to say that it conforms to NMRA standards, it has to pass all of the tests that check that product against the standards. Passing these tests results in the NMRA issuing a Confor-

mance Warrant. Recommended Practices (RPs), on the other hand, are just that. If a product incorporates a particular RP, it has to pass a test for that RP but if it doesn’t incorporate the RP, it can still receive the conformance warrant. The NMRA also produces Technical Notes (TNs) and Technical Instructions (TIs). These are supplementary documents to help supplement the standards (TNs) and provide additional instruction (TIs). For more information and details on this, I encourage you to visit the NMRA Standards & Recommended Practices website, [www.nmra.org/index-nmra-standards-and-recommended-practices](http://www.nmra.org/index-nmra-standards-and-recommended-practices). Some of the information on the website may look a little outdated — I want to reassure you that there is currently an effort to update a great deal of this information. Again, this is all being done by volunteers so please be patient. If any of this work looks like something you would be interested in contributing to, I would ask you to reach out and volunteer also!

The DCC Command Station (DCS) Conformance and Inspection (C&I) Testing program we are developing now is considerably more extensive than it was in the early days of DCC. The reason for this is that many of the original RPs have now been pulled into the standards. This means there are a lot more tests that a command station has to pass to achieve conformance. The good news is that technology has moved along quite a bit in 30 years, and we’ve got a lot more computing horsepower to work with. My approach to tackling this challenge is to use USB-connected test equipment combined with software running on a computer to automate the testing. The first command station tests will take me some time to develop but once that’s done, the next one will be much easier.

One of the challenges to this testing is coming up with a set of procedures that accurately and consistently captures each test such that it is repeatable and reliable. In order to do this, I created a test fixture to make connecting the DCS Device Under Test (DUT) to the test equipment such that the test setup is repeatable. One of the tests puts the DUT under load to make sure that the command station continues to work properly as you load it down with your layout. To test this, I built

*(Continued on Page 9)*



## Erich's Electronic Notebook

(Continued from Page 8)

a bank of power resistors to act as that load and I use a Digital Storage Oscilloscope to check for distortion of the DCC signal. This same load can be used to make sure that the short circuit protection works properly — this is a feature we test on a regular basis at train shows on the HUB Modular Railroad. Isn't it good to know that someone actually tested that? In addition to the electrical aspects of the command station, we also have to test that the DCC messages (called packets) it produces are all correct. In order to do this, I've incorporated a programmable digital logic analyzer into the test fixture. This device reads the DCC packets on the track and decodes them into a human-readable output. The analyzer I'm using also allows me to write Python scripts that

can be used to scan through the thousands of DCC packets to verify each test. If a command station is capable of connecting to a computer, I can also use JMRI to send commands to the command station, further automating the testing.

We are still working on bringing up this new test system. Given that COVID-19 has canceled so many of my plans for other model railroading, and so many other activities, we've found ourselves with some time. During this challenging period, I've been spending a lot more time on projects like this that need a more focused effort. It has the wonderful side-effect of keeping me occupied, so I don't think so much about what I'm missing. Even so, I do very much miss our meetings in person. Let's hope that changes soon.

I trust I've been able to give you a little insight into what goes on behind the



The NMRA DCS Test Load (Left) and DCS Conformance Test Fixture (Right).

scenes of the DCC Working Group (I've barely scratched the surface). This is an exciting time in the NMRA. The working groups are more active now and there are a lot more opportunities to really make an impact in this hobby that we love so much. To me, this work is the definition of "the NMRA is what you make of it." Please feel free to reach out if you have any questions about this work or anything in electronics that has you scratching your head. Take care and be safe.

## Tortoise Connectors Courtesy of Doc Johannes

By Dave Insley

When I was getting ready to start my first LCC implementation, I needed to install Tortoise switch machines. I recalled years ago seeing a modification that Dick Johannes (Doc) had made and was fortunate to have saved the email he sent me with the instructions. I ordered some of the Kobiconn connectors from Mouser, part number 158-P02EK381V8-E. The older Tortoise switch machines required drilling some holes as the existing holes are staggered. I used a #61 bit, but I probably should have used a #58, which I did not have on hand at the time. It was then a simple matter of inserting the pins of the connector into the holes and soldering them in place.

I recently bought some new Tortoise switch machines and was thrilled to discover that they changed the hole patterns on the tabs and the smaller holes are perfectly spaced for these Kobiconn connectors, making the drilling step unnecessary. Doc would have been thrilled.



The older Tortoise machines require drilling holes for the connector since every other tab is offset.



The finished connector installed makes it much simpler to wire when it is installed on the layout



I soldered the pins to make connectivity. This picture made me realize I needed to redo a couple of them.



The new hole pattern on the Tortoise makes installing connectors a breeze.

## My First LCC Network

(Continued from Page 1)

pletely signal my railroad using LCC so this project is the first step in getting to that ultimate goal.

I decided to start in my staging yard that represents Mechanicville, New York on the Boston and Maine.

Here is a summary of the items I will be using to power my four turnouts:

- LCC Starter Kit from RR-CirKits
  - LCC Buffer-USB
  - LCC Power-Point
  - LCC Terminators (2)
  - Tower LCC board
- SMD-8 Daughter board
- 12V Wall Wort
- Ethernet Cable (CAT-5)
- 10-wire 28AWG Ribbon Cable
- Laptop running JMRI

There is still a lot I do not know about LCC and reading through the various sources still has me somewhat confused. I have learned enough to set up my first network and control some turnouts in my staging yard, so hopefully this will help those of you trying to accomplish similar things.

LCC is a peer-to-peer network, and as such requires at least two nodes but does not need a master controller or command station. For my network, I chose to use my laptop running JMRI connected to the network using an LCC Buffer USB and a Tower LCC board that would hold the connections to the switch machines. I did not need to use a laptop and instead could have created a physical panel with push-buttons, but this was a simpler solution for me. I will add the push-buttons later so I can control the turnouts from either my laptop or from a control panel.

The other major concept to consider in LCC is that it is an event driven network that has nodes that will produce events and other nodes that will consume those events. For my turnout control, I need something to send an event to tell a specific turnout to throw, and when that message is sent, I need that turnout to throw. Pretty simple. The beauty of all this is that these nodes are all self-describing, which means you just need to plug them in.



*XO Tower consists of an LCC Power Point that provides power to the network, and a Tower LCC board that holds the SMD-8 daughter boards that connect to the turnouts. The grey cable goes to the laptop that connects with an LCC Buffer USB*

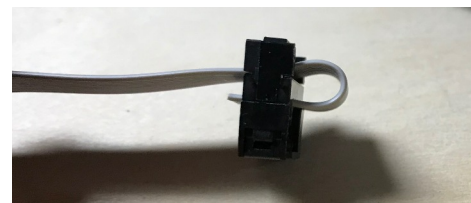
I created my XO Tower on a pull-out shelf underneath my Mechanicville Staging yard. I needed to power the network, which is done using the LCC Power-Point, and I connected that to a Tower LCC board. This board has two connectors that can take a secondary daughter board, which in my case was an SMD-8. This controls up to eight stall motors, such as my Tortoise. I can connect two of these to control a total of 16 switch machines. I will need to add other boards when I create my physical panel with push buttons, but for now, I have what I need.

The other node in my network is my laptop running JMRI. This is connected to the network using the LCC Buffer-USB. This will allow me to produce events that send the instructions to the switch machines. That's it. My network is complete! That was pretty simple.

The next step in the process was to connect the switch machines to the SMD-8 board. This will then fit into one of the 10-pin connectors on the Tower-LCC.

You connect the turnouts to the SMD-8 board using a 10-wire 28AWG Ribbon Cable. I got mine on Amazon, which was kind enough to suggest a crimper and a box of extra connectors. How could I refuse? The RR-CirKits boards come with connectors, but I knew I would mess up something so I figured having extras would not hurt. The crimper made getting

good connections on the wire simple, as long as I paid attention and had the cable inserted correctly.



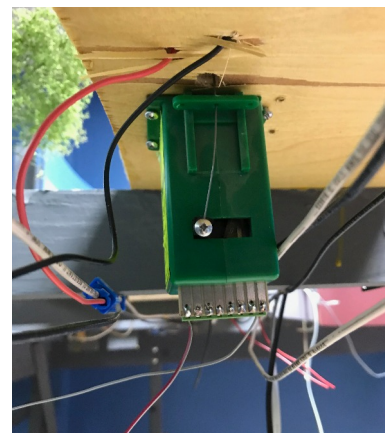
*The connector press-fits into the ribbon cable and wraps back around to prevent it from pulling out. The crimping tool helps make sure it seats properly*

I next unwound enough of the ribbon cable to reach the furthest turnout from the LCC boards and cut the cable with a sharp pair of scissors.

You connect the four turnouts using pairs of wires from the ribbon cable. I could tear them with my fingers, or a sharp hobby knife would also work. The first two pairs and last two pairs of wires go to the switch machines leaving the middle two wires unused in this application.

The biggest challenge was stripping the wires. I finally invested in a pair of wire strippers that went down to 30AWG wire. Even without that, I could manage without taking off too many strands. The connectors I added to the Tortoise made connecting the wires simple. See Page 9 on how I did this.

Once complete, it was a simple matter of connecting them to my connectors on the Tortoise.



*The Tortoise is wired using one pair of wires from the ribbon cable. Turnout power comes from a 12V wall wort that is connected to the SMD-8*

Now, all I need to do is set up JMRI and create my panel and I am finished!



# HUB Headlight

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## Headlight Printers

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## Modules For Kids and Those That Want to be Kids Again – Part 2

(Continued from Page 7)



Module with new skirt. Track and grass mat to be installed.

We also made up a specialty train for Halloween, which has a Lionel RS-11 Legacy engine running in Bluetooth mode equipped with scary Halloween Sound effects and painted as a winged Bat. This is followed by a Rail King Tombstone flat car with blinking candles, followed by a box car from one of our favorite Micro Breweries (the Woodstock Inn out of NH), followed by a Rail King gondola car full of blinking Pumpkins, followed by a lighted End-of-the-Line caboose by Lionel.

What is planned for the next year is a command console (see prototype spacing in picture below), and a lift bridge so you do not have to crawl under to get to the inside of the expanded 9-foot by 12-foot or larger display



Command Console mockup - WiFi router, GW-180 and PowerHouse 180, remote switch controllers, Legacy base, and second PowerHouse 180.

For Christmas we have the Polar Express and The Thomas Kinkadee Christmas Train. Both of which are available as starter sets. We may run with some extra cars to show that things can be expanded.

We are now ready to start looking for folks who want to become the early club members to help decide where we go from here. What would be nice is one or two volunteers, preferably with young children interested in the hobby, to help with setup, the running of trains, and tear down at the end of the shows.

Anyone interested in three-rail Lionel O-scale can just send me an email at harter@newenglandcustomrail.com.

Bottom line: let's have fun running trains!