



The Local

Newsletter of the Mid-Eastern Region, NMRA
The Local, 76, Number 5, Sept-Oct, 2021

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Official publication of the Mid-Eastern region, NMRA – A tax-exempt organization

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75th Anniversary Issue!

As you know, the Mid-Eastern Region (MER) of the NMRA is celebrating its 75th Anniversary this year and we wish to commemorate that event in this issue and the next. As I looked at this picture of Katie's Roadhouse ([Photo 1](#)) built by Mark Gionet of the Potomac Division, I couldn't help but come up with a few comparisons of this model with the MER. This is a strong structure that has survived many years of weathering, but it has served as a warm, welcoming dwelling for lots of folks coming and going. As those travelers are gathered in the den during the morning and evening hours, enjoying the comradery with other passengers, sipping on warm beverages, and



Katie's Roadhouse built by Mark Gionet

discussing the day's events, they are each bringing their own individuality and creativity into the discussion. Sure, it needs a new paint job, but the walls have soaked up so much wisdom and fortitude from its dwellers that they could never fail. Some of the patrons are looking out the windows watching the trains go by and excitedly waiting for their train to take them to the next event where they will discover new things and learn more about what others are doing. At the end of the day, they will come back to the den and tell everyone all about what they saw.

If you haven't already registered for the [Mount Clare Junction Convention](#), please do so now. It's not too late. Join us for a few days of comradery and discovery. Enjoy the layout tours, the clinics, and the discussions, and most of all share what you have learned with others. See you there!

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Mid-Eastern Region Board of Directors & Administrative Staff

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MER Board of Directors Meeting Schedule

1. MER Board of Directors Meeting – October 21, 2021 (Delta Hotels Baltimore, 245 Shawan Rd, Hunt Valley, MD 21031) (Contact the MER President for access to the meeting)
2. Annual Meeting – October 23 (10 am, October 24), 2021 (Delta Hotels Baltimore, 245 Shawan Rd, Hunt Valley, MD 21031)
3. Board of Directors Budget Meeting – 10 am, January 29, 2022 (Zoom)

Mid-Eastern Region Division Superintendents

	<p>New Jersey Division 1 John V. Gallagher (856) 228-2239 njdiv.super@gmail.com Division web page: njdivnmra.org</p>		<p>Potomac Division 2 Martin Brechbiel, MMR superintendent@potomac-nmra.org Division web page: potomac-nmra.org/</p>		<p>Philadelphia Division 3 Joe Walters, MMR (302) 521-5884 josephfwalters@yahoo.com Division web page: www.phillynmra.org</p>
	<p>Tidewater Division 4 Fred Humphrey (757) 482-9498 tidewater.mer.nmra@gmail.com Division web page: nmra-mer-tidewater.org</p>		<p>James River Division 5 Phillip R. Taylor (434) 589-6006 drphilster@gmail.com Division web page: jrdnmra.blogspot.com/</p>		<p>South Mountain Division 10 Alex Polimeni southmountaindiv@gmail.com Division web page: http://www.smdnmra.org/</p>
	<p>Susquehanna Division 11 Tim Himmelberger (717) 695-7958 timh@susquehannanmra.org Division web page: www.susquehannanmra.org</p>		<p>Carolina Southern Division 12 Alan Hardee (704) 868-6976 superintendent@carolinasouthern.org Division web page: www.carolinasouthern.org</p>		<p>Carolina Piedmont Division 13 John Sokash jasokash@bellsouth.net Division web page: www.cpd13.org/</p>
	<p>Chesapeake Division 14 Tom Casey (410) 426-8947 super@chesdiv-nmra.org Division web page: www.chesdiv-nmra.org</p>				



Be sure to visit the [B&O Museum](#) while you're attending the [Mt. Clare Convention](#) in October!

Mount Clare Junction Convention Update

By Rick Uskert

Discounted Registration has Ended

But Advanced Registration is Open Through October 3, 2021

Make plans to join us at the Marriott Delta Hunt Valley Hotel this October 21-24, 2021 and visit the convention [website](#) to register.

The “early bird” discounted registration period ended August 31st, but not to fret, you may still register online to attend the in-person convention through October 3rd. Visit mtclarejct.com to complete an online reservation or submit your paper copy by regular mail; however, it *must* be postmarked by October 3rd, 2021 to be accepted. After this date, all registrations must be made on-site, at the convention Registration Desk.

Hotel Reservations Closing September 28th, 2021

The Delta is located immediately off I-83 (exit 20), 17 miles north of downtown Baltimore and 18 miles south of the PA-MD state line.

The convention room block discounted rates will be available until the cutoff date of Saturday, September 28th, 2021. After that date, unreserved rooms will be released for general sale and attendees wishing to stay on-site will pay the general room rate. A link to the Delta Hunt Valley convention registration page is available on the convention website and on the convention Registration page.

Convention Meal Selections Ending October 3rd, 2021

While on-site, enjoy breakfast and stay-in/take-along box lunches prepared by the Delta chefs. Saturday night, all NMRA members are invited to attend the 75th MER Anniversary banquet. All meal selections may be made through the [Registration page](#).

All on-site meal selections, including the NMRA MER 75th Anniversary Banquet, must be made by October 3rd to allow hotel kitchen preparations. Please submit your final selections with your final Registration submission. Meals cannot be added to your registration after this date.

[Read more about the Convention Schedule, etc. here...](#)

[Get Updates on Maryland COVID-19 Restrictions and Guidelines here...](#)

Planned Giving

By Bob Morningstar

Introduction

Model railroading for many is a lifelong source of enjoyment, education, and camaraderie; but like all good things they too must end. The intent of this article is to introduce our membership to the concepts that will extend your involvement in the hobby after we have boarded that last train. Most people avoid the topic of estate planning, wills, and the like; but a little bit of planning can ensure your participation in preserving and assisting in the continuation of the MER.

What is Planned Giving

Estate planning, gift planning, deferred giving, or legacy giving — or in generic terminology, planned giving, assists members in making plans to leave money or assets to the MER at a future date after death. There are different types of planned giving, but the most common are bequests, charitable gift annuities, and charitable remainder trusts.

In its simplest form, you can simply bequest a gift to the MER via your will. What is a bequest? These make up the majority of planned gifts. Anyone can make a bequest to a nonprofit through their will or estate plan. You can allocate a specific amount as a lump sum or a percentage of their total wealth, or they can choose to give the remainder of their estate to a nonprofit after all of their other bequests are paid.

The Ask

Consider making the MER a benefactor of your estate. Estate planning can be complicated or simple depending on your financial, tax, and legal circumstances. Please consult with your attorney, estate planner, and/or financial planner on how best to gift the MER. The MER is a 501(c)(3) chartered in the State of Maryland if your financial planner or attorney were to ask.

Next Time

We will discuss more sophisticated forms of planned giving such as charitable gift annuities, and charitable remainder trusts.



President's Column

Next Stop: Mt. Clare Jct.

Diamond Anniversary

President Kurt Thompson, MMR

When you get to read this, we'll be less than seven weeks before the start of the Mt. Clare Jct. Convention. I have very mixed feelings about the convention: part Christmas-like expectation and part performance review anxiety.

After the last two years since our last convention, the world and our hobby has taken a big spin. I'm ready to get off the COVID merry go round and see you all again.

As the model railroading adage goes, there's nothing like a deadline to motivate someone (me included). With only seven weeks left, I have some minor tasks to finish up before the convention. Chief among them is re-cleaning the track on the layout. Then it's vacuuming up all the clean-up shreds and shards. Lastly, it's time to stash away the rolling stock that's not ready for use or needed for the OPS session.

Luckily the two clinics are already in the can and ready to go. Even the demonstration track work for the Arduino clinic is done.

If you haven't registered, there's still time even if early registration has passed. Don't forget that the President's Award this year is wide open, as long as the subject of the model was in use by one of the railroads serving the Baltimore area directly in 1946. Look back through past issues of *The Local* for further details.

Now if you'll excuse me, I have a punch list to complete. See you at Mt. Clare Jct.



From the Editor's Desk...

Greg Warth, Editor

Full Circle:

So here we are at the 75th Anniversary of the Mid-Eastern Region of the NMRA. A lot has changed over the past 75 years! I wonder what our founders would have thought if they could have seen into the future of model railroading.

In the 1930s and early '40s, "model building" wasn't even in the top ten list of hobbies in the U.S. However, the seeds of growth were in place. Model railroaders had already been modeling trains since the early part of the century. Two-rail O scale kits and products were available thankfully, and there were the "tin-plate" trains made by Lionel, Ives and others. Many serious model railroaders scratchbuilt their own structures, tracks, and locomotives. Most of the models were made from metal, cardboard, and wood.

However, a revolution was brewing. Prefabricated model kits were just starting to be mass produced and were becoming available to the general public. Manufacturers, encouraged by the NMRA (founded in 1935), began to develop more standards for different scales. Plastic-made model kits were much less expensive and easier to build. After World War II, model railroading exploded and easily became one of the most popular hobbies in America.

Now we have laser-cutting machines, 3D Printers, automated lighting systems, Arduino-controlled train movements. and any number of power tools and devices that can be used to create unique models of all kinds. Interestingly, we use this new technology to depict scenes of the *past*, frequently heralding our railroad history from the 1940s and '50s. What goes around comes around. Happy 75th!

Reference: [“The HO Scale Model Railroading Revolution of the 1940s” by Alan Bussie](#)

This, the 75th Anniversary issue of *The Local*, is loaded with new information on testing your tracks, explanation of signals, scratchbuilding an MER stock car and a flat car, painting people, Mt. Clare Convention updates, historical perspectives, more great modeling tips, becoming an MMR, an amazing, featured layout tour, and lots more.

Please note that our calendar of events is now published on the [MER website](#) by our webmaster, Jeff Burch, and is updated on a regular basis.

Many thanks to all the authors, editors, publishers, distributors, webmasters, business managers, AP Managers, elected officials and all others who have contributed to this journal and to the MER overall for the past 75 years and counting. You have made us what we are today.

Don't forget to register for the Mt. Clare Convention if you haven't already. And don't forget to VOTE for your Director candidates, although it is a little disappointing that we only have a minimum number of people (3 candidates out of almost 1800 members) willing to step up for these positions. Please consider throwing YOUR hat into the ring for the next election. We need you. Think of that [Associates Official AP Certificate](#) you could rack up on your way to the MMR!

Send all articles, photos, tips, comments, requests, and feedback to [the LOCAL Editor](#).

Learn how to prepare an article for *the Local* [here](#).

Reminders:

1. Sign up for the Convention using the [Registration Form here](#).
2. Order your MER T-shirt on the Registration Form.

3. Send us your modeling tips, articles, and layout pictures to local-editor@mer-nmra.com
4. Don't forget to work on your Baltimore railroad car, structure or locomotive for the President's Award.
5. Send us any information you may have on the history of the MER for our next issue.

Above all, thank you for your membership in the MER and NMRA. We truly appreciate your support and your faith in our organization as an informational resource and as a method of collaborating with other modelers. Happy railroading!

Advertising:

If you have a business and find yourself wishing to place an ad on this page, please contact the Editor at local-editor@mer-nmra.com. The current advertising rates (one year) as follows:

Callboard ads (Division and Clubs Only)...Free

Business Card size	\$60
Quarter Page ad.....	\$125
Half Page ad	\$225
Half Page ad per issue (Div. only)	\$25

Your ad may appear as text, photo, art or any combination thereof. Art must be of high quality and camera-ready. Formats must be in txt, doc/docx, pdf, jpeg, bmp or tiff only. The content must be related to model trains or railroads or provide a benefit specifically to model railroaders. If you need help with your ad, please don't hesitate to ask the Editor.

The Local welcomes articles, photographs, and model railroad related material as contributions to members' education and enjoyment of the hobby. Materials should have a wide appeal. The Editor will exercise all due care of submissions, but contributors should not send paper/photo originals without retaining back-up copies. Editors, by definition, reserve the right and have the responsibility to make corrections, deletions, and changes to accommodate space. If your item is time-sensitive in any way, please advise the Editor. Otherwise, stories and photos that are

accepted for publication are used in approximately the order they are received.

Publication Schedule Submission Deadline

Jan/Feb	Dec 1st of previous year
Mar/Apr	Feb 1st
May/Jun	Apr 1st
Jul/Aug	Jun 1 st
Sept/Oct	Aug 1 st
Nov/Dec	Oct 1 st

Please observe the following steps to submit your contribution. **1.** Compose and submit your text in one of the following formats: TXT, DOC, or DOCX. **2.** Consider what photos, illustrations, or other graphics can go with the text. These are essential. But, **DO NOT** include/insert them into your text. **Do** put notations in the text such as “Insert Photo #1 here.” Send the illustrations separately and numbered as you would want them in the text. JPG, GIF, TIFF, or PNG formats are best for photos. **3.** If you have captions for your photos, etc., create a separate text file for the captions, each of which will be numbered to match a numbered photo or figure. A special note on photos or other exhibits; please only send us your creative work or that for which you have written permission to use so we can give that source proper credit. We need to avoid any copyright infringement situations.

Proofreaders:

Alex Belida , Martin Brechbiel, Bob Morningstar



Achievement Program Update

**By Dave Chance, MER AP
Manager**

August 2, 2021

Since the last report in *The Local*, the following Achievement Program certificates were earned and awarded:

Division 2 – Potomac

Pete LaGuardia – Model Railroad Engineer -Civil
Alex Belida – Association Volunteer
Bryan Kidd – Model Railroad Engineer -Electrical

Division 4 – Tidewater

Robert Cook – Master Builder Scenery
Robert Cook – Model Railroad Engineer -Civil
Robert Cook – Master Builder Structures

Division 12 – Carolina Southern

Ed Smith – Association Volunteer

Division 13 - Carolina Piedmont

Robert Gamble – Model Railroad Author
Jack Dziadul – Master Builder Structures
Tom Shafer – Golden Spike Award

MER’s Newest MMR: Alex Belida, MMR #685, of the Potomac Division, is MER’s newest MMR, so offer your Congratulations the next time you see Alex!

In a perfect world, this information will appear soon in the **NMRA** magazine. This should not deter you from giving recognition locally. Normally you will be able to recognize AP accomplishments long before the names appear in the **NMRA** magazine.

PROBLEM - The R&V form is for your personal use. Only use it with the Author Submission.

Please, NO R&V FORMS with other submissions.

Elections 2021

*****Election Notice*****

Jerry Lauchle, who has faithfully served one term on the MER Board and who has been listed as a candidate for re-election for 2021, has respectfully requested that his name be withdrawn from the ballot.

The remaining dates for 2021 are:

September 7, 2021 -- Deadline for electronic voting, also last day as shown by postmark for mailing paper ballots.

September 11, 2021 -- Deadline for receipt by Balloting Committee of paper ballots sent by mail.

September 18, 2021 -- Deadline for Ballot Committee to transmit results to President, the Director overseeing this committee, and the Business Manager.

September 25, 2021 -- Deadline for The President to communicate the election results to candidates. The Business Manager also notifies the MER Web Master and the NMRA of the election results.

October 9, 2020 -- Deadline for publishing election results on MER's website.

HELP WANTED: Publisher

Newsletter Publisher: *The Local* and *eLocal*

Appointed by:	President
Approved by:	Board of Directors
Reports to:	Editor of <i>The Local</i> and <i>eLocal</i>

Position Summary

Responsible for assembling the official publication of the Mid-Eastern Region, *The Local*, working directly with the Editor. The newsletter Publisher is responsible for providing "typesetting", article layout and arrangement, and pasting-up services for each issue, to produce a web-and-email-ready version of the full issue of *eLocal*, as well as a ready-to-print version of *The Local*. The Publisher shall also produce camera-ready-copy and ship the camera-ready-copy and related artwork to the printer in a timely fashion. Those efforts all rely upon the materials delivered from the Editor to the Publisher with direction as to which issue and where in that issue (sequence location) that content might be placed. The Publisher is to communicate objectives met on creation and insertion of content, sending frequent

draft versions of the *eLocal* to keep the Editor fully informed of the status of issues as they are being assembled.

The content of the first twelve pages of the print version of *The Local* shall be equivalent to the first twelve pages of the *eLocal*. The in-house official articles and business-related information must be contained within those first twelve pages. This ensures that all members will have access to this information regardless of which version they receive.

The Local serves as our official in-house publication and will contain all relevant articles of the organization and information of general interest to the membership. *The Local* must be presented as an image-building device for gaining membership and maintaining membership interest. The Publisher, working with the Editor, must exercise sound judgment and expertise for producing a uniform and pleasing tone to the publication.

Specific Responsibilities of the Publisher:

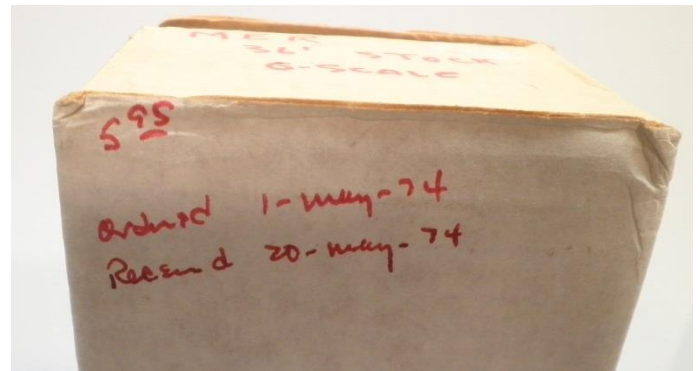
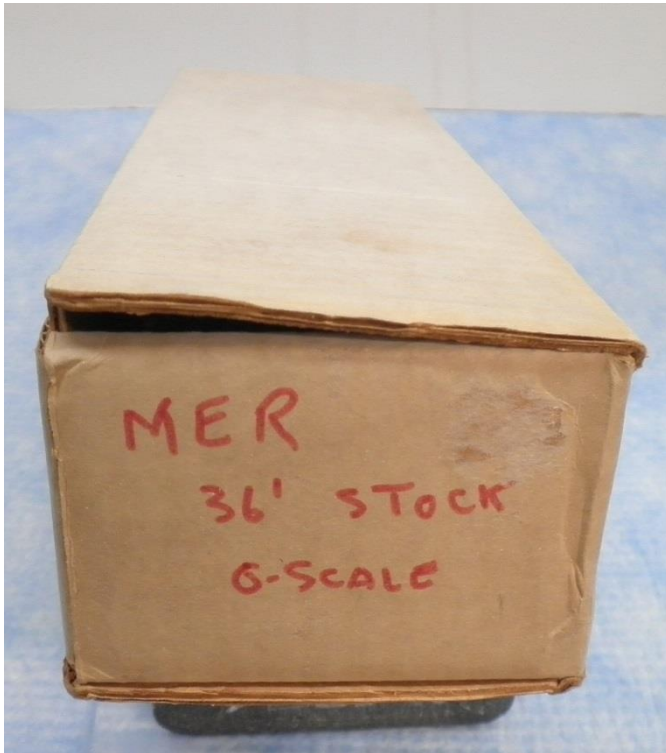
1. Keeps the Editor informed at all times.
2. Provides quality production.
3. Assembles the articles, photos and content obtained from the Editor into a pleasing and interesting presentation.
4. Collaborates with the Editor, when necessary, on layout design, presentation of content and space considerations.
5. Produces uniform quality and tone of the publication.
6. Acknowledges in writing (by e-mail) to the Editor confirming receipt of article(s) for insertion into draft versions of *eLocal* and communicates with the Editor routinely by providing draft versions of *eLocal*.
7. Prepares the ballot for all elections held within the Mid-Eastern Region of the NMRA.
8. Provides electronic copies of *The Local* and the *eLocal* of each issue to the Editor for final review and distribution

A Stock Car for the Ages...or 75 years.

By Martin Brechbiel, MMR

In response to the continuing call for articles from MMRs (Master Model Railroaders) in the MER (Mid-Eastern Region), and also it being the 75th anniversary of the MER, I felt that I should find something “interesting” for *The Local*. I had just the thing on a shelf in my rack of kits to build - a Main Line Models MER stock car! I have zero knowledge of the circumstances surrounding its creation and issuance by Main Line in the early 1970’s, (Photos 1, 2) but for reasons unknown I had it. At \$5.95 in

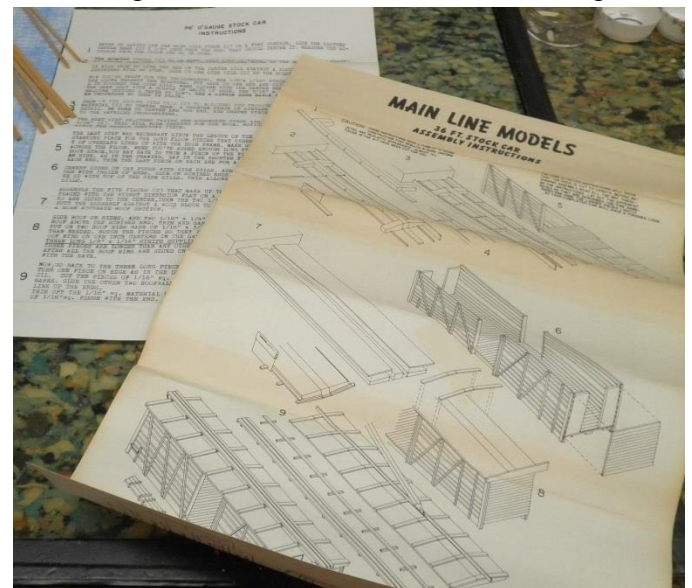
1974 this was probably a pretty good deal. Well, not being of any particular value by being kept stored in the box for another 35 years, I decided to build it.



First order of business here was to find out what was in the box, spread everything out, and try to make some accounting of the contents versus what the instructions called for and claimed was within this Pandora’s box of wood bits (Photos 3, 4). Repeated reading of the instructions while measuring the bits of wood revealed that things



were just not quite going to line up nice and neatly. Very few pieces of the strip wood were actually correct in dimensions, nor were nearly any of the



“pre-cut” bits actually cut. Simple solution was to muddle forward and just get close and good enough with the hopes that any accumulated errors would all cancel out. Hah! Like the Universe really works like that! But what could possibly go wrong?

After some extended existential sorting of wood parts, I jumped in and assembled the underbody frame ([Photos 5, 6](#)). This was actually the only real complicated thing to this kit and once done the rest of the car pretty much assembled itself. Okay, that’s hyperbole, but the sides, doors, and ends are prefabricated, and the roof is just three parts glued together. The sides and ends just get appended to the underbody frame and the roof drops into place. A little creative sorting of strip wood forms the door framing and then the doors drop into place.



So, let’s fast-forward and find that the car is assembled, painted, and has MER lettering added to the sides ([Photo 7](#)). I’ve added only a very few bits to the kit besides the paint. The roof has one of my tar paper substitutes on it – a few layers of single ply Panera napkins glued in place and painted with Lark Light Gray. I did add the roof platforms ([Photo 8](#)). The roof just seems a little naked without the platforms and grabs.





Thereafter, simply adding Kadee couplers (No. 0 x 3/8" wood screws) and some Bettendorf trucks completed this car ([Photos 9, 10](#)). It'll still need a bit of an overspray with some clear matte and some other dustings to finalize its appearance, but for now it's reached "good enough."



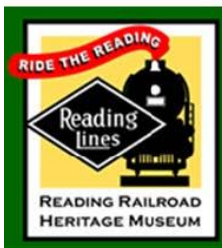
READING RAILROAD PROTOTYPE MODELERS MEET IX



[The Anthracite Railroads Historical Society is announcing a meeting at the Reading Railroad Heritage Museum in Hamburg, Pennsylvania on September 17-19, 2021](#)

Lots of Events and features including:

- * Displays of Reading and Anthracite Railroad modeling
- * Raffle of Prizes from major sponsors!
- * Reading and Anthracite Railroad inspired layout tours
- * Awards for popular vote models
- * Clinics on Reading & Anthracite Railroad modeling & history
- * Event t-shirts for sale (pre-order only)
- * Social hour to meet-greet your fellow modelers
- * Vendors selling Reading Railroad & other items
- * “White Elephant” sales table for registered participants
- * Make great new model railroad friends!



HOSTED BY-
The Reading Railroad Heritage Museum &
Reading Company Technical & Historical Society
Anthracite Railroads Historical Society



[Click here to learn more...](#)



Mid-Eastern Region, NMRA 2021 Convention MOUNT CLARE JUNCTION

October 21st to 24th, 2021

www.mtclarejct.com



Use Online Registration for Secure Payment and Best Up To Date Activity Availability. See Info Below.

Please enter (print legibly) all names **as you wish them to appear on your registration badge(s)**. They will not be changed at the convention.

Primary Registrant: _____ MMR? Y / N, Any Title for Badge? _____

Significant Other Attending (living at same address): _____

Children Attending (18 & under - list all + age): _____

Registrar's	Address: _____
Use	City: _____ State: _____ Zip: _____
Only!	Phone #: _____ E-mail: _____
	NMRA #: _____ Region: _____ Division: _____
	Favorite Scale: _____ Is this your first MER Convention? _____ Putting Items In Sale? _____

Description	ID	Cost	Qty	Paying
Registration (\$60 through Aug 31, \$75 Sep 1 thru Oct 3, \$85 On-Site Oct 21 - 24)				
Spouse/Significant Other (\$30 through Aug 31, \$40 Sep 1 thru Oct 3, \$45 On-Site Oct 21 - 24)				
Children 18 and Under (Name & Age)		\$0		No Fee
Banquet – Saturday Night				
____ Maryland Crab Cakes ____ Grilled NY Steak ____ Roasted Turkey w Sage Dressing	401	\$60		
Thu Lunch Buffalo Chicken Wrap Dix Roast Beef Sndwch Veggie Sndwch	402	\$20		
Fri Brkfst Ssge w Scrmbl'd Eggs Minced Ham w Scrmbl'd Eggs Griddle Cakes	403	\$18		
Fri Lunch Chicken Salad Sndwch Sourdough Turkey Club Veggie Wrap	404	\$20		
Sat Brkfst Grilled Ham w Scrmbl'd Eggs Bacon w Scrmbl'd Eggs Griddle Cakes	405	\$18		
Sat Lunch Tuna Salad Sndwch Italian Sub Veggie Sndwch	406	\$20		
Sun Brkfst Ssge w Scrmbl'd Eggs Omlt w Green Peas & Potatoes Griddle Cakes	407	\$18		
Sun Lunch Sourdough Turkey Club Dix Roast Beef Sndwch Veggie Sndwch	408	\$20		
Call Boards / Ops – Expanded Call Board Info Available on Web Site	-----	-----	----	-----
Don Marvel's Wilson Creek Division	801	\$5		
Fritz Dahlin's B&O/Chessie System Broken Timber Subdivision	802	\$5		
Jeff Mutter's Erie Lackawanna Scranton Div in 1975	803	\$5		
Ken Larsen's CL&W Subdivision	804	\$5		
Kurt Thompsons Cincinnati and Lake Erie Moraine Div	805	\$5		
Pete & Jane Clarke's East Broad Top Railroad	806	\$5		
Scott Wooddell's Deer Creek and Susquehanna Railroad	807	\$5		
Fred Eisen's Western Maryland Dutch Line	808	\$5		
Extra Fare Clinics – Registration Required, Further Info on Web Site	-----	-----	----	-----
Arduino Basics: Don't Be Scared	601	\$20		
Introduction to DCC	602	\$0		No Fee
Introduction to JMRI Operations Pro	603	\$0		No Fee
Making Pine Trees: Easier Than You Think	604	\$5		
Resin Casting Parts 1 & 2	605	\$15		
Tune Up Freight Cars for Reliable Operation	606	\$10		
Screen Painting	607	\$40		
Landscape Painting	609	\$55		
Painting and Weathering Rolling Stock	610	\$0		No Fee
Hands-On Hand-Carved Rocks	611	\$25		
Prototype Tours – Further Info on Web Site	-----	-----	----	-----
Baltimore Streetcar Museum	201	\$10		
Canton Railroad	202	\$10		
Tradepoint Rail	203	\$10		
B&O Restoration Shop Tour	204	\$10		
Custom Model Railroads Factory	205	\$0		No Fee
Would You Like To Be A Contest Judge At The Convention – Circle - YES or NO	-----	----	---	-----
Have You Been A Contest Judge In The Past – Circle - Yes or NO	-----	----	---	-----
TOTAL			➔	

Online Registration – <http://test.mer-nmra.com/index.html>. Please refer to COVID-19 and cancellation policies online.
 Print Registrations must be accompanied by check payable to **MER Conventions**. Send to: MER Conventions, PO Box 426, Sykesville, MD 21784-0426
 Any questions and/or additional information, e-mail to mer-registrar@mer-nmra.com, or 410-442-0446.

Hotel – Delta Hunt Valley, 245 Shawan Road, Hunt Valley, MD 21031, 410-785-7000. Reference-MER Model Railroad Convention 2021.

Online Reservations <https://www.tinyurl.com/MER2021> Room Rate - \$109.00 night + tax. Room Rate applies 10/21/2021 to 10/24/2021.

Further information at: www.mtclarejct.com

Updated 8/18/21

How to Fill Out NMRA Contest Forms

By Alan Mende, MER Contest Chair

It seems from my experience that many modelers are hesitant to enter NMRA contests because of the dreaded paperwork. I'm here to tell you that it is easy.

First of all, go to either this web site: <http://www.mer-nmra.com/judge.html> or this one:

<https://www.nmra.org/celebration-contests-3>.

The first site will allow you to download Forms 901, 902, and 903 in MS Word (Form 903 is just for modules). Fill them out, save them to your files with a unique name, and print them out for when you enter the contest room. The second web site will give you the same forms, but as PDFs. They, too, are pretty easy to fill out.

Save the PDF to your files. Then open it. Not only will you get the contest form, but also a side bar that will allow you to fill in the PDF. Here is a screen shot of the form.

Click on "Fill & sign." That will take you to the next screen.

Slide 1 - Adobe Acrobat Reader DC (32-bit)

File Edit View Sign Window Help

Home Tools Slide 1 x

1 / 1 114%

Sign In

nmra.org

NMRA NATIONAL CONTEST ENTRY FORM Entry No. _____

NMRA Form #901 Rev. J, 8/22/2020. All previous forms obsolete
Please Print All Information

ENTRANT / MODELER

Name _____ Age (if<30) _____ NMRA # _____

Address _____ City _____

State/Province _____ Zip/Postal Code _____ Country _____ New Modeler (Y/N) _____

Phone: (____) _____ Cell Phone (____) _____ Email _____ Region: _____

CONTEST EVENTS

MODEL CONTEST (Judged)

Classification

Scratch Built

Kit Built

Category

Steam Locomotive

Diesel & Other Loco

Traction

Passenger Car

Freight Car

Caboose

Non-Revenue Car

Structure

Display

PHOTO CONTEST (Judged)

Model, B&W Print

Model, Color Print

Prototype, B&W Print

Prototype, Color Print

Working on the Railroad Print

Panorama Print

RAILROAD PASS CONTEST (Judged)

Entry

PEOPLE'S CHOICE AWARDS (Popular vote - Direct entry)

Model

Favorite Train

Locomotive*

Rolling Stock*

Caboose

Structure

Display

Arts & Crafts

General

Needlework

Railroadiana

Photo (B&W or Color)

Model Print

Prototype Print

Special Award Categories

Photo Match

Thumbs Award

*Note - Judged entries are also eligible to be chosen for People's Choice Awards
- Loco includes steam, diesel & traction; Rolling stk. includes, freight, pass & non-rev.

MODEL SHOWCASE (Display only, all categories)

Entry

ENTRY NAME _____

CONDITIONS OF ENTRY

1. First place or Gold Award winners from previous NMRA National Contests are not eligible.

2. This Entry Form # 901 must be completed for all entries. Judge's Score Sheets # 902 must also be completed for each entry in the Judged Model Contests.

Search "Measure"

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More Tools

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1 / 1 114%

Sign In

Fill & Sign

Close

Who needs to fill and sign?

You

Fill form fields, add text and draw or draw your signature.

Fill and sign

Others

Add signers, mark where to fill and sign, send it out and track progress.

Request signatures

Help

POWERED BY Adobe Sign

Click on “Fill and sign” again to take you back to the form.

Click on each line and simply fill out the form. Make sure you save it to your files with a unique name.

Now open Form 902. Save it to your files and then open it as a PDF. Follow the same procedure to fill out the form. But if you find you don't have enough room on the form, just type in “See attached.”

Central Railroad of New Jersey Class C-32-6-0 No. 375

1. CONSTRUCTION: The engine was largely scratchbuilt including the frame, boiler, firebox, fireman's cab roof, tender frame and tank. I followed prototype plans of a similar CNJ locomotive for the sizing of the firebox and fireman's cab roof. I used similar official CNJ tender plans to construct the tender. I also followed photographs of CNJ Class C-3 engines. I formed the boiler, firebox, fireman's cab roof and tender tank from .010" sheet brass. The locomotive frame was cut from brass channel. The tender frame is fabricated from various K&S brass shapes as well as some Special Shapes brass structural shapes. I soldered everything together. For control I used a SoundTraxx Eonami ECO-100 sound decoder with a pair of sugar cube speakers in the tender. I used Micro-Mark micro-miniature connectors to hook up the wires between the engine and tender. I formed wipers from .020" phosphor bronze wire to connect the second and third left side (insulated) driver to the decoder. For lighting, I used Train Control Systems golden white SML LEDs in the head and back-up lights.



2. DETAIL: I used the following commercial details:

Archer	3021 reverse lever
AR88087 zivet starter set	3023 Edna type injector
Cal - Scale	3041 Bullseye, triple-feed lubricator
AB-306 tender air brake set	3050 butterfly fire door (2)
AD-228 auxiliary dome with fittings	3058 Chambers backhead throttle
BE-317 modern bell squat base	3308 "down" mount boiler steps
319 pilot air hoses	3215 poling pockets
BH-367 air brake stand	3302 cast handrail stanchions

Open your favorite word processing format (MS Word, WordPerfect, etc.) and type what wouldn't fit in Form 902. Save your document. Print out all of them to accompany your model.


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UPCOMING MER CONVENTIONS

2021 Convention – Chesapeake Division – “Mount Clare Junction” Oct. 21 - 24, 2021 - Delta by Marriott Hunt Valley Inn, 245 Shawan Road, Hunt Valley, MD

2022 Convention – Carolina Southern Division -- “Carolina Special Look South”, Oct. 20 - 23, 2022 Charlotte, NC

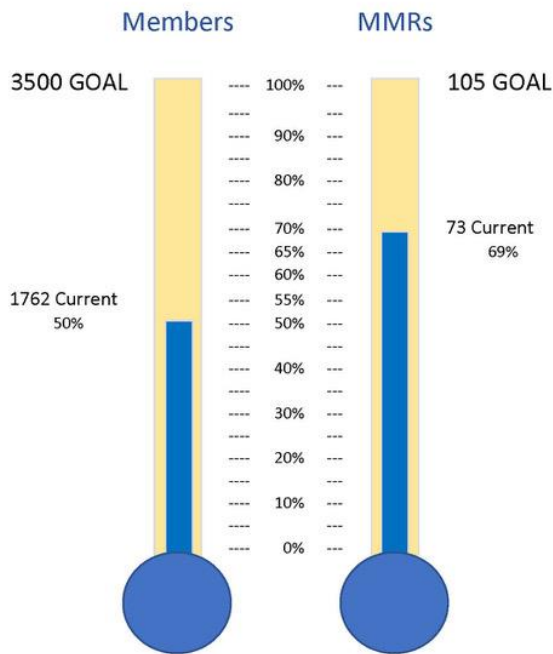
2023 Convention – Susquehanna Division – Dates and location tbd

2024 Convention – Division, Dates and location tbd

2025 Convention – New Jersey Division, Dates and location tbd

MER 75th Anniversary Goals

By Kurt Thompson, MMR



There’s still time to recruit new members and to get your MMR (Master Model Railroader) designation before the 75th Anniversary celebration on October 21st (if you’re close). We’d really like to move these thermometers up a little before then.

Since the last issue of *The Local*, we have lost a net of 19 members (26 in, 45 out), which brings our total membership to 1762 (The previous number noted in the last issue represented a miscount, for which we apologize).

We have gained a new MMR (Congratulations to Alex Belida, MMR #685 of the Potomac Division!) This brings our total MMRs for the Mid-Eastern Region up to 73.

Based on the latest Achievement Program Update, there are several members getting achievement awards which tells us there are more MMRs coming down the pike soon. Keep up the great work! And congratulations to all those who have made it! You remain an inspiration to the rest of us.

The thermometers reflect our progress toward achieving these targets.

Building a Flat Car Using Styrene Plastic

By Ernie Little, MMR

For too many NMRA members, the thought of scratchbuilding a railroad car causes much anxiety and visions of frustration, and that the effort will be too much for them to take on. These are the “It’s Too Hard” delaying thoughts: thinking that their efforts will involve wasted modeling time; having to be judged; scratch building itself; and there just being too much paperwork. They all stop modelers from moving forward and getting into the scratchbuilding mode. In reality, these are just excuses for not wanting to take on the challenge and they prevent many from success in achieving the Master Builder-Cars AP (Achievement Program) certificate.

Let’s step back and look at what we need to do to be successful in scratchbuilding a car or taking on any of the Achievement Program certificates. First, if you are going to attempt the Cars AP certificate you need to develop a plan on how you will do it. Like anything you do in life, planning and development of a strategy of what route(s) you are going to take is IMPORTANT to your success! Reading and understanding the [actual certificate requirements](#), [judging guidelines](#), matching your skills and interest with which car you want to build, and going for the low-hanging fruit will help you be successful.

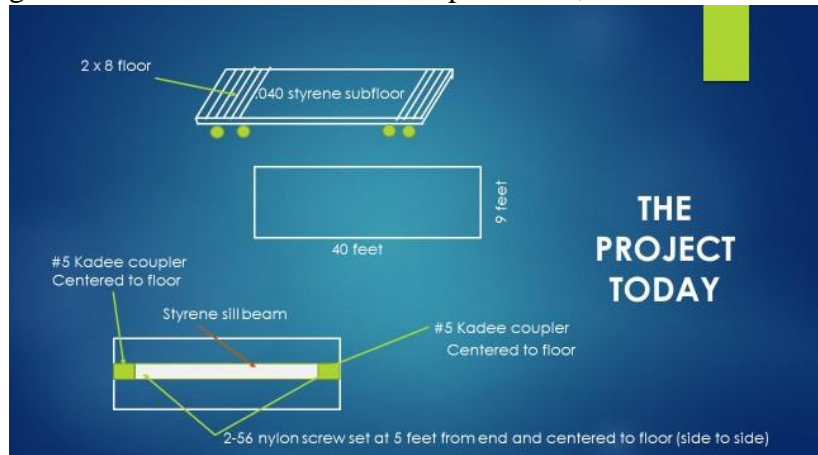
With that said, let’s take a look at the definition of scratchbuilding. The term “scratchbuilt” carries the implication that the builder alone has accomplished all of the necessary layout and fabrication which establishes the final dimensions, appearance, and operating qualities of the scale model. But it doesn’t prevent the use of any tools or jigs as long as the builder alone has done the work necessary for the tool to make the part. For example, when I started working on the Car AP, it was difficult to keep car parts that I was gluing together square and in place. So, I made a jig consisting of a piece of 3” wide basswood about 6” long and glued two HO scale 2” x 8” pieces of wood to it at a 90-degree angle. (Photo 1) By using double-sided tape, I was able to hold a piece of material in place and place other pieces I was trying to assemble to it square while gluing. For about fifty cents I had a jig that I used on every car I scratchbuilt. Scratchbuilding also allows drawings or computer files to control Computer Numerical Control (CNC), automatic lathes, laser cutting machines, 3-D printers, and other tools, as long as the user creates the code for these files.



Scratchbuilding uses basic shapes which are things builders of the prototype would use as raw materials such as scribed sheeting, brick sheets, and scale lumber. However, ladders or castings, such as doors or windows (including wall sections) are not considered basic shapes and thus are not considered as scratchbuilt components (In other words, it is not a requirement that you make those items yourself, although you can if you wish to get more points. – Ed.). One last thing about scratchbuilding, a model is considered as “scratchbuilt” if at least 90% of the model’s parts/pieces (not counting basic shapes) are fabricated by the modeler (As mentioned above, be sure to [read the NMRA guidelines](#) carefully to see what is required if you plan to submit your model for a Merit Award. – Ed.).

So why build a flat car? Just about any car you scratchbuild will start with and be built up from a flat car. The flat car is the base upon which many if not all railroad cars exist. For example, a box car is a flat car with four sides and a roof; and a gondola car is a flat car with four sides. That was an easy question to answer, but now how do you build it?

The first step is to draw or [find a plan](#) of a car you want to build. I paid five dollars for an unassembled Ambroid kit of the Southern Railway Hoghead Tobacco Car at a white elephant sale, and voila! - there was a plan I could use. It was in HO scale and provided plenty of information about the car body. I made duplicates of all the wooden parts using styrene and scratchbuilt the car. But you don't necessarily need a manufacturer's scale plan. Just make a sketch of the car you want to build and go from there! So, let's build a flat car out of styrene plastic and as said before start with a plan.



Here is a sketch plan of a basic flat car that a group of Potomac Division members used at a clinic held in May 2021 ([Photo 2](#)). The plan is of a 9' wide by 40' long flat car that has 2"x8" wood flooring, a sill beam, two trucks and two couplers. The build process for this car goes as described below.

First, a piece of 0.040" styrene plastic was cut to HO scale 9' by 40'. This created a subfloor for the car. Care was taken to assure that the cuts made were straight and square. Next, the cut piece was placed in Ernie's famous "car jig" and held in place with a piece of double-sided tape. With the subfloor held in place, individual pieces of HO scale 2" x 8" basswood were cut to a HO scale length of just a little over 9' HO scale. Why just a little over 9'? This will allow the individual pieces to be glued to the subfloor and then, after the glue was set up, a light sanding was done using 300 grit sandpaper to make the sides and ends of wood car floor flush with the plastic subfloor. You can always sand some off but it is very difficult to add length to the floor pieces.

Second, the floor assembly was removed from the jig and turned over to allow access to the car bottom. The assembly was placed back in the jig in that fashion and a centerline was established which was marked along the car's length. Number 5 Kadee coupler pockets were mounted onto each end of the car body with the open end of the pocket just sticking out past the end of the car. Each pocket was glued in place assuring that the pocket was centered to the car and in alignment with the length of the car. After mounting the coupler pockets the sill beam, a piece of styrene of the same width and depth as the coupler pockets, was cut to length and glued to the floor assembly centered to the centerline of the length of the car body.

Third, Number 5 Kadee couplings and centering springs were placed in the coupler pockets and coupler lids were glued in place making sure to not allow glue to get inside the pockets. An alternative to gluing would be installing a 2/56 nylon screw through the hole in the coupling pocket. This would require a hole to be drilled and tapped in the plastic floor for each coupler. Care would have to be taken to not drill or have the tap go through the wood flooring. With this completed, the couplers were in place. Next step, mount the trucks to the car body. The centerline of the car was re-established and 5' HO scale from the end of the car was marked on it. A hole was drilled and tapped through the sill beam using the appropriate drill and clearance to accommodate a 2/56 nylon screw. As mentioned before, the holes

were drilled making sure the wood flooring was not penetrated. The trucks were mounted, and the car is now almost ready to go on the rail and start delivering goods.

This completes a basic flat car, but it now needs additional work on it to have it ready for judging and for it to achieve enough points to get a “Merit Award”. Although possible, flat cars with no frills are probably not going to get enough judging points needed for a Merit Award. The sill beam (center beam) would have to be changed from a solid piece to one or two beams with webs and flanges with cross supports that would be held in place with rivets. The car needs brake pads, a brake wheel, brake lines, valves, and air reservoirs (depending upon what braking system you use) to reflect the braking system as it would be on a prototypical car. There are several different braking system types such as K, split K, AB, etc. A good reference for braking systems is a book published by Kalmbach titled “Model Railroader's Guide to Freight Cars” by Jeff Wilson. I found that this book provided good detail on the many types of braking systems and was able to use it to provide information for modeling the braking piping and other components.

In addition, grab rails (irons) and stirrups are needed again to reflect what a prototype car would possess. For me, making the grab rails the same size and shape is challenging. I found a tool sold by Micro-Mark that greatly assists you in making grab rails and stirrups of consistent shape and size (**Photo 3**). The type of grab irons and stirrup steps will need to be researched to determine which ones will be required for your car depending on the prototype (Your car can be free-lanced, but it still needs to conform to the basics of what you would usually find on a prototypical car to get the most points at judging - Ed.).

Last, the wooden deck and remainder of the car need to be stained or painted and the decals need to be added as would be appropriate to make it look like a prototypical flat car.



So with a little time, patience, and dedication you can build a flat car with styrene easily. Here is a picture of the flat car we just built at the stage where the detail parts are ready to be installed (**Photo 4**).

If you need more information there are several resources available that you can tap:

Your Division AP Coordinator.
Your Region AP Coordinator.

References:

[Master-Builder – Car Guidelines](#)

[Judging Guidelines for Motive Power, Cars and Structures](#)

[Ambroid Kit Plans and Instructions](#)

[“The NMRA Master Builder Cars Achievement Program Certificate”, by Ernie Little, MMR, The Local, July-Aug, 2020, pp. 22-29.](#)

[“Freight Car Scratchbuilding for AP Awards” by Dave Roeder, MMR](#)

The Road to MMR: Is It for Everyone?

By Alex Belida, MMR



I was honored to become Master Model Railroader #685 this year. But the truth is that it wasn't something I set out to earn back when I joined the NMRA in 2018. All I wanted was to meet other modelers and have a layout in my retirement after years of putting off both desires because of family, work and frequent travel, including 25 years living abroad.

So how did I get to MMR so quickly and what does my experience mean for others? Are you perhaps wondering about the value of pursuing that goal or, for that matter, working towards any of the individual AP certificates?

Let me acknowledge straight out that it might not be for everyone. Obviously you can still enjoy this great hobby. Model railroading is supposed to be fun. Why ruin it by striving for some plaque, you might ask?

But here's the thing, as a means of developing your skills in model railroading, especially if you are just starting out or have been modeling in isolation, I personally can't think of a better approach than the AP program. That's what motivated me. I wanted the best layout I could build and I wanted to learn from those with experience in the hobby.

My recommendation: take it step by step, at whatever speed your circumstances allow, and start with the areas of modeling that most appeal to you. You may not make it to MMR but your skills will benefit. I'm convinced your enjoyment of this hobby will increase because your layout and your models will be better.



In my case, since I always enjoyed scenery and structure building, they were the first Master Builder certificates I received in 2019 after starting my layout. That was my first encounter with my NMRA Potomac Division Judges. My scenery met the requirements easily, but my structures -- especially my trestle bridge -- needed more work and a better understanding of what was deserving of a merit score. That was a huge learning experience. Most importantly, it enabled me to improve my trestle and other models and nail down that structures certificate.

Once I started my layout after retiring as a journalist with the Voice of America. I didn't want to be a "lone wolf" so I got involved in Potomac Division activities. It was a great opportunity to mingle with some very accomplished modelers. I'd urge you to get involved with your Division as a volunteer in whatever capacity. Join an Operations Group. Attend clinics and go to a MER Convention. Get to know your AP Coordinator. Start a blog about your layout and then write for your Division newsletter to become an Author.

Because I had spent years writing professionally, I started blogging about my layout construction [<https://esprblog.wordpress.com>] and offered to supply content for the Division newsletter, *The Potomac Flyer*. That, in turn, led me to even sending off an article to the *NMRA magazine*, which, to my surprise and delight, published my first submission: *Railroad Reporting – A Former Newsmen's Approach to Modeling*. I picked up my Author certificate in 2019 and started helping produce *The Flyer*.



One of the structures I built during this period was a replica of the Woodsboro, Maryland depot, no longer in service but beautifully restored and used by the Woodsboro Historical Society. One of my sons bought a house about 100 yards away and I thought it would make a great model gift for his family as it didn't fit on my layout, a mining operation in Nevada in the late 1800s. When I learned from the Historical Society's archives that tiny Woodsboro was once the main center for goldfish — yes, goldfish -- supplied throughout the U.S., I was sold.

Scratchbuilding the depot led to two articles for *The Local* (July 2019 and November 2019 issues) and a decision to make the depot the centerpiece of a larger 2'x3' diorama that added an old mill, a hardware store/warehouse and a couple houses plus terrain with trees and a dirt road, figures and wagons to recreate the scene at Woodsboro station as it looked in the early 1900s. With the pandemic raging, it was easy to stay home and work on this complex project, doing the modeling as well as further historical research that included finding an early Sanborn map for the area.

That led to my Master Builder - Prototype Models certificate in June 2020, one that even the NMRA says many believe is the most challenging category. But to me it seemed a nice, logical way to couple scenery, structures and cars as well as a locomotive. Because of the COVID pandemic, I produced a 60 page plus submission with scores of photos for the judges to evaluate remotely and they approved.





Having built three super-detailed kit cars for the diorama, and with the pandemic still raging, it was time to try my hand at scratchbuilding my own rolling stock. My other son was a tech-oriented type who had his own 3D printer. I was able to use it to make some basic underframes, bolsters and queenposts. Adding stripwood to these, plus a whole lot of other detail materials, enabled me to make two narrow gauge D&RGW MoW cars -- a "rail and tie" car and a "wheel and tie" car.

I was also interested in the original oil tank cars of the 1860s and decided to make two Densmore tank cars, a short version that is perhaps the one best remembered and a longer version that existed at least in plan form. This project prompted me to call on two veteran MMRs in upstate New York, one of whom had drawn up the prototype plans I needed (Harold Russell MMR #14!) and the other of whom (Richard Senges MMR #483) had actually made a



similar model and co-authored a Densmore study with an oil historian. (This is one of the great side benefits of the model railroading world, getting to know other veteran modelers and drawing on their expertise. I have yet to meet any who aren't willing to help!)

I delivered these cars along with a scratchbuilt log flat car and a low-sided wooden gondola plus the kit-made RPO and boxcars from my Woodsboro diorama to our great Division AP Coordinator Mat Thompson MMR #595 in a masked and gloved rendezvous. He, in turn, summoned other masked and gloved judges to examine my work. The result: the first four cars they evaluated -- the two Densmores, one of the MoWs and the kitbashed LaBelle RPO -- all received merit awards and I became a Master Builder-Cars in late October 2020. (I was told the judges didn't bother evaluating my other cars because I had received the four Merit Awards before they even looked at them. But Mat said he was sure they would have scored high enough to also earn Merit Awards.)

So, I had five certificates. I knew I would have the points needed to receive my Association Volunteer certificate in the summer of 2021 for all the work I put in for *The Flyer*, including months as editor and publisher, and for service as a proofreader and assistant editor for *The Local*.

That made six of the seven certificates needed for the MMR. Suddenly I was aware that lofty goal was within reach. Why not go for it?

My big hurdle was the requirement to get at least one certificate in the Engineering and Operations category. What to do? I wasn't involved in any operating groups to potentially get Dispatcher. Electrical wasn't my thing as my own layout, set in the late 1890s, had just moved from basic DC to primitive DCC and I had no electrically controlled switches, signals or other such gear.

So it had to be Civil. It was easy enough to make the layout plans. Some of the required layout features were items I wanted to have anyway so I moved quickly to add to my simple yard, sidings and elevation to install an ash pit, an inspection pit, and a dump trestle. I even electrified my old wooden gallows turntable, a project I had set aside for some future day.



But then came the hand laid track requirement. Although Potomac Division AP Coordinator Thompson lent me some FastTracks templates, PC ties, some rail and other tools and supplies, this challenge almost did me in. I struggled. Problem after problem: too much solder, PC ties where I stripped away too much copper, and insulation gap cuts that sent bits of track flying.

And once those issues were fixed, I had to add wiring and then test run locos on the gauntlet track, crossover and turnout I made. The locos derailed or stalled. Time and again. Frustration!

Some modelers think making cars is the toughest challenge. For me, it was trackwork. But I kept plugging away, deciding to re-read all the instructions and to conduct a really careful analysis of problem areas. At last, success. But frankly without Mat's encouragement, I wouldn't have reached my goal of getting that Civil certificate in 2021.

I'm honored to join the ranks of those modelers who have achieved the MMR rating since the AP program's inception in 1961, including MER Secretary and Potomac Division Superintendent Martin Brechbiel MMR #629 and past Superintendent Brian Sheron MMR #469, both of whom have been of great help to me. I'd also like to thank for their support Division stalwarts John Paganoni MMR #615, Ernie Little MMR #647 and the late Marshall Abrams, a past Potomac Division Superintendent who was publisher of the *Potomac Flyer* when I got involved with the newsletter. Kurt Thompson MMR #619, the MER President, also offered encouragement along with *Local* editors Jack Dziadul and Greg Warth.

As for my future plans, I will now spend more time on my small layout, which has been sorely neglected. But with the knowledge I have gained from the AP program and my fellow Division members, I already have ambitious plans for renovating and improving it. And I want to make another diorama -- this time of the early Drake's Oil Well in Pennsylvania so I have an appropriate place to park my Densmores.

I've also decided to explore making my own motive power -- and not just because I lack the Motive Power certificate. The challenge appeals to me and it might be useful for my layout. The railroad era and location I model in Nevada was home to a real line called the Eureka and Palisade RR, later named the Eureka Nevada Railway. They had some nifty little railcars that I want to try to model.

Stay tuned.

Here's a factoid that might spur your interest in striving for the MMR: more than 5,000 persons have reached the summit of Mount Everest, but fewer than 700 have become Master Model Railroaders.

Build a Track Test Train

By Paul Welsh



Figure 1 - Track Test Train - A track test train traverses a tricky piece of track consisting of an “S” curve, a wye switch, and a convex vertical curve. Testing is being done during the track laying stage and scenery will be added only after the track is certified as reliable. Note the wooden shims under the ties used to adjust the vertical contour of the track.

Any kind of testing must be quick and easy, otherwise it won’t get done (we are all human, after all). And it must be effective, or it wastes time and leaves the test subject with defects. This project describes a test instrument comprised of two cars and a loco that satisfies these test objectives, and can be used to certify the operating reliability of the most critical operational element of a layout - the track. It can test every inch of track on a layout in the time it takes to run an operating session by applying a set of mobile gauges that check critical track dimensions against specifications (like track gauge). It also detects track defects like misaligned rails, inadequate clearances, and electrically dead track segments.

The heart of the test train is the “track geometry car,” which detects even the most deeply hidden defects. They may not cause failures during routine operating conditions, but they could emerge when conditions change, or when new cars or locos are added to the layout. A second car in the test train is the “dedicated idler car,” which enhances the geometry car tests, and also finds electrically dead track segments. The third element of the test train is the locomotive. Its only function is to pull the test train, so it can be selected from your existing fleet of locos. Any smooth-running loco is fine, but a 6-axle diesel may help to detect trackage that might cause trouble for 6-axle locos.

DO YOU NEED A TRACK TEST TRAIN?

Building a track geometry car and a dedicated idler car will take a fair amount of time that many modelers will think is better spent super-detailing a loco or building scenery. But the whole point of building this train is to invest a little time now to save a lot of time in the future testing newly laid track

and chasing down hidden, trouble-causing, defects. The two test cars can be completed in a week or two of evenings if you have the necessary skills, tools, and supplies. Here are five reasons why you might want to invest the time and resources in building them:

1. It will encourage you to properly test your newly laid track because it will be quick, easy, and maybe a bit of fun.
2. It will likely be more effective than any testing you do now, and troubleshooting will be easier.
3. The larger and more complex your layout (lots of turnouts, complex curves, and steep grades), the greater the need for fast and effective testing. A flat loop on a ping-pong table won't benefit from a test train.
4. The greater the diversity of skills, knowledge, and experience of the layout builder(s), the greater the need for effective testing (Attention: Club Maintenance-of-Way Superintendents).
5. Defects will continue to appear over time in even the best track because of wear, roadbed warps, accident damage, and untold other things. So, it is good to have a test train in your toolbox to deal with them over the long haul. For example, construction started on the Nordel Model Railroad Club layout 27 years ago and the track test train is still used for diagnosing problems.



INSPECTION

Inspections check dimensions to determine if they meet numerical specifications. They are the best type of test because:

- ***They are quick:*** It usually takes only a few seconds to make a measurement.

- ***They are unambiguous:*** If a measurement fails, you know what the defect is. Troubleshooting is usually not required.

- ***They are effective:*** Either the subject fails the measurement and is known to be defective, or it passes and is known to be good.

The track test train uses inspections where possible, but they can only be used if a specification is available and measurable, such as track gauge. Other defects must be found indirectly with “functional tests.”

Figure 2 - Finished Track - The locos in this figure and in Figure 1 are in the same location on the layout. The loco above is cresting a 1.5% upgrade and will enter a 3.2% downgrade as it crosses the switch. The backdrop is a blown-up, computer printed, copy of a fine arts painting by the author's great grandfather.

FUNCTIONAL TEST

Functional tests look for malfunctions. They are caused by defects, of course, but troubleshooting will be required to identify them so they can be fixed. For example, the malfunction of a derailment can be caused by all kinds of defects including out-of-gauge track, snagged trip pins, track obstructions, and defective trucks, all acting interactively. In addition, the failures may be infrequent and unrepeatable which makes troubleshooting especially difficult.

Model railroaders conduct functional tests using three different strategies:

- Success test*
- Test it the way it will be used*
- Stress test*

As we shall see, the stress test strategy should be used, and that is what is used by the test train. It is the most effective in finding defects and provides the best leads for troubleshooting when a malfunction occurs.

SUCCESS TEST (FUNCTIONAL TEST)

Many a model railroader has “tested” a newly installed stretch of track by gently rolling a well-tuned box car along it. This “test” will be successful, and essentially useless, because a test is useful only when it causes a failure and exposes a defect. R&D engineers would contemptuously call this a “success test” because the objective is to pass the test.

TEST IT THE WAY IT WILL BE USED (FUNCTIONAL TEST)

This is undoubtedly the most popular form of testing used by model railroaders, and it does seem like a logical approach. But this is actually a form of success testing, with somewhat more-challenging conditions than gently pushing a well-tuned box car along the track. If you run a long train around your layout and it doesn’t derail, all it means is that particular train can probably be run reliably on the trackage you ran it on. It doesn’t tell you if a longer train can be run, or if other cars will stay on the tracks, or anything else about the reliability of your layout.

STRESS TEST (FUNCTIONAL TEST)

The first, and most important, thing you need for an effective test is a new mind set! As a modeler you have spent all your time building things and now you need to try to “break” them. It goes against human nature to find failures in your own work but that’s the only way you will find the defects. You must become the hunter and rejoice when you bag your prey!

The purpose of stress tests is to find defects and the best way to do that is to apply stresses outside the range of normal operating conditions, to try to force a failure. If no failures occur, then none should occur during normal operating when the conditions are more benign. No time is wasted on low stress, normal, operating that won’t cause failures or expose defects. And, troubleshooting effort is reduced because the defect is implied by the type of stress applied, and the failures are usually repeatable.

Unlike “testing it the way it will be used,” the track test train is independent of any operating style or layout. It applies high stresses to all the important track parameters so that if no defects are found, the track will be “certified reliable” and failures should not occur even if layout conditions change. The stresses are targeted at particular types of defects, so the link between a test train indication and the targeted defect is usually apparent, minimizing the troubleshooting effort.

TRACK GEOMETRY CAR

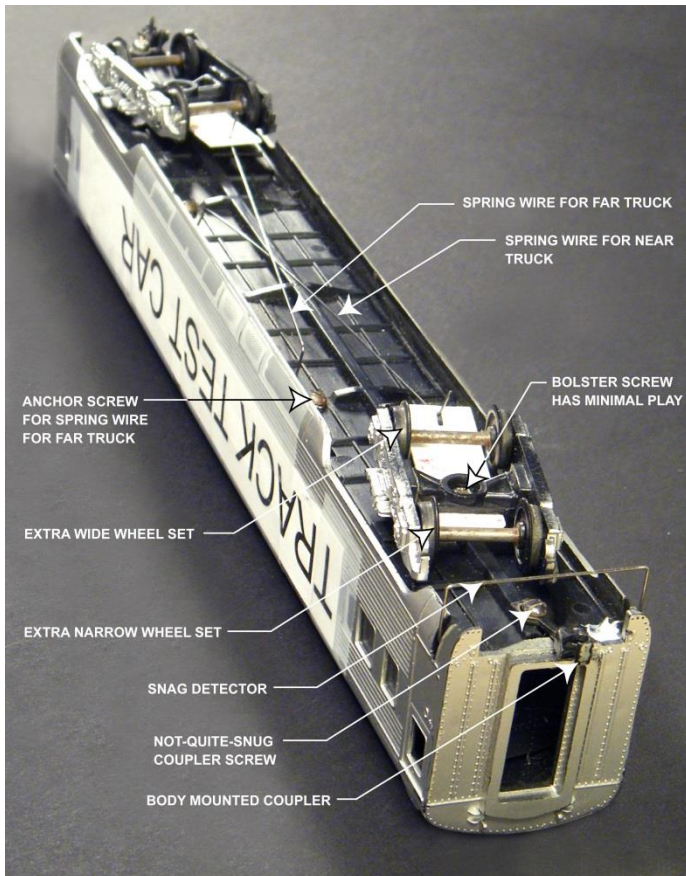


Figure 3 - Track Geometry Car

- The horizontal swing of its ends outside of horizontal curves.
- The overhang of the center of the car on the inside of horizontal curves.
- The vertical swing of its ends on a vertical curve.

The purpose for maximizing these body swings is to:

- Maximize the width of right-of-way swept by the car as a check on clearances.
- Check for excessively sharp “S” curves, and horizontal curves as indicated by contact between the end sills of the geometry car and the idler car.
- Detect excessive vertical curvature that could cause the problems seen in [Figure 4](#). If a horizontal curve occurs on an excessive vertical curve, any wheels that are “lifted off the track” will derail.

The track geometry car is a stress tester, designed to derail, uncouple, or short the track, when it encounters a defect. It includes a mobile set of gauges for the inspection of track shape and dimensions, and it is susceptible to rail snags, kinks, and gaps. Some adjustments need to be made while building the car that require a certain amount of judgment and “feel” and they should be set so the car is on the edge of failure. In other words, it should not fail on good track, but a minor defect will push it over the edge.

Remember the earlier words about the purpose of stress testing: “...apply stresses outside the range of normal operating conditions to try to force a failure.”

Car Weight

It should be relatively light so small forces can cause it to derail. Use a plastic car and remove any lead or steel weights.

Car Length

This affects the detection of defects in curves and the longer it is, the better, because the length determines:

The car in the photo is a scale 72' long, but any full-length passenger car is a good choice.

Couplers

They must be body-mounted rather than truck-mounted in order for some of the tests described later to be effective. Couplers should be mounted with a not-quite-snug screw, instead of a draft gear, as shown in the figure “Track Geometry Car”. This mounting provides precision of vertical positioning (little-to-no vertical play) with no resistance to horizontal movement, such as would be applied by springs. A height gauge, like the Kadee coupler height gauge, should be used to set the couplers precisely and the trip pins should be snipped off.

Snag Detector

This is a 0.020” spring steel wire that spans the car side-to-side but is positioned only 0.020” above the rails. This is slightly less than the clearance of Kadee coupler trip pins above the rail tops to apply some extra “stress” to the clearance measurement. It will snag anything full span between the rails that would snag a coupler trip pin or loco pilot, such as a track nail, a vertical kink or a high turnout frog. Its width and overhang at the end of the car also allow it to snag scenery that the steps on passenger cars or pilots on locos might hit. It shorts the rails on excessively concave vertical curves and its sensitivity is maximized by using a long car. It can serve as a derailment detector by shorting the track, to pinpoint the locations of derailments. For this function to be fully effective there should be one snag detector on each end of the car in order to detect the derailment of either truck. But the car in the photo ([Figure 3](#)) has only one, on one end, because the author didn’t think he needed a derailment detector.

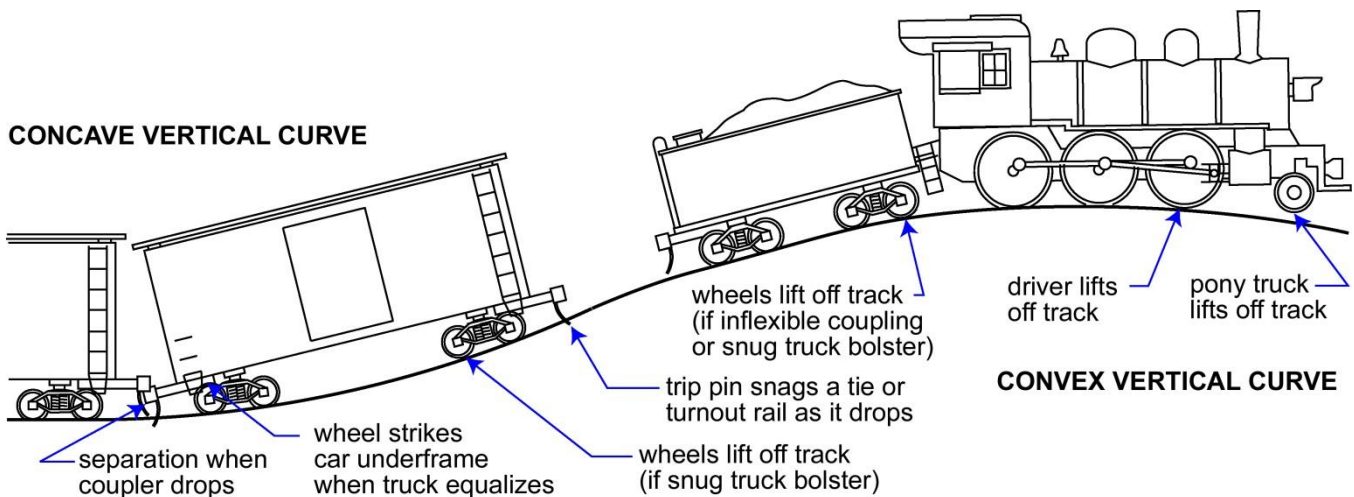


Figure 4 - Vertical Curves

Wheel Gauge

All wheels should be to the extremes of the allowable gauge, at least. Those on one axle of each truck should be excessively narrow and the others excessively wide to detect out-of-gauge track and out-of-spec flangeways in turnouts. One truck should have its wide wheelset toward the outer end of the car and the other truck should have it toward the inside for maximum variation of the test conditions. Use the NMRA gauge to set them. The author set his wheels a little out-of-gauge such that they do not quite pass the NMRA gauge, to provide a bit of extra stress in the test. When a failure occurs, an NMRA track gauge is used to help decide if repairs are necessary.

Trucks

A long wheelbase (the distance between axles) is best. The longer it is, the more sensitive it will be to lifting off the rails on combined vertical and horizontal curves, or twisted track. Two-axle passenger car trucks, like those in [Figure 3](#), are good or three-axle passenger car trucks with the center axle removed. If the center axle is left in it would interfere with the tests. Any trackage that would cause trouble for 6-wheel trucks can be detected by the 6-wheel truck on one end of the dedicated idler car. Obviously, equalizing, or sprung trucks should not be used because they would conform to the track shape and reduce the test effectiveness.

Truck Twist Springs

Derailments can be caused by wheel flanges snagging mis-matched rails at track joints, poorly seated switch points, and the point of a frog (caused by an excessively wide turnout guard rail clearance). Derailments during normal operation tend to be intermittent, and often infrequent, because the wheel flange often doesn't reliably bear against the rail with the defect. The track geometry car needs to find these defects with a single pass, so wheel flanges are pushed against the rails by a gentle twisting force applied to the trucks. This also provides a nudge off the track to wheels that may be lifted off the rails for other reasons and close to derailing. The twisting force is applied by springs that push against 0.025" styrene tabs glued to the tops of the trucks. The springs are formed from 0.020" steel wire, 5.25" long (the straight section), with loops formed on the anchor ends. Screws inserted through the loops into tapped holes holds them in position and they can be loosened to allow the spring tension to be adjusted. The springs should be adjusted to a tension that just barely allows the car to negotiate a known-good turnout as well as a curve with your minimum radius.

Bolster Screw Adjustment

This can be used to make the car more, or less, sensitive to derailments on combined vertical/horizontal curves and twisted track. It should be snug enough to allow truck wheels to lift off the rails (say, on a convex vertical curve), but loose enough to allow the car to traverse acceptable track shapes. Start by adjusting it for maximum stress by snugging the screw as much as possible while still allowing the truck to rotate freely around the screw. If you experience a lot of derailments on track that checks out as okay, loosen the screw a little and continue to test with the new setting. Continue this until the car does not derail on known-good track.

In any case, the trucks on both ends of the car should be adjusted to be the same.

DEDICATED IDLER CAR

The dedicated idler car detects dead or dirty track and, when coupled to the track geometry car, tests interactions between long cars on curvy track. This car should be maintained as a test instrument and not just pulled randomly from your passenger car fleet whenever you do a test. That is why it is called "dedicated". This ensures the reproducibility and consistency of tests over time because the same car will always be used for this purpose. It also ensures that it will satisfy the specs in this article, be properly maintained, and not roughed up in routine operating. A distinctive, non-prototypical, paint job will help protect it from misuse.

Car Weight

It should weigh more than the geometry car; normal weighting is fine.

Car Length

An 80' (nominal) passenger car is best because it will maximize the horizontal and vertical end swing on curves, enhancing the effectiveness of the track geometry car in checking curves.

Couplers

They should be mounted in exactly the same way they are mounted to the track geometry car, and for the same reasons.

Trucks

They should be normal 3-axle trucks of the type used on heavyweight passenger cars because they could be useful for detecting trackage that would cause trouble for 3-axle loco and car trucks. If a “dead track detector” is installed (see next section), one of the trucks will be replaced by a special 2-axle pickup truck.

Dead Track Detector Truck

A 2-axle diesel truck from a scrapped loco was re-purposed as a passenger car truck as shown in [Figure 5](#). The gears and side frames were removed to ensure free rolling and some styrene supports were installed to hold it in place. A 4-axle diesel truck was used because they are designed for effective electrical pickup and will detect dead segments that are as short as 1-1/4". This allows the detection of dead track in the most common places where it is found – at points and closure rails on turnouts.

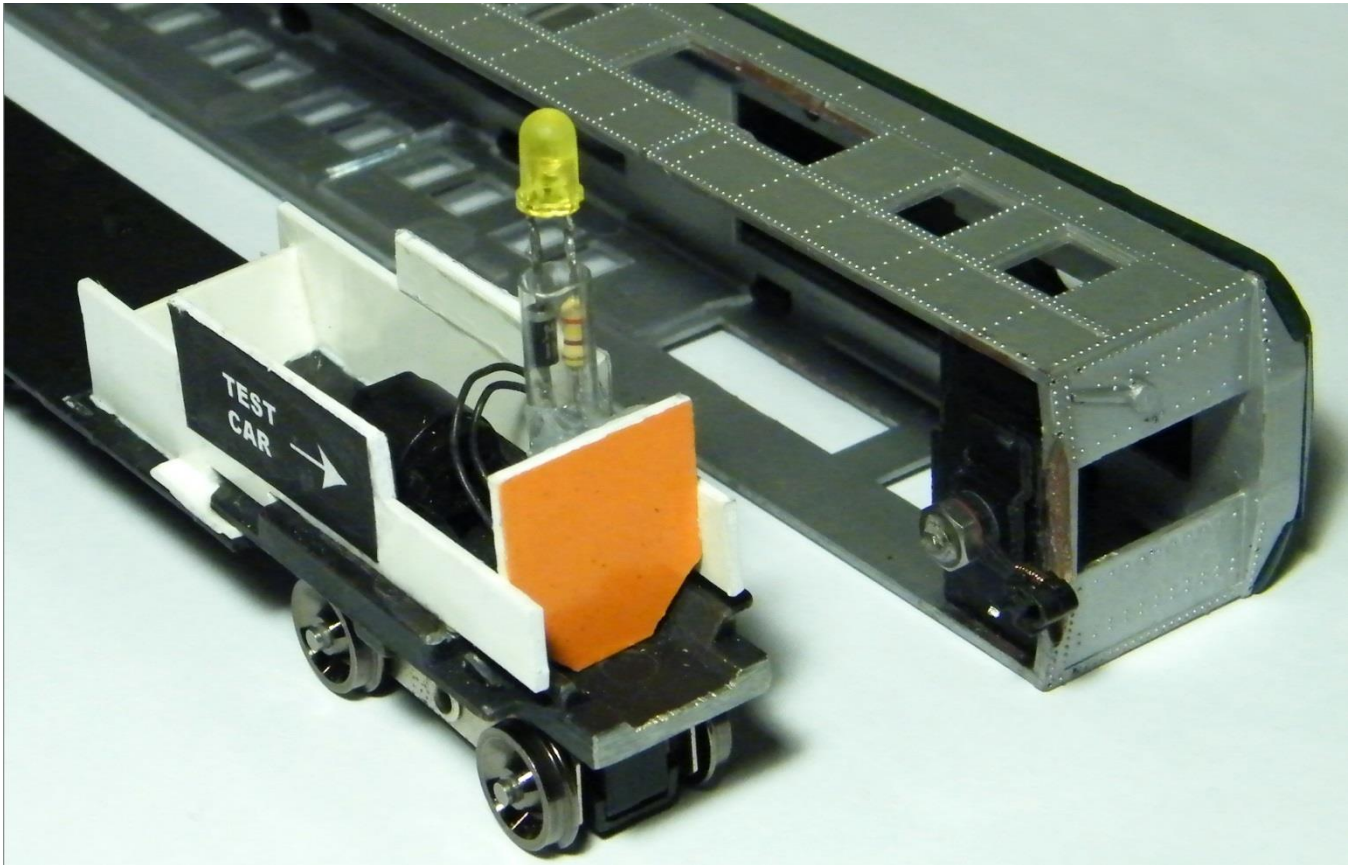


Figure 5 - Dead Track Detector In The Dedicated Idler Car

Tow Locomotive as A Dead Track Detector

It may seem that the tow locomotive would be a perfectly adequate dead track detector, but since all wheels pick up on both trucks, a 4-axle loco won't detect dead track sections that are less than about 5-1/2" long, and longer for a 6-axle. But the tow loco can be modified to get around this problem by removing the electrical connections to the motor and removing all the gearing and side frames on one truck. The pull from the unmodified truck will be sufficient to pull the test cars. A dedicated idler car will still be required, though, to interact with the geometry car.

LED Indicator

A bright LED indicator is mounted on top of the car or modified loco for 360-degree visibility. The LED assembly shown in the photo is for use on DCC track and is connected to the track power pickups. It consists of the LED, a diode, and a current-limiting resistor, soldered in series. The diode must have the same polarity orientation as the LED and a 240-ohm resistor is suitable for 12V or 14V track voltage (power is on only 50% of the time). An incandescent lamp is best for DC layouts. In addition to its primary purpose as a dead track detector, it is useful as a track cleanliness indicator when coupled to the last car in a track cleaning train. A steady glow means the cleaning job is done and serious flickering will indicate spots that need special cleaning. When it's not needed for its other duties, it can be parked on a siding for a continuous indication of track power status.

Clearance Extensions

Body extensions can be added to check the margin on clearances with mountain sides, bridges, and tunnels. The car in the photo doesn't have any because the normal overhang of the car, along with the "snag detector" on the track geometry car described earlier, were considered to be sufficient to check for clearances. For those who run stack trains, it might be a good idea to add an extension on top because of their excessive height.

OPERATING THE TRACK TEST TRAIN

The detection of a defect is indicated by a test train derailment, separation (uncoupling), or an electrical short. These can be readily traced to the defect with a minimum of troubleshooting. Either of the track test cars can be used solo for its particular test capabilities, but when they are used together, they complement each other's test functions. The track geometry car can be pulled or pushed, but it should always be at the end of the train with one end coupled to the idler car or locomotive, and with nothing coupled to the other end. The car was not designed to pull other cars, and if it is used that way, that will interfere with the tests. It is best to move the track geometry car slowly with a locomotive, but if you move it by hand, hold onto an idler car. Don't touch the track geometry car because hand forces will change the test characteristics. The train should be run in both track directions with the track geometry car turned both ways for each direction; that's four separate runs. The goal is for:

- The car to roll over every turnout in both facing point and trailing point mode.
- The leading axle on the leading truck to have over-gauge wheels in one direction and under-gauge wheels in the opposite direction. The trailing truck will be just the opposite.
- The truck twist springs to push the leading wheels on each truck toward the inside of a curve in one direction and to the outside in the opposite direction.

Modeler's Haven

There are literally thousands of tips and tricks that model railroaders use to enhance their skills, make things, save time, improve operations, etc. Here are a few more...

Hand Throw Turnout Indication – from Brian Sheron, MMR

During a layout visit at the MER Convention in Princeton, NJ, I noticed a neat, simple way the layout owner used to indicate turnout direction and also to grab the throw bar for hand-thrown turnouts that use hand throws such as those made by Caboose Industries.



First, tack a small nail or brad with a flat head into the layout table on both sides of the turnout throw, and locate them so the flat end of the throw bar will rest on the nail head when thrown. This will keep the throw bar off the ground and easy to grasp when you want to

change the turnout's direction.

Second, paint the top of one of the small nails or brads red, and the top of the remaining one green. Then paint one side of the throw bar end red and the other side green. Decide on your color convention (green showing for when the turnout is aligned to the mainline, or when the turnout is aligned for the straight direction) and paint accordingly.



Photo 1 shows a Caboose Industries hand throw with the small nails/brads in place and painted. **Photo 2** shows the turnout thrown in one direction, and **Photo 3** shows it thrown in the other direction. (Reprinted with permission from The Potomac Flyer)

Mirror Material – from Jerry Lauchle, MMR

I have a brand-new piece of 1/32"-thick by 24"x38" piece of acrylic plastic sheet with an excellent mirror silver finish which I used to make a couple of mirrors that were placed on the backdrop of my model railroad (see photos). If anyone would like some of this mirror material just let me know the dimensions of the piece required, modeler's name, and address. You will be charged for the shipping cost only. Notify the [Local Editor](#) if you are interested.

[100 Often Overlooked Details](#) – by Scott G. Perry

This has been published before in The Local (Jan-Feb 2006), but it's definitely worth another look!

Mortar and Mullions – What To Do? - by Pete LaGuardia



As a model railroad hobbyist, I was never satisfied using washes, paints, and other methods to simulate mortar joints on brick buildings. No matter what method I used or saw never really defined the difference between the brick and mortar in a way that represents a life like appearance.

A friend of mine recently mentioned he used DAP— Fast 'N Final Lightweight Spackling to simulate concrete walkways and roads. I tried this and it worked great. I decided to use the same material to simulate mortar and I was very pleased with the results. The material is so simple to use I just rubbed it on the bricks with my thumb which filled in the relief nicely and gave a great representation how mortar should look. I continued to rub the bricks with my thumb removed the excess from the brick surface. Recently, I purchased Walthers Cornerstone Machine Shop (<https://www.walthers.com/exec/productinfo/933-2902>) — low and behold the windowpanes and mullions were molded into one piece. Now what? How do I paint the mullions and keep the panes clear? I came up with a method first spraying this item with Dull Cote on both sides. Next, I took a black Sharpie and painted the mullions. Then I applied the windowpanes to the building. The overall result was very pleasing and gave me the results I was looking for (**Photos 5,6**). Try it yourself and I believe you will find it easy to do and happy with the results. (Reprinted with permission from The Potomac Flyer)

Thanks to John Paganoni for notifying us about some of these tips from the Potomac Flyer Division. [See more of the same at this link...](#)

Paper Structures

If you're looking for some nice structures for your layout but you're on a super-tight budget, consider making structures with card stock. They look very detailed. You can print out a variety of wall patterns from your own printer, and best of all, they're only a few dollars each. If you make a mistake, just print out another wall!

Check out the website at [Fiddlers Green Paper Models](#)

Reference Photos

One of the best ways to create a scene out of nothing is to start with a reference photo (**Photo 7**) that shows what you want to depict on your layout. You don't have to duplicate the scene exactly as the photo shows it, but it will give you a place or an idea to get started. You can see what you like about the scene or get an idea about the essence of the scene or era that you're trying to model, and then go from there.

The photo may give you some idea about the proportions of one part of the scene related to another. You can actually use software to get scale measurements of structures from an online photo (Apps like “AR Ruler”).

If you want to paint a backdrop, a reference photo is indispensable unless you're already a talented artist. You can also see what details are present in the photo that will help to make your scene more realistic. A wonderful resource for reference photos can be found in the [NMRA Online Archives](#). You may even want to go visit the actual location you are modeling on your railroad and take your own reference photos. It's a fun way to spend an afternoon while you're on vacation.

Take several shots from different angles. Take at least one physical measurement of something in the same plane, for example, one of the columns, or capture a person (whose height you know) standing next to the building. If you have that you can figure out the dimensions of the rest of the structure using a ruler app.



Photo 7: Train Station: Ashland, Virginia. If you have a reference photo like this, it will help you create a similar scene on your layout. You'll also need a front view and a side view of the structure.



The Electronics Corner



Explanation of Interlocking and Block Signaling

By Earl T. Hackett, Jr.

Block Signaling

Block signaling has been written about extensively in the model press. I know of only two or three articles about modeling interlocking signaling. Given the complexity of interlocking signaling it's easy to understand why. Block signaling comes in several flavors, but the objective in all cases is to keep a safe separation between trains travelling in the same direction on the same track.

Photo 1 – A C&O signal bridge with block signals, note the number plates. This and other photos were taken from the rear vestibule of a private car so the signal governing our track is always at stop.



Almost all block signaling on class I railroads in North America use a 3-aspect system (**Photo 1**). Block entrances are protected by a numbered signal with a single head that can display three aspects:

- G Clear, proceed
- Y Approach, proceed at medium speed prepared to stop at next signal
- R Stop and proceed at restricted speed

Another block system adds a fourth aspect, Advanced Approach, Y/Y. A 4-aspect block system can use shorter blocks, increasing train density, but at the cost of the extra hardware and additional relay circuitry.

Photo 2 – Our train has moved onto the passing siding. Note there is no number plate. These are absolute, not block signals. Stop means Stop. The three head mast can display Clear Slow. Note the new 'Darth Vader' signals in the background. When this photo was taken they had not yet been activated.





prevent a dangerous situation ([Photos 2, 3](#)).

A typical sequence would be G, Y/Y, Y, R. I have also seen this sequence displayed as G, Y, R, R/R. From what I've seen, it does not appear to be cost effective on major railroads, but it is often seen on light commuter rail and subways. (Some railroads use a flashing yellow aspect for Advanced Approach to avoid the cost of a 4-lens head.)

Photo 3 – This time we stayed on the main. There are the 'Darth Vader' signals waiting to replace the old C&O signals.

In single track territory passing sidings permit trains travelling in opposite directions to pass each other. Each end of a passing siding is a small interlocking. Although a very simple example, the switches and signals are interlocked in a manner to

Interlocking Signaling

Interlocking signaling can be thought of as another layer of signaling overlaid on the normal block signaling. If the switches are aligned straight and the signals are cleared, to the engineer the interlocking acts exactly like a block signaling system. Automatic block signaling can handle single track with passing sidings, but when more than one route is involved, additional protection is required that interlocks signal and track controls. According to *Signals, Systems, & Transforms*, 5th Edition, by Phillips, et al., the general definition of interlocking is to "interlock operating devices, switches, signals, and other forms of signal apparatus in such a way that their movements must succeed each other in a predetermined order." Once you have operated one of these machines the definition will become clear.

There are two types of interlocking signaling in use today, route signaling and speed signaling. Route signaling is widely used throughout the world, including the western USA. Speed signaling is used in the eastern USA and possibly some other locations. Route signaling tells the engineer what route he will follow but provides no information about the safe speed. Speed through the interlocking is the same regardless of route and is specified in the timetable or other publication. The downside of this is that speed through the interlocking is determined by the slowest route. Speed signaling indicates the maximum safe speed but provides no information about the route. Of course, the engineer can make a pretty good guess about the route depending on the allowed speed. With a two head signal, route and speed aspects are very similar with similar meanings.

Speed signaling is particularly useful in areas where complex, high speed track is common, such as the Northeast Corridor. If speed signaling is needed on one division, it is usually standard throughout the system. A good example of an interlocking that requires speed signaling is Davis Tower (now abandoned) in Newark, Delaware. I'm very familiar with it because for four years, it was just across the street from my dorm at the university and it was not unusual for me to sit in the tower late at night to study for an exam. The operator was always happy to have some company.

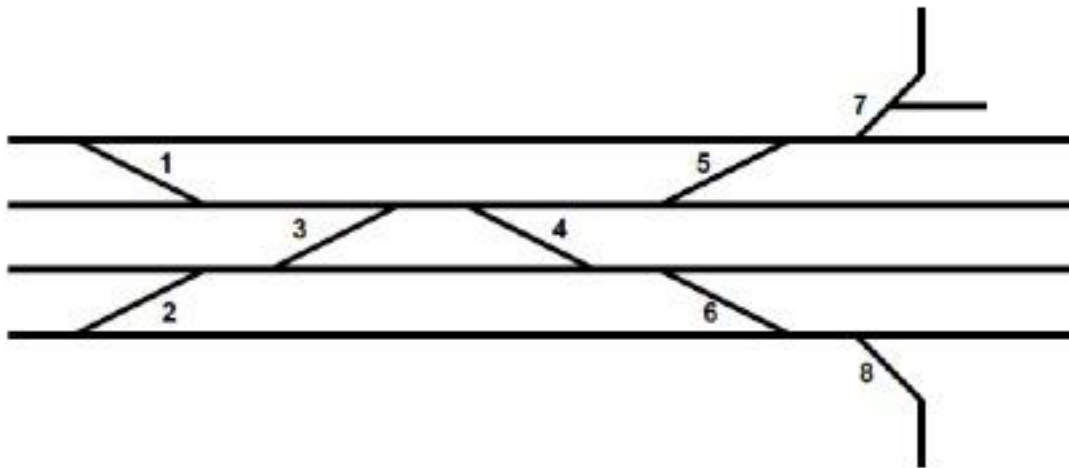


Photo 4 – Schematic drawing of Davis Tower interlocking at Newark, Delaware.

Switches 1 through 6 are No.20 crossovers that can be transitioned at medium speed (**Photo 4**). Switches 7 and 8 lead to very sharp curves and require a slow approach. It would be inefficient if the slow speed required for these two switches was applied to the entire interlocking.

Route signaling generally uses two signal heads. The upper head indicates block conditions for the through/high speed route; the lower head governs the diverging route. From an AAR presentation, route signal interlocking aspects are:

G/R	Straight ahead, CLEAR
Y/R	Straight APPROACH, prepare to stop
Y/G	Straight APPROACH, prepare to diverge
R/R	STOP
R/G	Diverging CLEAR
R/Y	Diverging APPROACH, prepare to stop

Speed signaling uses two or three heads and the indications can be very complicated. The C&O, the prototype I model, used speed signaling, but in 1950 used only two signal heads and had only 6 aspects.

Clear	G/R	Proceed (at track speed)
Approach Medium	Y/G	Approach next signal not exceeding medium speed
Medium Clear	R/G	Medium speed through interlocking then proceed at maximum allowed speed
Approach	Y/R	Proceed not exceeding medium speed, prepared to stop at next signal
Restricting	R/Y	Proceed at restricted speed, prepared to stop before any obstruction
Stop	R/R	Stop

There was a special signal face "Take Siding," a square face with five yellow lamps arranged in an X configuration. This was not a common signal. The only photo of one I've seen is in the far distance on the eastern approach to White Sulphur Springs.

Some usages of these aspects are:

Approach Medium: The maximum safe speed for the track configuration beyond the next signal is medium, 30 mph. The next signal could display either Medium Clear or Approach.

Approach: The engineer must be prepared to stop at the next signal. The next signal could display either Stop or Restricting or could be a dwarf showing Clear Slow. Dwarfs always indicate slow speed.

Restricting: Often used where the train is leaving signaled territory. It becomes the engineer's responsibility to avoid collisions or other damage to the train. The maximum allowable speed is slow with the ability to stop within half of the visible distance.



Photo-5 – A dwarf signal on the old C&O had a light arrangement of Y/G/R and indicated a slow speed. Y/R on the same dwarf is Approach Slow, Y is Restricting.

The signal operator (either the dispatcher or the operator nearest to the interlocking) has only two decisions to make (**Photos 5, 6**). A switch can be set either normal or reversed. A signal can be set to either stop or go. If the signal operator selects to let a train go, logic in the field will determine what aspect should be displayed. Once a route has

been selected and the signals cleared, the signals along the route will behave as block signals. There is no exit signal for an interlocking so the entrance signal to the interlocking will serve as a block signal for the combined interlocking route and the following block.

Photo 6 – Main Line Dwarf

To operate any switch or track device, all signals controlling tracks to that device must be at stop and the track section cleared of any traffic. The normal position for signal levers is at Stop. With all the levers at Stop, the operator can set up any permissible route.

A mechanical locking plant uses locking bars or dogs that are driven into a notch in the lever actuating bar. The basic concept is shown below. The right lever has been reversed, driving the locking bar into the notch in the left lever. These two levers are mutually exclusive; only one can be reversed. A typical application would be the switch levers controlling a double crossover or signal levers controlling opposing signals.

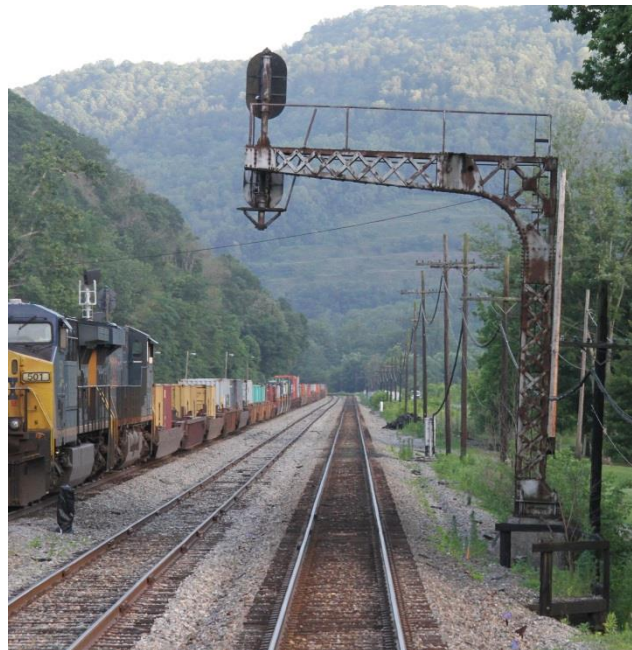


Photo 7 – Mechanical Lever Locking

In a mechanical plant, to avoid duplicate locking and unnecessary complexity, there is a locking hierarchy (**Photo 7**):

Signals can lock higher numbered signals;
 Signals can lock switches;
 Switches can lock higher numbered switches.

My first thought was to build mechanical plant, just like the prototype. It didn't take long to realize that this is an extremely complex task, and if there was a mistake it would not be an easy fix. There was also a good chance that I would like to change the track configuration, requiring a complete redesign of the interlocking bed. Plastic would not be strong enough to be reliable and the weight of a brass frame would be impressive. Since I had to have an electric lock for block occupancy and route locking, I decided to do everything in code and use a solenoid to do all the locking. In code, mutually exclusive locking does not exist, so every combination of the switch and signal lever positions have to be addressed.

Encoding these rules and validating that it actually works as intended has historically been very expensive in terms of man hours. Recently there have been significant advances in automating the generation of interlocking software. Although I don't understand the mathematical symbols, a very readable paper is located at the following link:

<https://pdfs.semanticscholar.org/6a28/3af886ba86667e7f2df80a7dc4488d60350b.pdf>

This describes a system for automatically generating interlocking software for the German Railways. This is the basis for the software used by Modratec, Australia, to generate their model railroad route interlocking plants.

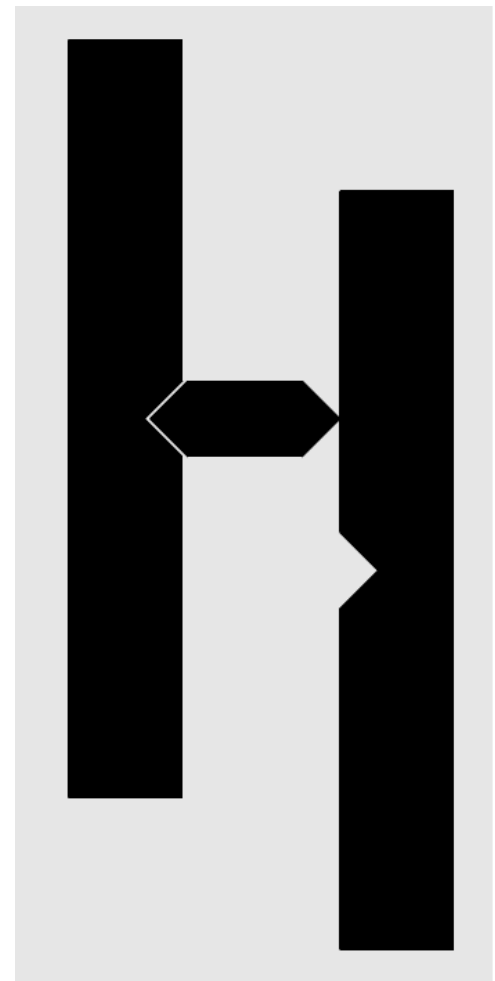
Signal levers I model are:

Home signal	Red,
Switch & derail	Black
Spare levers	White – removed from the rebuilt frames

Lever that I don't model are:

Distant signals	Yellow - my distant signals are automatic
Point locks	Blue
Crossings	Brown

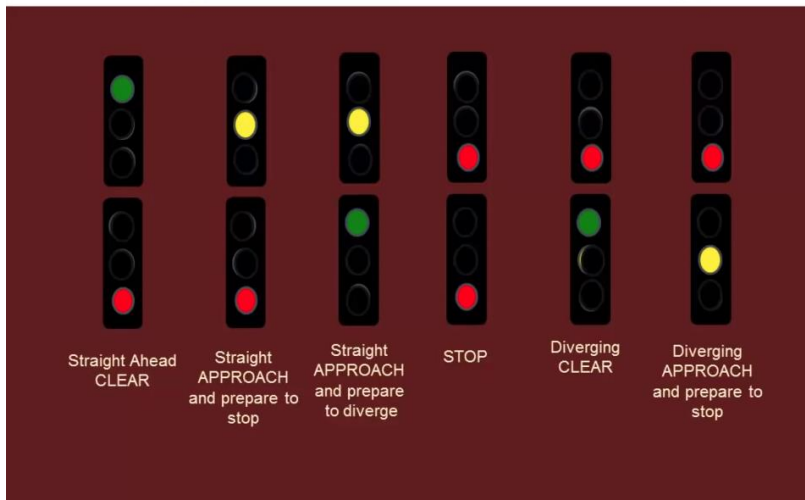
I didn't bother with point locks as this is confusing enough for visitors (they are only required for facing point moves), and I don't have any signaled crossings.



Most modelers are unaware of the time locking feature of an interlocking plant. If the home signal is Clear, the distant signal will also display Clear. If the signal operator could just drop the home signal to Stop at will, a train that had passed the Clear distant signal would suddenly be confronted with a Stop signal while at speed and would not be able to avoid entering the interlocking, a very dangerous situation.

To prevent such a situation, signal levers have a double lock. The operator can release only the first lock. When this is done, a timer starts and the distant signal displays Approach. This is commonly known as "running time," and provides sufficient time for a train that has already accepted the Clear distant aspect time to enter the interlocking. Once the timer runs out, the second lock is released, and the operator can move the lever to the stop position. The distant signal remains at Approach and the home signal is at Stop (**Photo 8**).

Route Signal Aspects – At Interlockings



Finally, there is the question of what aspect should be displayed when a signal lever is reversed. Depending on track conditions (switch position, block occupancy, etc.), the Most Permissive Aspect can be determined. For example, consider signal 1 in the above simple interlocking. If all blocks are clear, if switch 3 is normal (straight) the Most Permissive Aspect for signal 1 would be Clear. If switch 3 is reversed, the Most Permissive Aspect would be Medium Clear, and the distant signal to signal 1 would display Approach Medium. Switch 3 also determines the route or block sequence

and block occupancy with normal block signaling rules would dictate signal aspects as the train transits the route.

The next installation will describe how I modeled interlocking signaling on my layout using Arduino microprocessors.

Additional references:

[Primer on American Railroad Signals](#)

[Guide to Signals and Interlockings](#), March 22, 2021, by Dave Abeles (from *Model Railroader*)

Bryan, Frank, "[Railroad Signals](#)", *Trains*, May 1, 2006

Keller, Allen, and Kizer, Kevin, "[Installing Approach Signals for an Interlocking Plant: Part 1](#)", *Model Railroad Academy*, circa April 2017, with links to Parts 2 and 3.

McGowan, Mark, "Railroad Signals Explained", <https://youtu.be/LH17IJ3IEMg>

Featured Layout

Boston & Maine, Western Route, in HO Scale

By Mark Gionet and Bill Lyders

In *The Local's* ongoing search for great layouts to feature, on a tip from Alex Belida, MMR, we came



1.

upon an article in the September 2019 issue of *The Potomac Flyer* showing Mark Gionet's depiction of the Boston & Maine, Western Route, which fit the bill perfectly. We also used the information and write-up about Mark's layout in that issue written by Bill Lyders. Having obtained permission to use the information and photos from that article as well as subsequent photos of the same layout from the Aug-Sept, 2020 *Flyer* issue and the April-May issue of the same publication, we decided to merge the work into a featured layout article for *The Local*. We deeply appreciate the courtesy of those mentioned above as well as the opportunity to provide a broader audience for this wonderful HO scale model railroad (**Photo 1**).

Photo 1: Boston & Maine, Western Route by Mark Gionet

It had been a long time since I had been to the Mount Vernon area, about an hour from my home in Gainesville, VA. But the visit to Mark Gionet's Boston and Maine Western Route was well worth the trip. The layout has quite a bit of scenery on the two "peninsulas" and the roads/streets are constructed in the two towns to complement the structures in each. I had discussions with Mark about making his trees, building his structures, and most important to me, his track [since I am working on my AP Civil certificate]. He had a diesel locomotive with passenger cars slowly and smoothly



2.

doing a continuous run around the layout (**Photo 2**).

The big town in the layout was based on Dover, NH and other New England towns (**Photo 3**). Mark has numerous background scenes around the layout made from New England pictures he and a friend have taken and he integrated with Photoshop as you can see in the trees, pond, and backdrop photo next to his small town (**Photo 4**).



Mark also kitbashed two craftsman kits from South River Model Works as a paper mill (**Photo 5**). If you want to see some good water construction, take a look at the raceway spilling by the mill and over a wall next to the mill. There is also an intriguing collapsing "dock" going out into the stream that has sections literally modeled as collapsing into the water. The weathering on this dock is excellent (**Photo 6**).

Mark said he originally modelled the 1970s but has slowly drifted back in time to the 1950s. The B&M Western has a fiddle yard where he builds and starts his trains and three industrial sidings with turnouts controlled by Bull Frog machines. Since I had not seen one in operation, Mark let me operate one of them. His layout is controlled by the NCE DCC system. I had a detailed discussion with Mark and John Paganoni about the scratchbuilt turnouts and some details needed for the Civil AP certificate. The B&M Western has code 83 tracks on the mainline and code 70 on the sidings.





In all it was a very good Open House visit. If you have not attended any Open House layout tours, give it a try. The conversation and comradery with attendees and host are very enjoyable. You may even want to host your own!



Photo 7: Icehouse on the Boston & Maine

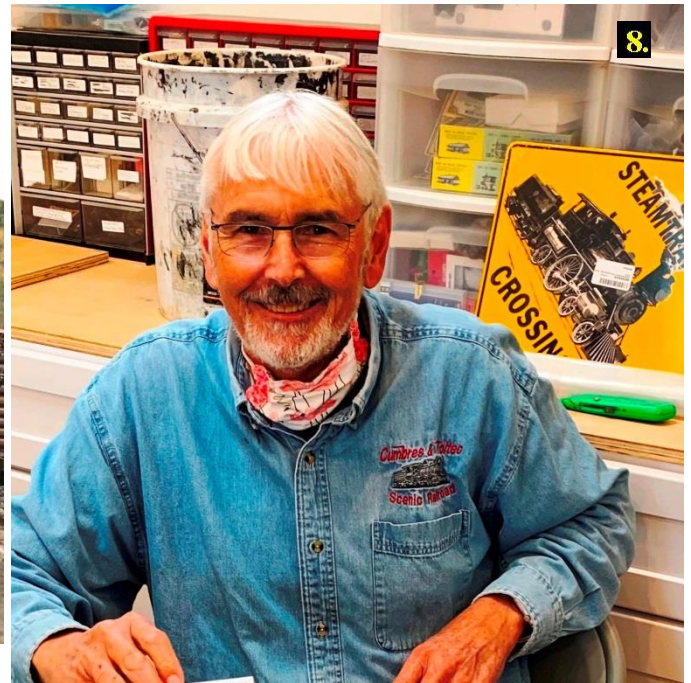


Photo 8: Mark Gionet models the Boston & Maine's Western Route in HO scale. A New England native and landscape architect by profession, he and his wife live near Mount Vernon, in Alexandria, Virginia.

The Last Stop...

More photos from our featured layout - The Boston & Maine, Western Route, by Mark Gionet:



Photo 1 – Yard in front of the Icehouse: The Boston & Maine, Western Route, by Mark Gionet (Photo by Bill Lyders)



Photo 2 – Rough Water: The Boston & Maine, Western Route, by Mark Gionet (Photo by Bill Lyders)

And another one from The Pennsylvania RR by John Johnson:



Photo 3 – Driftwood, PA in the Fall of 1955: PRR layout by John Johnson, MMR (Photo by Roger Bir)

Thank you for reading *The Local*. And thanks to all those who made it possible. Please let us know if there are any particular topics that you would like us include in future issues. Also remember to send in your photos, tips, tricks, and techniques that you would like to share with others. We are always open to receiving more articles. Stay safe. See you at the MER Convention in October!

