

# THE POTOMAC FLYER

---



## **Issue Highlights:**

**Remote Ops Sessions: Lessons Learned**

**The Challenge of Master Builder-Prototype Models**

**Layout Renovation: Making A Helix**

**Workbench Tips, Scratchbuilding Sources**

**And Much, Much More...**

## Remote Operations—Part 2 Applying Practice to Theory

by Bob Rodriguez

### Bill of Lading

Remote Operations—Part 2 Applying Practice to Theory.....	2
Looking For a Challenge? Try Working for Master Builder-Prototype Models!.....	10
Installation of Operating Crossing Gates.....	14
Building a Brace of MoW Cars—Part 1.....	19
From the Business Car.....	22
Potomac Division Holds First Virtual Clinic.....	23
The Layout Survey.....	23
<i>Flyer</i> Editor’s Note.....	25
Company Houses (and How to Ensure They’re Level on a Layout).....	25
Layout Renovation.....	28
Water Stop at Misty Creek.....	30
Icehouse Project.....	31
Doyle Sand & Gravel, Montville, Connecticut, 1950.....	32
Colorado to Maine.....	33
New Book on Photographing Your Model Railroad.....	33
On the Workbench: Pioneer Valley.....	34
Workbench Tips.....	35
McLean Hardware.....	36
Achievement Program News.....	37
Mark Me Up: Can I Go Now?.....	38
Potomac Division Events Calendar.....	40

*Tip: The above entries are all links. Click on the title to jump to the article.*

### Potomac Flyer

The Potomac Division’s Bi-monthly Newsletter

#### Submission Deadlines—Issue

Dec 15—February-March	Feb 15—April-May
Apr 15—June-July	June 15—Aug-September
Aug 15—Oct-Nov	Oct 15—Dec-Jan

Cover photo: Mark Gionet photographed the new ice house in the fiddle yard of his HO scale Boston & Maine Western Route. See the article on p. 31.

In the last issue of *The Potomac Flyer* (June-July 2020) I discussed the idea of conducting remote operating sessions in the era of COVID-19. In this article I will discuss applying practice to theory to make remote operations a reality.

Since the writing of my last article, I have successfully hosted eight remote operations sessions on my railroad, the Nickel City Line. As the sessions have progressed, my remote crew has become more proficient in the art of remote operations. Since COVID-19 remains a concern for many of us today, the remote operations format on my layout will be the norm—rather than the exception—for the majority, if not the remainder, of 2020.

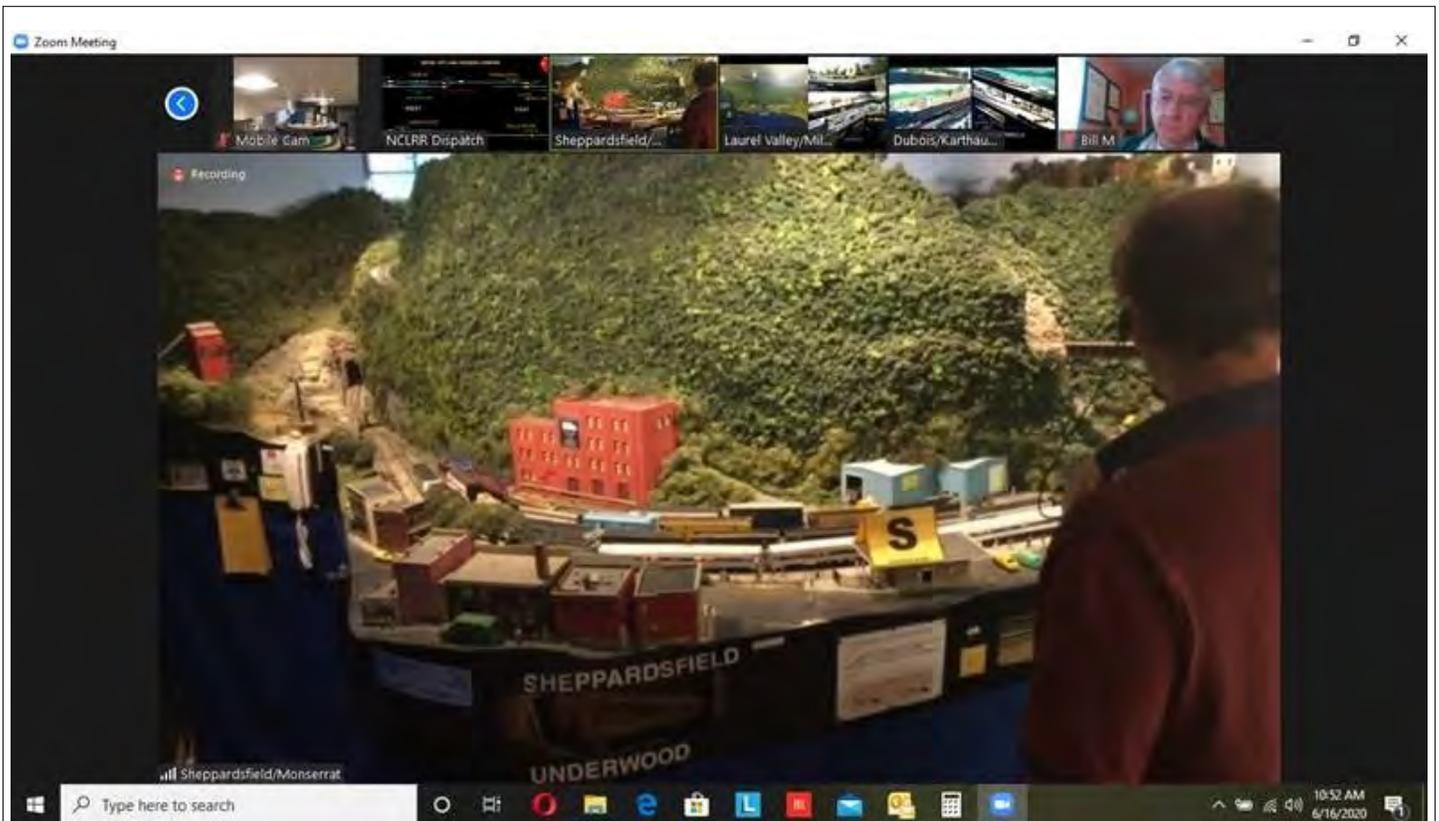
#### Equipment Needed

To recap from my last article, a layout and its operators need some hardware and software components to create a working remote operations system. These include, but are not limited to:

- Physical components for turnout control, block detection, and signaling (if present).
- A software interface to operate the hardware components, such as Java Model Railroad Interface software (JMRI) (<https://www.jmri.org/>).
- A software app to operate throttles that is compatible with the layout’s software interface. My operators and I prefer the use of WiThrottle (<https://www.withrottle.com/html/home.html>) for iOS devices or Engine Driver (<https://enginedriver.mstevetodd.com/>) for Android devices.
- A software program to interact with the Dispatcher’s computer, such as TeamViewer (<https://www.teamviewer.com/en-us/>).



WiThrottle for iPhones



*An Amtrak passenger train arrives in the town of Sheppardsfield while the local switches industries on the adjacent track. The layout owner is seen to the right on the large screen serving as the brakeman while the operators work remotely via Zoom. Several of the layout cameras can be seen in the smaller Zoom windows above. The large 'S' aids operators in locating passenger stations on the layout. Screenshot by Bill Lyders*

- A software program that facilitates video and audio communication between operators and the layout's host, such as Zoom (<https://zoom.us/>).
- A series of cameras that link into the video and audio software so operators can see segments of the layout remotely.
- Sufficient documentation prepared and sent to operators in advance to aid in remote operations.
- For the operators, a home computer with a microphone and camera connected to a reliable internet provider.
- For the operators, a good size computer monitor, two are preferred.

On my layout I use Digitrax BDL168s for block detection and transponding; and Digitrax SE8c's for turnout and signal control. I use JMRI to communicate with the layout along with Rodney Black's Computerized Assisted Traffic System or CATS (a JMRI overlay software) to run the Dispatcher's console (<http://cats4ctc.wikidot.com/>).

### Video Coverage

I purchased a number of inexpensive webcams from [Newegg.com](http://Newegg.com), an internet retailer, to provide visual coverage on my layout. Since the cameras cost around \$13 each, I didn't feel bad about purchasing a large number of them. I also purchased several 16-foot USB extension cables to get the reach I needed between the cameras and the computers.



*A tripod and rubber bands were used at first to secure a webcam for viewing the town of Canova.*



*A 3D printed iPad holder for a tripod allowed for an iPad to serve as another camera.*



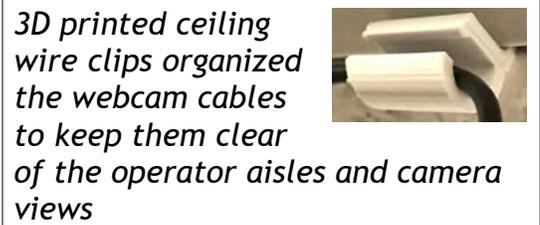
*A stool and some boxes elevate a laptop to a level where the laptop camera can be used for viewing the location of Mills River.*

When I started setting up cameras, I used whatever was readily available (a tripod, stool, folding table, curtain rod hook etc.). But soon I designed and 3D-printed a series of ceiling camera mounts and cable holders. This provided better mounting options and a cleaner workspace. The ceiling mounted cameras also displayed a much larger view of each area of the layout, which I needed to aid my operators. I used my iPad and my iPhone to supplement the cameras. I 3D-printed tripod brackets for both which provide a stable platform for each device to be placed during a session.

One of the problems I ran into was how to use multiple cameras when they outnumbered the computers I had on hand. To accomplish this, I use Open Broadcaster Software or OBS (<https://obsproject.com/>). OBS is open source software for creating streaming videos on the internet. Like JMRI, it is open source, and free to download and use. It is updated regularly by a group of volunteer programmers. With OBS I was able to connect four cameras to a computer and use OBS to set up the scenes. I added labels and overlays in OBS that aid my operators when they view the OBS output. To get the video pushed out onto the internet, I installed an OBS add-on called VirtualCam (<https://obsproject.com/forum/resources/obs-virtualcam.539/>). VirtualCam simulates a webcam on the computer. It shows whatever scene is set up in OBS. Once I set up the scenes in OBS and started the VirtualCam, I then log into Zoom and tell it that the VirtualCam is my webcam. I can push out four separate webcam images in a single Zoom window. This enables my operators to see a great deal of the layout in one concentrated window.



*An unused curtain rod bracket and duct tape made for an easy camera mount.*



*3D printed ceiling wire clips organized the webcam cables to keep them clear of the operator aisles and camera views*



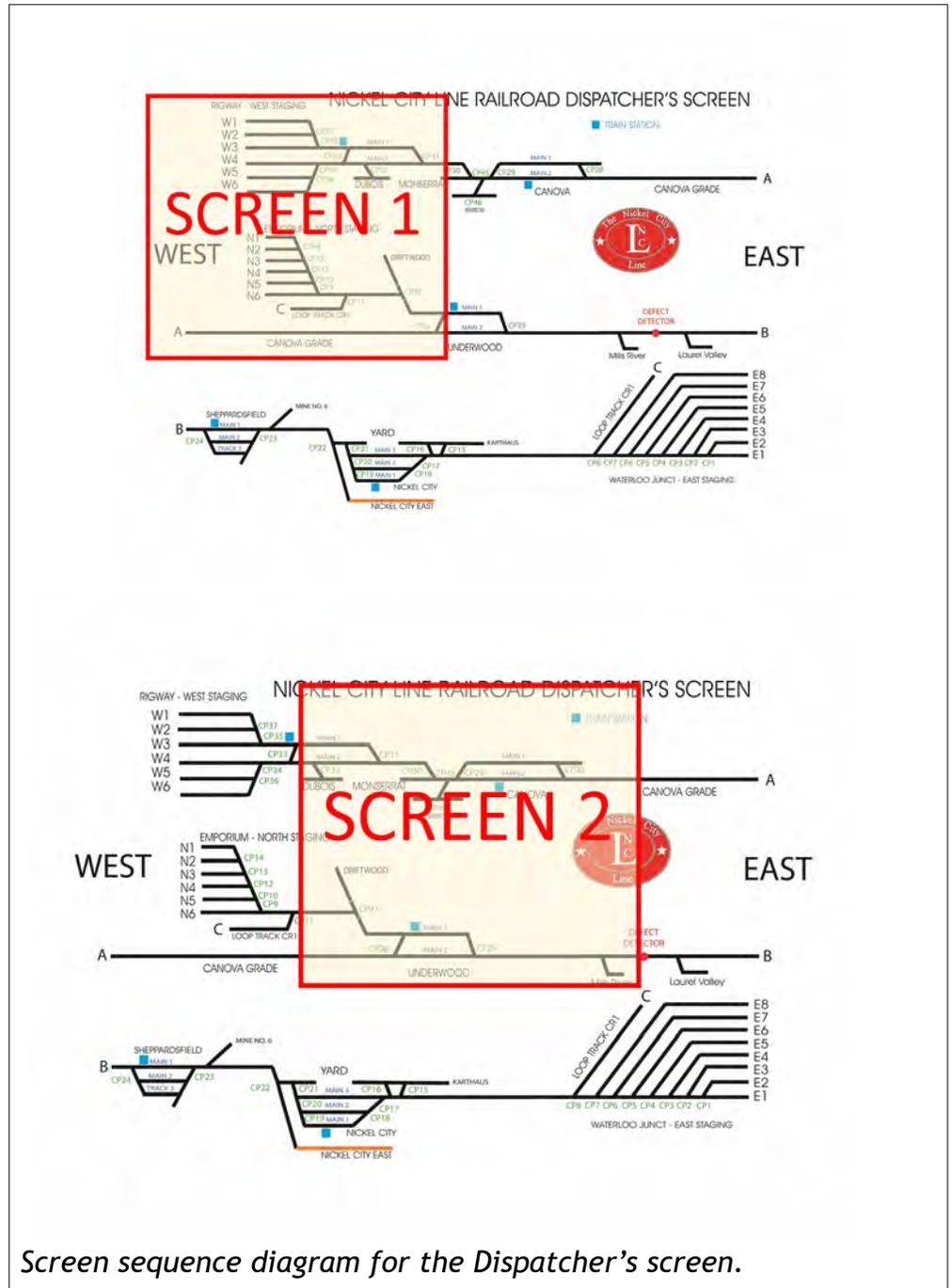
*A 3D printed ceiling camera mount improved viewing areas of several webcams in the layout room.*

My operators also needed to see the Dispatch Console as they follow their train across the layout, especially in areas without camera coverage. On the Dispatch computer I use OBS and VirtualCam to push out the Dispatch Screen as a screen capture. Because the Dispatch Screen is very large, I broke it into six smaller scenes. Each scene rotates from left to right, top to bottom, every five seconds. This allows each operator to see in greater detail the Dispatch Screen and track their progress across the layout. Because the six scenes overlap in coverage, it is fairly easy for operators to track their train's progress from scene to scene.

I use four older desktop computers (three of which were donated by a friend), a laptop computer, an iPad, and an iPhone to provide the camera coverage I need. Each device joins the ops session Zoom meetings separately. When the operators sign in they see six Zoom windows, one for each device, displaying cameras in multiple locations covering the layout.

**Testing and Training**

Preparation for the first remote ops session involved several tests of the equipment over a two week period. In each case I had one or two volunteers log into Zoom and TeamViewer to operate either the Dispatch Console or locomotives using one of the throttle apps I mentioned earlier. After each test, I made a few adjustments to the software and procedures until I was ready for the first unofficial remote ops session. The first session was kept small and simple. A Dispatcher, two operators, and I operated for about an hour. I had three trains held over from my last in-person ops session back in early March that needed to complete their runs. With a crew of three, we easily completed all the required work within the allotted time.



*Screen sequence diagram for the Dispatcher's screen.*

The next phase was to train the remaining operators who were interested in participating in remote operations. To do this I needed to obtain each operator's home external IPv4 internet address. An IPv4 external internet address is the address of your home router. Just like your house address, the internet needs an address to send stuff to you. To find out what your IPv4 address is, simply open your web browser and type "What is my IP address." Your search results will provide you with your IPv6 and IPv4 addresses. JMRI and the throttle apps are set up to use IPv4 addresses.

In order for the throttle apps to work over the internet, JMRI uses specific access ports to permit access to layout computers to operate locomotives. JMRI uses a default access port of 12090 for the throttle server. You can change this port to another number if you desire.

Once I have the addresses, I go into my router and set permissions for those addresses to access the JMRI port. I also set my firewall to recognize those addresses. If I don't provide the addresses for either the router or the firewall, the addresses are identified as a threat and are rejected by the router.

With the router and firewall configured, I start JMRI and the JMRI throttle server. Once the server is started, operators can configure their throttles for my external IPv4 address and the JMRI port for the throttle (I provide this info to the operators. The address and port look something like 123.45.678.10:12090). Once the operators are in, they can select any locomotive on the JMRI roster, although we have specific locomotives assigned for each session. The throttle response is fairly quick, with a delay of 1 second during instances of high internet bandwidth usage. Once a locomotive is selected, the operator can control the direction, speed, lights, and sound functions.

With the operators trained, I turned to what the remote operations format would be. I decided that sessions would be limited to only four people at a time. That included a Dispatcher and three operators. Since I am the only one in the layout area, this was the maximum number of people I could interact with during a session. The sessions would run between 90 minutes to two hours maximum. I believed this was the maximum amount of time someone would want to be sitting at a

**Regular vs Remote Operations Table**

COVID-19 Status	Normal	Phase I	Phase II	Phase III
Operators	In Person	12	1	1
	Remote	0	3-4	3-4
Session Length	4 hrs	1.5-2 hrs	1.5-2 hrs	2 hrs
Schedule Type	Time	Sequence	Sequence	Sequence
Fast Clock	Yes	No	No	No
Trains per Session	10-14	4	4	6
Scheduled Freight	Yes	Yes	Yes	Yes
Scheduled Pass	Yes	Yes	Yes	Yes
Local Freight	Yes	Yes	Yes	Yes
Extra Freight	Yes	No	No	No
Extra Passenger	Yes	No	No	No

*The components used for in-person and remote operation sessions.*

**DISPATCHER LINE UP - VIRTUAL**

	Sequence	TRAIN	TYPE	Trick	
A-1	1	201	FREIGHT	1ST TRICK	
	2	401R	COAL		
	3	501T	LOCAL		
	4	402	COAL		
A-2	5	300	INTERM		
	6	403	COAL		
	7	303	INTERM		
	8	202	FREIGHT		
A-3	9	100	COMM		
	10	601	PASS		
	11	646	PASS		
	12	101	COMM		
B-1	1	502T (a)	LOCAL	2ND TRICK	
	2	102	COMM		
	3	103	COMM		
	4	650	PASS		
B-2	5	BF3	FREIGHT		
	6	714	FRIEIGHT		
	7	405	COAL		
	8	KS411/12	COAL		
B-3	9	650	PASS		
	10	502T (b)	LOCAL		
	11	X421	COAL		
	12	641	PASS		
	13-EVEN	212R**	FREIGHT		
C-1	1	116	COMM		3RD TRICK
	2	115	COMM		
	3	713	FREIGHT		
	4	117	COMM		
C-2	5	204	FREIGHT		
	6	503T	LOCAL		
	7	X422	COAL		
	8	118	COMM		
C-3	9	622	PASS		
	10	203	FREIGHT		
	11	304	INTERM		
C-4	12	504T (a)	LOCAL		
	13	407R	COAL		
	14	504T (b)	LOCAL		
	15	653	PASS		
	16	BF4	FREIGHT		

*The schedule change from regular to remote ops sessions. Under the regular schedule, in person operators worked a single Trick, Under remote ops, each Trick is broken down into 3 or small smaller sessions as noted by A-1, A-2, A-3, etc.*

computer for an ops session.

### Schedule Changes

The schedule I originally ran for in-person ops sessions had to change. I use Shiplt software to set up my car forwarding. Shiplt depends on cars moving from one train to another in order to get to their final destination. Keeping my freight trains in sequence would avoid having to invent a new operating format. Instead of time-based operations I switched to sequential operations. This meant that when one train was finished, the operator would operate



*Two of the four computers used for remote operations sessions are ready to join Zoom for an upcoming ops session.*

the next train on his or her assignment list. This helped spread out traffic, which was critical to the success of remote operations.

I cancelled all extra trains, since they were not critical to daily operations. I also dispersed the local trains so that only one local operated during certain sessions. Freights that interchanged with the main yard were also limited to one or two per session. Each session, which normally saw 12 to 16 trains running, was broken down into smaller sub-sessions of four or five trains. Passenger trains were redistributed throughout all the sessions regardless of schedule, since we were no longer dependent on time-based operations. This allowed me to fill each sub-session with one or two passenger trains to keep remote operating interest up, while allowing me the ability to interact with the freight trains in the yard or the local on the main line.

In the main yard, car pickups were pre-staged in advance to minimize switching time. In between sessions, any cars set out in the yard were relocated and blocked for the next session. I discontinued the use of Track Warrants in dark territory in order to simplify operations and keep the sessions moving on schedule.

Because everyone was remote, I prepared a number of documents to serve as visual aids. I created a camera diagram which showed the camera locations and areas covered for each computer. I also provide a Dispatch Screen sequence handout which shows when each of the 6 scenes from the Dispatch Screen is displayed. I send out the switch lists and train line up sheets to all the operators along with train routing diagrams for each train. These aid the Dispatcher and operators so they know the expected route of travel for each train. Of course, the Dispatcher can re-route trains as conditions permit, but having a guide handy that tells you the route you should travel goes a long way towards keeping everyone comfortable during a remote session.

## The Remote Ops Sessions

During remote sessions, the emphasis is to have fun. Everyone takes their time and completes whatever they can get done in the time allotted. I usually schedule two sessions a week over a three week period and then take a week off to do maintenance. I schedule a daytime and an evening session so everyone has an opportunity to operate based on their work or home schedule. I add a Saturday morning session here and there as well.

### Some of the paperwork sent out to operators in advance to aid them during remote operations:

Nickel City Line Railroad

Train: BF4  
The Bison  
Class: 2nd  
Type: Through Freight

Switchlist  
Session: 50  
2/11/1998

Switch: Buffalo

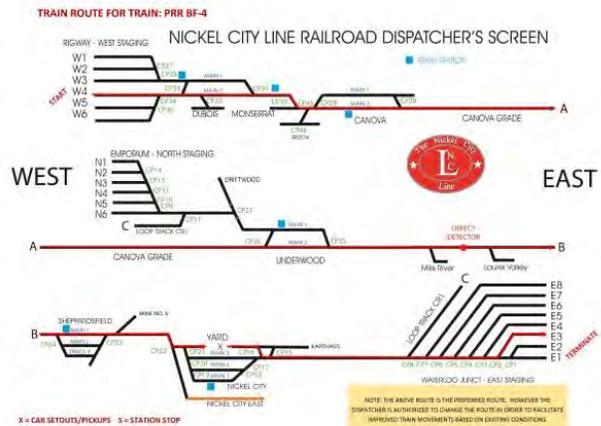
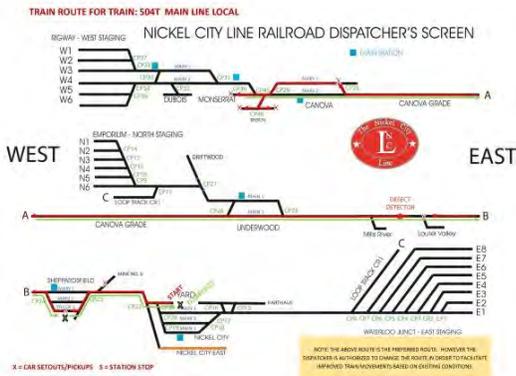
Town: Buffalo		Arrival: 7:32PM	Departure: 8:02PM			
Road	Number	AAR	Pickup	Setout	Lading	Destination/Town/Industry
PR	28475	JMC	Buffalo Terminal		Timber - Forest Bldg	Home City/Market City Yard
NW	29754	JMA	Buffalo Terminal		Empty	Ends/Ends Terminal
NW	81512	JM	Buffalo Terminal		Empty	Ends/Ends Terminal
PR	27254	JSM	Buffalo Terminal		Apparelment	Ends/Ends Terminal
PKDD	32426	JMAA	Buffalo Terminal		Empty	Home City/Market City Yard
ICBD	18725	JM	Buffalo Terminal		Empty	Home City/Market City Yard
SGU	45581	JMM	Buffalo Terminal		Home & Industry - GM	Home City/Market City Yard
NSAK	19752	JMB	Buffalo Yard		Empty	Ends/Ends Yard
IC	18475	JMM	Buffalo Yard		Empty	Ends/Ends Yard
JM	25425	JMC	Max Huter Inc Company		Apparel - Hats	Ends/Ends Yard
SGU	28865	JMC	Max Huter Inc Company		Apparel - Hats	Ends/Ends Yard

Run Train #BF4 East from Buffalo to Nickel City, Switch Nickel City.

Town: Nickel City		Arrival: 9:01PM	Departure: 10:31PM			
Road	Number	AAR	Pickup	Setout	Lading	Destination/Town/Industry
ATD	12878	JM	Nickel City Yard		Timber	Ends/Ends Terminal
SGU	18788	JSM	Nickel City Yard		Empty	Ends/Ends Terminal
JM	25470	JMC	Nickel City Yard		Timber - Paper Bldg	Louis Valley/Louis Valley CO
PGAD	88468	JMAA	Nickel City Yard		Empty	Frederickburg/Frederickburg Terminal
ICD	18720	JM	Nickel City Yard		Empty	Nickel City Yard
SGU	45581	JMM	Nickel City Yard		Home & Industry - GM	Home City/Market City Yard

A switch list details work for each train during a session

A camera diagram helps operators orient themselves to what they see in each camera window.



Train Route Diagrams help guide operators through the layout when they look at the image of the dispatcher's screen remotely.

Operators can sign up for as many sessions as they want. I make sure those with limited availability get first choice on one session. I then work to get everyone else who is interested into at least one session each week. Because the remote ops session format is new to everyone, I decided to hold more sessions than I normally do in order for my operators to gain a higher comfort level. This has resulted improved sessions as we move forward.

Thirty minutes prior to the beginning of each remote ops session, I start up the computers, load OBS, Zoom, and configure the cameras. One computer serves as the Zoom host, and the others simply join the meeting. The host computer is the only computer that uses audio, which is connected to an FRS (Family Radio Service) radio with the VOX (voice operated switch) feature activated. The mic jack on the radio is connected to the computer speaker jack, and the radio speaker jack is connected to the mic jack on the computer. Because I am the only occupant in the layout room, the FRS radio is how I communicate with the remote crews and Dispatcher during the session.

About 15 minutes prior to the start of the session, the operators join the Zoom meeting. The Dispatcher also logs into the TeamViewer connection on the Dispatch Computer. The road crews set up their throttle apps and confirm they are connected to the JMRI software. If there are no issues, everyone has time to socialize a bit.

Once the session starts, operators mute their microphones and only unmute them when they need to transmit a message. As the host, I serve as the Traffic Supervisor of Operations or TSO. I also serve as the Yardmaster and road brakeman. With a properly adjusted schedule, I am able to perform all three roles with a minimum of effort. When the session ends, we have a short wrap-up before everyone signs off.

As the host, I put extra effort in the layout prep beyond what you normally would do for an in-person session.

- Clean and inspect the trackwork completely.
- Do a good look-over of all rolling stock and locomotives a few days beforehand.
- Run each train once or twice before the session to check for irregularities.

This extra prep work pays off when three trains are running remotely on the layout and I can stand back and watch the action while hearing the road crews communicate with the Dispatcher over the radio.

In one of my last sessions I stood and watched several times while opposing trains in the same town safely moved through switching interlocks from single track to double track locations without incident. I could tell the operators were focused on the camera feeds and well aware of their train speeds. It was a great feeling seeing the layout come to life while I was the only person physically present in the room. You can view a video of one of our recent remote ops sessions on YouTube at: <https://www.youtube.com/watch?v=eVyo7J3XDy4>

## The Rails Ahead

So what lies ahead? More remote ops sessions and more people to train! So far I have had a guest operator from Indianapolis attend and operate remotely at one of my sessions. I now have three more operators on the east and west coasts who will be joining my regular operators for upcoming sessions.

I have a few more webcams to install. I am also working with several

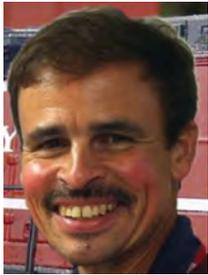


*A Raspberry Pi Zero W, camera, and power bank loaded onto an old Tyco passenger car chassis will serve as a wireless train cam for upcoming remote ops sessions. The car will receive a special 3D printed locomotive body which will blend in with the powered locomotives. The car will run on the head end of assigned trains and the image will be viewable on a web browser.*

Raspberry Pi Zero W's and Raspberry Pi cameras to create some WiFi traincams. This will give the remote operators an in-cab view of their trains on a separate browser tab, which will add greatly to the remote operation experience. And as we begin to ease into Phase III of COVID-19 recovery, I will be adding one more person to the layout room to work the main yard as a brakeman. That will permit me to add a remote Yardmaster and remote Yard Engineer position to upcoming sessions for a total of six remote operators.

While COVID-19 has changed the way we do many things, it has created an opportunity for me to create a safe environment for my operators to continue to interact, operate on my layout, and enjoy the hobby until we can once again meet in-person. I am very grateful to each of these operators for their enthusiasm and friendship during this surreal event in our lifetime. 

[Return to Bill of Lading](#)



Bob Rodriguez has been a model railroader for more than 40 years and has built several small and medium-size layouts, including assisting with construction of the Prince William County Model Railroad Club's layout formerly in Quantico, Virginia. Bob began operation sessions on his own Nickel City Line railroad in November 2002 and has hosted more than 100 sessions to date, introducing 80 model railroaders to operations on his railroad. He also operates with a round-robin group of model railroaders from Maryland and Virginia. You can view Bob's layout at: <http://nclrr.potomac-nmra.org/>.

## Looking For a Challenge? Try Working for Master Builder-Prototype Models!

Article and Photos by Alex Belida, *Potomac Flyer* Editor

If you look at the list of Potomac Division Achievement Program (AP) certificate holders, you may notice that the fewest number of X's are in the column for Master Builder-Prototype Models.

That could stem from the fact that in the NMRA's own description of AP certificates, Master Builder-Prototype Models is described as "the category which many consider to be the most challenging."

MB-Prototype Models involves elements of scenery, structures, rolling stock, and motive power. To qualify, you must include six examples of prototype equipment or structures. Specifically, these must include a freight car, a railroad structure, a caboose or passenger car, and a locomotive. Any two of these elements must be scratchbuilt.

The first challenge is finding an appropriate prototype scene to model. That challenge becomes more difficult when, as in my case, you pick a scene dating back to 1900. I decided to build a prototype diorama focused on the area around the Woodsboro, Maryland train station back when there was an adjacent mill, a hardware store/warehouse, and some homes.

To add to the challenge, there was no single photograph showing the entire scene I wanted to model. But there were individual photos (all black and white of course) plus an early Sanborn map showing how the structures and track were situated back then-important, as the trackage and structures have all changed. The station, for example, is no longer involved in any rail service. It serves as the home of the Woodsboro Historical Society, which rescued it from decay and provided me with a floorplan for the station and access to the old photos.

I began my quest by first building a model of the Woodsboro station as it looked in its heyday in the early 1900s, when the Woodsboro area was the U.S. center for goldfish breeding and sales. Fish cans, resembling milk cans, were stacked at the station for shipment around the country. [See article in [The Local Nov.-Dec. 2019](#)]



*An aerial view of the diorama*

Having built the station model, I then decided to replicate the N.Z. Cramer hardware store across the tracks as it looked at the turn of the century. [See article in [The April-May 2020 Potomac Flyer](#)]

With Cramer's built, I turned to the "Old Mill" directly opposite the station and across the street from the hardware store. A turn of the century photo of the mill helped me recreate the building, which has since been remodeled and expanded and no longer bears any resemblance to the original structure.

The station, Cramer's, and the mill were scratchbuilt, using stripwood and styrene with Tichy windows and doors. I installed lighting in all three buildings using Evans Designs mini-LEDs powered by 3V watch batteries.

I subsequently made two houses to complete the scene: one that I scratchbuilt that was directly behind the station in 1900 and was torn down sometime before 1922 (and was not on the Sanborn map of that year) and one across the road from the station that still exists. I used a kit for that house (American Model Builders "Two Story Section House," kit No. 128). I installed another mini-LED inside that home.

I also used a kit (JL Innovative Design's "East Junction Yard Office") to mimic the outbuilding partially seen next to the old mill in an archival photo.

So with four scratchbuilt structures, I had completed that portion of the Master Builder-Prototype Models requirements.

Next I turned to scenery. I cut a 2'X3' piece of ½ inch plywood for the base and glued one-inch thick pink foam insulation on top. I added additional thicknesses of insulation on one long side to duplicate the slight rise in the terrain behind the station.

Once done, I laid plaster cloth over the entire base and painted it brown, ready for the addition of ground cover, and laid out lines for a dirt road, paths, and the track. I also cut and nailed on fascia made from Masonite.

If you visit Woodsboro station today, you'll only see one main line of track and the remnants of a siding. But the old photos clearly showed two main lines plus a third set of tracks that formed a siding that ran by the mill and N.Z. Cramer's.

I used Micro Engineering Code 83 flextrack set directly onto the base with caulk, and added a thin layer of ballast.

Using Woodland Scenics products, I added various types of ground cover and light-colored gravel where appropriate for paths and a road. I took an HO model wagon and ran it up and down the road to make tracks. I made some trees from small branches taken from my yard and inserted them into the base. In other cases, I used Woodland Scenics Fine Leaf Foliage as trees, carefully planting the very fragile thin stems into the base terrain. I gently sprayed all the trees with Tamiya Olive Drab paint to mute their brightness.

With the terrain and structures complete and placed on the base, I was ready to embark on the motive power and rolling stock requirement of the project. Since the prototype photos showed fish cans being loaded into an RPO (Railway Post Office) car, I substituted that for the caboose or passenger car requirement



*Some archive photos are seen in this night shot, mounted on the flip side of the backdrop I made*



*The diorama base under construction using foam insulation panels*

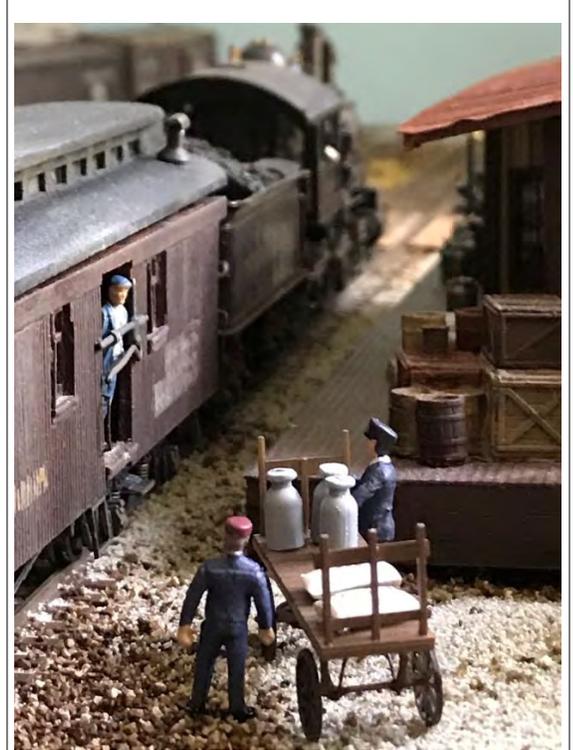
(after confirming with the Division’s AP Coordinator, Mat Thompson MMR, that an RPO was permitted.)

I bought an old wooden LaBelle RPO craftsman kit on eBay. I scratchbuilt a brake system for the undercarriage and uncoupling levers at the ends. I added window bars on the inside of the car from American Scale Models and RPO interior fixtures from Gold Rush Bay. These included mail sorting shelves, mail bins, desks, and stools. I added two Woodland Scenics figures, one sorting mail and the other standing in the open door as in the prototype photo I worked from.

For rolling stock, I bought resin Westerfield kits of a Pennsylvania Railroad “Union Line” XG-class boxcar and a RD reefer, modeled after the same 1896 type seen in the old photos I used for the project.

For the motive power requirement, I obtained an aged brass Ken Kidder 4-4-0, like Pennsylvania Railroad D10-class locomotive #728, which a railroad historian in York, PA confirmed was in fact used on the line back around 1900.

Though challenging, it was relatively easy to “super” detail the Westerfield kits as both came with all kinds of add-on fixtures, including handgrabs, undercarriage brake elements, chains, truss bars, and more. Like the RPO, I weathered them using India ink wash, Doc O’Brien weathering powders, and Pan Pastels.



*Loading fishcans on the RPO at the depot*



*The motive power: a Ken Kidder 4-4-0*

As for the locomotive, a brass model was already richly detailed, even including a cab interior, the only work needed was removing a decal on the tender and application of the appropriate PRR lettering.

With the diorama complete, I compiled a lengthy document (60+ pages). The document described all the elements in my build in detail and outlined all the construction steps. There were lots and lots of photos. I sent it off to Mat Thompson.

With COVID-19 forcing us all to stay home, there was no way to assemble the regular judging team. But Mat got approval from the MER Regional AP Chairman to send my submission to other judges in the Potomac Division to review, saying they could call or email me for any questions they might have or to seek additional photos.

But it wasn't necessary. The judges decided on the basis of my text and photos, awarding me 111 out of a possible 125 points to earn my certificate as a Master Builder-Prototype Models. 

[Return to Bill of Lading](#)



Alex Belida is a retired foreign correspondent and news executive who worked for the Voice of America. Besides living in Europe and Africa, he travelled extensively in the U.S. and abroad while covering the White House and the Pentagon. He and his wife live in Rockville. For the moment, his E&SP is in a second floor 10x12 bedroom once occupied by son Brian, founding father of Eureka.

## Installation of Operating Crossing Gates

by Brian W. Sheron, MMR

Most of us with layouts will have scenery that includes roads, and usually these roads will eventually cross our railroad tracks. In 1889, the first automatic crossing bell was introduced. In 1912 the first wave light signal, the forerunner to the crossbuck flasher, was introduced. In 1914 the wig-wag warning was introduced, and in 1936 the first automatic crossing gates were introduced. However, the era and region that you model will determine to what extent automatic crossing signals were installed at roadway crossings.

Today, most roadways in urban and suburban areas will have detection systems that activate flashing lights on crossbucks, a bell, and gates which drop down across the roadway to stop automobile traffic when a train approaches the roadway crossing. The detection system then turns the flashing lights and bell off and raises the gates once the train has gone past the roadway.

A number of companies sell systems for detecting our model trains as they approach roadway crossings on our layouts and for activating alternating flashing lights on crossbucks (e.g., Berkshire Junction, Logic Rail Technologies). These usually use photocells embedded between the rails, or infrared emitters and detectors to detect when a train is approaching a crossing, as well as when it has passed by it.

Some of these circuit boards will also have outputs that can be used to operate crossing gates and activate a crossing bell. For example, the Berkshire Junction crossing flasher circuit board has a relay switch that closes when the circuit is activated. Depending on your electrical skills, you can use this switch to activate crossing gates and a crossing bell. On the other hand, Logic Rail Technologies has a circuit board called Grade Crossing Pro that has outputs on the circuit board to specifically operate a crossing bell and crossing gates driven by Tortoise or other motor-driven 12VDC switch machines.

I will mention that MTH does make an operating crossing gate system (Operating Crossing Gate 80-10001, \$179.95). However, it appears to require a relatively open area under your layout.

With the COVID-19 quarantine, I had a bit more time that I could spend working on my layout and decided to add some operating crossing gates to a roadway crossing. The location of my roadway and the double tracks which it crossed posed a potential problem, which was that the location for one of the crossing gates was very close to the edge of my layout.

From previous experience, I felt that the most realistic-looking combination crossbuck and crossing gate assemblies were those made by NJ International. The gates swing up and down by means of a brass wire connected to the gate arm. The wire feeds down through a slot in the layout surface. A mechanical device then needs to be installed under the layout that will push the brass wire up and pull it down to raise and lower the gate.

### **The Remote Tortoise Mount (RTM) and the Remote Signal Activator (RSA)**

Most of us are familiar with slow motion motorized switch machines, such as the Tortoise switch machine. These are potentially ideal for driving our gates up and down, because crossing gates need to raise and lower in a prototypically slow manner. The problem is how to connect the back and forth motion of a Tortoise switch machine arm to the up and down linear motion needed to raise and lower crossing gates.

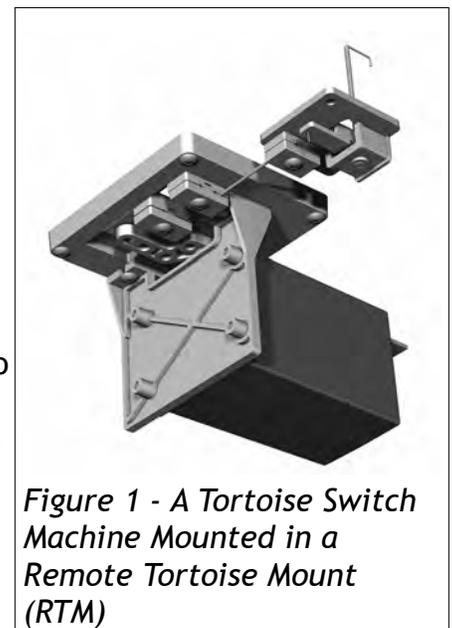
If you have a fair amount of room under your layout where the crossing gates are to be located, you can design and build linkages that will translate the back and forth switch machine motion to a vertical motion. Moreover, when you design such linkages, you can even design them so that a single switch machine can be used to raise and lower two crossing gates.

Marshall Abrams installed operating crossing gates on his layout using a single motorized switch machine and a linkage system to drive two crossing gates up and down. This is described on his layout website at <http://abrams-railroad.potomac-nmra.org/CrossingGates/CrossingGate.html>.

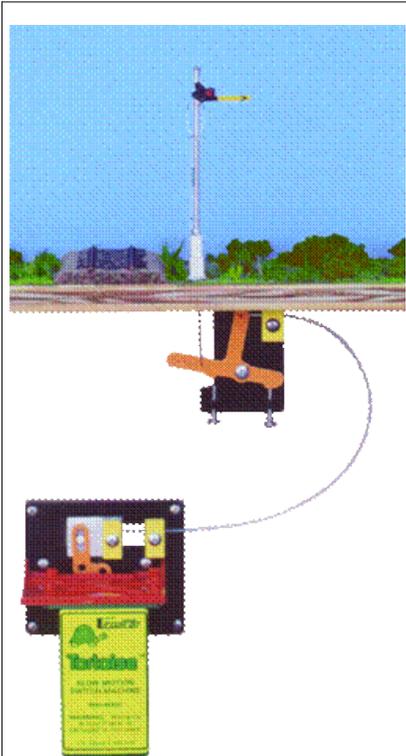
However, you may have space limitations or obstacles (e.g., benchwork framing) under your layout where you want to install operating crossing gates. In that case, Circuitron, the company that makes the Tortoise motorized switch machine, also makes two mounting devices for the Tortoise switch machine. One is called the Remote Tortoise Mount (RTM), and the other is called the Remote Signal Activator (RSA). The RTM is primarily intended to operate turnouts and the RSA is primarily intended to operate semaphore signals.

Tortoise and other motorized switch machines that are installed when the track and turnouts are first being laid are usually connected to the turnout throw bar by means of a stiff wire connected to the swing arm of the Tortoise machine. This passes through a slot in the layout surface and inserts in the center hole in the turnout throw bar. However, if you are motorizing an existing turnout, or replacing a coil magnet switch machine with a motorized one, it is often not possible to cut a slot under the turnout throw bar after the turnout has been laid and ballasted.

To solve this problem, motorized turnout machines are available that have a linear motion. These can be connected to turnout linkage that mounts just to the side of the throw bar and connects to it. As an example, the Circuitron RTM translates the swing motion of the Tortoise machine into a linear push/pull motion. This motion can then be connected to a turnout link that connects to the portion of the turnout throw bar that extends outside of the rails. Figure 1 (provided with permission by Circuitron) is a diagram of a Tortoise switch machine in the RTM.



*Figure 1 - A Tortoise Switch Machine Mounted in a Remote Tortoise Mount (RTM)*



*Figure 2 - A Tortoise Switch Machine Mounted in a Remote Signal Actuator (RSA)*

While this is fine for operating switch points, the benefit of the Tortoise motor mounted in the RTM is that you can adjust the linear distance that the RTM moves. This is important, because the linear motion needed to move crossing gates is often very short.

### **RTM or RSA?**

The Circuitron RSA kit consists of the RTM and a remote pivoting arm assembly that moves via a cable connected between the RTM and the pivoting arm assembly. The pivoting arm assembly, when connected to the RTM via a cable, provides an up/down motion that can operate a semaphore. Figure 2 (provided with permission by Circuitron) is a diagram of the RSA.

If the RTM is mounted sideways under the layout, the rod connected to the crossing gate and passing down to the underside of the layout can be easily clamped to the RTM. Similarly, if space is a limitation, you can use the RSA with the remote pivoting arm to drive the crossing gate rod (rather than a semaphore) and mount the RTM in a more convenient and/or accessible location.

On my layout, I found that it was easiest to just install the RTM to operate my crossing gates rather than to install the RSA. It meant fewer devices to mount, and it eliminated having to install the connecting cable between the RTM and RSA and to cut and bend the gate actuator rod to connect to the remote pivoting arm. However, you will need one Tortoise motor and one RTM for each crossing gate. If you use the RSA, you can just buy an additional remote pivoting arm and cable and connect two cables to a single Tortoise machine mounted in an RTM. Then you only need one Tortoise machine to operate two crossing gates.

Installation of the Tortoise machine and the RTM under the layout is quite simple. The first step is to make sure you have sufficient room next to where the crossing gate actuator rod extends through the underside of the layout to fit a Tortoise machine, RTM, and your RTM mounting bracket.

### **Adjusting the Distance of the RTM Motion**

The next step is to determine the distance the RTM has to travel. The location where the pivoting arm of the RTM pivots is adjustable. There are five holes on the RTM frame that can be used as the pivot. At each hole where the pivot is located, a different vertical distance the RTM will move will result. The instructions that come with the RTM provide a table which shows the vertical distance the RTM will move when the pivot is located at each of the five possible pivot locations.

First, measure the vertical distance the crossing gate actuating rod has to travel in order to go from an upright to a horizontal position. Then, look up that distance and the corresponding pivot hole number on the table provided with the RTM and insert the screw in the pivot arm at that hole number.

In case the vertical motion of the RTM cannot be accurately adjusted to match the maximum vertical motion of the gate actuator arm, you can consider putting a V-shaped bend in the actuator



Figure 3 - RTM Mounting Bracket

arm that will flex to accommodate any excess RTM vertical travel.

### Mounting and Testing the RTM

I made the RTM mounting bracket out of 3/4" pine board. There is nothing magical about the dimensions. The size of the board that the RTM will mount on should be

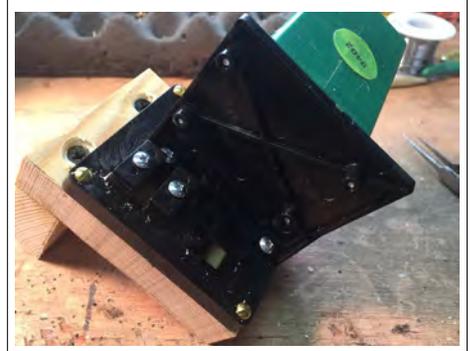


Figure 4 - RTM with Tortoise Switch Machine Attached to Mounting Bracket

about the same size as the RTM mounting face. A second piece of 3/4" pine, the same width as the RTM mounting piece, should be cut and attached at a 90-degree angle to the mounting piece. It should be just long enough to drill two holes in it for mounting screws (see Figure 3). Figure 4 shows the Tortoise switch machine mounted in the RTM and the RTM mounted on the bracket, ready for installation under the layout.

The next step is to hold the bracket with the RTM against the underside of the layout so that the gate actuation rod lines up with the location of the plastic clamp blocks on the RTM. Mark where to drill the holes for the mounting screws; then mount the bracket (see Figure 5).

After you mount the bracket, slide the gate actuation rod between the plastic clamps on the RTM (see Figure 6). The top clamp is used to guide the rod but must not be clamped tightly to the rod (i.e., the rod must be able to slide freely through the top clamp). An alternative is to pass the actuator rod through a piece of tubing and clamp the tubing to the top clamp. The bottom clamp should be tightly clamped to the rod.

Note that a mounting bracket may have to be custom made to fit your particular location. Figure 7 shows a mounting bracket that had to be shimmed on one side to

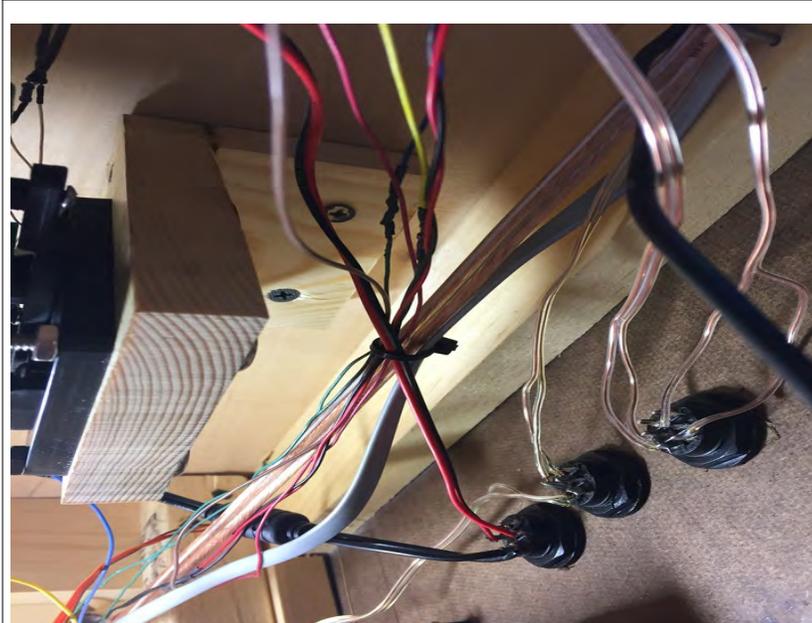


Figure 5 - Mounting Bracket with RTM and Tortoise Switch Machine Attached to Underside of Layout

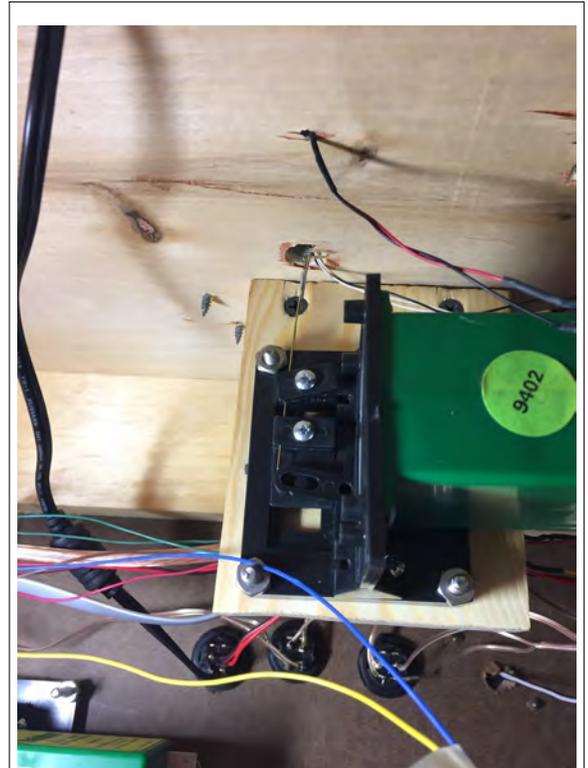


Figure 6 - Crossing Gate Actuator Rod Connected to RTM

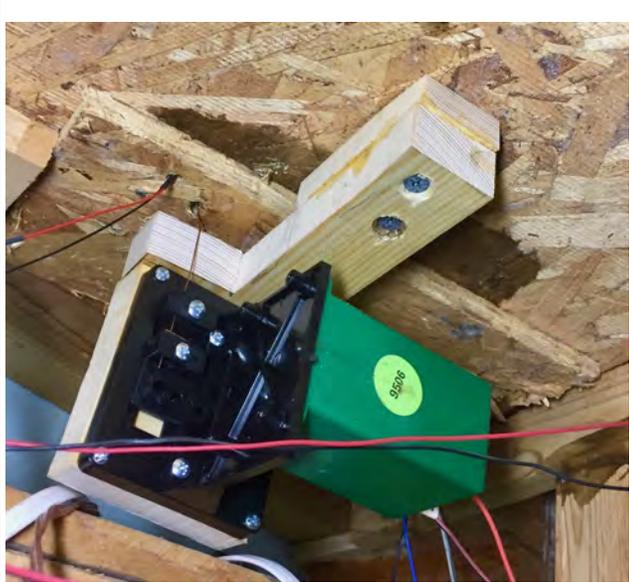


Figure 7 - Customized Mounting Bracket



Figure 8 - Crossing Gates in the UP Position

accommodate a splice board under the layout. Also, the horizontal part of the bracket had to face forward and be partially cut away in order not to interfere with the crossing gate rod.

Now is the time to test the installation. Before hooking anything up permanently, I suggest testing it with a simple 12VDC power pack that can reverse polarity. Simply connect the power pack to the two leads to the Tortoise switch machine and turn it on. The gate should move up and down smoothly as you switch the polarity of the power pack leads.

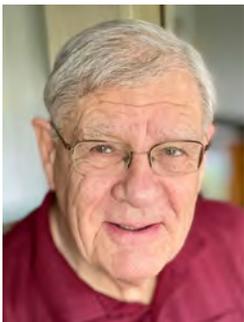
## Conclusion

Operating crossing gates can be installed relatively easily using Tortoise switch machines and the Remote Tortoise Mount. Figure 8 shows the crossing gates in the up position on my layout, and Figure 9 shows them in the down position.

Tortoise switch machines retail for \$22.95, and both the Remote Tortoise Mount and the Remote Signal Actuator retail for \$16.95. 



Figure 9 - Crossing gates in the Down Position



Brian is a long-time model railroader who models the Port Jefferson and Atlantic Branches as well as the City Terminal Zone of the Long Island Rail Road in HO scale. He earned Master Model Railroader (MMR) certificate number 469 in 2011 and was formerly the Superintendent of the Potomac Division. Brian's layout was featured in the September 1997 issue of RailModel Journal. When he's not working on his trains, he enjoys playing bluegrass banjo and plays in a local band.

[Return to Bill of Lading](#)

## Keeping Busy During a Pandemic

# Building a Brace of MoW Cars—Part 1

by Martin Brechbiel, MMR

Back in February, I slapped together a stack of basic flats thinking I might have a bit of time on my hands to grind out a few cars in the queue that I had wanted to build. These were just basic frames waiting for the construction of the rest of the car. I decided that I would build cars in parallel in pairs. (Photos 1, 2)



I started off by building a pair of water tank cars. These were envisioned to be something akin to vinegar tank cars in style, but a little rougher and basic for just hauling water about where needed for MoW (maintenance of way) use at work sites. I needed to build two tanks. Electrical conduit tubing over at Home Depot in 10' lengths builds a lot of tank cars; and even though I had already used a good bit, there was plenty left over in the corner of the garage. Two sections were cut, and the ends were sanded smooth and square. The ends were closed over with scribed siding; and a hole for an access dome was drilled in the center of the tank.

The access dome was built up from brass tubing, some brass hollow square stock, and some thin sheet brass all soldered together. These were inserted into their respective holes and secured in place with Goo and CA (superglue). Then the tubes were sheathed board-by-board to make a pair of wood tanks. This all takes a bit of time letting the CA set, fitting the boards around the access dome, keeping these all in alignment, and then trimming off the excess, allowing adequate overhang at the ends to make each tank. Some larger basswood square stock was cut and beveled to provide the cradle for the tanks to rest between on each car (Photo 3).



In the past I made barrel bands from brass that would be slid into place over the tank bodies. This time I wanted to echo the vinegar tank car feel with cables secured with hoop fasteners from Grandt Line staggered around the tank body. This was seriously tedious work, gluing fine black thread inside each styrene casting, mounting the casting with thread to the tank body, and then wrapping the thread around back onto the styrene casting. I found lots of other things to do while working on this stage of the build. Watching glue dry was not one of them. And, it took a combination of Goo and CA to make sure that the styrene castings did not pop off the tank just when I thought that a loop was finished.

With the tank set, the underbody of each car was next on the agenda. I added my resin bolsters (I cast and sell these) drilling and tapped for 4/40 screws, and the supports for the queen posts (Photo 4). After those were in place, I added the entire K Brake system using white metal castings, some Grandt Line brake levers, and PSC (Precision Scale Company) brake lever hangers. The system



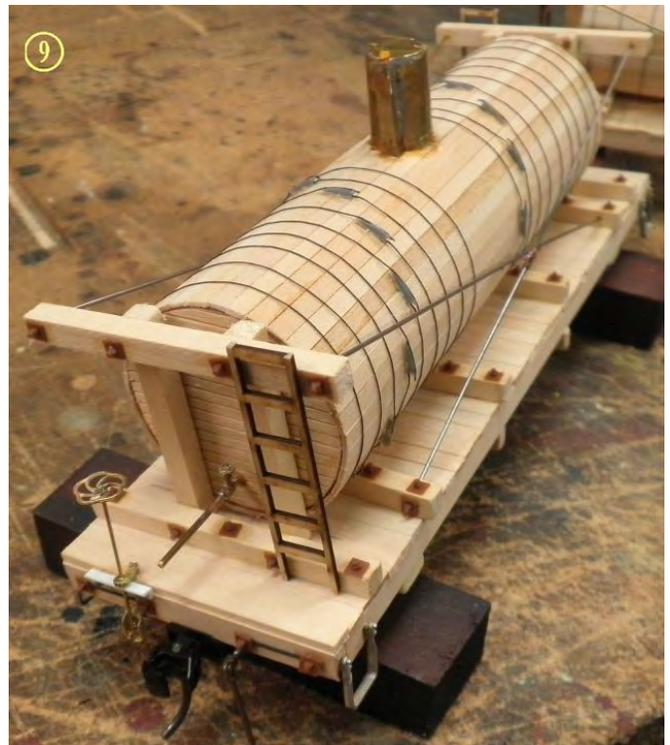
is tied into the brake staff hanger at the end where the brake wheel and the accompanying topside parts are installed. The truss rod queen post supports (Grandt Line) were also installed in conjunction with the truss rods (surgical silk) threaded through the car four times, with turnbuckles added, with each passage all held in place by the end cap Nut Bolt Washers (NBW) (Photo 5).

Back on top of the car, I built up the end brackets supports for the tanks and added the truss rods, tying the ends together using brass or steel wire with turnbuckles from Tichy. And then I added lots of NBW castings (Tichy) added to hold everything together (Photos 6, 7).



Additional details were added. Each tank hatch has a handle and a drain line with a valve at one end. Stirrup steps were added, and a brake wheel with a ratchet and pawl assembly casting above and through the brake staff hanger, with chain tying it into the brake system underneath. Ladders were added to the end supports. These were laser cut from some source that I've forgotten (Photos 8, 9).

Right before I painted these, Dave Emery suggested adding walkways on top of the tanks. The more I thought about these, the better the idea





became. Some walkway supports (Berkshire Valley) and some stripwood were used to make walkways. The car bodies and tanks were painted separately, and the details then touched up with black paint, along with the walkways getting some brown paint. Much of the underbody parts were also painted black, but all of the wood parts got a liberal application of Minwax walnut stain.

After adding Kadee couplers and some archbar trucks, these two cars are done for now (Photos 10-13). I'll be back with the next two cars in the series in the next issue of *The Flyer*. ☒

[Return to Bill of Lading](#)



Martin Brechbiel, MMR is the Superintendent of the Potomac Division.

### **DON'T FORGET THE DIVISION'S "GROUPS.IO" SITE**

Perhaps you've overlooked it, but the Potomac Division's new online information exchange service is at: <https://groups.io/g/PD2MERNMRA>

So far, the site has been used mainly for passing along news about clinics and other activities – alas, of late, mainly cancellations.

But this resource can be another way for members to help one another in these times of social distancing. Need help finding plans for a scratchbuild? Or a very old bit of prototype railroad data?

Try asking the members. You'll never know until you ask.

## The Division Crew

Superintendent  
Martin Brechbiel, MMR  
703-309-3082  
email: [Superintendent](mailto:Superintendent) \*



Senior Assistant Super.  
Andrew Dodge, MMR  
301-774-7753  
email: [Sr-Asst-Super](mailto:Sr-Asst-Super) \*



Assistant Superintendent  
Ernie Little  
571-383-7316  
email: [Asst-Super](mailto:Asst-Super) \*



Paymaster  
Jerry Stanley  
540-364-1815  
email: [Paymaster](mailto:Paymaster) \*



Clerk & Layout Tours  
Nick Kalis  
703-585-0100  
email: [Clerk](mailto:Clerk) \*



Achievement Program  
Coordinator  
Mat Thompson, MMR  
703-743-1895  
email: [Achievement-Program](mailto:Achievement-Program)



Webmaster  
Ernie Little  
571-383-7316  
email: [Webmaster](mailto:Webmaster) \*



Potomac Flyer Editor  
Alex Belida  
301-424-8164  
email: [Potomac-Flyer](mailto:Potomac-Flyer) \*



Publisher & Web pages  
Marshall Abrams  
301-588-1005  
email: [Potomac-Flyer](mailto:Potomac-Flyer) \*



\* all email addresses end with  
[@potomac-nmra.org](mailto:@potomac-nmra.org)  
Click on address to send email.

## From the Business Car

### And here we all sit ... still!

by Martin Brechbiel, MMR, Division Superintendent

It is nearly the end of the first half of 2020, and I'm looking forward into a very unclear second half of this year. And, don't even ask about 2021! That seems so far off into the future as to just be wishful thinking.

I had some faint hopes that everything might get under control, that the people of the country, state, etc., would accept responsibilities, and that we could actually find an end to the first wave of COVID-19. But as I write this that's been demonstrated to be pretty much a failure.

So much for worries about a second wave taking place later this year. The O scale meet that I would have attended in August was cancelled just a few days ago. Attending the O scale meet in Indianapolis in September is off the table due to budget constraints. The RPM meeting in September near Baltimore has been called off, but the O Narrow meet in Harrisburg is on. Maybe some, any, of these will be held...or not. Uncertainty seems the standard. But what does any of this mean for the Potomac Division?

Well, it's very simple. Very little is really going to take place or be open, and we simply have to play that hand as it has been dealt to us for the foreseeable future. Getting together for events, meets, shows, etc., seems to be on hold until whenever. *Whenever* is the usual vague *sometime*, if we can figure out how to have people in a place where the host agrees and that the county/state permits. And that's a moving target during the best of times. As much as we want to schedule events, clinics, and open houses, we can't and certainly can't without the complete and total support of our hosts. We will do what we can to reschedule open houses, hopefully in a structured manner linked to clinic days. But then again, we're not really in charge of what we can or want to do now.

The social aspect of the hobby is suffering and being sorely tested due to the isolation and/or very limited contact that we can afford to experience. Yes, many of us have decades of kits and projects on shelves, in the closet, in the basement, or in the attic, and some of us have even dared to work on some of these precious prizes that were stashed away only to be touched in reverence at some future time. It seems for some of us that the future is every day, and that we're building stuff and keeping busy. I hope some of you are sending photos and articles to our Editor for inclusion in *The Flyer*. Right now, our socialization is

*The Flyer*, and I am glad now more than ever that we have taken it from a quarterly publication to a bimonthly. We also have a *groups.io* site that only a very few have been taking advantage of.

The Potomac Division, Mid-Eastern Region, National Model Railroad Association includes the District of Columbia; Calvert, Charles, Montgomery, Prince George's and St Mary's Counties in Maryland; Arlington, Fairfax, Fauquier, Loudoun, Prince William, and Rappahannock Counties in Virginia, as well as all area independent cities.

Virtual meetings and clinics, and even Division meets, are possible and are being developed to fill the gap simply because they are possible. However, we have no idea how long this will be the solution. Stay tuned and look for announcements. These will probably be via Zoom, so those of you with camera and microphones attached to or built into your computers will be ready to participate. Those of you who do not have this technology, please consider making upgrades and learning how to use such technology. Join us when you can.

Looking ahead to 2021, we will have to hold elections for three (3) Board of Directors positions sometime next year. I suggest we do this in April as we did this year, so as to maintain a sense of regularity in the Division. We will need a Nominations Committee and a Chair of the committee. John Paganoni has decided that this past year was his last, and we sincerely thank him for all of his efforts in this department. We are most fortunate that by his hand we have a position description available, and the Division's policy document includes a detailed description of the entire election process. If you are interested, please contact me as soon as possible. In the meantime, if you are interested in running for election to the Board, please contact at least two (2) Board members so we can register your interest and forward this information to the Nominations Committee (as soon as we identify a new Chair.) 

[Return to Bill of Lading](#)

## Potomac Division Holds First Virtual Clinic

Over 20 members of the Potomac Division logged in on Sunday, July 19<sup>th</sup> to hear Andrew Dodge, MMR and Division Senior Assistant Superintendent, present the Division's first video-conferenced clinic via Zoom—a clinic on railroad infrastructure.

Andrew discussed the various requirements for real railroads to operate and how these can be applied to model railroad layouts. Topics included track size and weight, bridge construction and roadbed standards, and coal dock and water tank requirements for steam engines of various sizes.

The clinic was held over two 40-minute sessions and included a short question and answer session and a general discussion. Assistant Superintendent and Webmaster Ernie Little, who hosted the virtual gathering, recorded the event and hopes to put it on the PD website for all members to view.

The Division plans to hold another virtual clinic in mid-to-late August. The topic will be announced in the future. 

[Return to Bill of Lading](#)

## The Layout Survey

by Nick Kalis and Martin Brechbiel, MMR

Let's start with the simple stuff. We were delighted that so many of our members were willing to participate in the Potomac Division's layout survey. There was a very simple intent. We wanted to get a better handle on just what level of model train activity our members were engaging in, since we were all sitting around at home, presumably working on our layouts.

One detail to keep in mind with the results is that about 19% of our members were not included in the survey. That is because they have chosen not to provide an e-mail address. We have asked, and the Potomac Division is unique in the Region in having such a high percentage of members who decline to supply an e-mail, so the results are skewed by those members not being included.

What did we learn? Well, it seems the large majority of our members are either building a layout (“is it ever done?” some might ask), or at least are in some stage of construction, ranging from plans on the wall to installing the never-ending array of final details. It seems that we have a lot of layouts in the Potomac Division.

What actions are planned with this information? Well, not having names to go with every response really makes it hard to go back to everyone to ask them to host an open house. We really did not want to push that inquiry, and we leave the decision to a member’s discretion. We would hope that by asking these questions we might spur a few to come forward and offer to host an open house at some future point. We are also looking into how an open house might be done virtually.

With a majority of members in the Potomac Division building layouts, your Board has a host of follow up questions about what members really want from the Division.

Let’s look as few. What do layout builders want? Do they want us to help facilitate round-robins to keep their construction momentum going? Do they want articles in *The Flyer* about what fellow modelers are building? Do they want how-to articles in *The Flyer*? Do they want regular open houses? Do they want clinics, and on what subject matters? Do our members want to take organized trips or shopping excursions to hobby shops or vendors?

Would there be interest in a skills directory of members with various layout building talents who are willing to lend a hand to someone lacking those skills? That would, of course, require some volunteers with those skills and associated equipment. Would a lending library of shop tools, modeling tools, and how-to books be of interest? (For example, there is a Division in the NMRA that had a lending library of the jigs used to scratchbuild turnouts.) Do layout builders who change scales want the Division to act as a clearinghouse to facilitate liquidation of items no longer wanted? We’ve tried that in both *The Flyer* and the with the old Yahoo group without much success. Does everyone sell their excess on eBay, or does it just sit in boxes stored for heirs to address?

Nick is willing to putting his money where his mouth is, and offers to help in the following ways:

- On-site carpentry help
- Painting—valances, fascias, landscaping surfaces
- Offering his garage table saw and drill press to members to bring wood to cut and drill
- Applying ground cover

We suspect that there are dozens of you out there who would also agree to be listed in our skills directory.

Let’s talk and see how we can help each other out when we get on the other side of this health and economic mess. Contact us at <https://groups.io/g/PD2MERNMRA> to let us know where you will help take your Division forward. 

[Return to Bill of Lading](#)

### **DON’T FORGET TO CHECK OUT THE DIVISION WEBSITE!**

There’s lots of good material on our ever growing website at:

<https://potomac-nmra.org/PDnewsite/Main/Home.php>

Aside from back issues of *The Flyer* that can be found in “The Library”, you can find additional useful information under “Clinics”. There are other resources as well to help you with your modeling and keep you up to date on the Division’s achievements and activities.

And don’t forget to look into NMRA-X video tutorials and layout visits. Info on accessing those is right there on our website’s front page! Or you can also go directly to the NMRA’s Facebook page at: <https://www.facebook.com/nmra.org> or the Association’s YouTube site: <https://www.youtube.com/channel/UCHw-7-1FWB5zQgTM0ZVY-Yw/videos>

## Potomac Flyer Editor's Note

Summer has arrived with its plethora of outdoor activities, but the members of the Potomac Division have still been working hard on their model railroads and sharing progress reports with *The Flyer*. We thank them. But since we upped our game to produce six issues a year, we still need all the help we can get.

Though we welcome them, your contributions don't have to be 2500-word long essays with scores of photos or other illustrations. You can surely dash off 200 words and send us a single photo, right?

So, here's the appeal:

1. Tell us what you are working on in your model railroading, whether it's scenery, structures, rolling stock, trackwork, electronics, or something else. Please attach a photo or two. Let other members learn from your work.

2. Send us a photo of your workbench. What could be easier? Maybe add a few words to explain how you have it organized or what your go-to tools or supplies are. Our members are always looking for tips.

3. How about sending a photo for "Models We Admire"? Show pride in your craftsmanship and share it. It can inspire other members.

4. And don't forget: please send us a brief bio and a headshot photo of yourself with your contributions.

Thank you. And a special thanks to our proofreaders: Dan Ebert and Bob Sprague. 

[Return to Bill of Lading](#)

## Company Houses (and How to Ensure They're Level on a Layout)

by John Paganoni

Company houses were very commonplace around the turn of the 20<sup>th</sup> century in America, as industries began expanding their facilities. As the need for establishing a stable work force increased, housing became an important part of the recruiting process. All across the country, large industries built inexpensive houses for their employees. Company houses were found near many large industries such as coal, steel, lumber, and fabrics. These houses had very little in the way of utilities, and few had any of the basic comforts we have in today's houses. Such things as bathrooms, electricity, plumbing, and heating were rare while the companies owned the structures. During WWII and after, companies began selling these houses, allowing new owners to install necessities such as bathrooms and running water. The area I model included large paper and fabric mills, and in the period I model (1940–1957), company houses were still the predominant type of housing in the town. While I enjoy scratchbuilding structures, I needed to save some time, so I looked for much needed commercial kit houses that I could build to fill a void on my layout. City Classics solved that problem with their great "Railroad Street Company House" kits. I purchased their kit that had three houses in it. The pictures show two that I have now built. City Classics includes a fine bit of the history of company houses in their easy-to-follow instructions. They also went the extra mile and included a lean-to and outhouse.

The two models I have finished have some very modest variations that are easy to apply to "individualize" them. I included window dressing such as pull down shades, curtains, and venetian blinds. I also added roof shingles which I put on top of the kit provided roof panels. Rain gutters and downspouts help enhance the prototype appearance. The addition of TV antennas helps define the era if you are modeling the period close to the one I am modeling. Don't forget to point the



TV antennas uniformly toward the broadcasting “station.” A little weathering and some added small details will result in a very enjoyable project.

While this kit would not earn the minimum number of points needed for a Structures Merit Award, it could be one of the 12 structures required by the Master Builder Structures category. If you are just starting on your Achievement Program journey, or even considering it, a kit like this is an excellent place to start and hone your modeling skills.

Getting structures level on a layout is often a chore—especially if you have rolling hills, a rough landscape, or mountains. During layout basic construction this may not be a big problem, but after you have done a lot of terrain contouring and decide you want or need additional structures, you can have a bit of a challenge. Here is a method I have used with some success in adding structures after the terrain contouring is done:

1. Measure the footprint of the structure and add a scale foot or two to the dimensions.
2. Take a piece of clear plastic or acrylic and draw the extended footprint on it. I used 3/32” acrylic I purchased at Home Depot. This becomes a pad for leveling Sculptamold.
3. Rough out the area where the structure will be set.
4. Mix up some Sculptamold and spread it over the roughed-out area with enough thickness so you can level it by pressing the plastic/acrylic pad on it.

5. Level the pad by pressing it into the Sculptamold using a small level. I used an inexpensive bricklayer's small level made by Stanley that I purchased at Home Depot—it's a level that can be hooked on a taut string for laying real bricks and blocks. With this level, you have to check from front to back and across the sides. A level I like better is #847 made by General, as you can leave it in the middle of the footprint as you press the Sculptamold level and not have to move it around. Once the pad is level, use a small brush to level the "squeeze out" around the pad, but keep it off the pad.
6. Let the Sculptamold dry for two to three hours, and then gently lift the plastic/acrylic pad off of the Sculptamold. With the Sculptamold still workable, you can use a brush to clean up the edges of your structure's site. Once the Sculptamold is totally cured, this becomes a bigger problem.
7. Now all that's left is some grading and landscaping around the site and putting the structure in place.

I hope the pictures help you see the process and that you find this process helpful for your site prep for structure placement on your layout or module.

Bottom line—HAVE FUN!!



### **PARTS & MATERIALS LIST:**

1. City Classics Railroad Street Company House Kit #111 (single house) or #112 (3 houses)
2. Shingles: BEST Item 3012 and Master Creations B.T.S.
3. Venetian Blinds: Builders In Scale #503
4. Lace Curtains: Builders In Scale #265
5. Pull down shades: Colored paper
6. TV Antennas: Gold Medal Models #87-05
7. Rain Gutters and Downspouts: Micro Engineering Company # 80-163
8. Porch Railing: Grandt Line #5035
9. Weathering Powders: Bragdon Enterprises
10. Testors Dullcote, Floquil, Tamiya, and Tru-Color Paint 

[Return to Bill of Lading](#)



John Paganoni grew up never out of sight of the Central Vermont Railway in the days of steam. He lived in Montville, Connecticut, where there was a lot of activity for the paper mills and fabric mills in the late 1940's to mid-1950's. A lifetime objective was to try to capture the CV in those days of steam in HO scale; and John, a Master Model Railroader (#615), was fortunate enough to gather enough historical information to draft scale drawings of all the major CV facilities between New London, Connecticut, and Montville. He is in the process of building a very compressed layout to feature the main interest items that recall the CV's "Golden Years."

## Layout Renovation

by Ernie Little, MMR

With the onset of the COVID-19 restrictions, I found that I had a good amount of free time available. So, I started a major renovation of my HO scale Norfolk Southern Connector layout, where I am adding a second deck, a helix, and a track grade.

My original layout in 2004 was a 4' X 8' HO scale layout based on one of the Atlas plans I had found on the Internet. Over the years it expanded, and now the main line does not use the older portion of the layout. So, that brought me to the idea of expansion.

I started by researching how to build a helix. I knew that I wanted a 16-inch difference in levels but was not sure how to accomplish moving between the two levels. In searching the Internet, I found a website, <https://www.modelbuildings.org/helix-design-calculator/>, that had a track rise and helix calculator. The helix calculator allows you to put in information regarding the track radius, which in my case was to be 26-inches; the height of the tallest train, in my case 2  $\frac{3}{4}$ -inches; the total height of the climb, again in my case 16-inches; the width of the rings, which I selected to be 4-inches; and the number of segments per level, which I wanted to be six. The calculator then produced information that I needed to build the helix.

My helix would be 56-inches in outside diameter, the distance between rings would be four inches, the circumference of each ring would be 175.84 inches, and the grade of the track would be 2.27%. It would take four rings, and each segment would be 29.31 inches in



*Original 4 foot by 8 foot layout cleared of dual track and buildings*



*After cutting a 24 inch access hole to permit access to the interior of the new helix*



*Marking a helix segment using a pattern that had twenty four inch inside radius, 26 inch track radius, and 28 inch outside radius*



*After installation of the third part of the wye that will go to the helix*

length. The total track length in the helix would be 703.26 inches, and it would take 19.54 square feet of material. I created a track plan which involved taking the main line under the helix as a tunnel due to space limitations, and I determined that the helix would be built in the corner of the space to allow better support.

I started the renovation by removing the track, buildings, and scenery on the original section and cutting a 24-inch diameter access circle in the helix area. I also had to add some additional bench work to properly support the area. Next, I added the track grade that leads to the helix, as it would determine the level of the first ring to allow the main to pass under the helix. The sub-roadbed material is half-inch plywood, with cork roadbed and Atlas flex track.

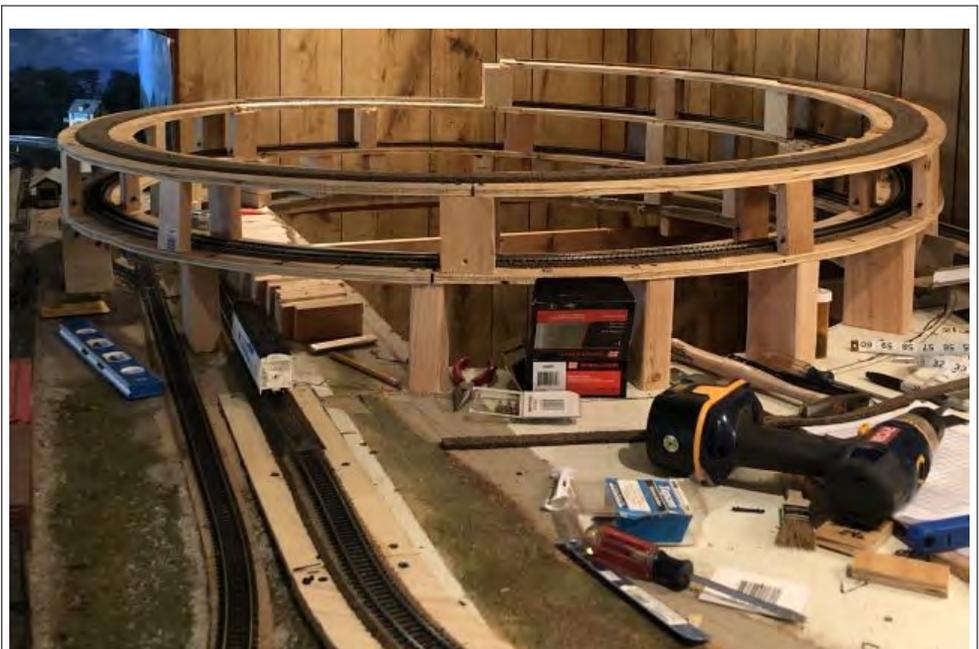
I have completed the track grade and laid the associated track. With that I have created a wye that will allow the main line to access the helix from both directions and also return to the main and go in either direction. One thing that I forgot was to isolate one leg of the wye from the other two, to avoid a direct short. I discovered this when I tried to run a train on the new track, but my Digitrax system had other thoughts. However, as of today I have gotten the track grade tied into the first level of the helix, and I have installed three of the six segments of that level. I have plenty of work yet to do, but I am learning a lot about helix construction.



[Return to Bill of Lading](#)



*Using a hopper car to verify the clearance between level 1 and level 2 is sufficient*



*Status after installing the first segment of the third level*



Ernie Little, MMR resides in Manassas, VA with his wife Joyce. His twelve foot by twenty foot HO scale model railroad, the Norfolk Southern Connector, is freelanced and represents a connector railroad that runs between two major railroads. He currently serves as a Potomac Division Assistant Superintendent and Potomac Division webmaster.

## Water Stop at Misty Creek

by Ron King

Going back to narrow gauge with steam powered locomotives on the Misty Creek branch forced me to build more water tanks for my layout. I had an old Durango Press D&RGW water tank that I built many years ago, and frankly I did not look forward to building more. It was a nice “craftsman” kit, and took a month or two of work to construct. I am now thirty years older



and my days of spending endless weeks (and months) on a single project are behind me, so I looked around for an easier alternative.

This water tank started life as a styrene Walthers Wood Water Tank kit (933-3531). I was happy to discover that the tank itself is almost the exact same size as the standard D&RGW/RGS narrow gauge tanks. This made the project much easier, because all I had to do was cut the foundation down to proper height and scratchbuild the spout/counterweight structure.

I added the extra floor joists needed to support the spout and counterweight sheaths and then created the extra framing out of styrene. The Rio Grande used ropes instead of chains on the tanks I saw in Colorado; and it shrouded the counterweights in wooden channels because of icing conditions during the winter.

I have always preferred to build wooden structures out of wood, but I must confess that this styrene water tank turned out so well that I am a convert. Besides, it only took a week of effort instead of months! . ☒



Ron King is a retired Systems Engineer. He started building HO scale railroad models when he was 12 years old and fell in love with narrow gauge after a visit to Colorado in 1960 where he got to watch several D&RGW K-37 Mikes at work. His first project was to use a razor saw to convert some Atlas Snap Switches to dual gauge so he could run a PFM HOn3 C&S 2-8-0 and he has constructed narrow gauge models in many different scales since then. His latest project is the HOn3 Misty Creek Branch of the D&RGW.

[Return to Bill of Lading](#)

## Icehouse Project

by Mark Gionet

This is a COVID-19 project, a small icehouse. It is part of a South River Modelworks kit to which I added an office and modified the conveyor with some scrap parts. Next will be a creamery that will go across the tracks. The boxcar in the middle is another coronavirus project, an F&C (Funaro & Camerlengo) resin kit. The shot is actually staged in my fiddle yard, as the location where this will go still needs more work. Note the water trail on the ice ramp. ☒

[Return to Bill of Lading](#)



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 Western Route was the subject of the September 2019 Potomac Division Layout tour:



[https://potomac-nmra.org/PDnewsite/LayoutTours/Prior/Mark\\_Gionet/Mark\\_Gionet.php](https://potomac-nmra.org/PDnewsite/LayoutTours/Prior/Mark_Gionet/Mark_Gionet.php)

## Doyle Sand & Gravel, Montville, Connecticut, 1950

by John Paganoni

The Doyle Sand & Gravel facility in Montville, Connecticut, was one of the major industries on the Central Vermont Palmertown Branch. While sand and gravel was a significant line of business, cement products, well digging, and foundation excavations generated a large part of the company's income. The scene that I have made is a very compressed version of the prototype facility, as I have a small layout; however, I did want to include Doyle Sand & Gravel.



The main structure is the large cement and sand hopper, and it became the most challenging part of my scene. While I could not find any photos of the facility when it was in full operation, I was fortunate to have photographed the derelict remains of the hopper shortly before it was torn down. Unfortunately, I was unable to determine exactly how this thing worked, so I spent a lot of time studying each part of the hopper. My main interest was determining how the cement railroad hopper was unloaded. Since I could not find any evidence of a pit under the spot where the hoppers were unloaded, I had to assume they were unloaded by powerful vacuum machines. There were two conduit pipes that ran from the rail side up and over the large tank and up to the top of the sand and cement hopper. The “hoses” shown in the photo are connected to these pipes in an effort to simulate the prototype configuration.

Once I thought I had somewhat of a vision of how the unit worked, I sketched plans of the separate parts of this unique structure and built it out of styrene. The tanks are made from PVC pipes. The conveyor is a Sheepscoot Scale Products kit #75002. I made the conveyor belt out of 600 grit, gray wet/dry sandpaper.

The “office” is scratch built, and the checking booth in back of the office is a Bar Mills Crossing Shack kit. The crane heading out of the facility is a kit bash using a Woodland Scenics backhoe body and a Sheepscoot crane boom kit on a truck frame I had in the scrap box. The clamshell bucket is from Rio Grande Models, Ltd kit #3532. The steam shovel is a Jordan Models kit. The dump truck is Alloy Forms, and the cement mixer truck is a kit bash using an Alloy forms Mack chassis and a Kibri cement truck.

This was a fun project and makes an interesting “mini-scene.” I wish I had more room for this scene, as there are many more details that would be appropriate for such a facility. These might include a wash rack, water pumping facilities, fuel pumps, workshops, covered buildings for repairs, large piles of graded materials, and cement block piles. ☒

[Return to Bill of Lading](#)

## Colorado to Maine

by Andrew Dodge, MMR

I will be moving the theme of my model railroading from the central Colorado Rockies to the island coast of Maine. I have decided to incorporate my love of model railroading and my infatuation with ships into one modeling effort. The 1890s era will remain the same, but my new, upcoming home will be Belfast, Maine; Deer Island; and a mountain retreat depicting a freelance line to be called the Central Maine Railway.



The *Mt. Desert Isle*, along with a tug and car float, will have sailing times from Belfast to Deer Island and back when the tides are good. One of the items to be shipped will be high quality white granite, and the upper-class citizens will take the side-wheeler for a stay at the island's first-class resort hotel.

Due to the virus issue, I am behind my original "move" date. I am still hoping to have one final op session if things get back to "normal" in the early fall. If not, I will just have to move on during the winter months. ☒

[Return to Bill of Lading](#)



Andrew Dodge, MMR is the Senior Assistant Superintendent of the Potomac Division. He build his first layout in 1958. Prototype modeling and recreating the Colorado Midland as it operated in 1897 have been his main interests, but he's now shifting to Maine.

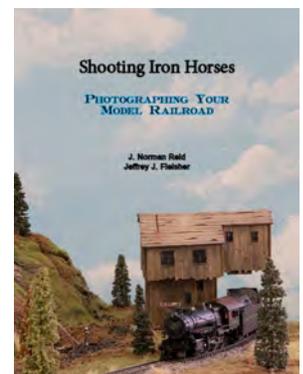
## New Book on Photographing Your Model Railroad

*The Flyer* has received word that Norman Reid of the Potomac Division and Jeff Fleisher, another NMRA member, have just released a book on model railroad photography called *Shooting Iron Horses: Photographing Your Model Railroad*.

The book features photos from several northern Virginia model railroad layouts. The diorama shown on the cover is from the authors' own North Fork and Crooked Run Railroad layout that is under construction in a corner of Jeff's woodshop.

*The Flyer* will have a review in a future issue.

*Shooting Iron Horses: Photographing Your Model Railroad* is available as a 75-page full color paperback from Amazon.com. The price is \$29.99. ☒



## On the Workbench: Pioneer Valley

by Martin Brechbiel, MMR

I have a fairly large area for building models that is about 12' x 3'. There are three sections fitted out with ¼" glass surface work areas (about 24" x 30") set up for projects. I generally have three to six projects underway at any given time, as I am always starting something new while waiting for the glue to dry.

Recently, while exercising a purge of excess items, kits, and projects (an ongoing project all by itself!), I ran across a pair of flat envelopes from Pioneer Valley Models. One was open, a condition which I thought might compromise selling whatever was inside. So, I pulled everything out for a look. What I found was a cardstock structure kit for a foundry-type building. Although there has been a long history of modeling in cardstock, it is a material that I haven't used since I was about 25 percent shorter in stature.

Nonetheless, I thought, "How hard could this be and what could possibly go wrong?" I can just cut out all the pieces with a scalpel and metal straight edge; fold the tabs this way and that way; apply glue and tack the pieces together using weights and clothespins; and get it assembled!

Being paper, the structure is a bit floppy, but I can see that it will all stiffen up as the parts come together. I can also see that while Carpenter's glue usually works fine, it will not set up fast enough. But wait! In the drawer is a little hot glue gun, and that saves the day. After the glue gun gets good and hot, I quickly tack together all of the parts and roof, and now the cardstock structure is assembled.

Overall, this could really work. Maybe the printing when this kit was produced was not quite up to today's higher end printers, but I think if one were to exercise the three-foot rule on a layout, do a bit of weathering, and strategically plant some details around the structure, no one would notice that it was printed cardstock! ☒

[Return to Bill of Lading](#)

*Editor's Note: Don't forget to send us your items about projects you've got going on your workbenches.*



Martin Brechbiel, MMR is the Superintendent of the Potomac Division.



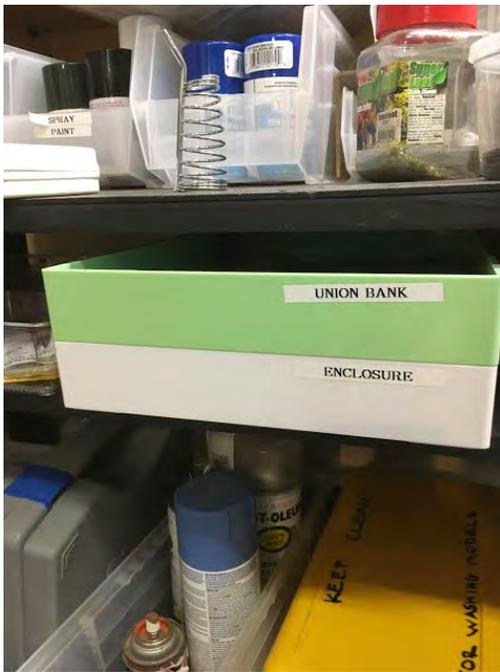
## Workbench Tips

by Nick Kalis

Trays for your projects have multiple uses. First, they keep small parts from getting lost and let you keep all the details you might have purchased separately for your kit or scratch building project in one place.

Second, they allow you to set aside one project while working on another.

Third, trays allow you to take your project off the workbench so that you can give it a good cleaning rather than waiting until the end (or never, as some folks experience).



I bought these sturdy and stackable trays at my local Container Store, but you can probably find trays at a lower price elsewhere.

Another tip: keep a paper towel dispenser handy at your workbench. Dirty hands are a hazard to any model you are assembling or painting, and so is a dirty workbench. A lack of paper towels could just bring a project to a halt—just like running out of any modeling supply.

Now perhaps you are in the market for a workbench.

There are many to choose

from, some quite costly. I went to Harbor Freight and bought three *Windsor Design* 60 inch, four-drawer workbenches. The list price is \$149.99 each, but 20 percent off coupons can often be found to bring the price down to about \$120.



On the positive side, these workbenches are sturdy. The bottom shelf can be filled with organizers to store supplies.

On the negative side, they have to be assembled, and the drawers pose a challenge. And that bottom shelf is not designed for heavy items.

One more thing: Keep a notebook handy. Why?

- It relieves stress by reassuring you that you will not forget what you included on your model.
- Nothing is more frustrating on a project than to run out of some supply or paint and not remembering what you used. Sure, you could keep empty packages and bottles around; but that is just clutter—and clutter is not what you need when building a model.
- It documents what you used so that you have the information you need for entries into modeling contests.
- It can document your efforts to earn awards in the NMRA Achievement Program.
  - Finally, it can serve as the basis for an article in the modeling press. 

[Return to Bill of Lading](#)



Nick Kalis is the Potomac Division Clerk. He models the Oahu Sugar Company in Fn3 in a diorama-style layout set during World War Two.

### ***Finding Scratchbuilding Supplies in the Potomac Division***

## **McLean Hardware**

by Nick Kalis

Potomac Division members are at a distinct disadvantage when it comes time to find supplies for their model railroads. Hardware stores can help fill that gap to an extent.

Here are some hobby items I have found at this hardware store: heat gun (used for bending styrene); an extensive selection of Dremel tools and accessories; some larger sizes of strip wood; K&S brass and metal—a relatively well-stocked selection; and spray cans of paint such as Krylon and Rustoleum.

If you are inclined to paint your fascia or benchwork, they have a great variety of paints in cans. They also carry PVC piping that can be handy for scratchbuilding.

My list is not meant to be exhaustive. Rather, I point out this hardware store, as many big box hardware stores do not stock K&S products.

If you know of other hardware stores that carry well-stocked supplies of K&S brass, please write to *The Potomac Flyer* editor so that he can share that with your fellow modelers.

My latest visit revealed that they require masks. 



McLean Hardware Co, Inc.  
1445 Chain Bridge Road  
McLean, Virginia 22101  
703 356-5496

#### New hours due to the coronavirus

Monday - Saturday 9AM - 5PM

Sunday 10AM - 4PM

Closed Easter, July 4<sup>th</sup>, Thanksgiving, Christmas,  
and New Year's Day

[Return to Bill of Lading](#)

## Achievement Program News

by Mat Thompson, MMR

The best thing about working in the AP program is getting to see some marvelous modeling and creativity.

Alex Belida's Woodsboro, MD, Station Diorama is exactly what I am talking about. He built it to qualify for the Prototype Model AP Certificate. The Certificate requires six models of an actual railroad, with at least one freight car, structure, caboose or passenger car, and a locomotive. Two models must be scratchbuilt, and the others superdetailed. All are displayed in a realistic scene large enough to model a photograph.

Alex describes his work elsewhere in this issue of *The Flyer*, so here are just two pictures, one of the prototype and one of Alex's model. You can see why he earned 111 of 125 possible points.



One other thing: we did the judging using Distant Evaluation. Distant Evaluation is not meant to replace in-person evaluation when judging models but is allowable when the model can be properly assessed at times such as now with the COVID-19 challenge.

Eight of the categories can already be assessed with photographs, video, and/or objective assessments. One example of this is that the evaluation of the track elements for Civil Engineer are now pass/fail in three areas. The same is true to demonstrate working track for the Electrical Certificate. Another example of this is using photographs and/or videos to evaluate model railroads for the Scenery requirements.



Cars, Motive Power, and Structures can possibly be distance-evaluated when the model is CLEARLY above or below Merit level, but for models near the Merit level, say in the 80-100-point range, an in-person evaluation is still needed.

The bottom line is: if you need an evaluation, let me know. We will do our best to work with you even in these trying times. 

[Return to Bill of Lading](#)



Mat Thompson's Oregon Coast Railroad was featured in *Great Model Railroads 2014*. Building structures and scenery are his favorite modeling activities. He is also an avid model railroad operator and regularly attends operating sessions.

## Mark Me Up: Can I Go Now?

by Mat Thompson, MMR

As an engineer, you don't just take off when the mood strikes. There must be some rules to follow. Without them, sooner or later you are going to run into another train. On the prototype, that's deadly. On a model railroad, it is just embarrassing, and you would only wish you were dead—at least momentarily.

So, there you are, standing by the tracks, throttle in hand, with your engine percolating away. Can you go? And how do you know?

The answer depends on the track authority the railroad uses, that is, the set of rules that allow trains to occupy the mainline. On the prototype this can get to be a complex subject punctuated with many ifs, ands, and buts, because different track authorities prevailed at different times, and many railroads put their own spin on things.

But let's simplify by talking about the train authorities you are most likely to encounter on a model railroad. These are Track Warrants, Centralized Train Control (CTC) and Timetable and Train Order (TT&TO).

**Track Warrants** became common in the 1980s as engines were equipped with radios. The idea is simple. You call the dispatcher and report “Train 4502 at Bigton for departure.” The dispatcher replies with something like, “Train 4502, you are cleared from Bigton to Littleton.” Now you can go, and the dispatcher won’t clear any other train to be on your track. You work as far as the dispatcher has given you permission to go. When you get to the end of that track, you call the dispatcher again; and the process is repeated.

Probably you will be given blank forms. As the dispatcher dictates, you fill in the blanks and then read back your copy to ensure you understood correctly. Rather than towns, your limits could be mile markers or numbered blocks. You may also be told to report clearing certain points so the dispatcher can allow other trains access to them.

On model railroads, warrants are mostly used on smaller, more modern layouts. In my experience, maybe 10% of operations-focused layouts use warrants. My guess is they will become more common as more modern-era layouts come online.

**Centralized Traffic Control (CTC)** railroads are also commonly called signaled layouts, because the signals are what an engineer sees from the locomotive cab. Trains are controlled by a dispatcher working a CTC board. As he throws toggles to set routes, signals along the route show the proper aspect for trains to proceed or stop.

For an operator, life is simple. If you have the signal, proceed. If not, stop. Not every railroad uses red and green signals, so you may have to learn a few light patterns. But other than that, a



*A Dispatcher is operating a CTC panel. There is a railroad diagram at the top of the panel. Lower on the panel are toggles for the dispatcher to remotely operate turnouts along the route.*

signaled railroad is easy for operators.

The catch is, they are rare. Installing signals is a lot of work and expense for a layout owner. I know of only two fully signaled layouts in the Potomac Division.

The most common track authority in use on model railroads is **Timetable and Train Order (TT&TO)**. A train is authorized by the schedule (the Timetable part) or by an order as an extra (the Train Order part). TT&TO was first used on real railroads before 1900 and lasted into the 1960s for some railroads.

TT&TO movements are governed by superiority—that is, a 1st class train is superior to a 2nd class train, and so on. Each railroad also declares a superior direction. If Eastbound is superior to

FORM 1140

Delaware & Hudson Railway Co.  
**TRACK WARRANT**

No. 9 Date OCT 5 1968  
To B.P. Dir. S At S.C.

(Mark "X" in box for each item instructed)

- 1  Track Warrant No. \_\_\_\_\_ is void.
- 2  Proceed from KG to BR on Track L
- 3  Proceed from \_\_\_\_\_ to \_\_\_\_\_ on Track \_\_\_\_\_
- 4  Proceed from \_\_\_\_\_ to \_\_\_\_\_ on Track \_\_\_\_\_
- 5  In effect after \_\_\_\_\_ arrives at \_\_\_\_\_
- 6  Hold \_\_\_\_\_ track at \_\_\_\_\_
- 7  Work Between \_\_\_\_\_ & \_\_\_\_\_
- 8  Joint Authority Btw \_\_\_\_\_ & \_\_\_\_\_

Note: Trains must move at RESTRICTED speed.

9  Other Special Instructions: \_\_\_\_\_

OK 1258 A M Disp. CSA Copied By MAI

<b>CABINS (Control Points):</b>	<b>ABBREVIATIONS:</b>
SC Whitehall North	DS - Dispatcher
KG Whitehall South	N - North
FO Fort Ann North	S - South
BR Fort Ann South	N-STG - North Staging
HM Fort Edward North	S-STG - South Staging
Z Fort Edward X-over	YM - Yard Master
MA Fort Edward South	RUT - Rutland
CX Gansevoort	
JR Switch at Staging	

**NOTES:**

\* "Work Between" grants authority to make back and forth moves within the authorized block such as a Local may do when switching customers.

\* "Joint Authority" permits two trains to occupy the same block. Trains must move at Restricted Speed (able to stop in half of your sight distance).

*This is a track warrant copied by the engineer of Train R02 on Chris Atale's Delaware & Hudson Railroad. Notice the 1968 date, a bit earlier than warrants were commonly used on prototype railroads. Many layout owners have adopted the form anyhow for its ease of use.*

Westbound, then a 1st class Eastbound is superior to a 1st class Westbound, and superior to any other scheduled train (2nd class, 3rd class, etc.) regardless of direction. Extras, that is a train created by orders instead of being on the schedule, only have superiority of direction.

Superiority is the confusing part of TT&TO. With both Track Warrants and CTC control, the dispatcher is responsible for making sure tracks are clear of other trains. TT&TO puts the responsibility on the engineer and conductor for determining when a train can move and when it must wait. For some, that's the fun of TT&TO. For others, that's the problem.

In the next *Potomac Flyer*, I hope to clarify some of the confusing parts of TT&TO. For now, what any new operator needs to know is most model railroads use TT&TO. In my experience it has been 90%. So, to play the game, you need to learn TT&TO basics. 

[Return to Bill of Lading](#)

## Potomac Division Events Calendar

Potomac Division Events Calendar				
<b>Open House Schedule 2020</b>				
<b>Cancelled</b>	Bernie Kempinski	USMRR Aquia-Fredericksburg Line	O	Alexandria, VA
<b>Cancelled</b>	John Swanson	Cresson Branch PRR	HO	Gainesville, VA
<b>Cancelled</b>	Brian Sheron	LIRR Port Jefferson Branch	HO	Poolesville, MD
<b>Cancelled</b>	Brian Benoit	Seneca Junction	HO	Poolesville, MD
Nov. 14	George Meyrick	The Tri-State Line	HO	Manassas, VA
Dec. 12	Todd Hermann	Lehigh & New England Railroad's Catasauqua Branch	HO	Falls Church, VA

Potomac Division Events Calendar				
<b>Outreach Program 2020</b>				
<b>Cancelled and will be rescheduled at a future date.</b>	Northern Virginia Model Railroad Club Vienna, VA (NVMR)			
<b>MiniCon 2020</b>				
<b>Cancelled</b>	<a href="#">St Matthews United Methodist Church, 8617 Little River Turnpike, Annandale, VA 22003</a>			
<b>Operations Saturday 2020</b>				
<b>Cancelled</b>	<a href="#">At least two sessions on the Maryland side of the Potomac and at least two on the Virginia side</a>			

Potomac Division Events Calendar			
<b>MER Conventions</b>			
Postponed to 2022	<a href="#">Crowne Plaza Charlotte Executive Park, Charlotte, NC</a>		Carolina South. Div.
2021, Oct. 21 - 24	Marriott Hunt Valley Inn, Hunt Valley, MD		Chesapeake Div.
2022	<a href="#">Crowne Plaza Charlotte Executive Park, Charlotte, NC</a>		Carolina South. Div..
2023, tbd	tbd		Susquehanna Div.
2024, tbd	tbd		New Jersey Div.
<b>National Conventions</b>			
<b>Cancelled</b>	<a href="#">St. Louis, MO</a>		
July 4-10, 2021	<a href="#">Santa Clara, CA</a>		
August 14-21, 2022	<a href="#">tbd</a>		

[Return to Bill of Lading](#)

## Improve your modeling with a few sheets of paper.

That's just what happens when you join the National Model Railroad Association and take part in the Achievement Program.

No, it's not a bunch of contests. It's modelers helping modelers become better modelers, to get the most out of their hobby. It's a way to hone your skills and become the modeler you've always wanted to be.

And it's just one of many benefits of NMRA membership.

It's never too late to start improving your modeling skills. And your hobby.



**We make it more fun.**  
[www.nmra.org](http://www.nmra.org)

