märklin DIGITAL CLUB

NEWSLETTER

Vol. 30 – No. 1
January – February 2018

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Current Central Station 3 Version – 1.3.2 (1)
Current Central Station 2 Version – 4.2.1 (0)
Current Mobile Station 2 Version – 2.7

As we start the New Year, there are updates for both Central Stations. The update for the Central Station 2 is just a housekeeping update, so the software version has not changed.

We are getting ready for the Amherst Railway Society Model Railroad Show / EuroEast 2018 in West Springfield, Massachusetts, January 27 – 28. We are very eager and excited to attend this show. There will be a dedicated area for European train layouts and sellers' tables. We hope you can brave the cold and make it out to the show! Be sure to stop by with your questions or just to chat.

In this issue, we explore the installation of lighting kits with an added custom LED strip. Our second article introduces some advanced applications by expanding the shuttle routing method for multi-train use.

Installation of Lighting Kits

I have a set of cars from a customer that wants lights installed. He sent me the Märklin Prussian car sets (43058/43059). These cars don't allow for current conducting couplers, so there will be a slider on each car. Since there are only four cars, the additional drag shouldn't be a problem for the locomotive.

This gentleman likes the Märklin warm white LEDs (73401) in favor of the amber ones (73400). These cars will also use a 73405 Slider Kit each.

Three of the four cars have what is described as a "ventilator hood" on the top of the roof. In the prototype, these look to be windows for venting the gas lighting. I thought that they should be lit because I believe they are seen from the interior, and would be illuminated with the gaslights.

The Components

I started with one of the passenger cars since the baggage car has a different roof it is the simplest light install. I didn't bother illustrating the lighting procedure in the baggage car. I'm assuming if anyone follows my example for the passenger car, then the baggage car will be the easiest and most self-explanatory car to light.

Fig. 1 - The first car to light

The passenger car "ventilator hoods" will need lighting inside them, so this posed an interesting problem. Somehow, I have to insert lights under them.

With the car selected, I can start the installation (Fig. 1).

The lighting kits I used are the Märklin 73401 warm white LEDs and 73405 slider kits as mentioned before, and I had also purchased some 2835 warm white LED self-adhesive strips to light a train display case. These looked like they would work well (Fig. 2).

Fig. 2 - Märklin lighting kit, slider kit and LED strip

Inside the lighting kit box, there is the light bar and the mounting hardware (Fig 3). The mounting hardware consists of two light bar holders and a couple of double-sided tape pads. The light bar holders are meant to sit on top of the dividers in longer cars. These cars don't have dividers in them so I will be using the double-stick tape.

Fig. 3 - Lighting kit contents

The Teardown

First I removed the roof, and then I removed the windows on the long sides of the car so I could remove the interior (Fig. 4 and 5).

I should probably note it's not necessary to remove these items for the install, but since I like to hide the wires as best I can, I decided to remove the interior and route wires where they are harder to see.

Once everything is removed, I can proceed.

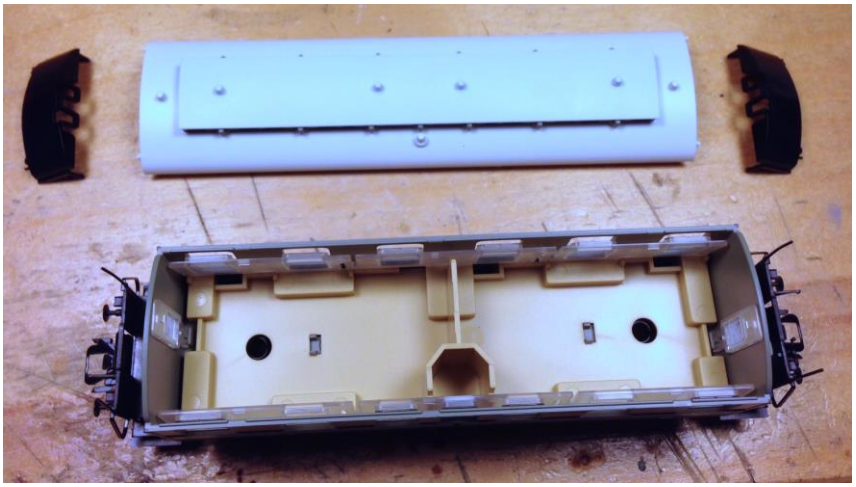


Fig. 4 - Roof removed

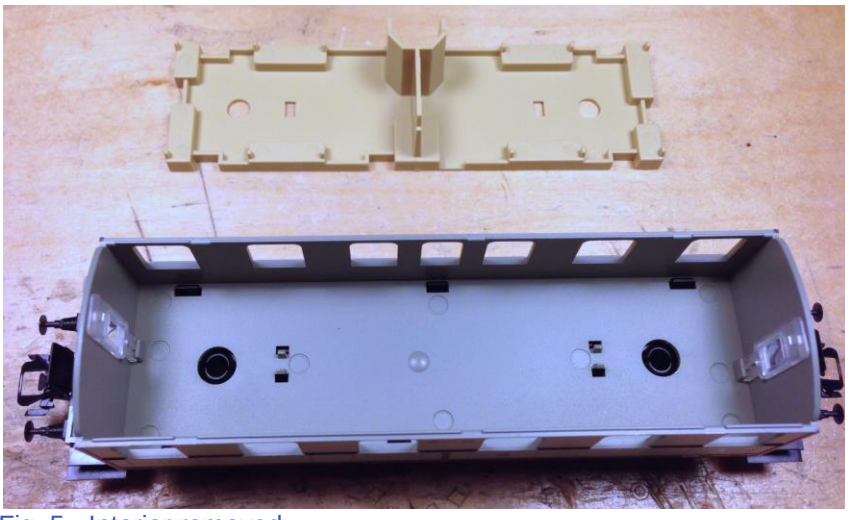


Fig. 5 - Interior removed

The Installation

The plan is to have the wires come up through the hole for the truck and then run under the interior to the wall, then up to the light bar.

This next step is the unnecessary part. I cut a channel into the underside of the interior with my hobby knife (Fig. 6). This is where I want my wires to run. I probably didn't need to do this step, but I want to make sure the wires don't interfere with the interior snapping back into place.

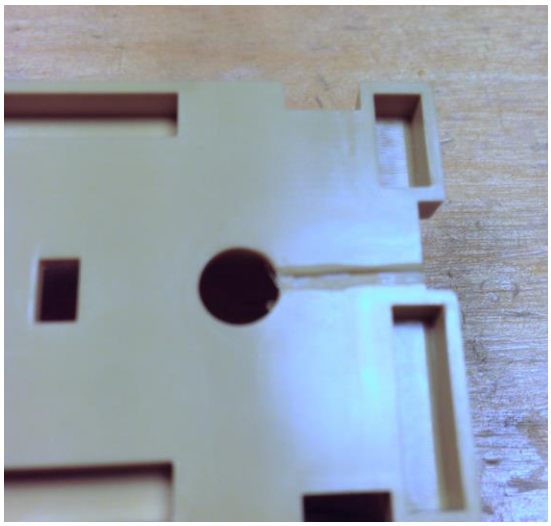


Fig. 6 - Channel for wires

Normally, the wires would run through the hole where the truck mounts, then straight up to the light bar. In my opinion, they are too visible there. This is why I like to hide them.

The slider kit comes with this ground spring (Fig. 7). The ends need to be trimmed to the proper length. Then the spring is installed under the axles (Fig. 8).

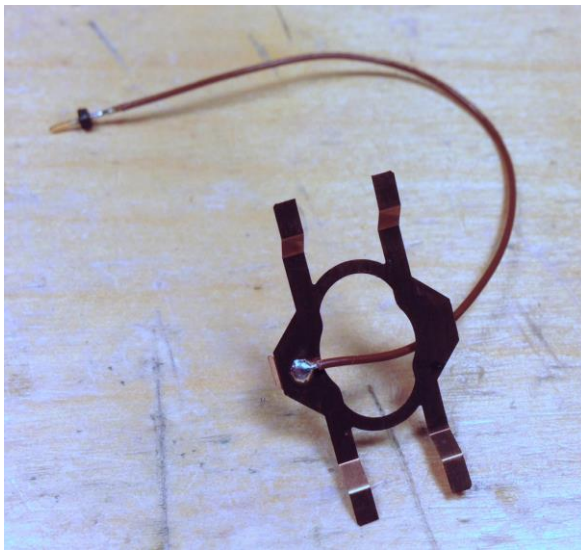


Fig. 7 - Trimmed ground spring

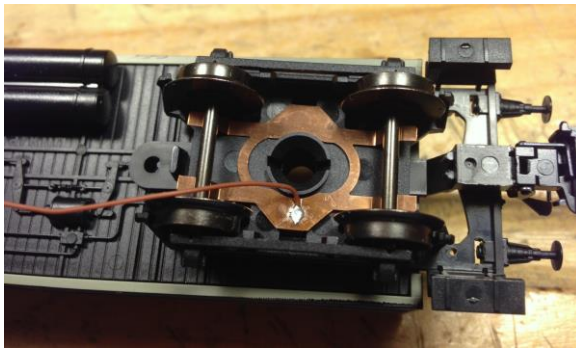


Fig. 8 - Ground spring installed

Fig. 9 - Slider installed

Fig. 10 - Wires correctly routed

It's important to note the ground spring wire does not run through the hole yet. The slider wire and slider need to be inserted into the hole first (Fig. 9), then the ground spring wire (Fig. 10). I also had to solder longer wires on both the slider and the ground spring.

Now I can install the interior. I made sure the wires ran through the channel I had cut on the underside of the interior. The wires ended up next to the wall and extended up for a neater look (Fig.11).

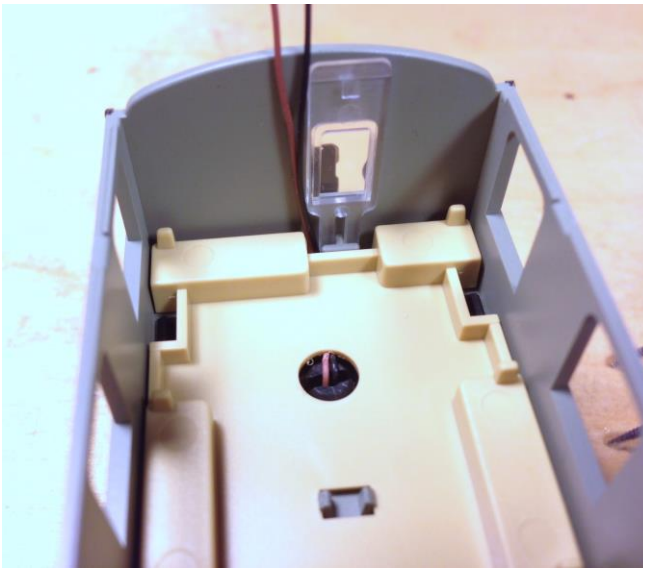


Fig. 11 - Wires neatly hidden

The Custom Lighting

This is where I need to figure out exactly how to light the "ventilator hood." I had already test-fit the LED strip under the hood and it fit very well. The only problem was how to wire it. To complicate matters, the LED strip was too bright, so I will need to install a resister.

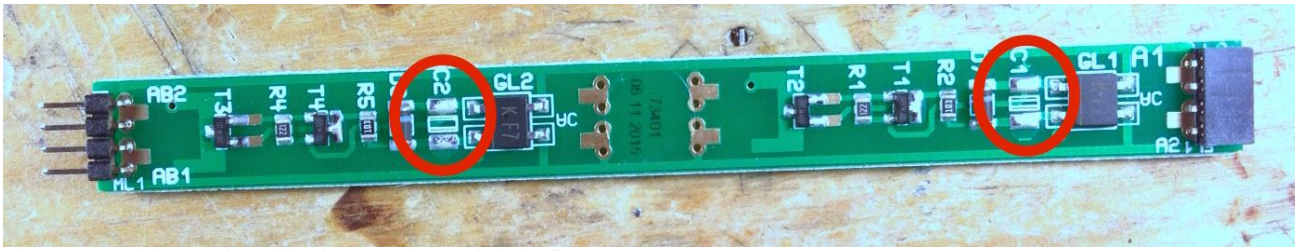


Fig. 12 - Solder pads with clean voltage (circled)

I had the idea that I could power the LED strip from the Märklin light bar in the kit. The problem was where to draw the power. I found two sets of solder pads that would work. They are the "C1" and "C2" pads on the circuit board. (Fig.12). These two solder pads have nice clean voltage and there is no digital flicker of the lights. Other contact points that I tested would flicker.

I soldered wires to these contacts and inserted a 1k-ohm resister to dim the LED strip for the ventilator hood (Fig. 13).

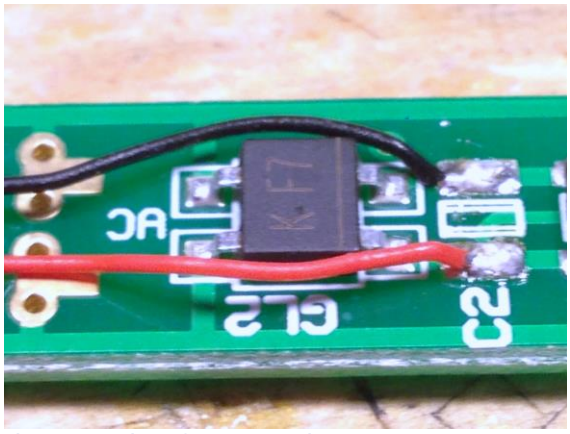


Fig. 13 - Wires for LED strip

The resistor (not shown) was a little too big to fit

under the ventilation hood, so it would be mounted inside the car.

I now had to drill a small hole for the wires to feed through to the ventilator hood. Then I was able to mount the Märklin light-bar inside the passenger car.

I used the double-sided tape pads to mount the lights (Fig. 14). I cut each pad in half to double the thickness, which would move the light lower in the car. This would also give me room for the resistor, which could tuck in above the light bar (Fig. 15).

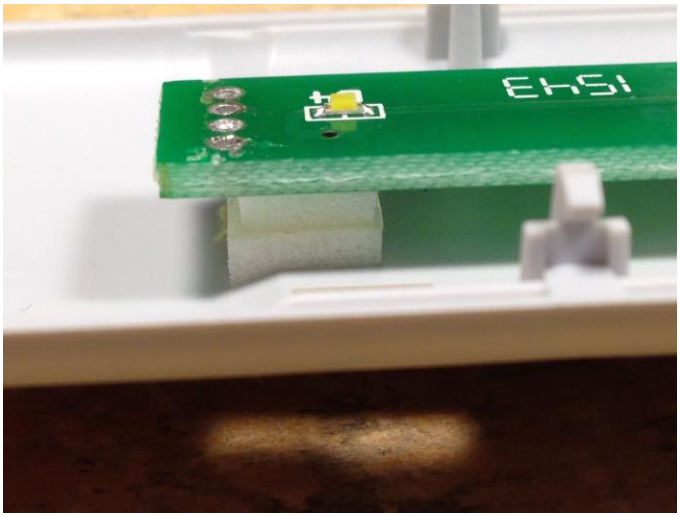


Fig. 14 - Light bar mounted with double-sided tape

With the ventilator hood removed from the car roof, it is obvious there is plenty of room for the LED strip to be installed. The strip comes with an adhesive back, so it was just a matter of centering it with the wires hanging out to be soldered (Fig. 16). Then all I had to do is solder the wires to the contact points on the LED strip (Fig. 17).

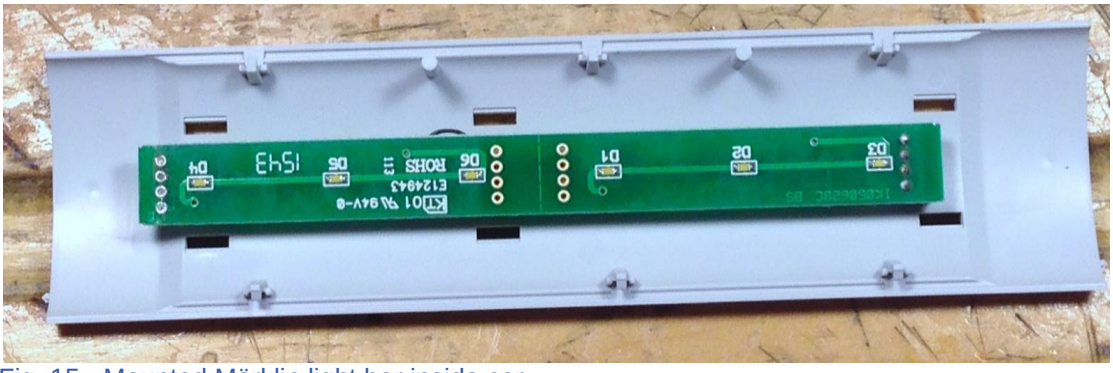


Fig. 15 - Mounted Märklin light bar inside car

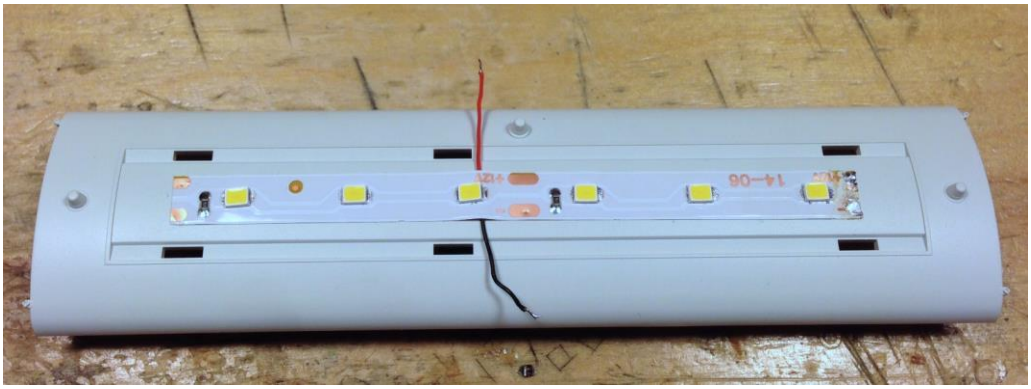


Fig. 16 - LED strip installed

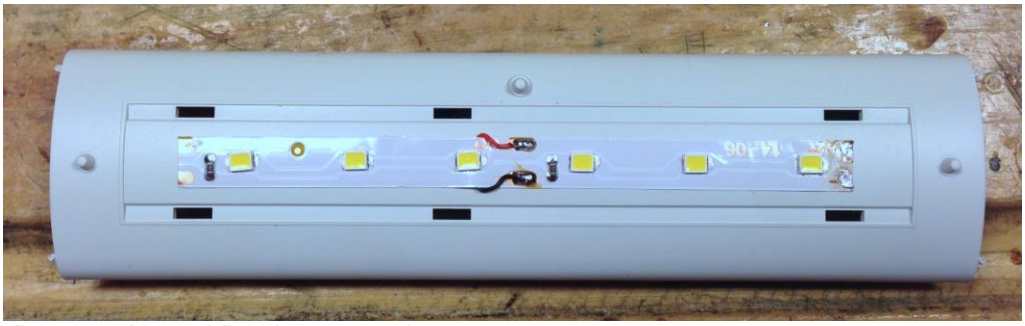


Fig. 17 - Wires soldered to LED strip

Since I had to solder longer wires to the slider and ground spring, I had to solder the connector pins on the wires (Fig. 18).

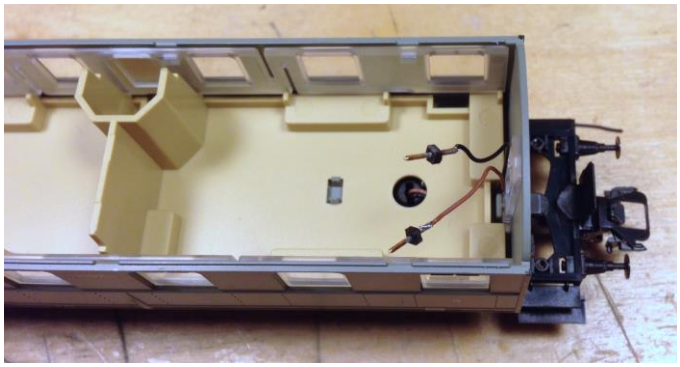


Fig. 18 - Pins soldered to pick-up wires

Now for the big test… (Fig. 19).

Fig. 19 - Test before final assembly

The lights work great and the intensity is good with the ventilator hood installed. It gives the appearance the light coming through the hood is generated by the interior lights (Fig.20).

Fig. 20 - Car reassembled and finished

While the wires can be seen if someone looks for them, I like that they are not obvious.

Fig. 21 - Finished car

I followed the same procedure for the other two passenger cars and since I know the owner wanted all cars lit, I installed lighting in the baggage car. The baggage car installation was very straightforward and basic. The whole train looks great now (Fig 22). The owner loves them and he will have more cars for me to light soon.

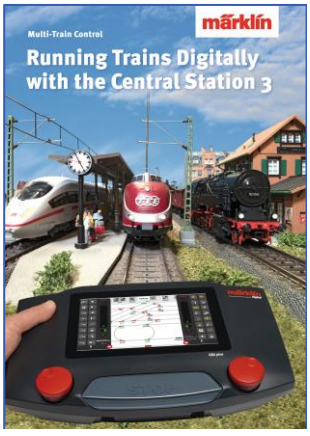
Fig. 22 - Finished cars lit

These lighting kits work well. They are easily adaptable to a wide variety of passenger cars. In a normal install, there is very little soldering and both the pick-up shoe kit and the lighting kit install very easily.

I hope this encourages some of you to try your hand at a lighting kit install. Just remember to go slow and follow the instructions that came with the car to disassemble them.

Enjoy your hobbies!

Rick Sinclair



Available from Märklin Dealers!
Running Trains Digitally with the Central Station 3

This book provides extensive information about the Märklin Digital system. It contains all of the essential information about the new controller Central Station 3. Another focal point is the description of the new generation of decoders. In addition, all of the Märklin Digital system's components are featured with complete explanations of their use on a Digital layout.

191 pages in the DIN A4 format. Version with English text. #03092

Advanced Programming and Sensor Tactics

The Incredible Multi-Shuttle Layout

In my previous article, I covered some of the practical applications of sensor use and placement with your Märklin Central Station. One of the topics covered, was a new approach in operating a shuttle train. In this article, I will be introducing some advanced applications by expanding the shuttle routing method for multi-train use.

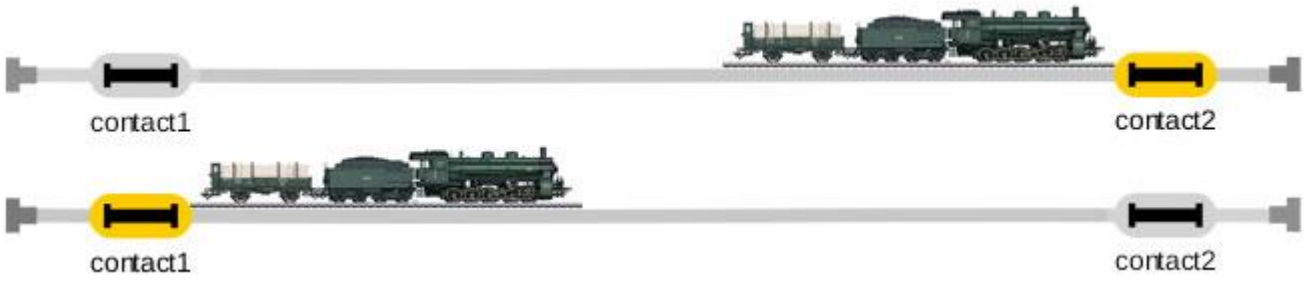


Fig. 1 - Single shuttle line

Let's first start with a quick review of how the simple shuttle is created. Figs. 1 and 2 illustrate the contact points and scripts for each contact on the line. Each contact controls the sole locomotive on the line. Each contact instructs the locomotive to accelerate towards the other end. This is a rare instance where assigning a locomotive to an automated script will work properly. Using this method, I can create multiple shuttle lines (Fig. 3 – top) by duplicating the shuttle scripts and assigning a different engine for each line.

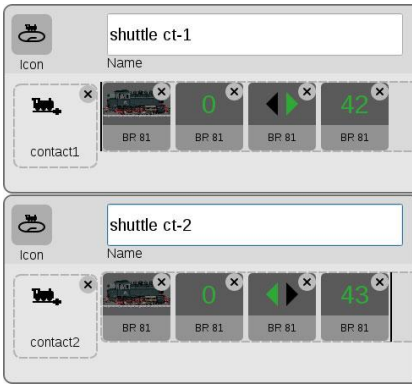


Fig. 2 – Event scripts for each contact. One set of scripts for each shuttle line.

Notice with three shuttle lines (top of Fig. 3), each train can run independently from the other and will not collide. If you apply the same scripts, to the bottom example in Fig. 3, you can see that if they ran independently, they will certainly collide on the single main line.

To create the event scripts that cycle through the multi line shuttle, I have to take a considerably different approach than the previously mentioned simple shuttle events. I need to break down the locomotive events into separate events. The first is the loco stop event, the next two are the loco acceleration events – one for each direction (in my case I labelled them 'eastbound' and 'westbound'). I illustrated the three event scripts in Fig. 4. Note how each of the event scripts are in Manual mode (the default), and the direction changes to the eastbound and westbound scripts.

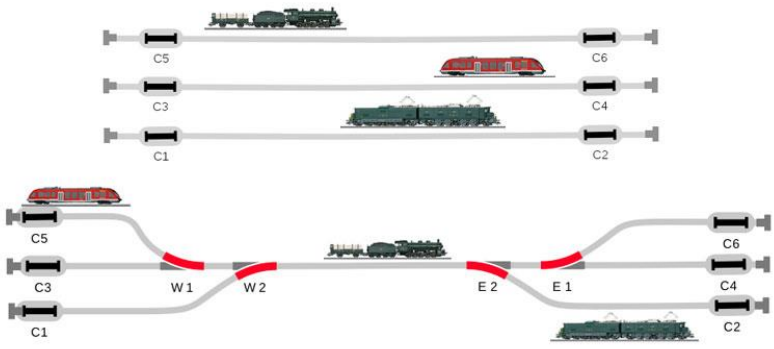


Fig. 3 - Multiple shuttle lines combined.

I should mention it is important to have an equal number of track lines at each terminal station. You can **not** have 3 lines at the west end, and 4 lines at the east end. This is because each end must have a specified locomotive pairing, and this process can't coordinate two locomotives with one contact. Therefore, you'll need a set of events (stop, eastbound, westbound) for each line in your terminal station. In Fig. 4, I have the events for 'loc 1' which will be assigned to track 1 of my station. In a 3 line shuttle, I will need to create two more sets of event scripts for 'loc 2' and 'loc 3.' It is a good idea to have all your locomotive scripts grouped together for this shuttle system, because you may be editing them frequently when you wish to switch out trains on the layout. I covered how this is easily changed in my previous article, so I won't go over it again.

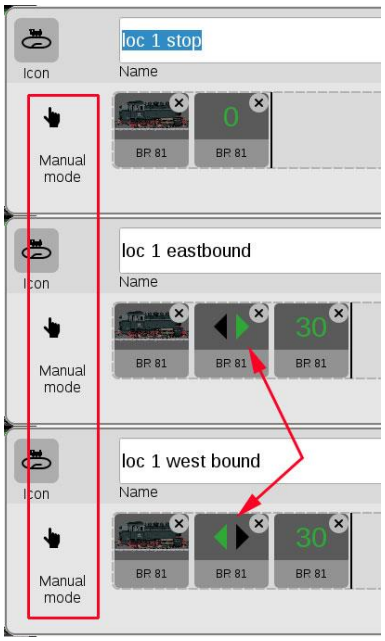


Fig. 4 - Loc event scripts, 1 set per track line.

Multi-Train Event Script and Event Nesting

In Event scripts, it is only possible to assign a single locomotive to control at a time. In my multi-line station, I want to use my contact sensors to stop an incoming train, and also send an alternate train out of the station. To control two different trains from a single trigger point, I will need to nest my loc events ('stop', 'eastbound' and 'westbound' events) into a trigger event. Recall in Fig. 4, my loc events are set to manual mode and have no track triggers to activate them automatically. When nested into a trigger event, I can activate controls for two locomotives instead of just one. Fig. 5 shows the first track trigger event script combining control of two locs. The yellow arrow shows the track trigger, red and green arrows indicate the nested events and resulting actions for two different locomotives.

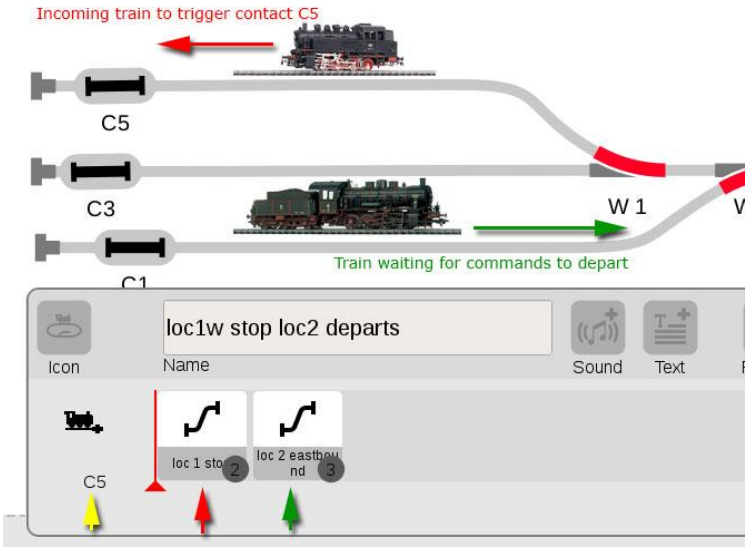


Fig. 5 - Controlling 2 locomotives with a single contact point

Event Sequence

In a simple loop track, the sequence of events is clear due to the circular path (point A to point B, B to C, etc.). In a multi-line shuttle, I have to create an event cycle in order to generate a virtual loop of events. This is similar in concept to how I create event sequences in a staging yard where an incoming train can send the next train out. Only in the case of a shuttle system, the next train out is heading in

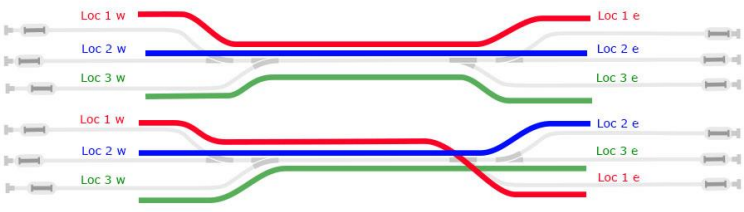


Fig. 6 – Mixing up the station line assignments for visual interest

the reverse direction. One critical difference is staging yard events control track articles only, whereas shuttle events control locomotives (AND track articles, which I will cover later).

Line Assignment

The first step in generating the event sequence will be to create the track line assignments within my yards. Remember, each shuttle line must have a pair of assigned endpoints. This is important to know the sequence in which the contacts will be triggered. This way I can generate a loop cycle of train operation. In Fig. 6, I show it will be more visually interesting to mix up my endpoints for each station.

Establishing a Train Running Order

The train running order should be considered here, because it will aid in keeping track of the Event Sequence. In simple terms, Loc 1 runs first, then Loc 2, and then Loc 3. After which, you start the cycle again.

Using my Line assignments with my contact track plan, I can now track the trains and establish my event sequence, which is essentially the order that my contacts will be triggered (see Fig.7). You can see that Loc 1, will first make contact with 'C2'. My 'C2' script will stop Loc 1 AND set Loc 2 to depart.

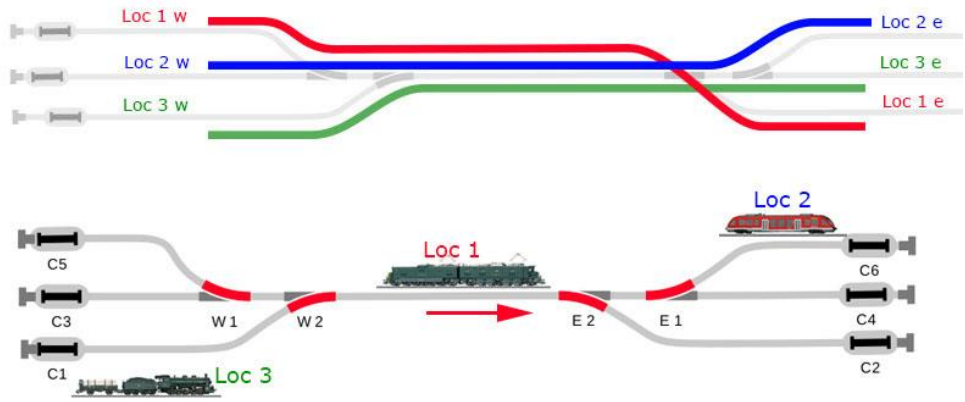


Fig. 7 - Visual reference for contact event trigger sequence

In the diagram, I have Loc 2 waiting by 'C6'. Loc 2 is set for departure, therefore, the next contact to be triggered will be 'C3', not 'C6' [if you follow the line assignment from departure to arrival (blue line)]. When Loc 2 arrives at 'C3', it will set the waiting Loc 3 to depart. The third contact will be 'C4'.

At this point you'll have to use your memory (instead of the graphic) and recall that Loc 1 has been stopped by 'C2' in the first step. When Loc 3 arrives at 'C4', I will now set Loc 1 to depart. Overall, my event sequence will be: C2 > C3 > C4 > C5 > C6 > C1 > and back to C2 again. In Table 1, I show a quick summary of each event in sequence and the script steps contained in each (from example in Fig. 5).

Contact ID/trigger	Event	Event	Departure Direction
C2 Arrival	Loc 1 stop	Loc 2 departs	Westbound
C3 Arrival	Loc 2 stop	Loc 3 departs	Eastbound
C4 Arrival	Loc 3 stop	Loc 1 departs	Westbound
C5 Arrival	Loc 1 stop	Loc 2 departs	Eastbound
C6 Arrival	Loc 2 stop	Loc 3 departs	Westbound
C1 Arrival	Loc 3 stop	Loc 1 departs	Eastbound

Table 1 – Event script directives

If you're wondering why I have 6 script events for 3 trains, the answer is in the right column. I have 3 trains that must cycle back and forth between my east and west end stations. Having an event sequence helps me keep track of my event scripting needs.

Adding Train Routes to Events

So far, I have only covered the events to control trains in a multiline shuttle system. (Didn't I say this was advanced?) The next required step in the program is to insure that my trains properly reach their destination (their assigned track line). By now, you should be aware of 'Arrival' and 'Departure' triggers when programming your events. Departure triggers are only applicable to users who use contact tracks. While it won't affect the script examples written here, I must point out the distinction, because I will give an example of both and it affects where your routing will be located (either with the departing train, or with the arriving train).

When I set a train to depart from one end of my shuttle, it can be the only train heading in that direction. Therefore, as it departs, I must preset its destination to its assigned 'end-of-line.' Amending my first Event script for 'C2', I must pre-set my track turnouts so that the departing Loc 2 successfully arrives at its destination by 'C3' (see Fig. 7 and Table 1).

My Table 1 'C2' script can now be altered with added events in the following example:

Contact ID	Event	Event	Departure Dir	Event Step	Event Step
C2	Loc 1 stop	Loc 2 depart	Westbound	W1 – Straight	W2 - Straight

Table 2 – Adding routing to each event sequence from Table 1 (sample only)

The Script event will now look like Fig. 8 (top). Alternatively, you can add just a departure script for Contact 'C6', because that is the contact that Loc 2 is departing from. The options for whether or not to use a departure event can depend on factors like yard signals and sensor preferences. I won't go into those variables in this article. It can also derive from your practical experience with this procedure.

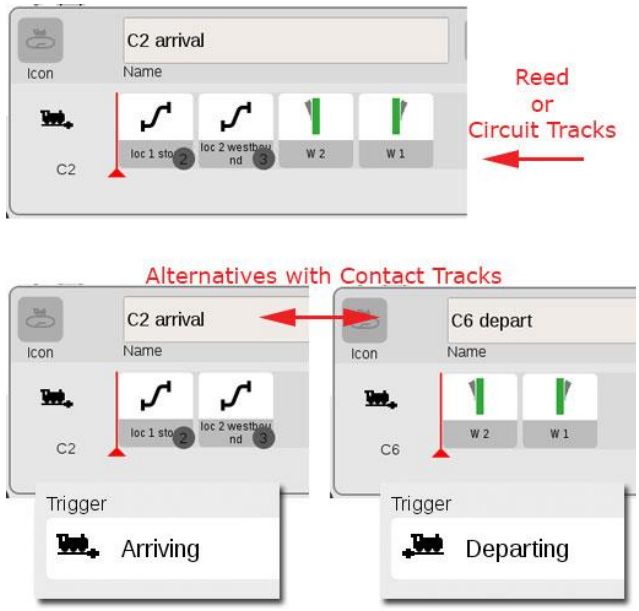


Fig. 8 - Two methods on creating routing

Starting Positions to Begin the Routing Cycle

In starting a Multi-line shuttle, it is best to have your trains in a 'Starting position'. It can prove to be a requirement if you find trains starting to move at the wrong time. The starting position I use for a multi-line shuttle is all trains should be positioned at a station (you can also have a single train on the mainline if you chose). In Fig. 7, I show my starting positions for my 3 line shuttle, with Loc 1 set on the main line and ready to trigger the first contact in my shuttle layout. If you do use contact tracks by starting all of your locs in a yard, you can start any locomotive you wish and the 'Departing' trigger (exemplified in Fig. 8) will pre-set the routing for you so that you know the locomotive will go to the correct line and start the automation cycle.

Making the Shuttle More Interesting

Hopefully, by now you see why I determine this article to be an advanced topic. What I am about to show you next, may just propel you into expert status, and you can be the envy of all your fellow engineers. Well, only in terms of Event scripting and automation.

In our current setup, I have a single main line with only one shuttle train running at a time. I am now going to illustrate how it will be possible to run two trains in opposite directions. There are two possible approaches in accomplishing this goal: Adding another main line or adding a passing track. By adding the additional mainline you can draw more interest at each of the terminal stations, because you create a different routing pattern for arrival and departure. If you choose to add a passing track on the main line, you can draw interest into a depot station as a third focal point on your layout. Of course, you can do both but it's good to break down my explanation into smaller pieces. I would say to keep it simple, but it's probably too late for that.

Dual Main Line Track Setup

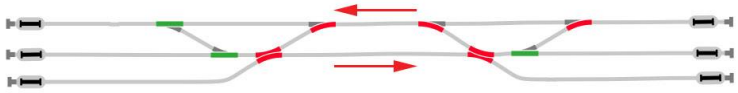


Fig. 9 - Adding a 2 line track to a multi-line shuttle

The first example will show the additional main line. The track setup will require some additional turnouts so that each end point will have access to each Main Line. I use the traditional right side traffic flow and indicate its direction in Fig. 9. Altering the routing for this set up is relatively simple, however as stated in the section "Adding Train Routes to Events" this is one area where using contact track sensors with 'Arriving' and 'Departing' settings can make a big difference.

Changes to 'Arriving' Contacts

The event scripts in Fig. 10 illustrate how I use them each for specific train switching. The first change is made to my Arrival script on contact C2. By the time the arriving train triggers C2, it should have cleared all the turnouts in the station making the yard available for re-routing (red arrow). At this point, I need to be sure that I route the next departing train to the proper main line (green arrow). I do this before I command the train to depart. The Event Steps for 'C2 Arrival' shows I have set the switch 'E1' to straight prior to sending Loc 2 westbound.

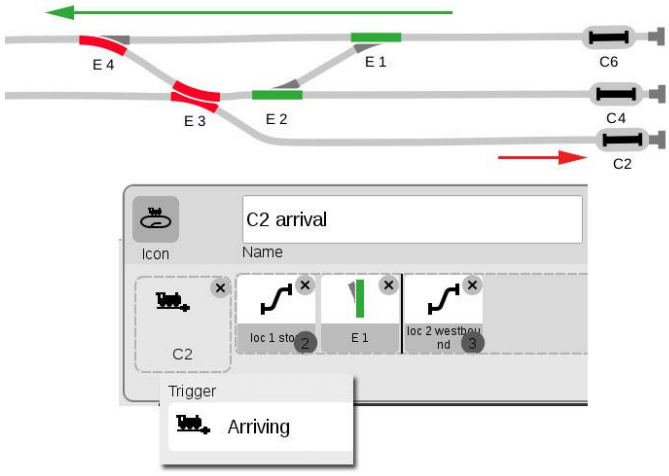


Fig. 10 - Arrival script sets the east station departure route

One thing to note, this method will work when running single trains through the main. The arrival event pictured here will be changed further when I discuss how to sequence two trains on the main line at once.

Changes to 'Departing' Contacts

My depart event script shown in Fig. 11 is triggered when the train leaves the station from 'C6' (see Fig. 10). Its purpose is to pre-set the destination route when the train arrives at the west end station (green line). The scripting change is straight forward and you should be familiar with how this is accomplished.

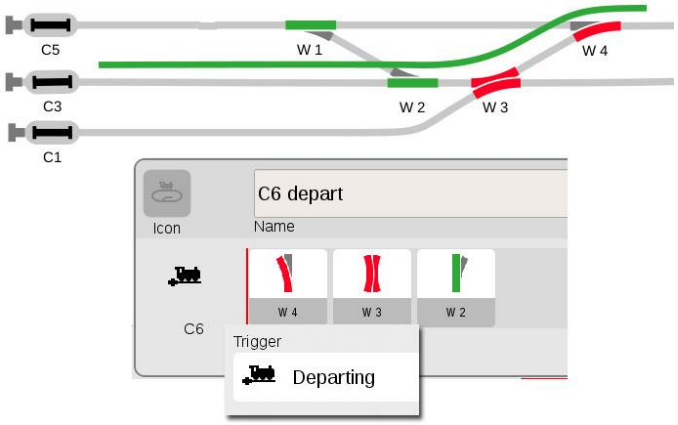


Fig. 11 - Departure script pre-sets the destination line at the west station

Adding a Passing Lane or Depot on a Main Line

By adding a passing line on single track, I can create a safe area for a locomotive to wait until the next track block has cleared from an oncoming train. In Fig. 12, I have added the necessary track articles to my layout to control the bi-directional line. In my previous article, I wrote about simple passing line controls. In this example I create some advanced controls due to the two-way travel on the main line.

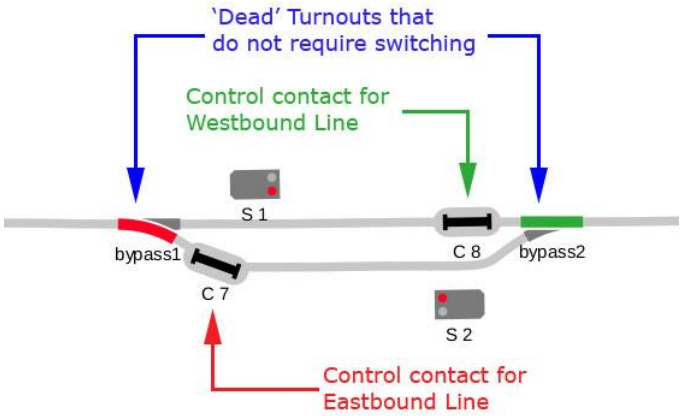


Fig. 12 - Track components necessary for a 2-way passing or Depot

No Routing Changes Necessary

Because I am adding a depot into my single Main Line shuttle, I won't have to make the routing changes that I discussed in the previous section ("Dual Main Line Track Setup"). You can see I have added two turnouts to the main line, which don't require switching if we follow strict right-hand traffic policy.

Description of Controls on a Two-way Depot

When a train is set to depart from the West station (heading eastbound), I will set the signal at S1 to 'stop', stopping any oncoming train (See Fig. 13). For a westbound train, I will set the signal at S2 to stop any eastbound train. Because I am using 'Dead' switches, the turnouts at the depot always direct the trains towards the correct control signal (i.e. eastbound traffic to eastbound control signal, see Fig. 12).

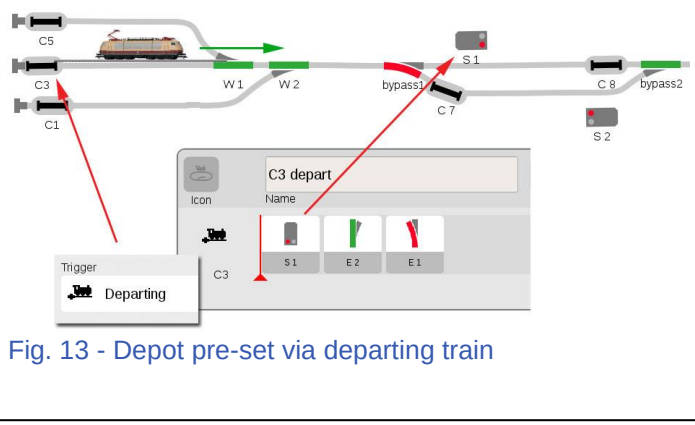


Fig. 13 - Depot pre-set via departing train

When a train arrives at the depot, by the time it approaches the control contact it should have cleared the turnout behind it. Therefore, I will use a 'Departing' trigger at the depot control

contacts to switch the opposing direction's signal to 'go'. Fig. 14, shows how my departure script on 'C7' can only be activated after the train has cleared the turnout 'bypass1,' allowing any waiting westbound train to proceed safely past.

Having Two Trains Running at the Same Time

So far I have focused on the track setup options, the additions were created while still using a single train operation. By following the script commands referenced in Table 1, you can see that each contact at *both ends* of the line contain a train 'departure command'. I should point out all the contact triggers are 'Arriving' triggers. I can confirm this by the Loc 'Stop' commands which are only activated by train arrival.

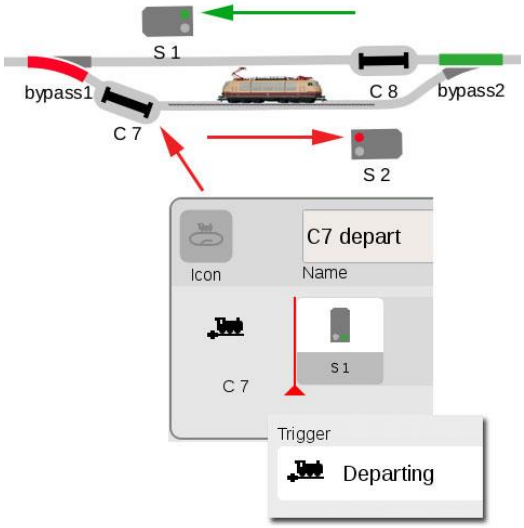


Fig. 14- Track clearance and signal release

The modification I will make for two train operation will be to move all my train 'departure command's to be controlled at only one station (not both). What this does is it shifts the timing of events, because I am not waiting for a train to arrive at each end. Instead of only using 'Arriving' triggers, I will now employ both 'Arriving' and 'Departing' triggers. Table 3 shows my event script directions for creating two train operation in a shuttle setup. I won't include the track routing, since it is independent of the train control events and their contact assignments do not change.

Contact ID/trigger setting	Event	Event	Direction
C1 Arrival	Loc 3 stop	Loc 1 depart	Eastbound
C5 Depart		Loc 2 depart	Westbound
C3 Arrival	Loc 2 stop	Loc 3 depart	Eastbound
C1 Depart		Loc 1 depart	Westbound
C5 Arrival	Loc 1 stop	Loc 2 depart	Eastbound
C3 Depart		Loc 3 depart	Westbound
C2 Arrival	Loc 1 stop		
C4 Arrival	Loc 3 stop		
C6 Arrival	Loc 2 stop		

Table 3 – Revised script events to manage a 2 train running operation on a shuttle line

Notice that similar to Table 1, I have departures for each train (Loc 1, 2 & 3) in each direction (Westbound, Eastbound). Also, I need to maintain a Loc Stop event for each of my 'Arrival' triggers at each contact on each end of the layout (C4, C5, and C6). In Fig. 15, I give a visual track representation of what one arrival/departure cycle will look like, including the sample scripts (without track routing).

End of the Line

The conversion from a single shuttle line to a multi-train shuttle, showed some advance techniques that I haven't covered before. However, many of these ideas have just combined concepts that have been considered in my previous article. 'Departing' and 'Arriving' triggers, while not new, are employed in creative ways that are challenging and fun to implement. The nesting of events gives us a way to manage control of different types of devices (locomotives with turnouts).

Each Event Script example that I illustrated here, are the prototypes of what you'll need to create a full running multi-shuttle layout. You'll just have to repeat the process for each line in your station. I only used three lines, but how exciting it would be if you used more? Switching locomotives to run, will require that you edit the locomotives in the 'Stop', 'Eastbound' and 'Westbound' loc scripts, and the new CS3 makes it a breeze to do so.

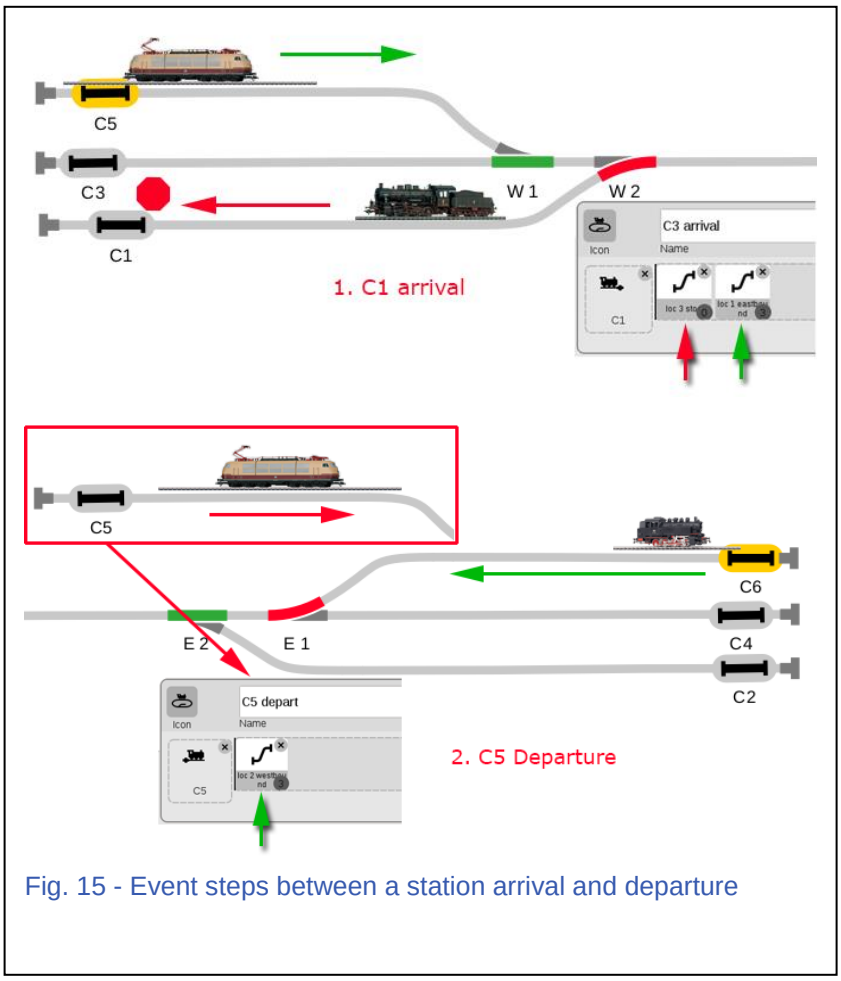


Fig. 15 - Event steps between a station arrival and departure

I hope that you were able to follow along with me and enjoyed my offering. It was a challenging article to write, and I encourage you to apply whatever you can and develop some new levels of operational control.

Curtis Jeung

Upcoming appearances:

Märklin Enthusiasts of America (MEA) Spring Meet
Steamtown
Scranton, Pennsylvania
May 6, 2018

Garden Railway Convention
2 Galleria Pkwy SE
Atlanta, GA 30339
June 4-9, 2018

Summary of Newsletter Articles 2017

As we start 2018, we want to provide you with this summary of the articles and topics we covered in the 2017 *Digital Newsletter*. If you are missing any newsletters, please send an email to club@marklin.com and they will be sent to you.

Title or Topic	Edition (Vol. & No.)	Month, Year	Author
2017			
Digital Upgrade - Series Ae 3/6II Loc	29 - 1	Jan - Feb 2017	Rick Sinclair
Central Stations 2/3/3+ Master/Slave connections	29 - 1	Jan - Feb 2017	Curtis Jeung
Digital Upgrade w/ sound - Austrian Crocodile	29 - 2	Mar - Apr 2017	Rick Sinclair
Line Merging - Pt 1, deals with Branch Lines	29 - 2	Mar - Apr 2017	Curtis Jeung
Steam Locomotive Upgrade	29 - 3	May - Jun 2017	Rick Sinclair
M83 - An in Depth Look, Part 1	29 -3	May - Jun 2017	Curtis Jeung
Locomotive Upgrade - Adding an Auxilliary Function	29 - 4	July - Aug 2017	Rick Sinclair
M83 - An in Depth Look, Part 2	29 - 4	July - Aug 2017	Curtis Jeung
Marklin mDecoder Tool, pt 1 -mDT3 Decoder tool	29 - 5	Sept - Oct 2017	Rick Sinclair
Marklin CS3 - Creating Track Board Plans	29 - 5	Sept - Oct 2017	Curtis Jeung
Marklin mDecoder Tool, pt 2 -mDT3 Decoder tool	29 - 6	Nov - Dec 2017	Rick Sinclair
Practical Track Events and Sensor Use	29 - 6	Nov - Dec 2017	Curtis Jeung

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