



# NEWSLETTER

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Digital Consultants

Rick Sinclair

Curtis Jeung

**Current Central Station 3 Version – 2.4.0 (5)**

**Current Central Station 2 Version – 4.3.0 (5)**

**Current Mobile Station 2 Version – 3.148**

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While the winter weather has kept most people indoors lately, it is a good time to work on our layouts. There is always maintenance or upgrades to do. Even if it is just cleaning track, it is time well spent.

Our first article deals with older Märklin cranes which fall into the category of digital accessories, and how to control them with modern controllers, while our second article discusses the topic of Event Controls in a Layout Merge or Split.

## **Motorized Cranes**

On a recent trip to a friend's house, I was working on his layout that I have seen many times over the years, he has the Märklin Coaling Station (76510) connected to an old 6021 controller. My thought was that this is an older digital accessory so what if someone wants to use this with newer controllers?

Not to brag (ok maybe a little), I have the 76500 Gantry Crane, 76510 Coaling Station and the 76515 Stationary Crane new in the box. Honestly, I have only taken them out to test them and if someone has a technical question. I also have every version of the older stationary cranes (7051/7651), ok now I'm bragging!

Märklin made an analog motorized version of the stationary crane in 1949 (451G) and the modern number 7051, with the last version in a starter set in 2002. In 1990 there was a digital version of the stationary crane (7651) (Fig. 1) and in 1992 a retrofit decoder for the analog version was released (7652). Lastly for this crane there was a "Below Baseboard Mounting Kit" (7054) (Fig. 2) to mount the motors under the layout for a cleaner look. Unfortunately, none of these items are produced any longer.

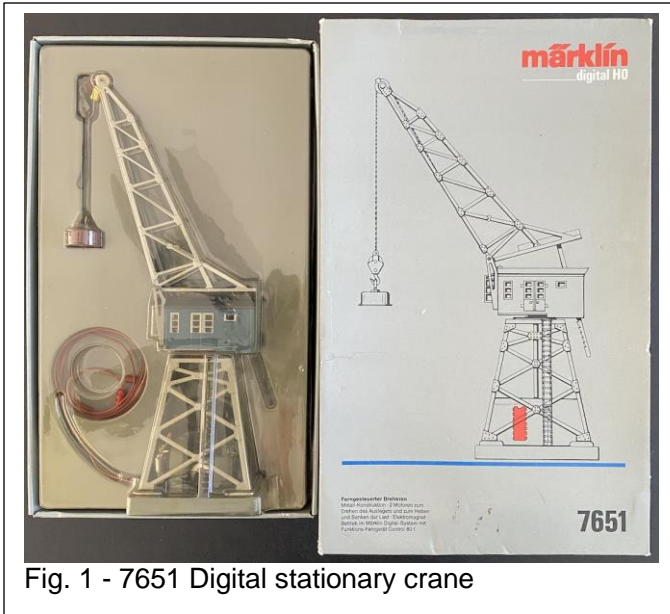


Fig. 1 - 7651 Digital stationary crane

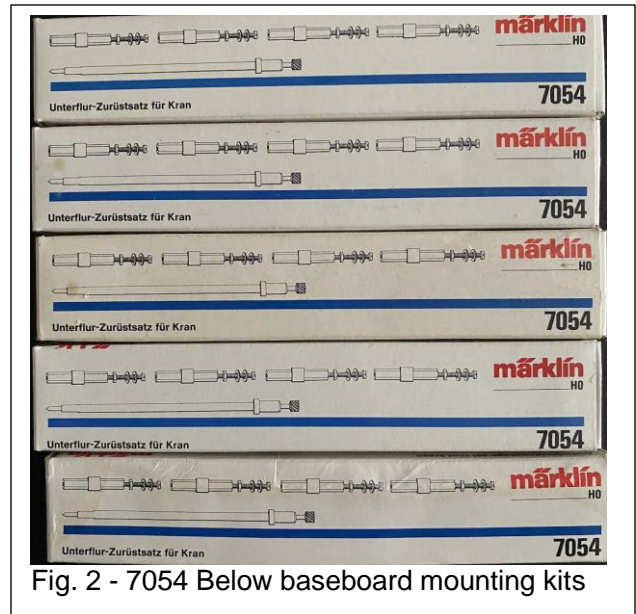


Fig. 2 - 7054 Below baseboard mounting kits

In 2003, the 76500 came out and it was the first crane that was made for the “Digital Era” so to say, since the 7651 stationary crane was basically an adaptation from the analog version.

This brand-new gantry crane had a wireless remote that looked like a game controller. Most people used this controller to operate the crane, or it could also be operated with the 6021 controller of the time (like I mentioned before). The wireless controller has a couple of features that the digital controllers cannot do but the digital controllers can do all the same functions as the wireless controller (Fig. 3). Not shown in the picture is the baseplate for the gantry to travel.



Fig. 3 – 76500 Gantry crane

The next crane was the Coaling Station (76510) in 2004 and had pretty much the same functions as the Gantry Crane (76500) except the Coaling Station has more lights and no motorized gantry (Fig.4). Not shown in the picture is the baseplate for the crane to travel. What was great about the Coaling Station was although it did not come with a wireless remote, it was controllable with the same wireless remote from the Gantry Crane (76500). Both cranes could not be connected to the wireless receiver at the same time, so it was one or the other, but at least it was an option. I could see connecting a switch to change from one to the other to easily work around this issue, but I am not getting into that here.

**WARNING:** It is not possible to operate either crane with the wireless controller and the 6021, the Mobile Station or the Central Station simultaneously. The cranes must only be connected to one controller at a time or damage will occur.

The last rendition was a stationary crane that came out in 2008 (Fig. 5). This had the same basic functions as the others, but the base does not move, this is more like a modern version of the 7051 stationary crane with only rotation and pay out of the hook with a connection for a clamshell or magnet on it.

When these items came out in the 2000s, I bought them because I thought they were cool, and they still are. Nowadays, they are a little hard to come by and there is always the concern of will they work properly and if the original packaging is included to protect these fragile items from damage.

These items are not supported by Märklin any longer and parts are very limited if there is a problem with one.

What makes all these digital cranes so convenient is they can be controlled by a Mobile Station or Central Station if they get wired to the track for power and control. So basically, there is very little set-up.

**Mobile Station Control**

Mobile Station control is easily achievable once the crane is loaded. To do so, select "New Loco" -> "From Database". Then scroll down to the bottom of the list to find the item number (for example, item number 76500).

Once there, this crane has two different listings, one for the gantry called "Kranbrücke" and one for the cab "Kranhaus" (Fig. 6). Both must be entered separately so this crane will take up two locomotive slots because it can move in 4 axis:

- Gantry back and forth
- Cab left and right
- Cab rotate
- Hook up and down



Fig. 4 – 76510 Coaling Station



Fig. 5 – 76515 Stationary crane



Fig. 6 – MS2 database

The 7651, 76510 and 76515 only take up one address so there is only one entry in the database for them.

When I entered mine into the Mobile Station, the first slot was for the cab and the second was for the gantry. One note is that I did have trouble loading the Cab. The top of the screen was a jumble of dots, and the address was incorrect for the crane (Fig. 7). I was able to change the address in the Mobile Station to the correct address and the crane still worked. Also, the gantry had the wrong address, but I was able to edit it also and it worked. The graphics were correct on the screen for the gantry. The only thing I can think of for this error is that I might have changed the address at one point to test it for a technical call. I think the MS2 probably retained that data once I re-entered the crane, either that or it was gremlins.

I wanted to verify that the address was correct in the database, so I did a factory reset of my Mobile Station and re-entered the crane. This time the graphic came up correctly with the right address, so I'm thinking it was gremlins (Fig.8).

Once this was accomplished, I could verify the crane functions and they work as they should. I had full control of the crane with the all the functions listed in the manual.

All that needs to be done is to select the direction of the gantry or the cab and turn the throttle up. The motor will run like a locomotive so the higher the throttle is set, the faster the function will operate.

### Central Station Control

After the success of the Mobile Station control, I decided to enter the crane in my Central Station 3.

As expected, I was able to search for the 76500 in the database and it also came up with two entries like the Mobile Station. One was for the gantry and one for the cab (Fig. 9). The control was a little easier with the Central Station as one would expect.



Fig. 7 – MS2 Entry gremlin



Fig. 8 – MS2 Entry gremlin gone

Like the Mobile Station control, the motor will run like a locomotive so the higher the throttle is set, the faster the function will operate.

What makes controlling the crane with the Central Station impressive is that once an accessory is controllable digitally, it can be entered into an event script. This way a series of movements can be programmed, and a sequence can be executed automatically to add to the animation of a layout.

The other cranes were entered just as easily into the Mobile Station and Central Station with the same results in control, but the other cranes only take up one address since they are not as complex.

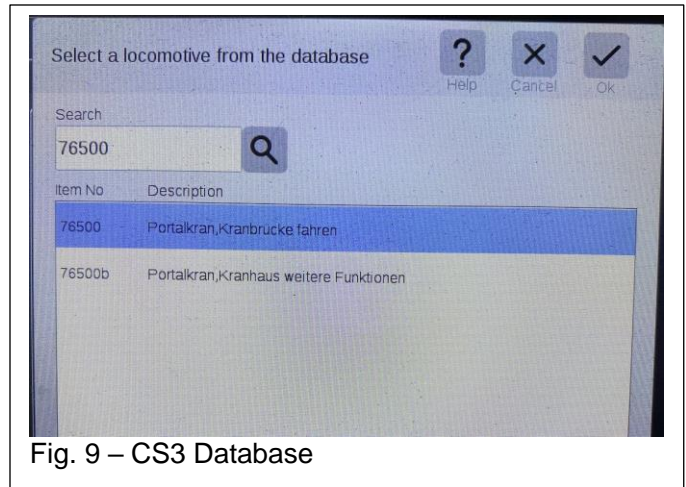


Fig. 9 – CS3 Database

### Wireless Controller

Going back to the wireless controller for the 76500. It has a couple of features that the digital controllers do not.

One of the features is that the gantry has a “trim” that can be set with the slide control. It will allow the speed of the gantry to be modified to run faster or slower. Also, when the F4 button is pushed, the gantry runs very fast. Pushing the F4 again will make it run the normal speed. I was able to add the “F4” function to the Mobile Station and the Central Station and the gantry moved fast just like the wireless controller. The problem is it does not look prototypical, and it is barely controllable, so I would advise not doing this.

The other feature that seemed convenient with the wireless controller was that if the “Magnet off” button was pushed while the magnet was off, it would turn on the magnet for as long as the button was pressed, so it is like a momentary button when used like this. I couldn’t find a way around this with the Mobile Station or Central Station.

As you can see, it is very simple to load these items in the Märklin family of controllers. It is almost not worthy of a newsletter article, more like I wrote all this just to brag...

**Enjoy Your Hobbies!**

**Rick Sinclair**

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## Event Controls in a Layout Merge or Split

In this article, I will be discussing various ways to control a single turnout. A single turnout may not seem like much if you regard it as a simple split, but it can have interesting challenges if utilized as a merge. I will not cover a turnout's use as a branch line control because it is less likely to see a branch line used in automated functions. Instead, I will be utilizing the turnout as a line exchange where automation may be more appropriate.

### Controlling a Turnout as a Split

The direction that is traveled over a turnout can have some very different control aspects. I'll begin by discussing the split direction, because of its relative simplicity.

The simplest control of which direction a train may take at a line split, can be approached with either a 'left/right' pattern (a toggle), or randomly. A more complex approach can involve track occupation and/or halting a train; similar to methods used in yard setups and not covered here.

A simple toggle pattern can be controlled with either pre or post turnout triggering. The turnout itself can simply switch back-and-forth using a pre-turnout control. The track setup is displayed in Fig. 1.

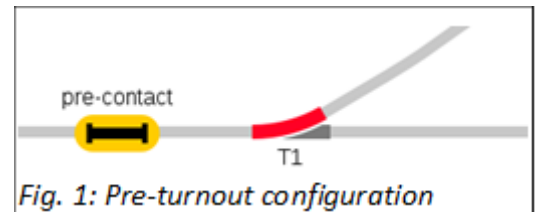


Fig. 1: Pre-turnout configuration

A 'pre-contact' event used with a MACRO if ('IF 1') event step is used in Fig 2. The macro checks the condition (or current setting) of T1. If the condition matches the current setting, then it will switch the turnout (to green). If it is a mismatch, then the macro will switch the turnout to the curved aspect (red).

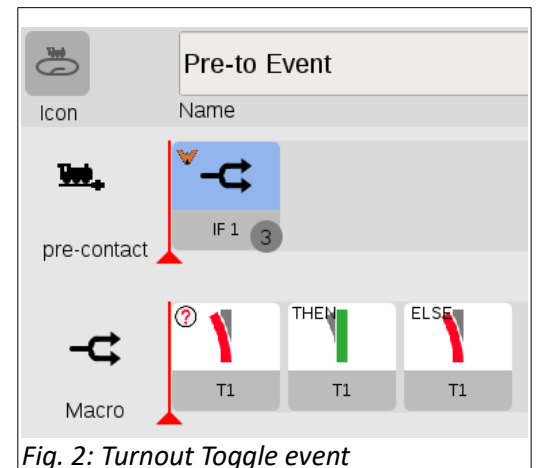


Fig. 2: Turnout Toggle event

If using a Randomizing Macro, will choose one of the options set within the event, shown in Fig. 3. Note that there are two 'T1' events next to each other. You may not be able to create the event with duplicate components next to each other. To work around this, add a 'text' step first, then add the duplicate element. The 'text' step should be between the two duplicated items. Once the duplicated element is in, you can then delete the text step.

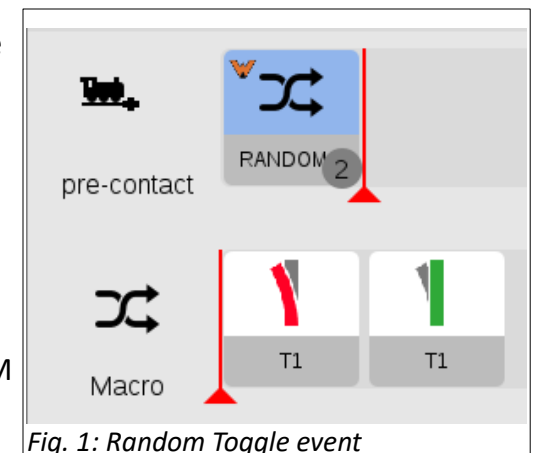


Fig. 1: Random Toggle event

### Using the same MACROS in Post-Turnout Configuration

You can position the triggers for these macros in a post turnout setup (Fig. 4). In this example, both contact triggers will use the exact same events, but you will not need to duplicate them. Instead, you can write up a single, non-triggered event ('RANDOM 1'), then nest it into the triggered events. You can see the two triggered events and the single non-triggered event in Fig. 5.

The method of nesting is shown in the display of both the triggered event steps of 'post-trig 1' and 'post-trig 2' (Fig. 6).

Post-turnout positioning

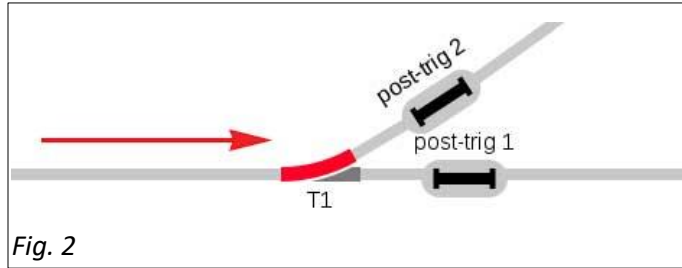


Fig. 2

Triggered events:

- post-trig 1
- post-trig 2

non-triggered event:

RANDOM 1

Departure events with nested 'RANDOM 1' event step.

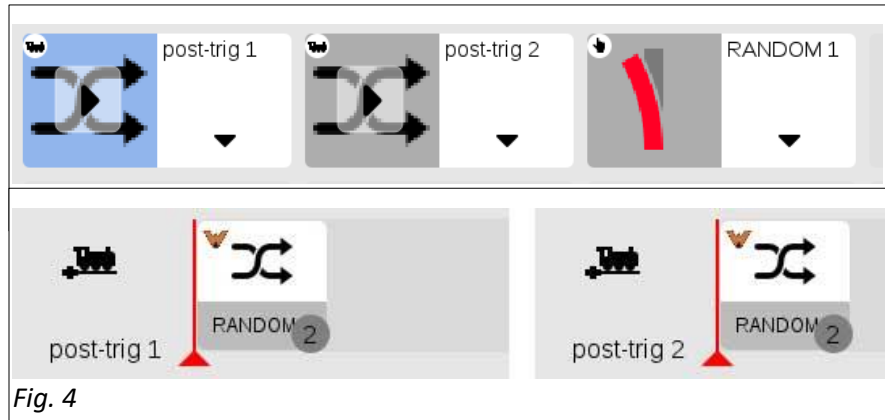


Fig. 4

**Factors Regarding Pre or Post Positioning**

While the pre and post positioning events essentially have the same commands, choosing which to use may have different conditions to meet. In the case of post positioning, it is ideal if you wish to have the turnout switched after a train has cleared the switch. On the other hand, the pre-contact position may be needed if you need to alter the command based on the availability of the entry point of the forthcoming block. This is accomplished by detecting occupancy and is displayed in-track in Fig. 7. The events are displayed in Fig. 8, in simplified form.

**Line Merger Setups**

If your travel direction utilizes a line merger, then event actions can become more complicated. There are considerations if the entry point of the line has another train on the block, or perhaps there is also another train waiting to enter the same line. How could we control that? In Fig. 8, I display an example of the components used in handling a merging line on a layout. It can be confusing trying to sort out the interactions between all the components. I will break it down into sections, just keep in mind that these are just parts of a complete cycle of events.

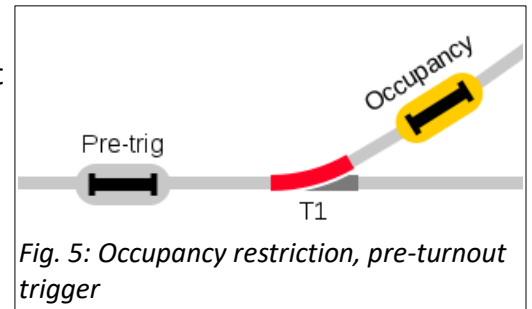


Fig. 5: Occupancy restriction, pre-turnout trigger

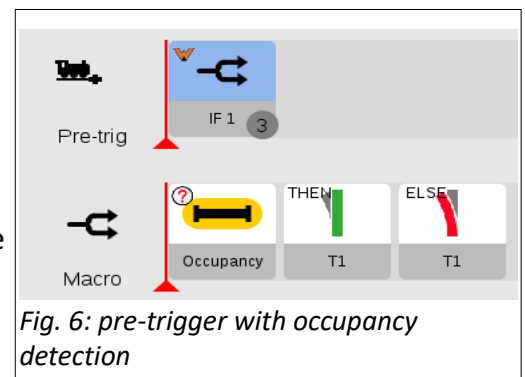
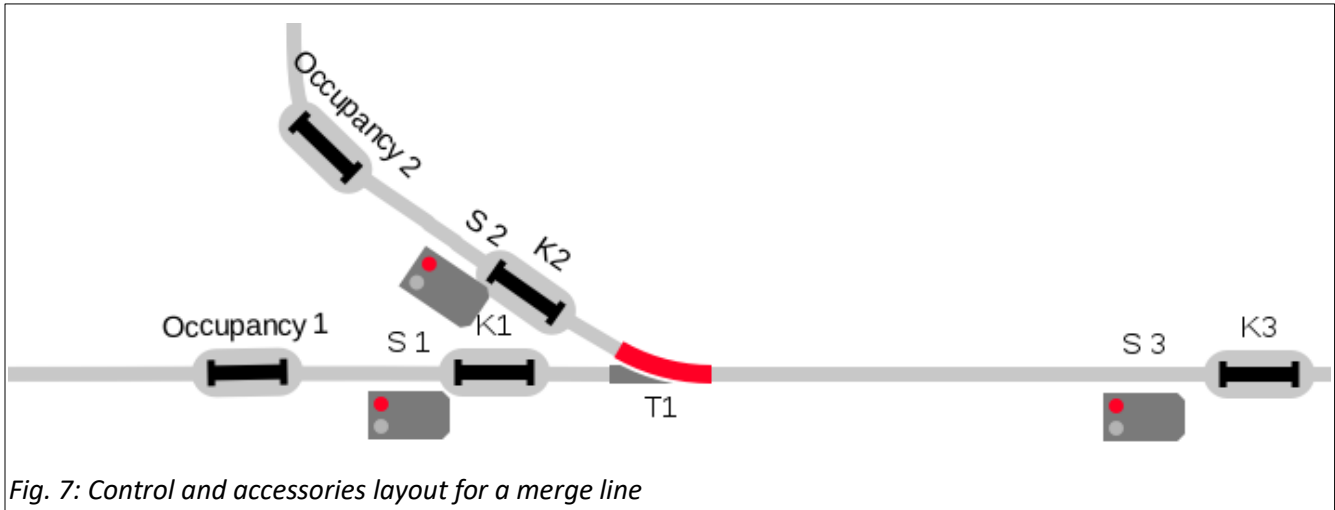


Fig. 6: pre-trigger with occupancy detection



### Initial Line Stops

The first safety procedure is triggered at the entry points of the merging line or block (Fig. 10). When a train from one line enters the block, it must prevent a train from a second line from entering as well. An event must be created for each of the contact triggers past the signals (K1, K2). The events simply activate the opposing stop signal and are displayed in Fig. 11.

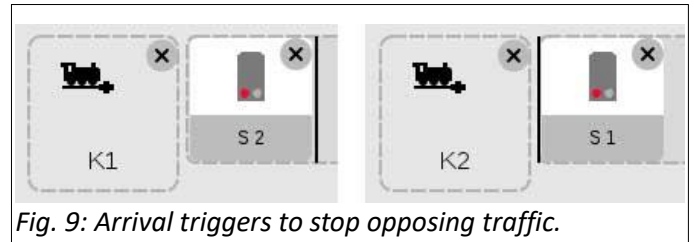
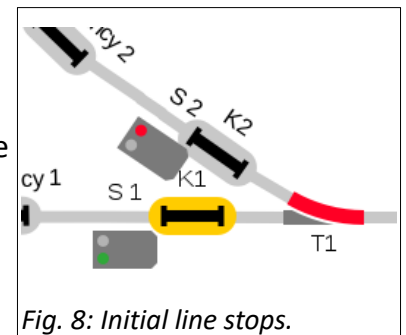
It should be clear at this point, that if there is no stop indication from a signal, a train would be free to continue past the signal without hesitation. The question is, how do we set the signals to 'go'?

### Establishing Line Procedures

What makes the merge line construct so complex is that you have 4 conditions that need to be evaluated to set the signals to green. Those 4 conditions are:

1. A train waiting on "line 1."
2. A train waiting on "line 2."
3. Both lines have a waiting train.
4. Both stops are clear from any traffic.

To begin to evaluate the 4 conditions, it must be clear that the block that the stopped trains must enter is clear. In other words, the block past the merge signals must be available for entry. To ensure clearance, we need to use a departure trigger on a contact track at the end of the 'clearance' block. This would be 'K3' shown in Fig. 9. Once triggered, we can start the evaluation process. Each condition will need to be addressed separately before it can be added into our triggered event.





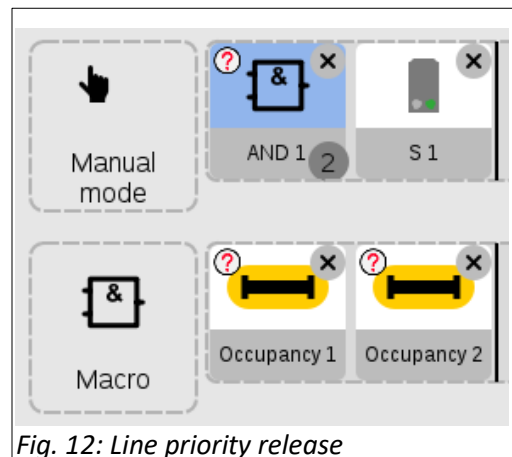
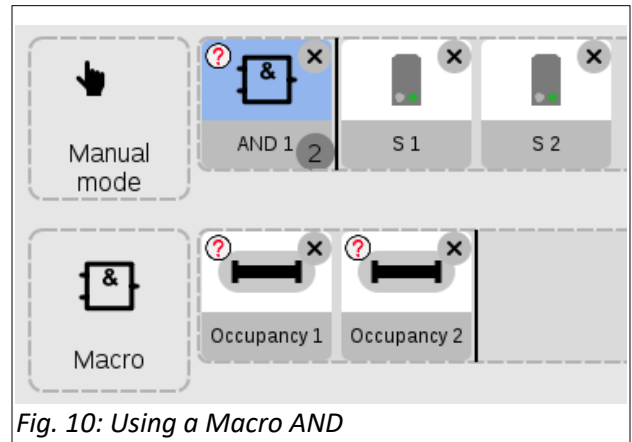
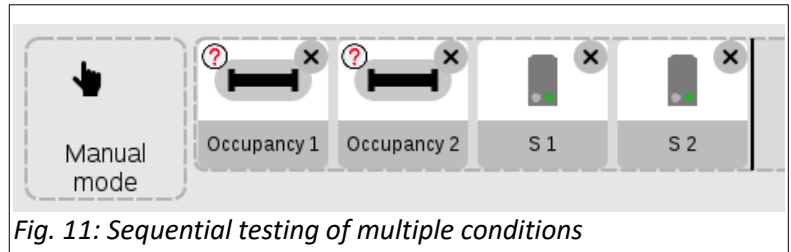
## The Evaluation Setup

Evaluating the instance where both lines are clear from traffic, and both signals can be set for 'Go' can be accomplished in a couple of ways. The straightforward approach looks at each track in the sequence of steps in a single event (Fig. 12). The conditions are checked in the order in which they are listed and if either evaluation fails, the event halts completion. Note that these, and following events, are not triggered (set as 'Manual Mode').

An arguably better method would be to use a 'Macro AND'. When there are multiple conditions to consider, it may be easier to have them encapsulated because the conditions may be easier to keep track of. The Macro And will check that both conditions are true before clearing the way for steps 'S1' and 'S2' (Fig. 13), unlike the sequential testing found in the previous example.

It is likely that you may have conditions where both lines are occupied. This occurs when the main line is blocked, and a train may arrive while another still waits. For the evaluation, we also use the 'Macro AND' container, but a decision will need to be made on which line can be released (does line 1 or line 2 go first?). You can either set the line release to occur in a set procedure, i.e., a primary line will always have precedence of going first. Or you can set the lines to be released in a random fashion.

By giving precedence to a specific line, the alternate line will need to wait until the presiding train has cleared the block before secondary line has a chance to enter the main line. This can cause instances where a secondary line train may be waiting as several trains might pass. This is because another train may arrive at the line 1 stop, before any entry to the block has been allowed. This situation may only reveal itself through testing of the system. An example of giving line precedence is shown in Fig. 14.



If precedence is not required, then a 'Macro RANDOM' can be applied. The CS3 will pick one of the options set within the random container. It will effectively create a non-predictable release of which train enters the main line (Fig. 15).

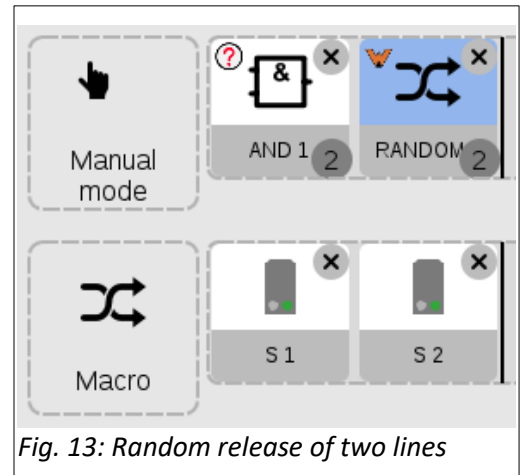


Fig. 13: Random release of two lines

Evaluating instances where there is only one stopped train at either of the merging lines is relatively simple. Normally, you might create an event for each line that checks for occupancy. The examples are displayed in Fig. 16. These would need to be modified, because the status of the two occupational sensors would have multiple conditions.

Again, we would use alternative forms of the 'Macro AND'. The respective differences to the Macros are shown in Fig. 17.

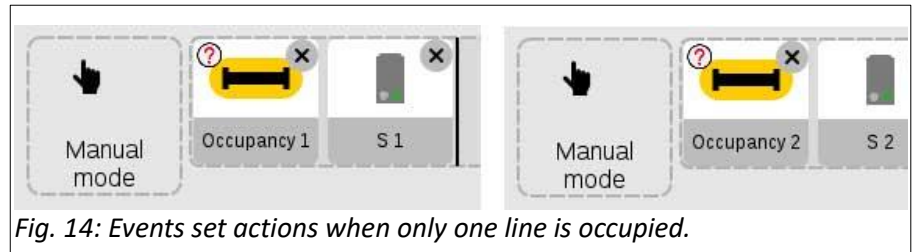


Fig. 14: Events set actions when only one line is occupied.

### Putting the Pieces Together

Now that we have the track evaluations established, we can put them together with a track triggered event to make a track merge section operate. This can operate by placing (or nesting) the events discussed into the triggered event. The order in which the events are loaded should not matter, because the Macro AND construction makes each evaluation event independently valid. One, and only one, of the nested events would be able to operate (Fig 18).

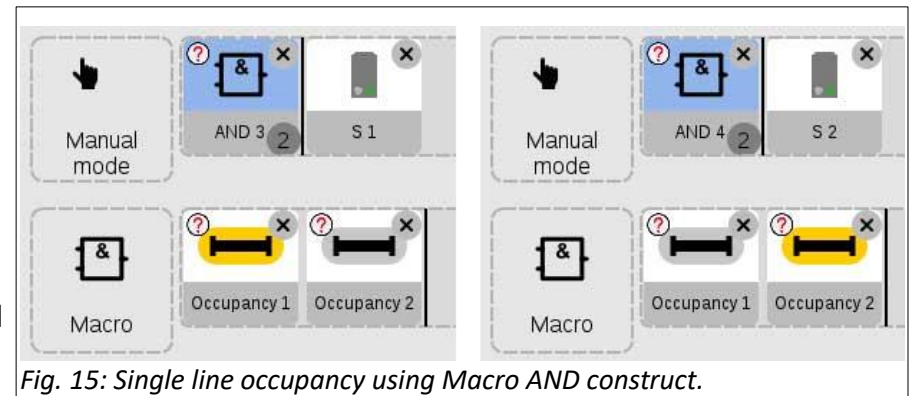


Fig. 15: Single line occupancy using Macro AND construct.

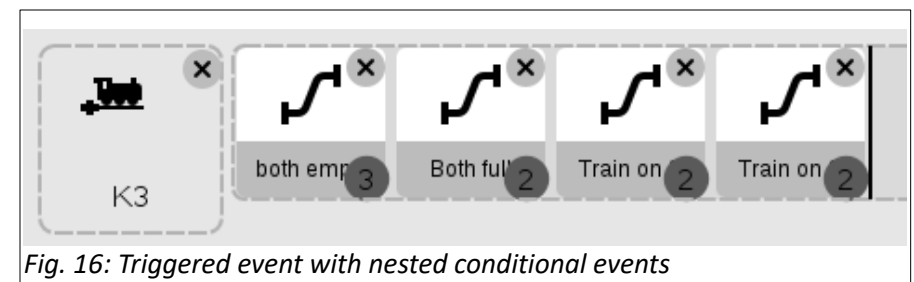


Fig. 16: Triggered event with nested conditional events

### Enjoy-Curtis Jeung

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**Upcoming appearances:**

- **ONLINE Webinar**  
February 8<sup>th</sup>  
11:00 AM Pacific time
- **Bushnell, Florida**  
**Train Club Seminar**  
March 11<sup>th</sup>
- **Rocky Mountain Train Show**  
**Denver, Colorado**  
April 1-2

**To contact Rick and Curtis for help with your Digital, technical and product related questions:**

**Phone: 650-569-1318 Hours: 6:00am – 9:00pm PST. Monday through Friday.**  
**E-mail: [digital@marklin.com](mailto:digital@marklin.com)**