



NEWSLETTER

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Current Central Station 3 Version – 2.3.1 (8)
Current Central Station 2 Version – 4.2.9 (0)
Current Mobile Station 2 Version – 3.121

Summer is almost here, and we are ready to enjoy sunlight again. We have completed one year of webinars covering twelve informative topics on how to use the CS3. The good news is we plan on continuing webinars but with a little different format. Moving forward we will do a bit more Q & A rather than focus on a specific topic. We have covered so many things in the webinars and in this newsletter that it is hard to come up with new ideas. Thus, we plan on re-visiting topics in the future because updates and new discoveries might have developed.

Our first such article is about adding passenger car lighting. We discussed this once before so to change it up a little we will install lighting kits into older metal passenger cars. Our second article is on Connections for Track Power.

Car Lighting

While my main work is repairs and upgrades, I sometimes get a nice diversion. I recently installed modern lighting kits into older steel passenger cars. Since I had never used the new LED lighting kits in these old cars, I thought I would document it for those who would like to try it.

So, the story goes that a customer wanted three of the 4xxx series passenger cars lit and asked me if I could do it. He preferred LED lights but if that wasn't possible incandescent lighting kits would work.

After some research looking up these cars, I was hesitant. These are the steel cars from 20+ years ago, well before the Märklin LED kits came out. I told him that I would have to see the cars before I commit to installing LED lights.

Honestly the install was easier than I thought. It went very smooth, and I even figured out a nice little trick for a ground wire that I will show here.

Assessment

Once I gathered all of the necessary parts (Fig. 1) I had to see what type of lighting kit would work best. I really did not want to use the old-style incandescent lights, so I did a test fit of the 73401 lighting kits. The determining factor was if any of the LEDs were blocked by the bracing under the roof of the car (Fig.2).

Good news was the LEDs just cleared the braces. Bad news, I needed 2 light bars per car and I could not plug them into each other and still have the LEDs clear the braces. There ended up being an easy fix that I will discuss later.

With a plan for the light bars in my head, I needed to determine how I would run the wires to the slider as well as the ground wire. Since these cars are all metal, the old style incandescent light bars used a chassis ground by way of a metal arch that supported the light bar so I would need to figure out how to get the chassis ground.

I removed the slider from the 7198 pick up shoe kit and noticed the screw that tightens the clamp to the bogie was insulated from the slider. I realized that this is exactly what I needed for a chassis ground. I took an extra ground tab from a motor upgrade kit and used it for the chassis ground. It worked out perfectly since I could easily solder a wire to the brass tab (Fig. 3 and 4). Finally, I had everything worked out and I could proceed with the install.



Fig. 1 Items needed.

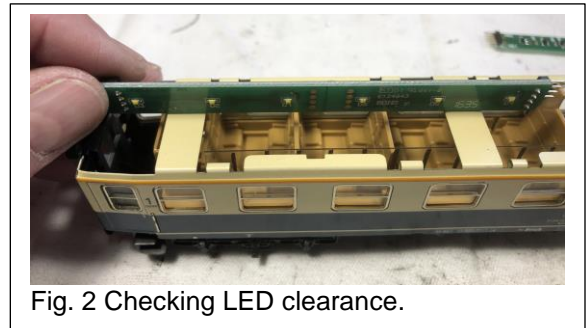


Fig. 2 Checking LED clearance.

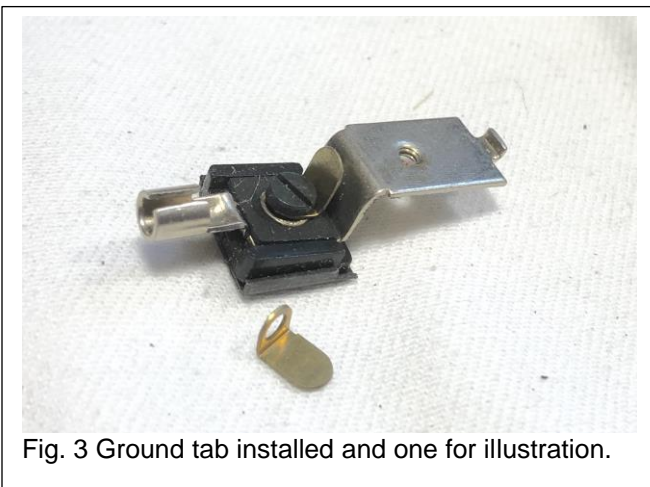


Fig. 3 Ground tab installed and one for illustration.

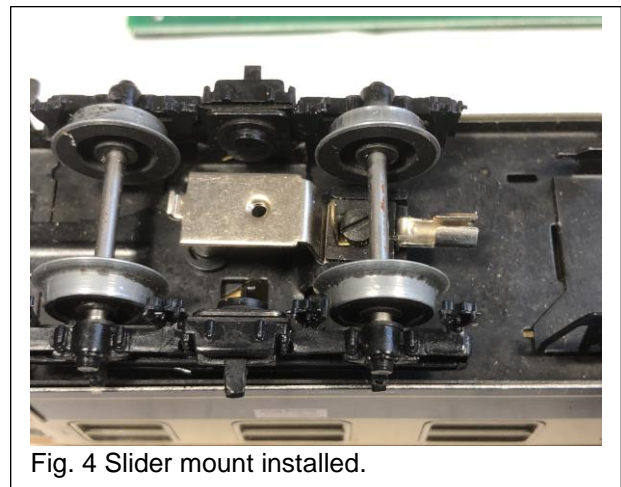


Fig. 4 Slider mount installed.

The 7198 pick up shoe kit was made for an old style Märklin plug. I didn't want a bulky plug under the car, so I soldered a wire to the tab close to where the plug inserted then soldered a ground wire to the brass tab that I installed. I chose brown wire for both since it would be harder to see inside the car and the LEDs would still work if I mixed up the wires.

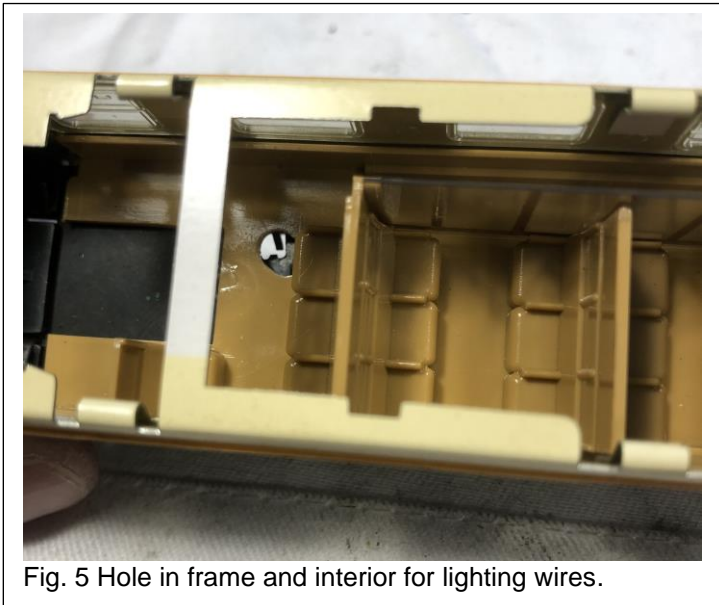


Fig. 5 Hole in frame and interior for lighting wires.

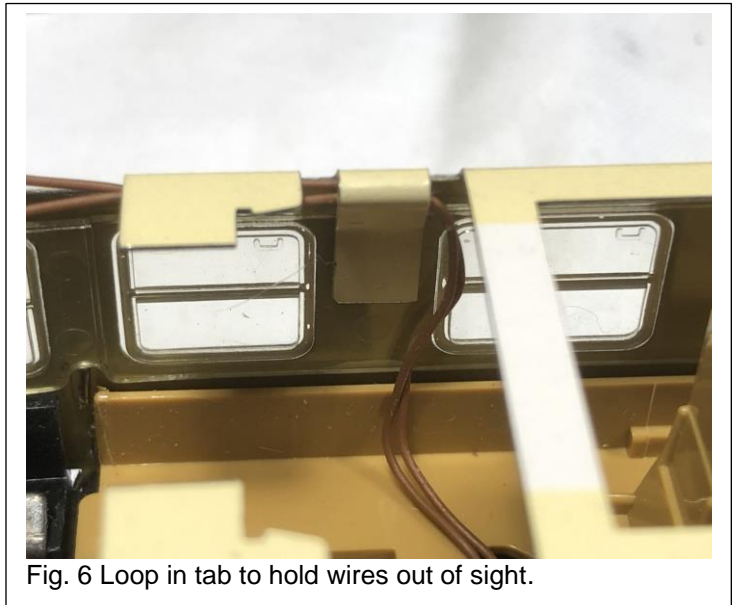


Fig. 6 Loop in tab to hold wires out of sight.

Above the bogie at one end of the car was a hole to pass wires through (Fig. 5). I used this hole for that reason. There were also some convenient loops above the tabs that hold the windows in place. I used these loops to hold the wires in place (Fig. 6).

The next thing was to mount the lighting kits. I placed them where planned and held them in place with a small amount of hot glue, they were solid. I chose to use hot glue because I was worried that the thickness of the double-sided tape would raise the circuitry of the light bar too close to the metal roof. This might keep the roof from snapping in place or worse, damage the light bar with a short (Fig. 7). Once the glue had cooled, I soldered the wires from the pickup shoe and ground tab to the light bar. I should note that I soldered everything so it didn't damage the components. Thus, the light bars and slider kit could be removed and used as if they were new.

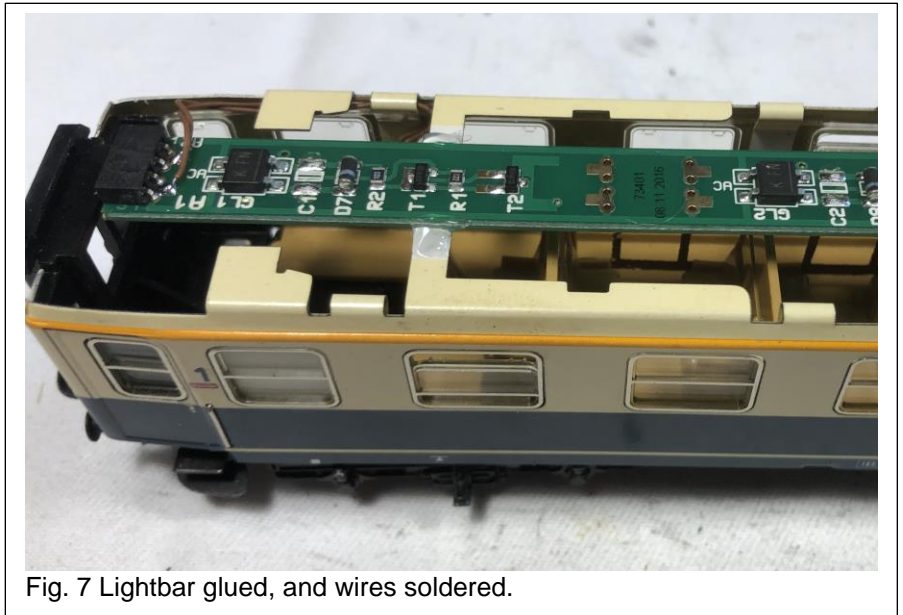


Fig. 7 Lightbar glued, and wires soldered.

Since each car takes two 73401 kits, I needed to mount the second one. Fortunately, I had checked the bracing

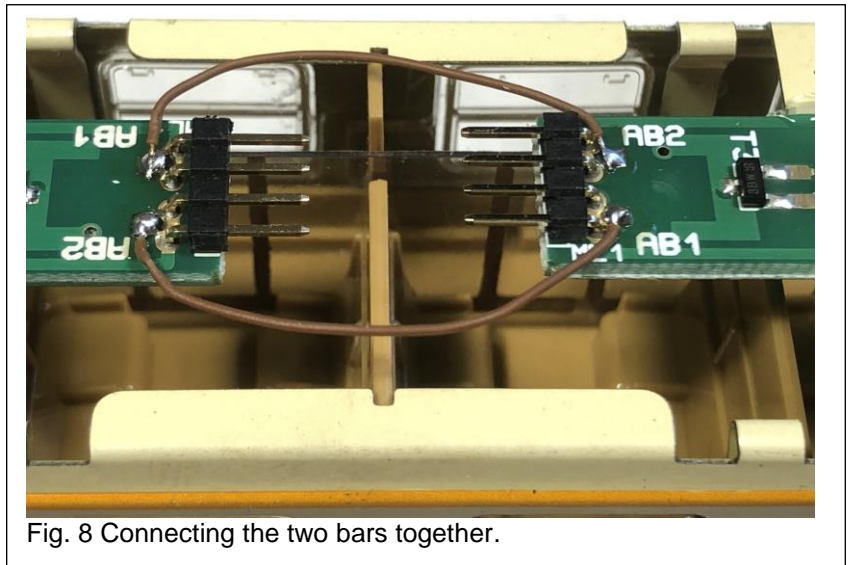


Fig. 8 Connecting the two bars together.

alignment and the LEDs would clear the braces on the other end of the car. The only problem was the light bars wouldn't be close enough to plug into each other. This meant I had to solder wires to connect them (Fig. 8). Because of the position of the LEDs, I had to turn one bar around for the even distribution of the light. So, the light bars were oriented "plug to plug".

Now that the passenger cars are finished, there is one restaurant car to light. While I followed the same procedure for the ground tab on the slider, the braces under the roof were different. This car took a different incandescent lighting kit than the passenger cars.

I had to see if there was clearance for the LEDs in between the braces, and like the passenger cars, there was just enough room (Fig. 9). Once I verified clearance, it was just a matter of mounting the light bar.

This restaurant car was made to have the lights/wiring above the braces where the passenger cars were made to have the lights below the braces. As you can see in Fig. 10, the braces have a depression in the center. Since you do not want the light bar to be seen, I used double-sided tape to mount the lights in this car. I cut the tape in half and doubled it up to get the light bar flush with the top of the braces. After



Fig. 9 Checking LED clearance with braces.

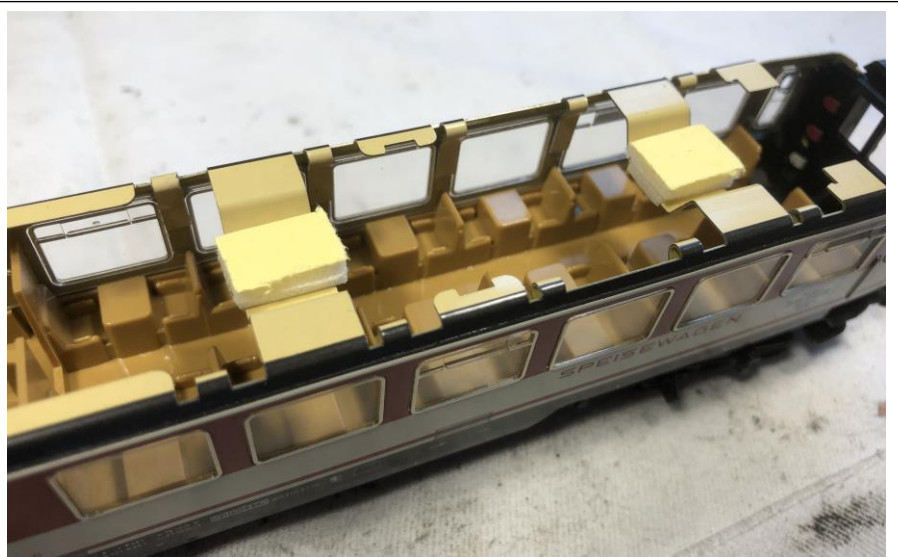


Fig. 10. Double-sided tape installed and ready for the LED light bars.

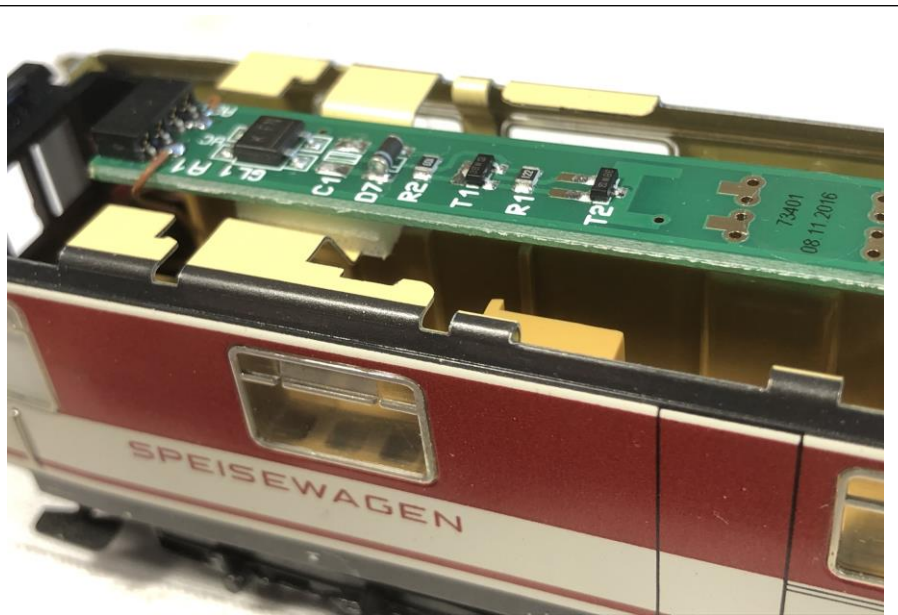


Fig. 11 Lighting kit installed.

that it was just a matter of sticking them on making sure there was clearance for the LEDs (Fig. 11). The wires were run the same as the passenger cars and also wires soldered to the lightbars to connect them to each other.

Once all of the lights were installed the cars looked great, the light was even throughout the car and the same from car to car. One thing I noticed was that there were considerably fewer power interruptions than newer cars. This is probably due to the metal couplers and frames that created a very good ground for all the cars.

Below are a couple of pictures of the finished restaurant car.



Finished restaurant car.



Side view.

So, the items that I needed were:

3x 7198

3x grounding tabs

6x 72401 lighting kits

I had calculated the cost of the old-style incandescent kits vs. the current LED kits. Even using two of the LED kits in each car, the price was only about \$10.00 more (per car) for LEDs.

I have to say that I was impressed with the look of these lights in the older cars. Now I might have to dig out some of my older cars and do the same.

Enjoy your hobbies!

Rick Sinclair

Connections for Track Power

In this month's article, I will discuss basic practices regarding the power supply connections from controller to track. Power supply setup is often asked about by new users. For those more experienced users, I will discuss some details on connecting modules that effect simple power supply wiring.

At its core, a track's power comes via a connection through a pair of wires (a positive and a negative) from the controller's outputs to the track connections. For Marklin users, it would be a red wire and a brown wire. For LGB, one Red and one Blue. Fig. 1 illustrates this basic connection. These are commonly referred to as Track Power Feed wires, or Track Feed wires for short.

On the back of the CS3/CS3+ there are two track connection ports. (Fig. 2). The connection described above is the "Main Line Track" connection. The "Programming Track" connection is used for Loks with programmable decoders that are NOT mFX/mFX+ type decoders. Attempts to program an mFX decoder on the programming track will fail. It has a lower power output and sends a programming code. It is meant for making alterations to a single Lok decoder and therefore you only need a short length of track to hold the Lok. This is primarily used for programming FX decoders and/or 3rd party decoders.

Single or double train layouts that are simple like that of Fig. 1 can be powered off a single-track feed. When expansion to the layout occurs, either with more track or trains, then additional feed wires are ideal. The general rule of thumb is to have a track feed per every 6 – 8 linear feet of track. However, there is a large degree of latitude and I would let your usage needs be your guide. I will show some examples further in the article.

The question I often receive is how to add more track feeds to a layout. I will describe a couple of methods here. The first method would be to employ a set of Distribution Strips (#72090). You need one strip for each colored wired connection to track. From there, you attach the CS's track connection to two separate strips. Then, connect additional wires from each strip and spread them to different contact points on the track (see Fig. 3). This is often a good solution for small tabletop layouts. I should also mention that the strips require the 7141x series of plugs (depending on the color needed).

The second method of distributing power around your layout would be to employ a 'power buss'. A power buss is essentially a power transmission line that can span the area of your layout. I have heard it being referred to something like a power supply ring. In this sense, it would be a loop of a power supply line. The benefit of this setup is that you

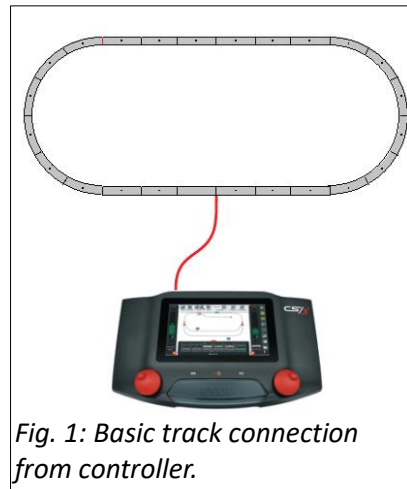


Fig. 1: Basic track connection from controller.

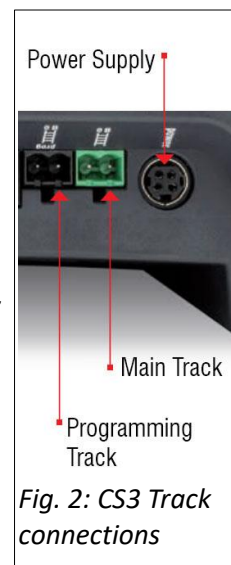


Fig. 2: CS3 Track connections

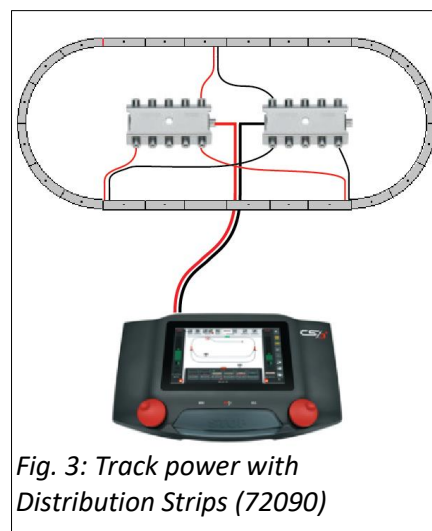


Fig. 3: Track power with Distribution Strips (72090)

eliminate added power interference caused by connection points (in this case, track to track connections). It is like the power transmission lines around the country that feeds into distribution stations and deliver power to your home. Figs. 4 & 5, give you a couple of examples on how these can be wired.

Fig. 4 creates a ring setup; this may be ideal for tabletop layouts where you can have equal access around all sides. Fig. 5 displays a single trans-mission line; this may be ideal for shelf style layouts if you are limited to a single wall in a room.

Essentially, a power buss is a main line routing of power and whatever wiring scheme you employ will work if it offers good access to a direct line of track power.

Wire Gauge

Some folks will ask for recommendation of wire gauge (wire size). I believe standard Marklin feed wires measure between 20-22 gauge (stranded). For a buss system, you can use a thicker wire. 18 gauge is pretty good for home layouts (speaking in terms of H0 gauge operations).

I know some who use 14 gauge for large operations, it may or may not be overkill, I cannot say. For larger scale trains? Probably not. Just be aware that you will need to be able to splice or connect to the main buss, especially if you are going to be using insulated buss wires (as opposed to bare wiring). The thicker gauge wire could have thicker insulation which could be more cumbersome to work with.

I am currently using two-piece T-connection plugs (see fig. 6). I will not make any parts recommendation, but you can do a web search for “wire T connectors” or “T-connection wire connects”. For these, the 18 gauge works great, whereas they do not clamp on 14-gauge wire (btw, 14-gauge is about the size of wire used for a house lamp). You can buy the t-connects for different gauge wires.

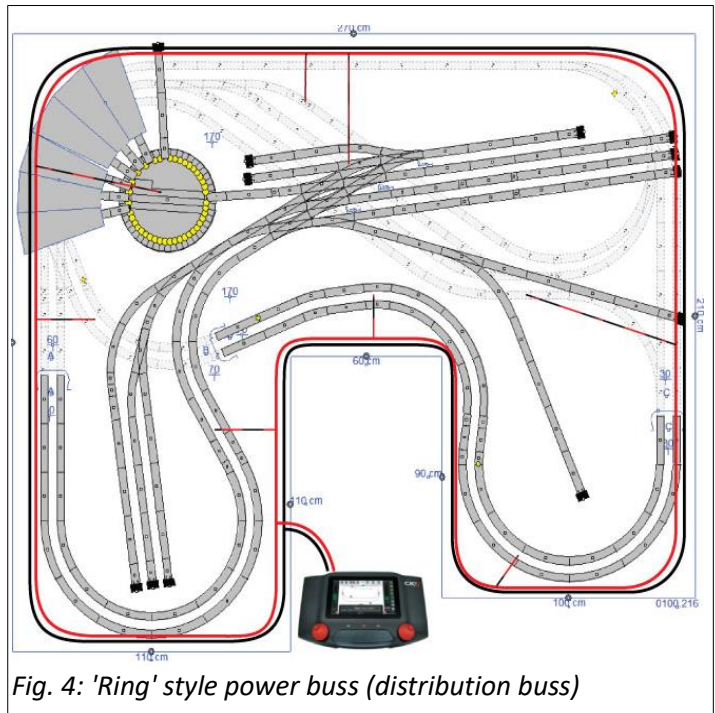


Fig. 4: 'Ring' style power buss (distribution buss)

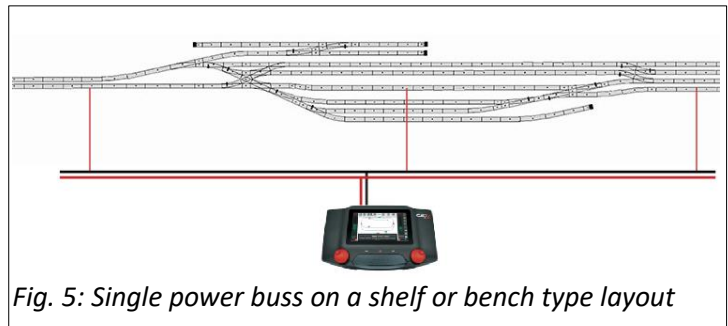


Fig. 5: Single power buss on a shelf or bench type layout

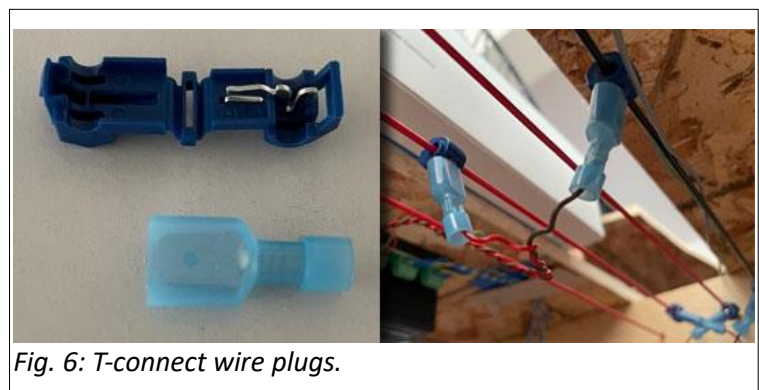


Fig. 6: T-connect wire plugs.

Larger Layouts that require Boosters

Larger layouts that need digital boosters do not require a full set of additional power buss wires. You will only need to wire a separate buss line for the Center rail (red connection for Marklin 3-rail track), or the negative (blue for LGB) wire for 2-rail systems. You can see that I have two booster busses plus my main control power on my layout (also shown in Fig. 6). Fig. 7 illustrates how booster and power busses are wired together along with the CS3.

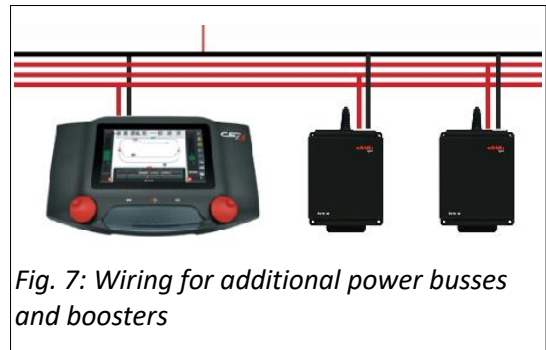


Fig. 7: Wiring for additional power busses and boosters

When you add boosters, you will need to be able to isolate the track sections from each power buss line using track insulators or separators. Like the booster, the insulators only need to be applied to the different power line.

To wire booster sections to track, it can be more subjective depending on your layout needs. I usually try to sort out an even distribution of power 'load' when the trains are in operation. In some layouts it could be a loop load, in others, a balance load. Maybe even both, the point is, it is essentially a user preference. Here are some examples of how you can distribute boosted sections which include where the insulators would be placed. I will color code the tracks to show the breaks between boosters (Fig. 8). You would distribute track feeds around each powered area as described earlier.

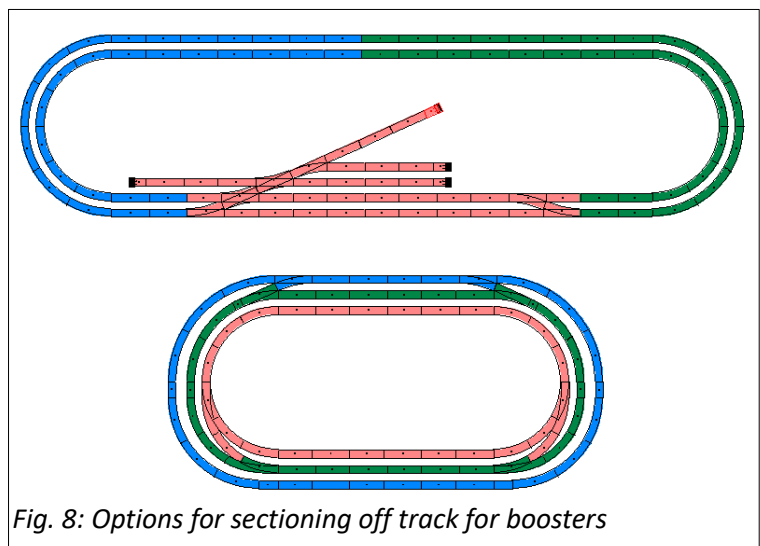


Fig. 8: Options for sectioning off track for boosters

Connecting Slow down or Stop Sections

Connecting stop sections of track often gets confusing because there are three general approaches. The common connection is to control stop sections via signal light or semaphore. I will not discuss this option here, because it is generally covered in the signal manuals. The other two methods are less defined in manuals. First is a stop section using an M84 as a control, the other is a Brake (or slow down) module that is controlled by an M83. I include these setups in this article, because they both require access to track power and are special cases.

Stop Sections

Simple stop sections can be digitally controlled via the M84 module (#60842). M84's can be directly connected to a power buss to receive the code instructions from the CS3. The

outputs for the track connections are displayed in Fig. 9. The center connection on the M84 will be wired as a track power input on a non-switching section of track (or directly from the power buss if you like). The red or green connection on the M84 will be the switching output. In the configuration shown, when the output is set to green, you supply track power to the stop section. When you switch the output to red, there is no power redirected to the green output and the stop section is powered off.

There is a CV setting in the M84 which will allow you to configure the module for 8 independent switches. Refer to the M84 manual or one of the digital newsletters for that info.

I have also included in the illustration, something that you may wish to consider when placing the stop track. Stop tracks cut power to the center rail where the slider (or ski) makes contact. The placement of the slider under the Lok (blue stripe) will indicate stopping point of the Lok. However, the physical front end of the Lok will not be at the same point. This may affect how the Lok appears with the placement of a signal or turnout in relation to the stopping point. The three signals in the illustration are options of where one could place a signal. For example, the far-left signal may work well with the electric Lok, but not for the steam engine. Just something you should keep in mind.

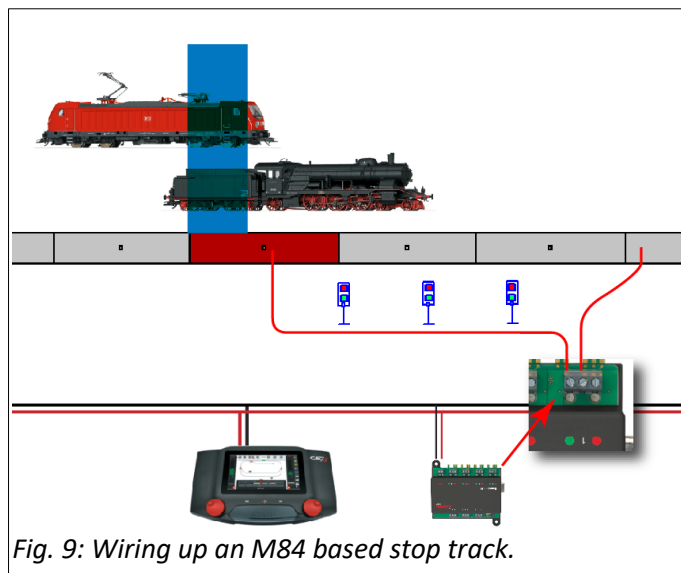


Fig. 9: Wiring up an M84 based stop track.

Slow Down Tracks (Braking Sections)

The use of stop tracks are the first steps in block control, they prevent trains from having double occupation a single section (or block) of track. The stopping motion, however, can be abrupt. For advanced users, you may consider using a slowdown module. This adds a section of track where the Lok comes to a gradual stop. The track wiring for a brake module is quite different from the simple M84 stop track. Two main differences with wiring the brake module is that it is controlled by an M83 and it requires 3 isolated sections of track.

Fig. 10 (Next page) shows a complete wiring scheme for use with an M83 and Brake Module (#72442). I have altered the colors of the power buss wires slightly for diagram clarity. The diagram is set up for brake module only and does not include connection to a signal. This is because you can use a signal to control the brake module, the BM can control the signal, or you can independently control both via event script in the CS3. The latter is my preference of operation.

Other considerations about the diagram. You will need to have center rail insulators (contact separations) at each end of each colored section of track. The blue bar indicates the stopping range for an engine, because you cannot accurately set where the train will come to a halt (except for the red section of track which will have its center rail power cut off). The description regarding the location of a signal to stop section described in the previous section holds true for this set up.

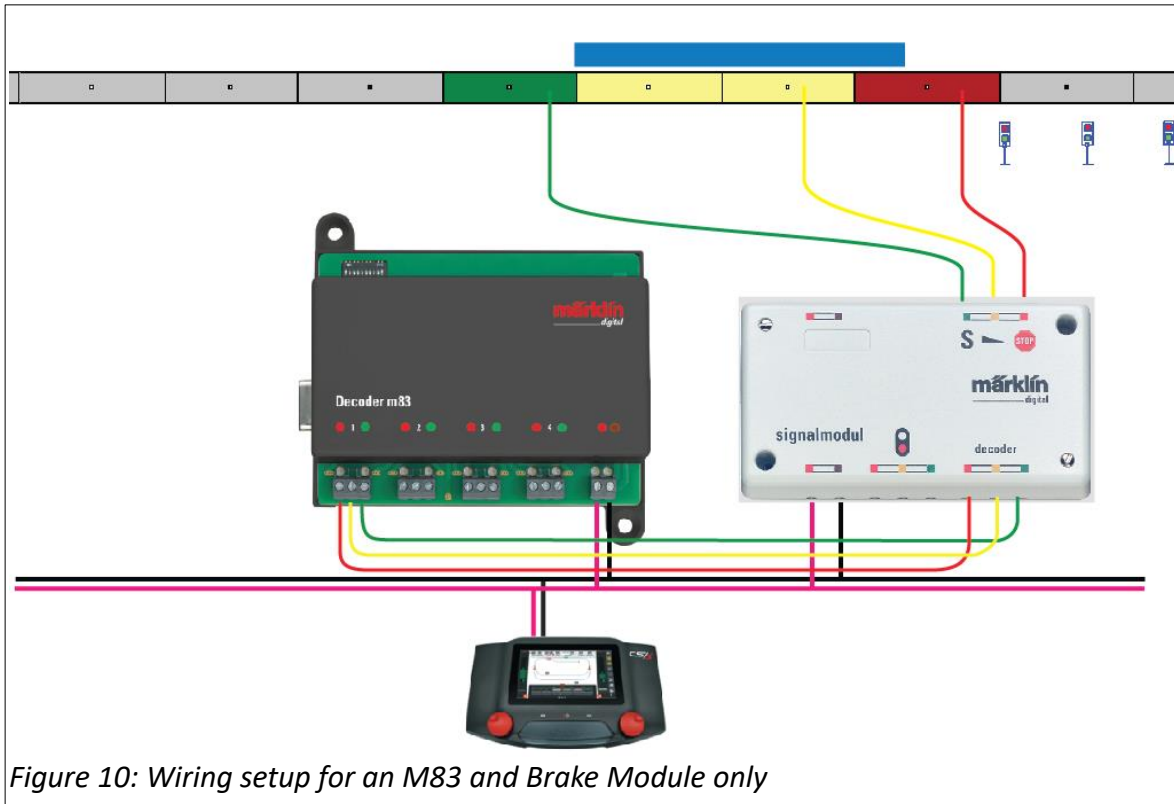


Figure 10: Wiring setup for an M83 and Brake Module only

Braking vs Stop Sections

Brake modules are ideal for visual impact when you can watch as a train slows to a stop, but you will not need one if a train is stopped in hidden areas such as a hidden staging yard. I mentioned the stopping point location of a train regarding a signal. This combination (signal/stop point) is rather useless in a hidden area because you will not see a signal in a hidden location. But the concept will be important if the stop section is near a merging turnout (in this sense, an entry point). You will want to be sure the train stops without blocking the point.

One final note regarding track power. Digital layouts will suffer more from a degraded control signal (the digital commands), before showing signs of diminished power. If you have errors with commands being received by your devices, then it is likely that your command signal needs reinforcing. This can be accomplished with feed wires or boosters, depending on what the fault is. And, as we sometimes say, check for dirty track first. With that, enjoy your hobby.

Curtis Jeung

Upcoming Appearances:

Märklin Digital Webinar #13

Customer Q & A

June 9th 11:00 – 1:00 Pacific Time

Login details remain the same.

Euro Train Swap

July 24th – 25th 10:00 – 4:00

Chrissa Imports Beer and Wine Warehouse

280 Harbor Way South San Francisco, CA

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

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