



# NEWSLETTER

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**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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We have not attended many shows since November, but we are getting back to it by attending the Rocky Mountain Train Show in Denver. Even though Spring has arrived, and Easter is past, many are still inside due to the weather, and we cannot wait for warmer temperatures!

Our first article tackles a difficult conversion from analog to digital and is for the more experienced hobbyist since special machinery is required. Our second article is all about Signals and Semaphores.

As many of you know, some conversions are easier than others and each one has unique challenges. So far, my articles have been about easier conversions, as in ones that can be done with standard tools. This conversion, however, is for the more advanced modeler.

## Difficult Conversion – Analog to Digital

As with anything new process, there is a learning curve. In this article, I will show the different variations I have come up with for a märklin EP 5 (E52) as seen in Fig. 1. I have converted a couple of these in the past few months so fortunately I decided to take some pictures as I was doing one.

The problem with this locomotive is the powered truck. There is only one mounting screw behind the truck, and



Fig. 1 - Märklin E 52 (Ep-5)

it is behind the drive wheels. That means as the wheels pull the train, the two front drive wheels may lift and sort of do a “wheelie”.

Märklin solved this by installing a spring that mounts on the frame and pushes the AC field magnet up to pivot the truck down for proper traction.

The solution works well except when converting this locomotive to digital. The reason is the magnet for the 60941-motor kit is much smaller than the original AC field coil so there is no place for a spring.

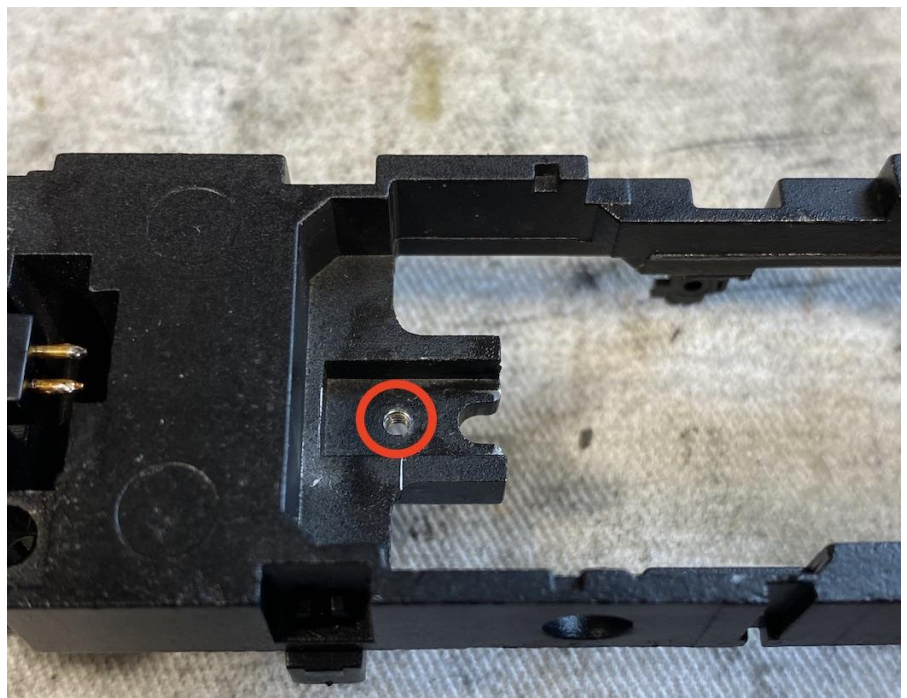


Fig. 2 - This is where the spring mounts

As with anything, people come up with their own solutions for this problem and it usually involves just leaving the spring out and hoping for the best. I like to think that the spring is there for a reason so I would like to keep the integrity of the locomotive intact. Here is my solution.

### **The Mounting Problem**

Figure 2 shows the stripped-down frame of the E52 (3366). The circle indicates the lower mount for the spring. Originally the spring is captured by the frame and field coil so there is nothing holding it in except for maybe the tip of the screw that mounts the bogie.

Since the top mount is gone once the field coil is removed, I needed to make a receptacle for the top of the spring and mount it to the bogie somehow ... simple enough.

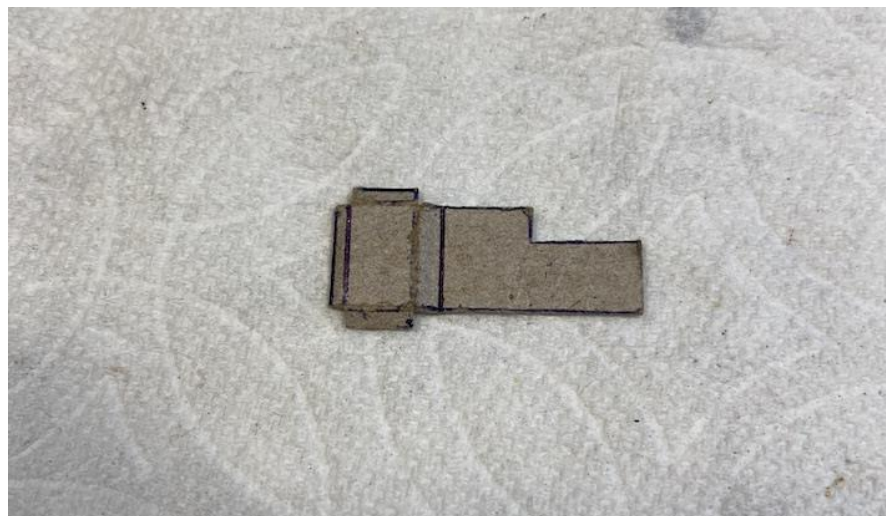


Fig. 3 - Spring holder template

I took some measurements of the spring and made a template out of cardboard (Fig. 3). This allowed me to make modifications as needed.

Once the cardboard template was test fitted, I used it to cut out some brass shim stock to form the holder for the top of the spring. I was able to bend it to create a holder for the top of the spring by making a cup (Fig. 4 and 5). The tail of the holder will slide under the magnet since there is just enough of a gap and be allowed to float so the bogie has a full range of motion with no chance of binding (Fig. 6).



### Machine work

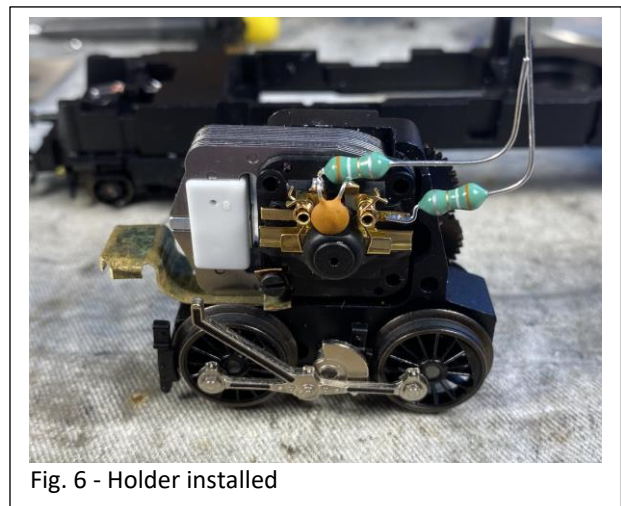
Now for the hard part, I removed some material from the frame to allow room for the spring since the holder is a little bigger than the original AC field coil. This also meant the spring would be slightly farther back in the frame so more material would need to be removed. Figure 7 shows the frame after milling and Figure 8 shows everything installed.



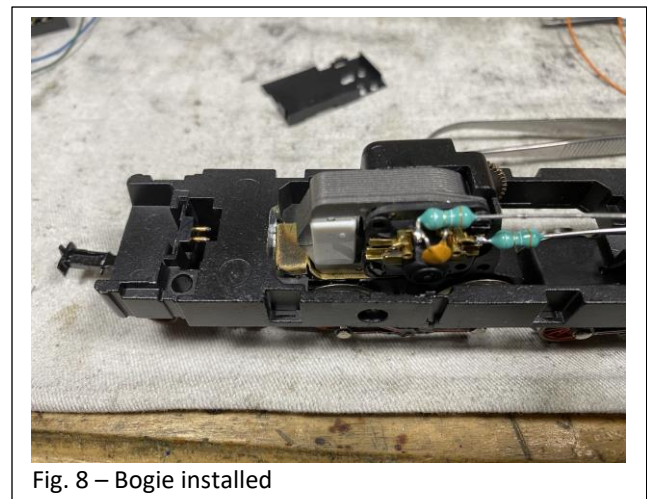
I do have to admit that I did not like taking out material since there is only one mounting point for this motor, although I did not really take out enough material to compromise the frame, one good drop from the layout and the motor could break the mount from the frame, but that is the way it is originally also.

I need to say that this worked great for the earlier versions of this locomotive (3366) however, I ran into a problem when I had a later version.

It appears Märklin faced the same problem when they made a digital version of this locomotive. They made modifications to the frame to allow for the spring to hold the motor. The problem is, when they did this, they also made an analog version with the old motor and the new frame.



When converting the newer analog locomotives, there is less material holding the motor. Removing as much as I did on the 3366 was not going to work. So, back to the drawing board.





## Holder v2

What I needed to do was make my spring holder smaller but still hold the spring and give the bogie full range of motion. What I decided to do was to just hold the spring down and not capture it with the sides of the holder. Instead, I drilled and tapped a hole for a screw to hold the spring (Fig. 9 and 10).



Fig. 9 – Holder v2

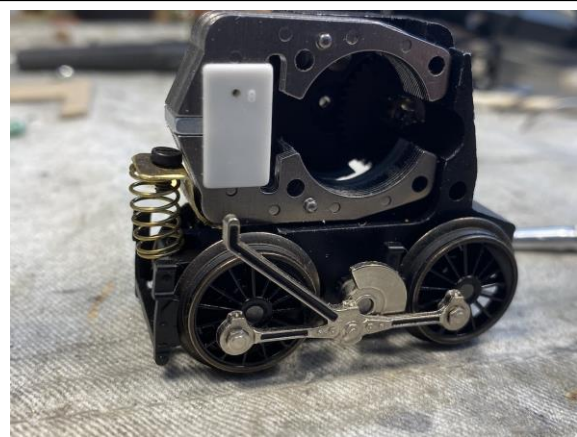


Fig. 10 - New holder installed

Well, I must say that this version of the holder was very short lived. As one would think, there is very little brass material to cut threads into, so the screw could easily vibrate out. I didn't want to glue in the screw either. This would take more time since it would have to dry, and it is not a very "clean" solution. On to version 3.

## Holder v3

I knew I had a solid plan with the last version, but I needed to make the spring stay on the holder. It occurred to me that I didn't have to drill a hole for a screw or pin when I could just make a dimple to hold the spring.

It took my center punch and tapped a dimple in the holder where the plate is for the spring (Fig. 11 and 12). Since I knew the tail worked well, I thought this modification would be best. It also was quicker and easier to make since there is less bending and drilling.

The last thing I needed to do was to mill the frame of the newer locomotive. Since the holder was much smaller, I would not have to take out as much material, therefore keeping the integrity of the frame.



Fig. 11 – Holder v3

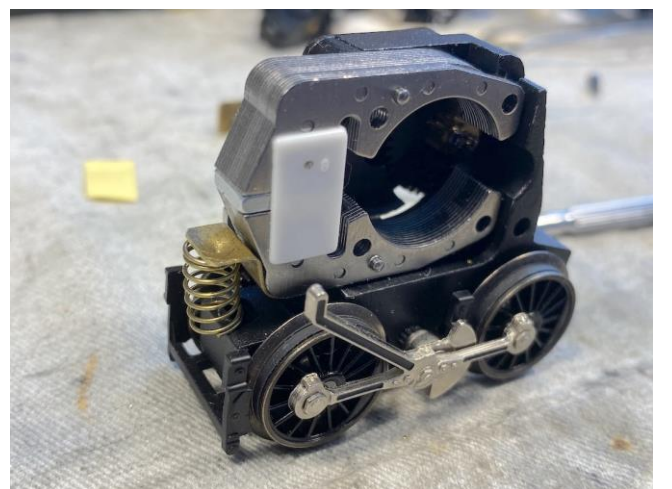


Fig. 12

As seen in Fig. 13, there is significantly less material taken out than in Fig 7, and fig. 14 shows where the holder goes without the magnet installed.



Fig. 13 – Less material removed

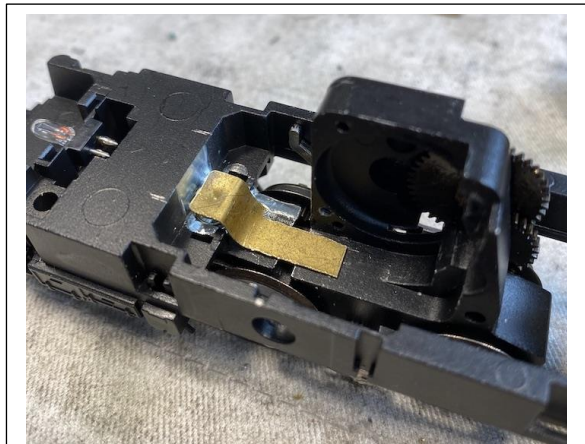


Fig. 14 – Holder placement

### Other Modifications

So, I was almost done but what I discovered was that the spring would push the motor down too hard. This caused the rear wheel of the bogie to lift. The only solution was to shorten the spring. I ended up taking off two full loops of the spring to get the correct tension to make the wheels sit level.

My next problem was where to mount the decoder. With the orientation of the wires in the mounting plate of the 60977 decoder, there was no hole to screw the holder down. I drilled a hole and tapped threads into the frame (Fig. 15 and 16). Again, this was quicker than glue and was a cleaner look.

Once the wiring was complete, all that was left was to put the body on and ship it to the customer (fig. 17).

I hope this gives an understanding of a digital conversion that would be more difficult than the average user can do. Most of this kind of stuff is trial and error and having the right tools.

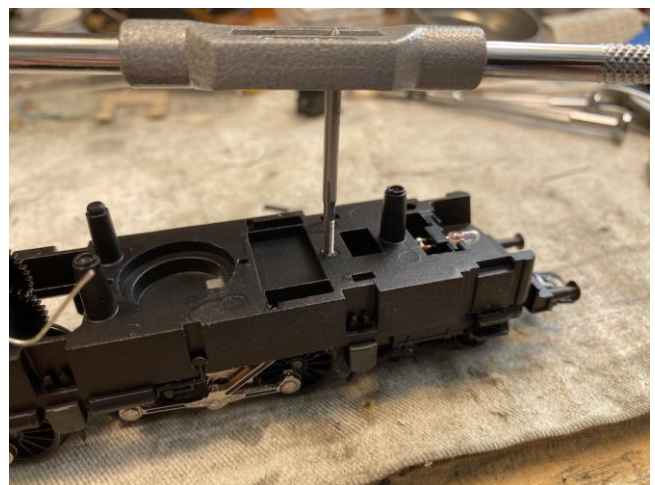


Fig. 15 – Drill and tap

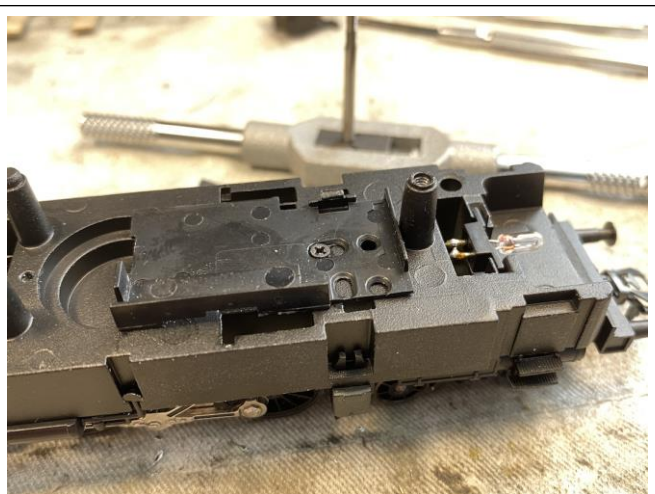


Fig 16



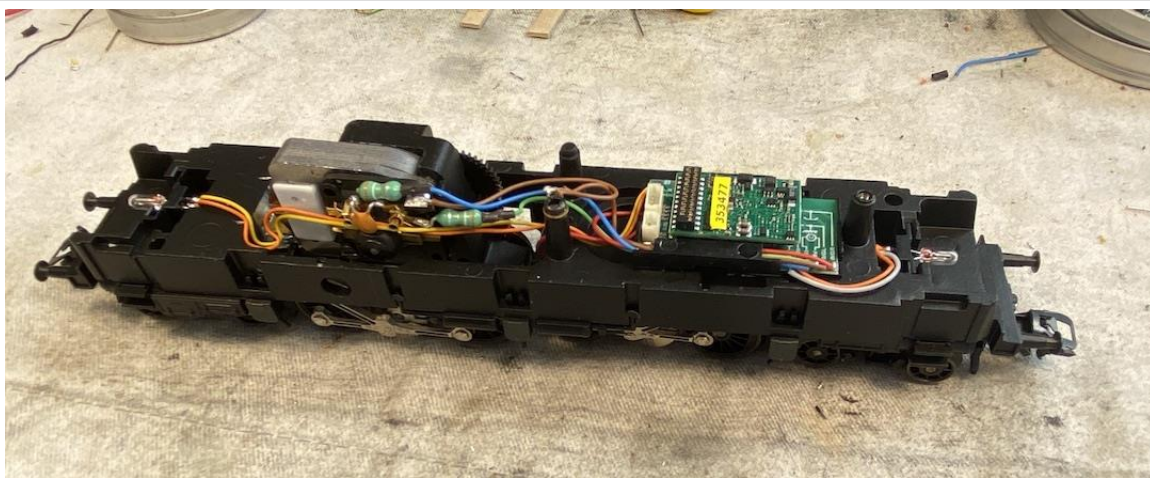


Fig. 17 – Wiring complete

I would hate to attempt this modification without a milling machine, and I cannot imagine trying to dig out space in the frame with a handheld grinder. This is why I say that most people would probably leave the spring out, which might work for them, but I think that if someone is sending a locomotive like this out to be converted to digital, they probably expect it done right.

Lastly, one might ask why I do not just order the parts from the factory to convert the newer locomotive frame to the 60941 motor and this is a very good question and honestly, I did not know there was a newer version of this locomotive frame until I did this last conversion.

For this article, I started researching this newer locomotive. As it happens, I have one in my collection (apparently, I have too many items to remember).

I located my locomotive and took it apart and it has the newer frame and the 60941 motor installed from the factory. What they have done is installed a plastic holder for the spring and mounted it sideways to push the bogie down. I never thought of that. Once I saw this, I looked at the exploded view to find that the parts they used aren't in the drawing. I also looked at other models and I could only find the spring as a part.

In the end, I do not know the part number is for the spring holder, so I cannot order it as a part. This would only work for the newer frame anyway. So, for now, until I can figure out the part number, I will do it my way.

**Enjoy your hobbies!**

**Rick Sinclair**

## Märklin's Signals and Semaphores

In this article, I will discuss the offerings that Märklin has for H0 gauge Signals and Semaphores. Fig. 1 & 2 shows the 764xx series of signal lights and may be listed under these classifications:

Track Block or Yard Signals: 76471, 76472

Home or Block Signals: 76491, 76495

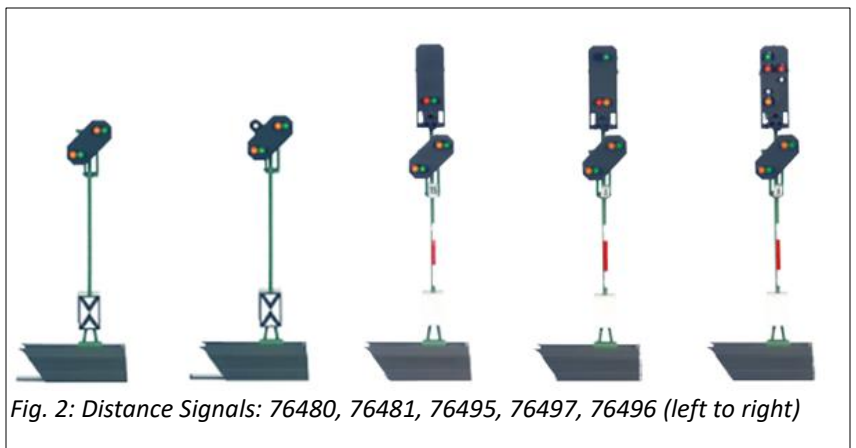
Entry Signal: 76493, 76497

Exit Signal: 76494, 76496

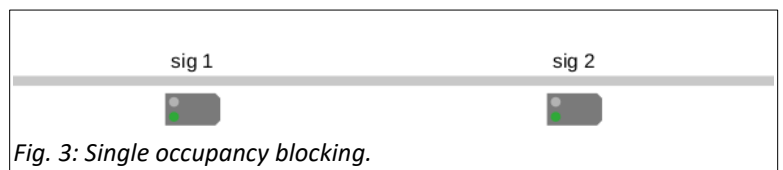
Distance Signals (only): 76480, 76481

(I will not reiterate the products that combine a distance signal).

In general, a signal is used to control traffic within a block of track. I define a block of track as a line of track where only a single consist can exist. In an interesting bit of research, I found this quote, *"Without the signals, successive trains have to follow by time interval, a rule still used in North America, but which has not been allowed in the UK for over 100 years."* Which leads me to state that certain comments are a generalization and not meant to address specific regional rules.



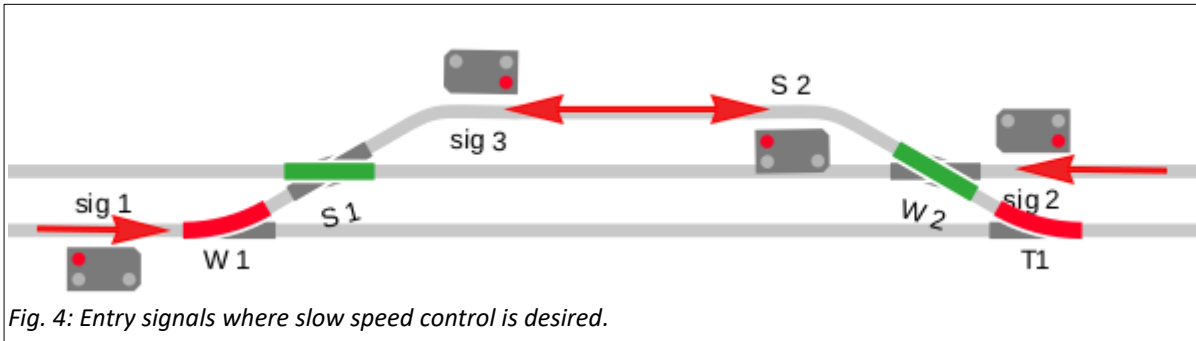
The basic block signal has two aspects only, Stop or Go. These are found in the simple, two aspect signals. Placement for these signals tends to be along main line routes where only a single train can be held on track (Fig. 3).



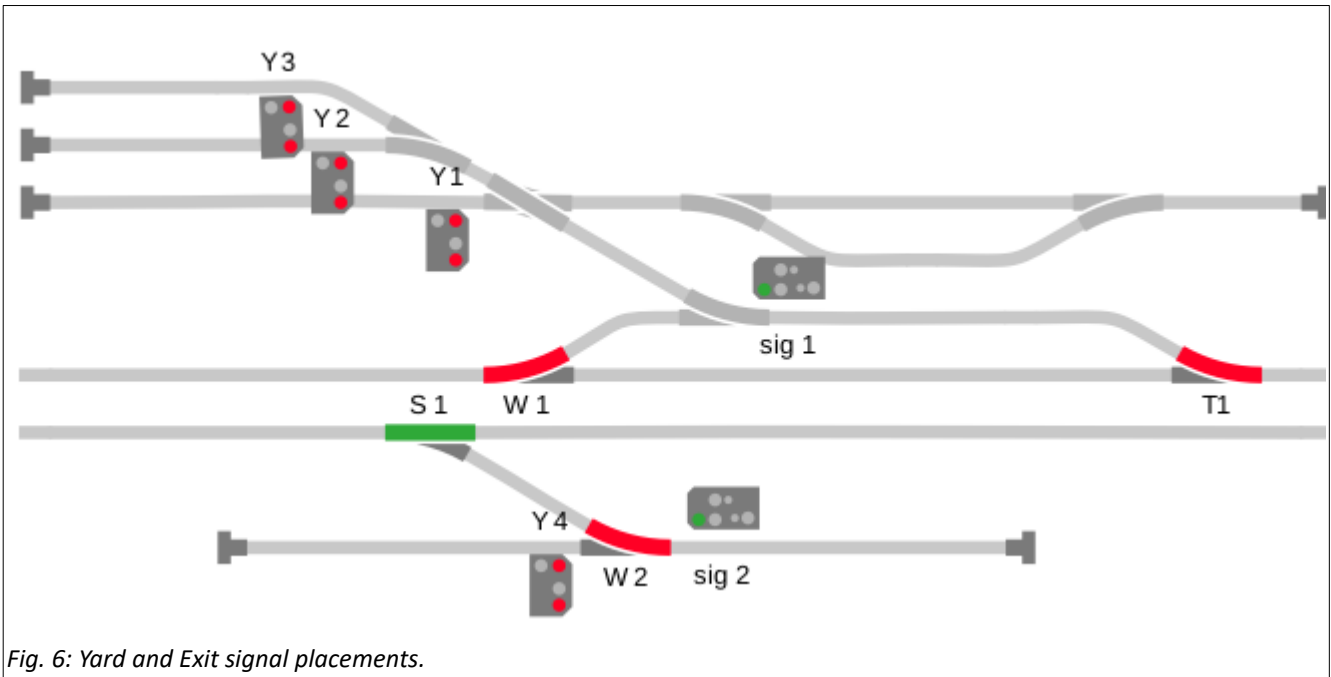
The first added signal command is the proceed slowly command. The speed is usually regulated depending on railway rules and/or through signage located along the rail lines. The signal aspect is found on the Entry and Exit signals.

The placement of these signals on your layout can be determined by the logic of where trains need to be operated at a safe speed. In the case of an Entry signal, a mounting point before entering a yard or station (Fig. 4).

Also, an entry signal from a branch line onto a main line could be considered over a simple block signal.

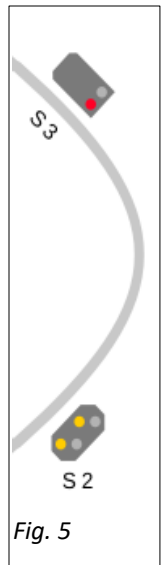


The exit signal is similar in operation to the entry signal but has an additional signal aspect which allows for switching Maneuvers. The placement would then be reserved for placements around entry or exit points where shunting maneuvers are allowed.



The exit signal is not necessary for the main switching or yard lines. In those instances, the yard signals will be used. Fig. 5 illustrates the different applications between both the Exit signal and the Yard signals.

Distance Signals are to be used where direct line of sight to the home signal is not adequate to react accordingly. An example is not having enough track line for a train to decelerate or stop, or if the signal is hidden around a curve, then you would want to place a distance signal to indicate a home signal's setting. Distance signals can be set to display 'proceed', 'stop' and some may be set to 'proceed slowly'. Fig. 6 illustrates an example of what this setup is like.





## Programmable Settings for the 764xx Series of Signal Lights

The programmable Signals in the 400 series lineup have some customizable settings beyond addressing. The light level can be controlled for brightness or dimming. There are a couple of settings for the switching behavior. Mainly you can control the timing duration for the light switching action. There are 4 settings between immediate and .5 seconds to switch between the two aspects. This would work in tandem with the crossfade behavior of the light switching changeover. For example, the crossfade can be simultaneous whereas one light fades off, the other would slowly fade on. Or you can set it as a sequential fade where one light will not turn on until the other is completely off. This can also have a slight delay in between.

## Semaphores

Semaphore signals are ideal if you like an older visual style to your layout. They can also be referred to as Target Signals (this just strikes me as something that encourages some bad behavior). They come in handy for identifying signal aspects in locations that may be hard to see. Signal lights can be faced away from you with no indication on their settings, while semaphores are easily read from any direction.

Märklin's semaphores are offered in two general styles: A Narrow Mast, and a Lattice Mast. The details are somewhat hard to see in the image in Fig. 7. The narrow mast has a narrow rectangular footprint with a ladder style beam look (left side). The Lattice has a square footprint, and you can see the lattice work (right side).



Fig. 7: Narrow and Lattice Mast detail

Within these two general styles, you can choose between single arm and double arm models. Single arm models have only the simple home signal aspect, stop or go (red or green). The double arm semaphore adds the possibility of a Proceed Slowly command, thus Red, Green, or Yellow.



Fig. 8: Single - 70391, 70392 and Double - 70411, 70412 Semaphores

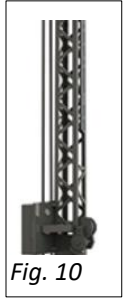
The collection has Distance Signals and yard signals. All signal heads are elevated on masts. The distance signals can be purchased with (70381) or without (70361) a proceed slowly aspect. All Semaphores with a proceed slowly aspect are controlled by two independent servo motors.

In addition to all the described semaphores, there are duplicates of each that are equipped with grey masts instead of green. The corresponding product numbers for the grey mast semaphores are: Single arm - 70393, 70394; Double arm - 70413, 70414; Distance - 70382, 70362; Yard - 70422. An example of this grey mast coloring is shown in Fig. 10.



Fig. 9: Distance Sigs - 70381, 70361; Yard Sig 70421

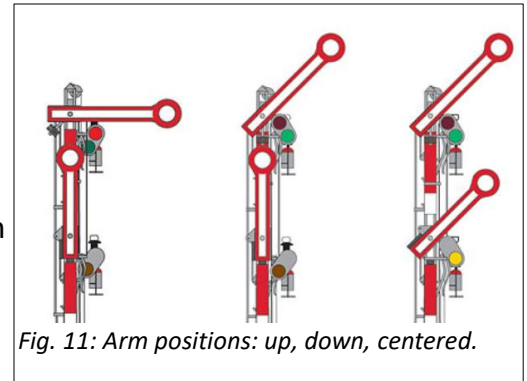
Track locations for the semaphores can be applied with similar use as described in the Signal Light section of this article. Block signals would use the single arm signals, where double arm signals may be used around stations, depots, yards, and any other locations requiring speed restrictions. There is no comparable semaphore signal to the Exit Signal Light.



### Programmable Settings for the Semaphore Signals

Adjustable CV settings for the semaphore signals include a brightness setting for the light intensity, but also contain special controls for the arm movement and position of the arm at its center of movement.

A description of the semaphore movement controls is: Slow, medium, and fast movement. Medium fast and fast movement with an arm bounce at end of motion (these can be set independently on models with two arms/servos). There is a centering setting for each Arm which controls the center angle of the arm. An example of how this looks is shown in the diagram shown in Fig. 11.



**Curtis Jeung**

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### Upcoming appearances:

- **ONLINE Webinar**  
April 12<sup>th</sup>, 2023
- **2023 Trainfest in Milwaukee, Wisc. has been cancelled – We were informed of this a few weeks ago and thought it was good to pass along. Hopefully, the show will return in 2024**

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

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