Current Central Station 3 Version – 2.3.1 (8)
Current Central Station 2 Version – 4.2.13 (14)
Current Mobile Station 2 Version – 3.121

Our first article conquers a pesky problem with converting a couple of early Märklin models while our second article is on Updating your CS2

18.4 (S 3/6) Motor Upgrade

I received a couple of locomotives to upgrade for a gentleman who didn't feel comfortable completing (Fig. 1). They were Märklin 3092 and 3111. While many people like the 18.4 (S 3/6) locomotive models, these are two that are particularly difficult to convert if a 5 pole hi-efficiency motor is desired.

While a 60944 motor conversion kit is correct for this locomotive frame, the problem is that the motor is too wide and there isn't enough clearance between the body and the brass components on the brush plate. This will lead to a short or the motor running at full speed and possibly, the worst thing, decoder damage.

While many have tried to overcome this by grinding the inside of the body for clearance, or removing a couple of field magnet plates, these techniques just do not usually end well for many reasons. I have been down this road too many times and I began to dislike these locomotives for those reasons.

After looking at the problem, I realized that I needed a brush plate that had the motor springs coming from the bottom instead of the top. I have seen a fix where the person removed the brush plate components and placed them at the bottom, I didn't feel comfortable removing them, turning them 180°, and gluing them back on.
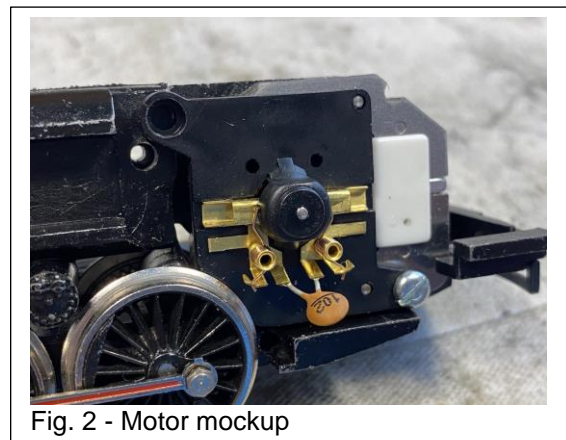

Fig. 1 Locomotive from customer

Fig. 2 - Motor mockup

I started looking at the one brush plate that Märklin makes where the components are at the bottom. It is the motor kit that comes as part number 188838. It has the wrong armature, and I will have to use the 8-tooth armature from the 60944 motor kit (part 210888). After looking to see what else would be needed for this to work, I noticed that all I had to do was to drill one hole and tap some threads into it. How simple is that? Below it the technique I have come up with.

Let me just say that this is an "advanced technique", and you should not try it without the proper equipment. If you choose to do this, you do so at your own risk.

First, I start by installing the armature and brush plate (Fig. 2). I had to use a longer screw for the lower hole. The one I had laying around was silver, but I did replace it eventually with the correct black screw from the 60944 motor kit. Once the lower screw was in place, I found the natural center where the armature turned freely by moving the brush plate on the pivot of the lower screw.

Next, I used a #32 drill bit (because it is a snug fit in the brush plate hole), I was able to twist the drill by hand to locate the center of the brush plate hole (Fig. 3). This is where I will drill (Fig. 4). Before I removed the brush plate, I scored a line on it using a hobby knife and held it against the wheel as a guide (Fig. 5). This line is where I need to cut the brush plate, so the wheel doesn't rub.

Once I knew where to drill, I could proceed. This is the part where I say that most people shouldn't try this. At the very least, one would need a decent drill press. I will be using my milling machine for the next step. For some reason I didn't take any pictures of me drilling the hole, but I drilled it using a #46 drill bit. In the position that I marked out.

Next using a 2.5mm tap, I gently cut the treads into the new hole (Fig. 6).
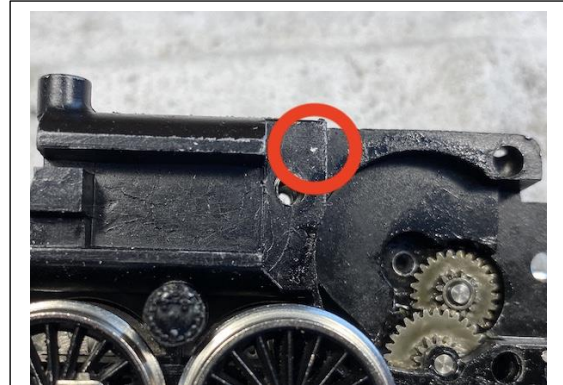

Fig. 3 - Finding where to drill

Fig. 4 – Drill hole location

Fig. 5 - Scoring a line for clearance

Fig. 6 - Tapping the threads

Once the machining is complete, I can modify the brush plate. Before I do anything, I want to enlarge the upper hole in the brush plate. The original screw that was designed to go into this hole has a smaller head, so I need to make room for a larger screw head. I am not drilling all the way through the brush plate, I am only enlarging the hole to the shoulder inside it. I use a #11 drill bit and turn it by hand so I can control the depth (Fig. 7). If I used a drill, the bit might grab and drive itself through the brush plate.

Next, I simply cut the clearance for the rear drive wheel with my wire cutters. I used the line that I scored earlier as a guide and cut a straight line across the brush plate (Fig.8).

Fig. 7 - Enlarging the hole by hand

Fig. 8 - Cutting wheel clearance
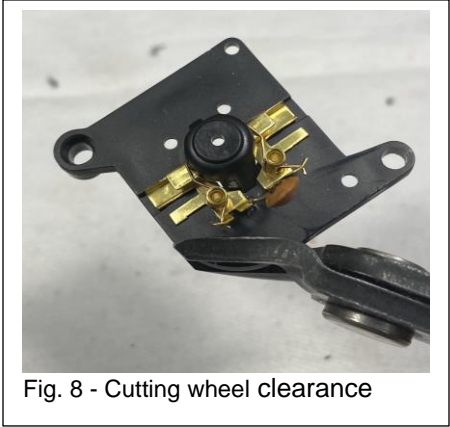
Now that the hard part is done, I need to make sure the body will fit on the frame. As you can see in figure 9 and 10, when I look down the frame, the brush plate doesn't have the same curve. This is where the brush plate and screw would contact the body and prevent a proper fit. While the curve of the brush plate doesn't have to match the body curve exactly, it does have to be close enough to fit without interference.

Fig. 9 - Removing the sharp edge

Fig. 10 – Sharp edge removed
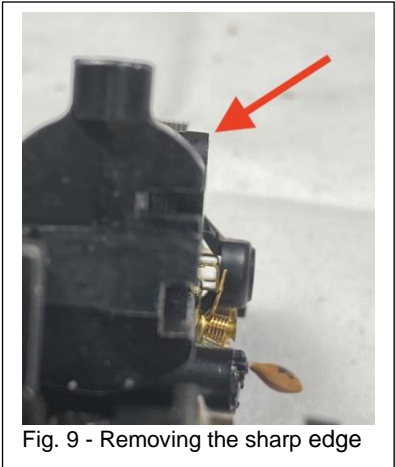
I start by filing down the area of the screw hole and along the sharp edge on the top of the brush plate. Once I get the shape I want, I can work on the screw. I need to install the screw as I would normally so I can mark where to file (Fig 11). Since I am not filing down the entire head, I need to make sure I have it seated correctly. After this is done, I just need to file down the screw to match (Fig. 12).
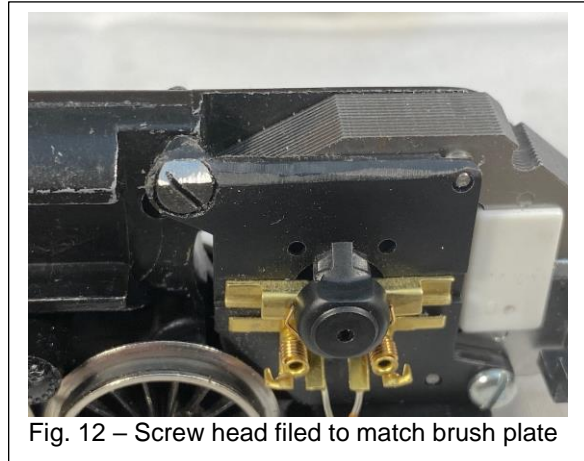

Fig. 11 – Fitting the screw

Fig. 12 – Screw head filed to match brush plate

To test fit the body I need to make sure that there are no "high spots". This is done by simply installing the body and rocking it from front to back. If there are no high spots, then the body will not rock.

The only high spot should be where the screw is, and I can see the pivot point if it is touching. In figure 13, I have pointed out on the outside where the screw/brush plate contacts the body.
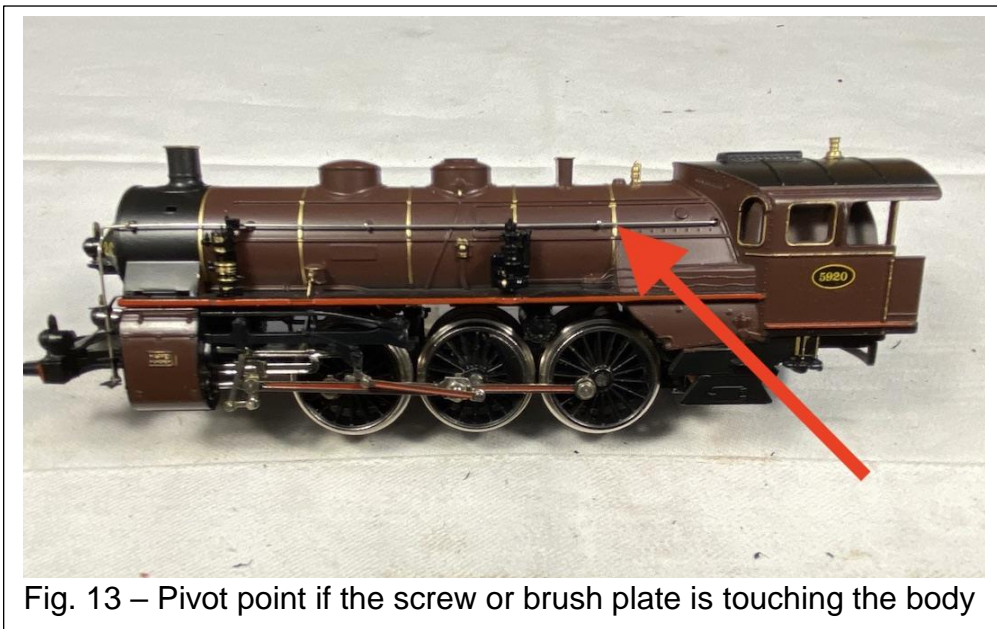

Fig. 13 – Pivot point if the screw or brush plate is touching the body

Once the body is fitted correctly it is easy to see that the brass components on the brush plate are nowhere near the body (Fig. 14). Now I can begin the decoder upgrade. Fortunately, the decoder install is standard (Fig. 15).
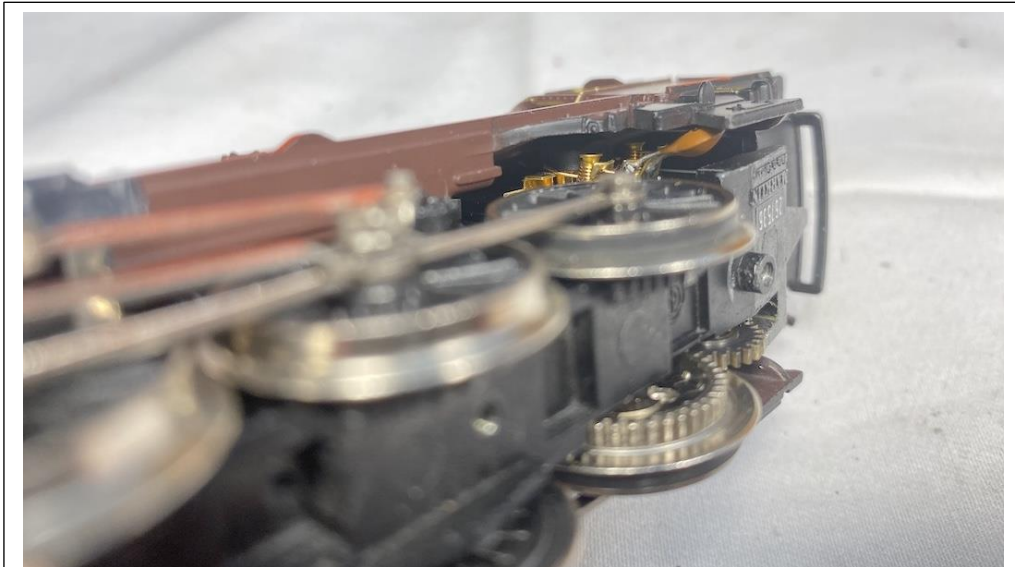

Fig. 14 – Brush plate clearance improved.
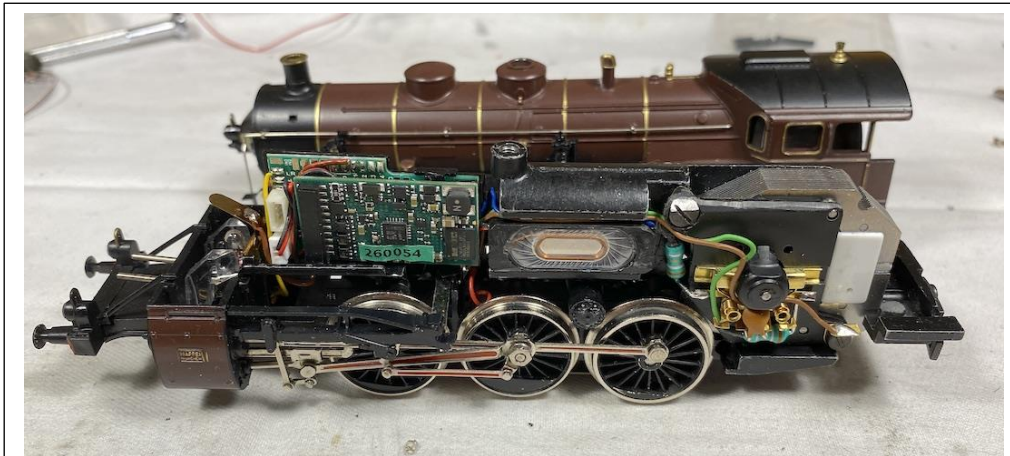

Fig. 15 – Ready for a decoder.

Fig. 16 – Here is an after picture

As you can see in Figure 16. There was a little more work installing a sound decoder. Conveniently this locomotive doesn't have rear lights and the tender just hooks on. This means there are no wires for rear lights going to the tender and no speaker wires since the speaker is in the locomotive.

Enjoy your hobbies!

Rick Sinclair

CS2 Updated Tips and Tricks

In this month's newsletter, I will be discussing some topics that come up with regards to the Central Station 2. While the CS2 may be considered the 'old' controller, it is still relevant for those who may not have the desire to have the shiniest coin in their pockets. I will reveal some updated features that have evolved in Märklin's digital capacities, as well as offer up some ideal tips on dealing with components that may not have been displayed in the original manuals of the CS2.

The first thing that you may want to do with your CS2, would be to ensure that the software is at its latest version. For the CS2 the software version is currently at 4.2.13 (14). Having a current version of the software can often resolve some loading issues regarding the current mFX decoded devices (Loks, Signals, etc.). You will find the software version by looking into the Setup/Version Panel (See Fig. 1).
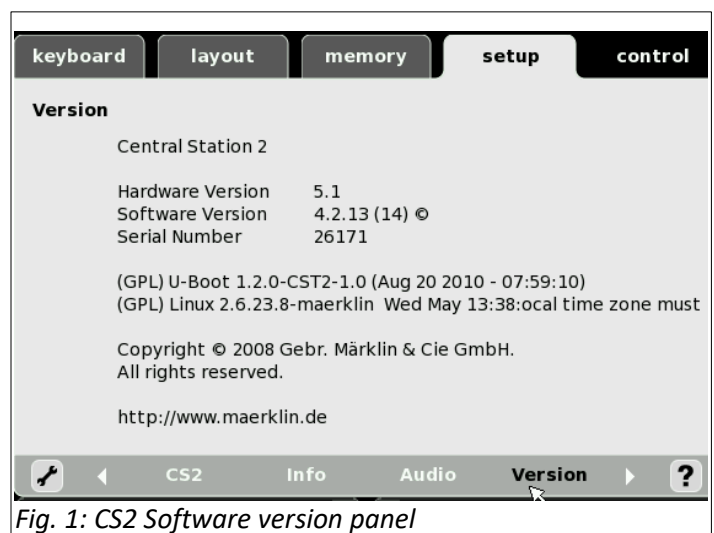

Fig. 1: CS2 Software version panel

Lok Functions

For locomotives, the CS2 adhered to the function limit (back then) of 16 functions. Current mFX decoders have an extended function capability of 32 functions. The CS2 needed a function range button icon added to access the extra function. In Fig. 2, I have assigned the same lok to both controllers and highlighted the function range icon and corresponding functions. Functions 0-15 on the left, 16-31 on the right. If you think that there should be 32 functions, in computer parlance '0' is a number. So, 0-31 is a count of 32 items.

Fig. 2: Accessing 32 functions on mFX decoders (if available)
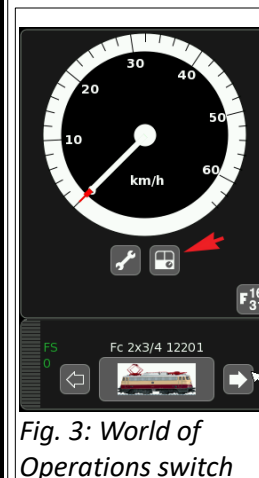
Fig. 3: World of Operations switch

You may be unfamiliar with an icon next to the Edit/Wrench button (Fig. 3 - red arrow). This is the World of Operation button that enables the Cab view for that engine. You can operate your lok as an engine operator. You'll want to be aware of some of these operation modes because they can have some side effects that may cause unnecessary concern.

Fig. 4 displays a sample of a cab view. To exit out of the WOO mode (or perhaps WoOP), simply click on the red 'X'. The choices for operation modes can be accessed by clicking on the Edit/Wrench icon. Then looking into the Operation Mode pull-down menu (Fig. 5). The options are (and affects):

Fig. 4: Sample Cab view for World of Operation0

"Without consumption" - Lok will not be affected by low fuel, water, etc.

"With consumption" - Lok speed will be affected by low fuel, water, etc.

"Maintenance... refueling" - Lok will require refueling stops.

Loks with this feature will have a World of Op manual for further explanation of these options.
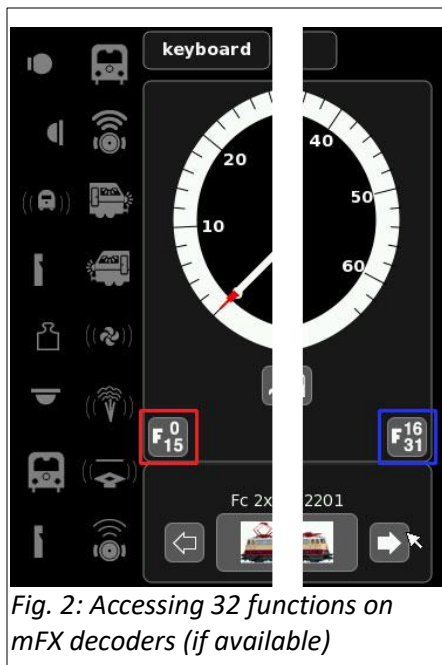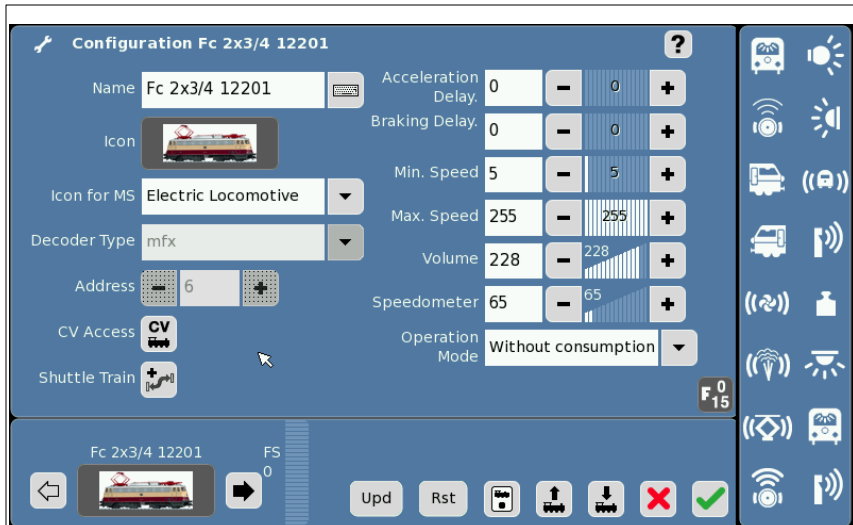

Fig. 5: Lok Configuration Edit window

Lok Edit Window Extras

Within the Lok Edit window, you can locate the 'Shuttle Train' icon. This reveals the setup window to configure a simple shuttle line for your train. This will require that you have an S88 sensor module and contact sensors set up in your layout. I will not cover the set-up instruction in this article.

If at some point you decide to tinker with the settings of your lok, then you will need to understand the CV Access button. CVs are Control or Configurable Values. These can have settings for variables that may best be left alone (like the 4+ variables that can affect motor performance).

You will also want to be aware of the "Upd" button and the "Rst" buttons. In short, the Upd button should enable a firmware update. The Rst button will reset the Decoder back to factory defaults in case you make a horrid mess of your CV adjustments. Just be cautious that you can't be too certain if the factory defaults will revert to the settings as they left the factory (thus maintaining the specific Lok type), or if they revert to a generic Lok setting (i.e. steam, electric, diesel engine). I've usually experienced the former, but I've never seen a written declaration on this (maybe I'm paranoid), and I will never know if you are dealing with a digital upgrade from a third-party installer.

Features in the Keyboard Tab of the CS2

The Keyboard tab contains the entry of solenoid accessories. This is generally described as turnouts, signal lights, lighting: anything that has switching or on/off function. When entering mFX devices, you'll need to initiate a search for mFX decoders by clicking the mFX icon (see Fig. 6). This is accessible by being in the Keyboard Editor mode, which is enabled by clicking the Wrench edit icon.

Fig. 6: mFX search Icon

For non-mFX decoded devices, you'll need to enter them manually by clicking on the location relative to the address that you want the device to respond to. Keep in mind how addresses can be blocked out when using multidecoder devices (*83 & *84 modules) which will use addresses in groups of 4. This will prevent any overlapping decoder instructions that may cause two devices to activate at once.

Non-mFX devices can have 4 different distinct address types that you need to know when entering them into a CS2. They are defined as:

"Old multidecoder" - K83, K84 with 8 dipswitch settings
"New multidecoder" - M83, M84 with 10 dipswitch settings (pre mFX models)
"Old installation decoder" - single device decoders that install inside turnout. Dipswitches on top side of decoder
"New installation decoder" - single device decoders inside turnout. Switches accessible from underside of decoder.

The Layout Section

The layout section allows you to have a graphic track plan of your Keyboard items. In general, it is a good idea to add your keyboard items in first. When keyboard elements are added, the CS2 will populate a selection list of related Layout items making layout entry faster. For example, by clicking the turnout icon in the layout editor, you'll be selecting the item/tool that's applied to the track plan. Then, when clicking on the grid surface, it pops open a 'Solenoid accessory' window with the default setting of 'create new'. If you accept these settings, you're essentially adding a non-addressed icon of the device into your track plan (Fig.7).
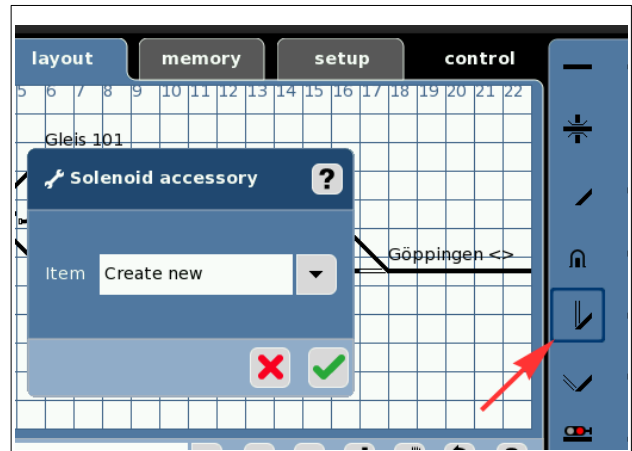

Fig. 7: Tool selection (red arrow) & Accessory selector default

If you populate the keyboard inventory first, the accessory window will populate with relative articles. Signals will not be in the turnout selections for example. The accessory window will have a selection list like the example in Fig. 8.

Navigating Layouts

Mapping your layout into multiple layout pages isn't always necessary if your layout is small or simple (i.e., very few turnouts). For large or complex layouts, its highly recommended, if not mandatory. Using multiple boards, or pages will require you to switch between boards during your running sessions. The common way that this is accomplished is by clicking on the board list at the base of the layout section and clicking the desired 'go to' board (Fig. 9). This method is okay if you need to jump to different destinations that are not in a logical sequence (point A to point B). If you wish to quickly switch from a set of sequential boards, in other words, board A goes to board B, then there is a faster way.

Fig. 8: Populated selection list

Fig. 9: Layout Control Board list

Located at the top left of the layout edit panel, is the 'Reference to track control board' tool (Fig 10). Simply put, it is the board linking tool. To utilize this tool, place this item into the layout grid at the end of the line which connects to the section of the destination board. The 'Reference to track control board' dialog box will open. Then, select from the 'Name' list, the track board which the link will connect to. This does require that you have additional boards to link to, otherwise you will need to build them first.
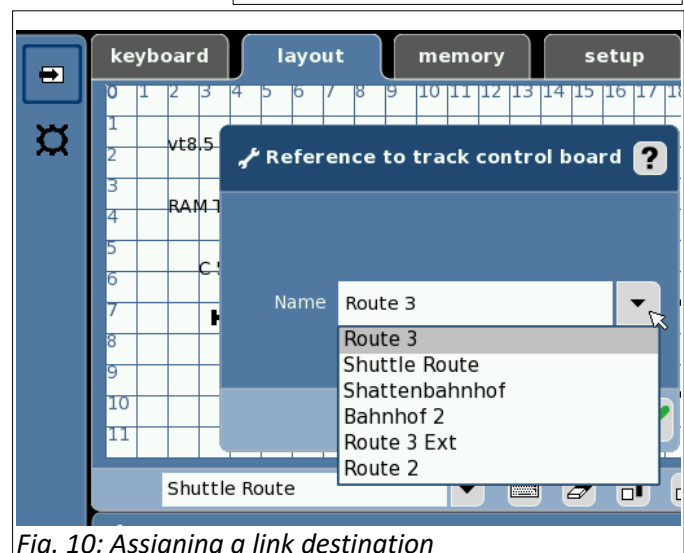

Fig. 10: Assigning a link destination

The second step to this procedure, is that you will want to go to the 'destination' board and repeat the process. Except this time, you will link back to the original board. In this manner, you'll have links that allow you to switch back and forth between the two sections. Completed board links can be applied in similar ways shown in Fig. 11. You can even add a destination label by using the keyboard tool in the layout editor.
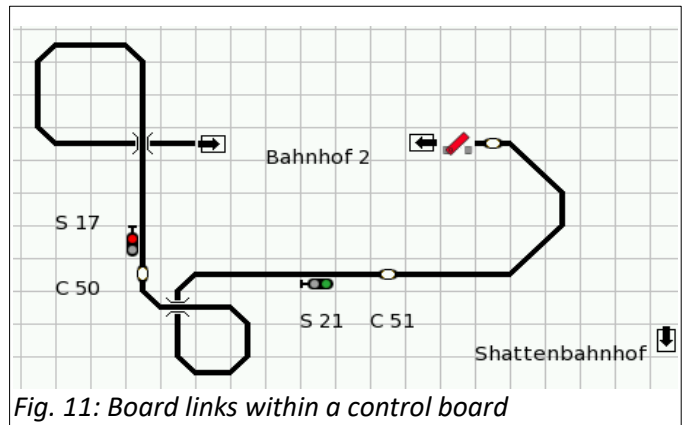

Fig. 11: Board links within a control board

Memory Section

The Memory section of the CS2 is relative to the 'Events' discussions directed at the CS3. It derived its name from the old Memory module in use with the 6021 digital controllers. Memory/Events are programmable sequences of track and/or train actions that can be triggered either manually or through indiscriminate track events. In other words, you cannot use a track sensor-trigger to have a specific Lok blow its horn at a specific spot in the layout. There is no feedback mechanism to identify a Lok's location on a layout, or which Lok triggers a function.

Unfortunately, the memory/event functions are too vast to cover in this or any single article. You can reference our digital newsletters from 2015-2016 which covers memory route setup and programming for the CS2.

One feature that is available in the CS2, which was eliminated in the CS3 software architecture, is the ability to enable or disable banks of events. This is controlled by the button at the right of each row of memory slots (Fig. 12). The top row has its memory slots set for manual control only, while the bottom is controlled by track/Lok triggering or manually if desired.
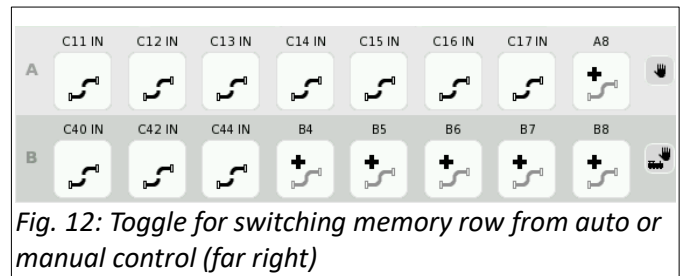

Fig. 12: Toggle for switching memory row from auto or manual control (far right)

Save and Restore

In this computer age, I don't think there is anyone who has not been advised to do a backup of their system. Likewise, I am sure, there are many people out there that do not do regular backups (I would be one of them, so I know). Your CS2 or CS3 would be the best candidate for you to get in the habit of creating backups of your CSs memory. Here are some of the reasons.

Saving your CSs memory is not purely about saving the data on the system. It is an ideal safeguard for when you load new items into your system. Especially for those who are unfamiliar with loading mFX decoded devices. mFX decoders allow for a convenient and automatic loading of devices, but occasionally non-mFX and mFX combinations can be the source of user edits. These edits can cascade into misunderstood and unrecoverable changes. One of the easiest error correction methods would be to restore a saved profile of your system.

Different saved profiles can have different uses. For example, you can save your layout with every memory/event routine to operate automatically, then you can save an alternate profile which has all or some of the memory routines set for manual. Likewise, if your layout can allow for two different travel patterns, save a profile for each routing pattern.

Be sure to save your profiles under unique names. Date them, if possible, because you will never know if you are trying to test something, and you will want to be sure you have a restore point which can help isolate changes you want or do not want. The CS may default to a generic backup name or date which does not change. By not saving under a unique name, you will only be overwriting the previously saved file. If you need to revert to the older file, those edits will have been lost because of overwriting.

I hope this quick feature article will help owners of CS2 learn more about their system. You may be getting back into your hobby, or perhaps picked up a used controller. These tips may not be discovered so quickly when there is so much of the CS's operations that may need to be learned.

Cheers!
Curtis Jeung

Upcoming appearances:

Amherst Model Railway Society Show
Amherst Massachusetts
January 29-30, 2022

Märklin Digital Webinar
Topic: Jan/Feb 2022 Newsletter Topics
February 9, 2022

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