

Randall Train Room - Operators Manual

Updated: 2023-04-29

This manual describes the rules and operation of the Randall Train Room for the Saturday Operators.

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1- Glossary

This is a glossary of terms used in the Randall Train Room -- these terms are referenced in this documentation as well as on labels in the train room.

Name / Label	Pictures / Description
Train Automation	Computer program that automatically moves the trains on a timer during museum hours, based on detecting visitors motion. It turns off automatically at 4:50 pm.
Train Layout	In Model Railroading terminology, a “layout” denotes the whole thing -- the miniature decor, the tracks, the trains, etc.
Pullman Car	Exhibit with the locked cabinet covering the lights and layout & outlet power switches. 
“Layout & Outlet” Power (main switches)	The main switches at the entrance. The “Layout & Outlet” Power must be the first on and always the last off. 
DCC Power Switch	The DCC Power Switch is located under the layout, next to the Automation Computer. It is located in a gray box protected by a gray cover. 
Auxiliary Power Supply	A power supply located to the right of the Automation Computer. It sometimes trips when powering up the layout. Toggle the black switch up when it trips. 
Automation Computer	The computer under the layout, next to the DCC Power Switch. It runs a custom-made program that orchestrates the whole train automation. 

Name / Label	Pictures / Description	
DCC Command Station	An electrical device that provides power to the trains. It is located behind the Automation Computer.	
Valley Panel 1	The large black console with toggles to the right of the Automation Computer.	
Automation On/Off Toggles	The two toggles that enable/disable automation, located on the "Valley Panel".	
Mainline	The main track where the Passenger and the Freight train runs. They share the track so only one can run at the same time.	
Branchline	The track where the 2-car silver train runs.	
Passenger Train (runs on mainline)	Currently that's the yellow train. Color may vary as we change cars/engines. Parked next to the station.	
Freight Train (runs on mainline)	The one next to the yellow train. Composition may vary over time. Parked next to the station.	
Branchline Train	The 2-car silver train running on the branchline, by the mountain side. Train may vary with time.	

Name / Label	Pictures / Description
Mountain Side	The right side of the layout with hills and slopes. It depicts California's Sierras.
Valley Side	The left side of the layout, which is mostly flat, and contains the large city with a station and the building on fire. It depicts California's Central Valley.
Stockton Station	<p>The main large station, located on the left side of the layout.</p> <p>The two Mainline trains (Passenger & Freight trains) are normally parked in front of it.</p>
"Engine" vs "Car"	Different parts composing a train. Typically the "engine" is the first part (with the motive power), and typically "cars" are the ones behind.

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2- Saturday Operators Days

The purpose of this section is to describe the rules and operation of the Randall Museum Model Railroad by individual Operators on Saturdays.

2.1- Operator Rules

The Randall Museum Model Railroad is under the jurisdiction of the Museum. The train layout does not operate like a traditional train club. As for right now, there is no notion of membership and fees. The following rules describe the situation as it is now, and may evolve later as needed.

The train layout is under the leadership of Jim Evans and Raphael Moll (the “coordinators”), as a direct result of us having worked towards restoring the relationship with the Museum, after the GGMRC donated the layout to the museum, and having provided the means to automate it as wanted by the Museum.

The structure that we established with the Museum can be summarized as follows:

- Train automation is the main purpose of the Randall Museum Model Railroad as a museum exhibit.
- “Operators” refers to individuals who are allowed to run their personal trains on the layout for public display, as long as the rules specified here are followed.
- Jim Evans is the lead coordinator for Operators.
- Raphael Moll is the lead coordinator for Automation & Maintenance.

Operators are museum volunteers and must abide by the Museum rules for volunteers, as well as the rules we have defined for operating on the train layout.

The main purpose of Operators is to run trains for the enjoyment of the public and enhance interest in model railroading.

Rules follow below.

2.1.1- Who can run

Only approved Coordinators as well as approved Operators can run on the layout.

Operators can only run *after* they have gone through the fingerprinting and orientation process, as explained in the next chapters.

Although it might seem to be a friendly gesture to allow young people or others to operate your train running on the Randall layout, being in a public setting, this can encourage others to request the same privilege. Therefore this practice is discouraged.

Age recommendation:

- Below 16, young operators can only run with *active* adult supervision required at all times from a parent or guardian. Both the younger and the adult operators must first have completed the fingerprinting and orientation process.
- At 16 or +, no adult supervision is required. Operators need to complete fingerprinting and orientation like adults.

2.1.2- Fingerprinting

Operators must have been fingerprinted using the process defined by the Museum and have the process completed *before* operating:

"The Randall Museum requires that all model railroad volunteers get screened by SF Recreation and Park Department for liability reasons. Please contact Nathan Robinson, Randall Museum Friends Executive Director at 415-554-9681 to get scheduled for screening."

2.1.3- Orientation

Operators must follow a short orientation from the coordinators, either Jim Evans or Raphael Moll.

The Randall layout can be somewhat tricky and the control panels can be finicky to operate. An operator can easily render a large portion of the layout unusable. To prevent this, we are having some basic mandatory orientation covering these rules as well as what is permitted and not permitted on the layout.

The orientation is not a training. It is expected that operators already have basic proficiency and are able to run their own trains. The layout uses NCE Pro Cab controllers which are easy to learn and use even for young operators.

We reserve the right to refuse operation to individuals who do not follow the rules, or do not exhibit the proficiency to run properly, or do not respect other individuals or the public. This list is not exhaustive.

2.1.4- Public Utility, Safe Operation

The main purpose of Operators is to run trains for the enjoyment of one-self and of the public.

At the time being, Operators are expected to:

- Only run on Saturdays.
- Only run on the mainline, in a clockwise direction.
- Only run equipment which is known to work reliably.
- Comply with the automated operation of the layout.
- Comply with the rules set here.
- Comply with the requests from the coordinators.

Saturday Operators Days is not a class.

This is not an experimentation place. Do not run trains which are too long (trains should always fit in the main yard or passing sidings), may be prone to derailments, or are not able to cope with the grades on the layout.

The layout is not forgiving. The layout design makes a lot of the trackage extremely difficult and time consuming to reach in case of derailment or equipment malfunction. Grades are fairly steep. Mishaps can block the single-track mainline for a long time and prevent both Operators and public from enjoying the trains.

Running trains on the historic Randall Museum Model Railroad should be an enjoyable experience and this can be achieved via good teamwork by the operators through the adherence to the common sense rules above.

Repeated violations will result in corrective actions.

2.1.5- Respect

Operators are expected to show respect, share with other individuals who want to run on the layout, and respect the public.

Common sense rules:

- Do not block the mainline.
This is never the right place to park a train or spot a set of unattended cars.
- Do not block interchange tracks.
This is never the right place to park a train or spot a set of unattended cars.
- Do not pass signals at danger, that is do not pass a red signal.
The layout does not have many signals. The only few signals present indicate that turnouts are not aligned properly. They must be respected.
- Always watch your train.
Check your train speed and be aware of the train in front. It may have stopped for technical reasons, and ramming it will only make a situation worse.
- Always communicate with others operating on your track both in front and behind your train.

2.1.6- Participation

Operators are expected to participate in some function in the maintenance of the layout.

The layout always needs work: track work repairs, turnout repairs, scenery.

A list of known issues and pending projects is posted on the layout description page (see sections “Projects” and “Known Issues” at the bottom of the page):

<https://www.alfray.com/trains/randall/about.html>

Main coordinator for repairs is Raphael. Please coordinate any proposed repair work with Raphael.

In the past, some questionable choices have been made on the layout, with sub-par work. To avoid repeating this, we ask that Operators evaluate their own proficiency and do not attempt repairs that may cause more problems than they fix.

One frequent issue with this layout is the lack of documentation. Please do not “silently” fix something without mentioning anyone. This only leaves a puzzle to those who follow and need to maintain the layout.

Please discuss and specifically document the repairs you are going to attempt *before starting* and after having completed the work in an effort to keep track of the state of the layout. Layout repair documentation should clearly indicate:

- The area being repaired.
- Its state before vs after.
- Clearly indicate cabling or equipment that has been changed.
- Pictures (smartphone) are always welcome.

2.2- Checklist START of the Day

Steps to be performed by Operators at the beginning of the day:

- Turn main layout power on then turn DCC on, per procedure listed in manual.
 - ⇒ See Section 2 in the manual.
- Set Automation toggles to OFF.
- Double check all DCC Yellow block toggles are Up, and that all Silver ones are Down.
 - Check to be done on Mountain Panel 1, Mountain Panel 2, Valley Panel 1, Valley Panel 2.
- On the Valley Panel, turn block B20 on.
- Double check turnouts panels. Turnouts to check:
 - On the Stockton Yard Panel: T210, T11, T212, T240, T124, T220 all Normal.
 - On the Valley Panel: T03, T04, T05, T06, T10, T20 all set to Normal.

Operators should only run when the automation is disabled, with the automation computer turned on.

In both cases, Operators must be conscient of the automated changes done to the Sonora turnout and must coordinate their trains accordingly (see chapter 5).

See pictures next page.

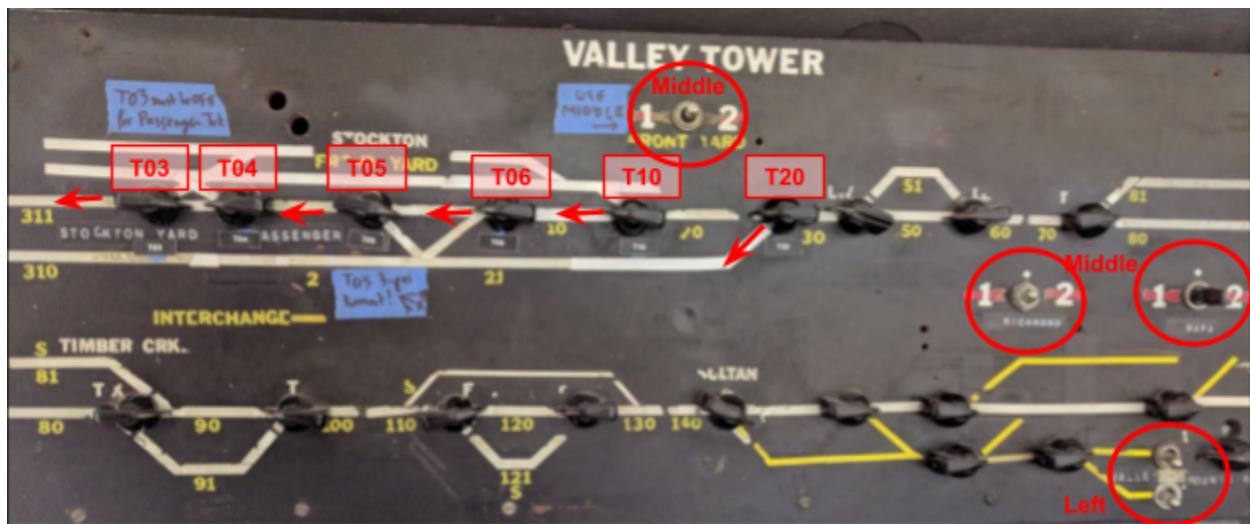
Stockton Yard panel in desired state, with relevant toggles highlighted:

<CURRENT PICTURE IS A PLACEHOLDER>



Valley Panel panel in desired state, with relevant toggles highlighted:

<CURRENT PICTURE IS A PLACEHOLDER>



2.3- Checklist END of the Day

Steps to be performed by Operators at the beginning of the day. Please ensure you allocate enough time to leave the layout in a good state before leaving. Don't just assume you can be out of there in a hurry and leave others to clean up after you.

Basics:

- **It is mandatory that the automation be left in a known WORKING state at the end of the day.**
It is the responsibility of the Coordinator present to ensure the automation is working.
“Working” means it has been tried successfully once for each automated train.
- The museum officially closes at 5 PM. Sometimes visitors linger around. This is fine.
- Operators are not required to stay till 5 PM.
- However if they leave early, they are still expected to clean up the room and leave the automation in working order.
- Be considerate. Do not leave your trains on interchange tracks or lead tracks for the yard ladders. If a spot is “convenient” for you, it’s likely to be convenient for others too.

Mandatory steps before returning to automation:

- Remove all trains from the mainline that are not in use by the automation.
- All the mainline and the first interchange track in Stockton Yard must be free.
 - ⇒ This is needed in case engines miss their stop at the station. They should be “rolling” free without crashing in other trains.
 - Block B02 (the inside mainline track) *must* be free, *including* in Stockton Yard.
 - Stockton Yard Interchange track #1 (the “3rd track” in front of the yard) *must* be free.
- All turnouts for the above mentioned mainline and interchange track must be left in Normal (closed) position.
 - Exhaustive list of turnouts to check:
 - On the Stockton Yard Panel: T210, T211, T212, T240, T124, T220 all Normal.
 - On the Valley Panel: T03, T04, T05, T06, T10, T20 all set to Normal.
- Power:
 - On Stockton Yard Panel, Yellow toggles for power on both interchange track must be up.
 - On Stockton Yard Panel, remove power to storage tracks 1 through 8 (white toggles down).
 - On Stockton Yard Panel, both interchange track power selectors must be in the middle “Y” position.
 - On the Valley Panel, the top-center “1 2” toggle, the Richmond one, and the Napa one must be in the middle position.
 - On the Valley Panel, the “Valley Mountain” toggles at the lower right must be on the left position.
 - On the Valley Panel, turn block B20 off.

See pictures next page.

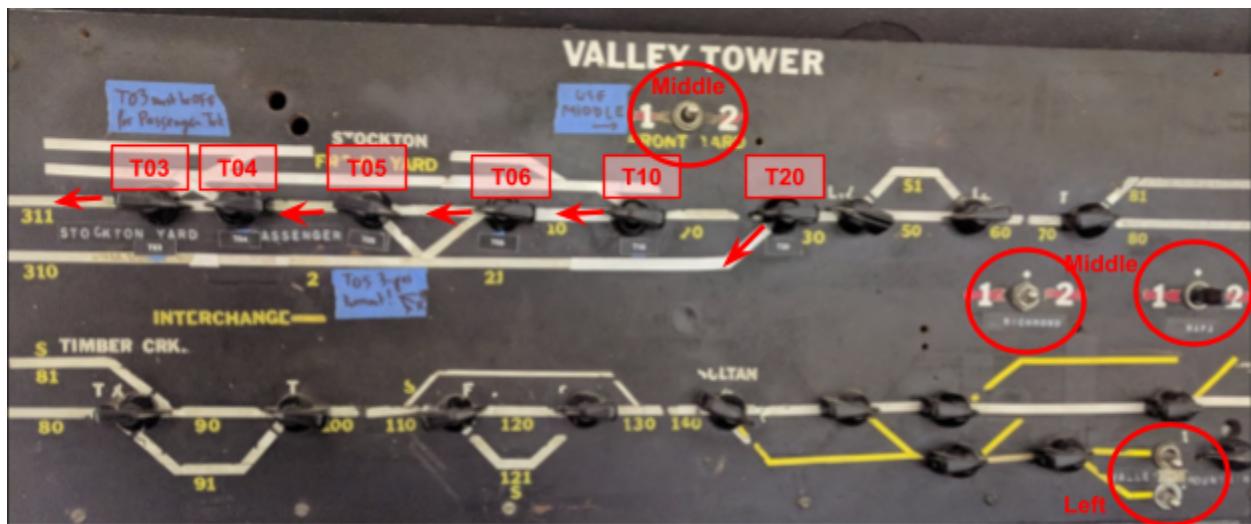
Stockton Yard panel in desired state, with relevant toggles highlighted:

<CURRENT PICTURE IS A PLACEHOLDER>



Valley Panel panel in desired state, with relevant toggles highlighted:

<CURRENT PICTURE IS A PLACEHOLDER>



2.4- Completion Sheet Before Leaving

Steps to perform before leaving the layout.

It is your responsibility to allocate enough time to perform the steps before leaving.

- “End of Day Checklist”:** Perform all steps (see other page).
- Turn Block B20 off, and align all turnouts T01 up to T20 to normal.**
- Enable and Try the Automation:** Run each train once using the motion sensor.
It is of crucial importance that the automation be left in a working state.
- Access Door Keys:** Placed on the nail by Stockton Yard labeled “Glass + Door Key”.
- Light off in the Rear Room.** It does not turn off with the rest of the layout.
- Side Access Doors:** Closed and locked.
- Leave the room in a clean state.**
- If it after 5 PM and the front desk people have already turned off the rest of the museum, you are in charge of turning it off too:
 - Power off DCC ⇒ See Section 2 for details.
 - Power off layout power.
 - Power off all lights.

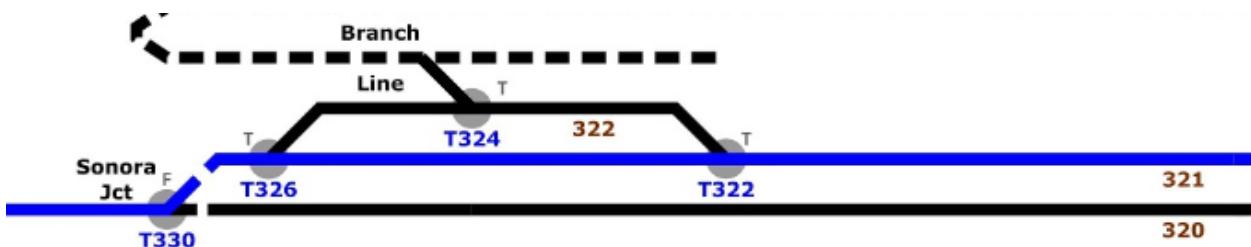
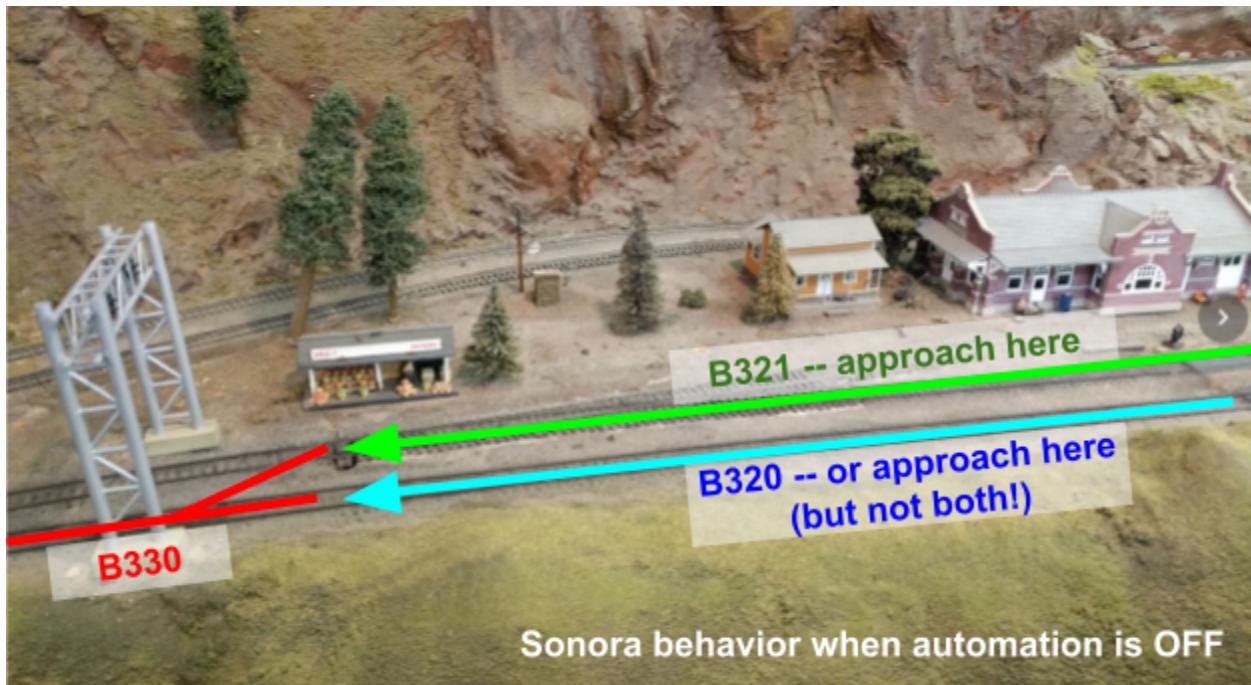
Special Notes / Issues:

Name:	Date:
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2.5- Running with Automation OFF

The Sonora Turnout (T330) Automation.



Historically, the Sonora turnout (labeled T330 on the new map) has always been a great source of confusion for *any* operator I have seen using the layout, including me. People constantly forget to throw the turnout and run their train against the turnout, shorting the mountain division, in a spot that is annoying to reach with the public around!

First of all, the Sonora Signal Bridge has been fixed to actually light up (it used to be dark for a long time). The side going up that has the turnout thrown properly is clearly signaled green and the side against is clearly red.

I know for a fact this is not enough. Very often operators ignore signals, even when they are red!

To compensate for that, the computer runs a secondary automation *only* when the Passenger Automation is turned off:

- If a train enters block B320 and *both* B321 and B330 are empty, the turnout T330 is set to Normal.
- If a train enters block B321 and *both* B320 and B330 are empty, the turnout T330 is set to Reverse.

In other words:

- **If the block after Sonora is free,**
- **And if there is ONLY ONE TRAIN on both sides of the mainline going to Sonora,**
- **Then the turnout is AUTOMATICALLY aligned for that train by the computer.**

This means that when the Passenger Automation is turned off, the Sonora turnout is automatically thrown towards a train going up. This should avoid 95% of the issues I noticed with this turnout.

There are four important caveats:

- This does *not* work when the passenger automation is turned on. That's fine since in this case the manually running train should *not* even be on these blocks to begin with!
- This logic does *not* work if a train is parked on the mainline on blocks B320, B321 or B330. That's ok since trains should *not* be parked there to begin with!
- The logic does *not* work if there are 2 trains going up on blocks B320 and B321 (or even just sitting there). In that case, the computer does not know which side to choose and thus does not choose any side.
- Remember that the block detection only detects engines and light cars that draw current from the track. This logic will fail to detect non-powered cars that are still crossing the Sonora layout. This could happen if an operator is running a train long enough that its head engines have left block B330 but the tailing cars are still on the Sonora turnout.
- This does not work if the computer is turned off!

2.6- Power Cycling the DCC On-Off-On

If for some reason the Coordination in charge decides to turn the DCC off and back again, it is important to follow this procedure to keep the automation computer properly running afterwards:

1	<p>Turn the “DCC Power Switch” off by the computer.</p> <p>⇒ The switch must be DOWN.</p>	
2	<p>Important: At this point do not immediately turn the DCC back on.</p> <p>You must wait for the Automation Computer to properly shut down.</p> <p>This takes about 1 minute. <i>Look at the screen.</i></p> <p>Wait till you see the screen actually go DARK before moving to the next step.</p>	
3	<p>Once the computer is fully turned off, you can now turn on the “DCC Power Switch” by the computer.</p> <p>⇒ The switch must be UP.</p>	
4	<p>Wait till the Automation Computer is fully turned on.</p> <p>This takes about 1 minute. <i>Look at the screen.</i></p> <p>It has finished starting when the map is displayed on the screen..</p> <p>If for some reason the computer does not turn on, consult step 4 in the troubleshooting section .</p>	

That being said, some Operators may want to power-cycle the DCC as a magical way to fix issues they do not understand. Most of the time, this is the wrong fix for the wrong problem. Before deciding to power-cycle the DCC, please read the troubleshooting section in this document.

3- Automation Overview

This section contains background information on the various components of the automation. It also details steps that the Museum Staff or anyone running on Saturday should be aware of.

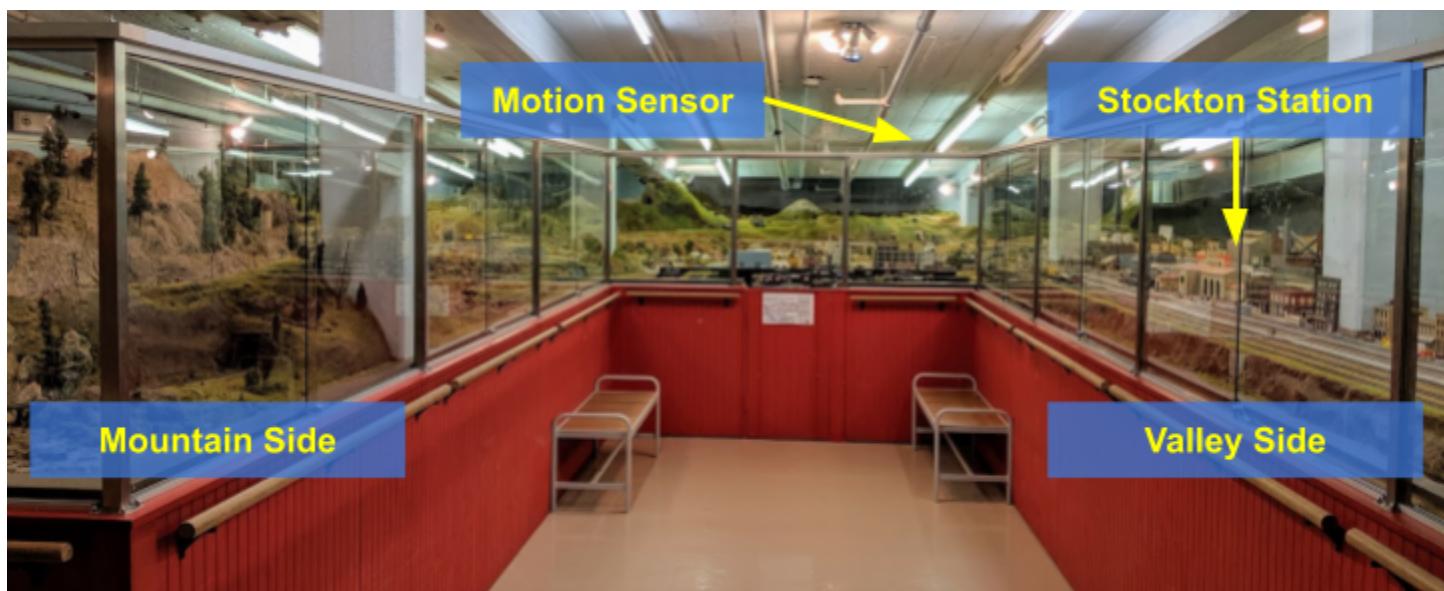
Three trains currently run under automation in the train room.

They are divided into two groups.

3.1- Train Room

The train model is loosely based on California. One side of the room has a flat scenery -- this is called "the Valley". The other side of the room has a range of mountains, evoking the California Sierras.

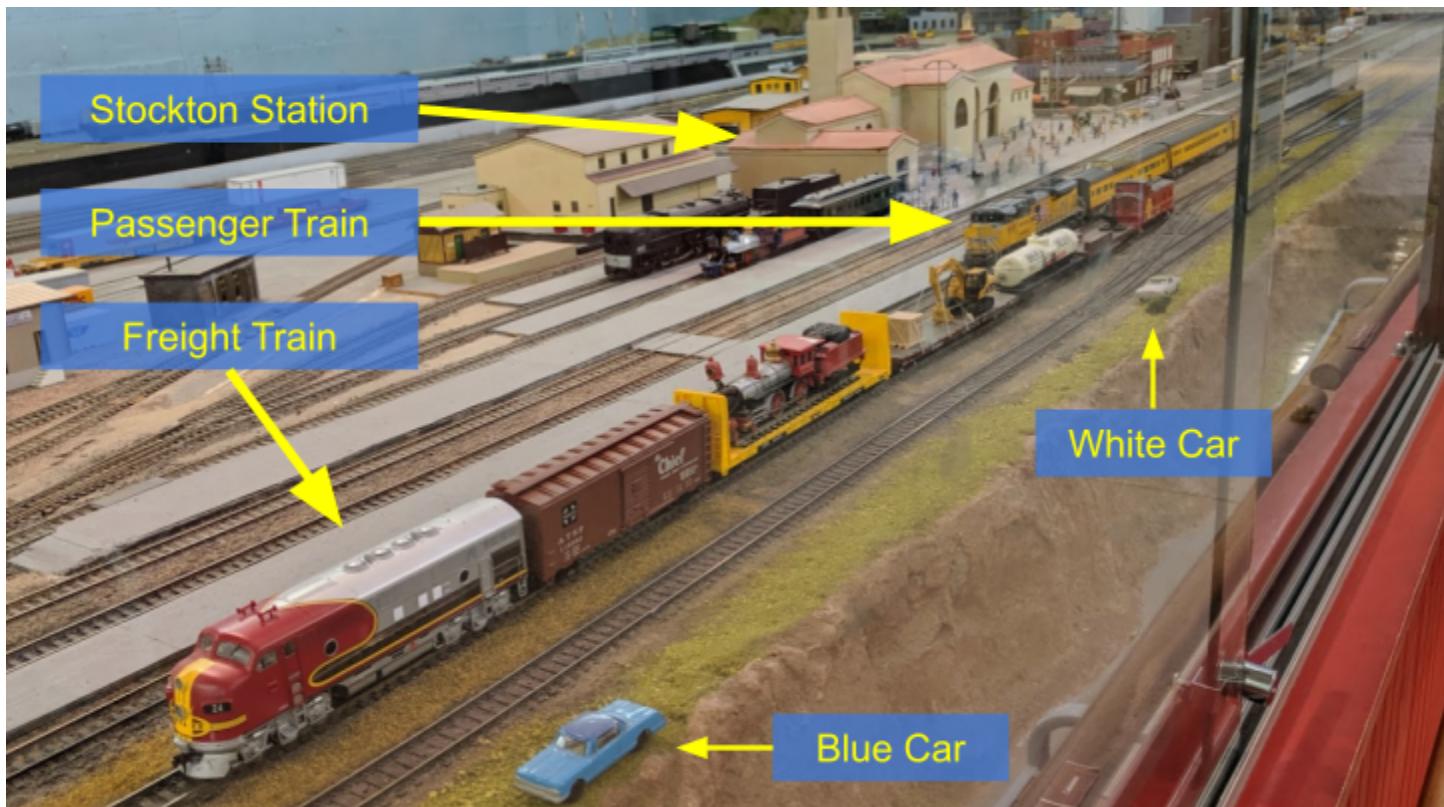
The train layout forms a U shape, with the space of the visitors in the middle. There's also a small passage on the left side of the room to view the other side of the mountain. The right part is private access to train Operators and Museum Staff, and features various control panels. Visitors should not be able to go there.



On the Valley side, the main station is the Stockton Station. This is where two of the automated trains start and stop. It is the main feature of the layout and visitors are naturally drawn to it when they enter the room.

On the end wall at the top is a motion sensor. This is what detects visitors and triggers the automation. It is calibrated in order to detect children when they are near the Stockton Station. Adults are detected a bit farther.

3.1- Mainline: Passenger and Freight Train



Two trains are parked by the large **Stockton Station**, on the left side of the layout:

We have placed **two small automobiles** on the layout roughly where the trains stop. On the picture above, these are the blue car and the white car that can be seen on the side by the window. These act as “markers” and they should not be moved by the staff.

The picture above shows their parked position:

- The **Freight Train** is the one on the right. It is located on the 2nd track and stops roughly where the blue car is located.
- The **Passenger Train** is the one on the left. It is located on the 3rd track and stops roughly where the white car is located, in front of the station’s passengers.

The train composition will change over time as we swap engines or cars. The picture above is a reference of where the trains stop, but not necessarily how they look like.

The track where these trains run is called the “main line” since it is essentially the main long track line that loops around the whole room. Both trains share the same track and take turns running on that track.

During automation, these two trains circle from the left to the right side of the layout. Both trains are programmed to stop and eventually come back in reverse direction where they started from. However they differ in speed and they differ in where they stop & reverse.

3.2- Branchline



On the right side of the layout is the “mountain”, which features the track & trains moving at different elevations. The 3rd automated train runs on a secondary track line called the “branchline” which is parallel to the mainline.

Currently the Branchline Train is a small train composed of one or two silver cars.

The picture above shows where the train is parked when not running under automation.

This train circles around the mountain via a few tunnels and ends in a little town composed of a few buildings on the other side.



3.3- Train Automation

For train automation to work, obviously power needs to be turned on in the train room. This manual details this in the following section.

Sometimes it is desirable to turn off the automation. There are toggles on the main Valley Panel that enable or disable the automation. Each line (mainline or branchline) can be turned on or off separately. This way, if there's a problem with one of the trains, the other line can keep running.



A motion detector is installed in the room, next to the Stockton Station. It detects people as they walk in and approach the station, and then the computer proceeds to automatically start the trains, one per line.

Each train runs in “shuttle” mode, meaning they run along the track, reach a point where they stop, then reverse and go back to the original starting point. After each run, the trains have a pause before they can be triggered and running again. The pause varies -- it is currently 1 minute for the mainline and 3-10 minutes for the branchline. That delay can vary as we adjust the computer program over time.

A tablet is located at the entrance of the room. It displays whether the automation is running or stopped, and which train would run next. To keep the display simple, the tablet only displays the status of the mainline trains as this is what seems more relevant to the visitors.

Note: The tablet connects using WiFi. On rare occasions, the tablet can get out of sync with the computer and the display does not end up reflecting the current automation status. If that's the case, simply let Raphaël know so that he can reset the tablet.

4- Powering the Layout

This chapter will guide you through the steps to turn power on for the layout and place the trains under automation. The steps to power off the layout are exactly the same, just in reverse order, and are covered here too. A one-page laminated “cheat sheet” summary of this is kept at the reception desk and next to the automation computer.

4.1- First Step, by the Pullman Car

The “**Pullman Car**” is an exhibit next to the entrance wall in the train room. This wooden structure depicts a Pullman passenger car with various questions printed on windows that move up and down, revealing answers.



The rightmost window does not move up and down. It is actually a disguised locked door to an electric panel that provides power to the lights in the room, as well as containing switches that power the whole layout. These are named the “**Layout & Outlet**” Power and look like this:

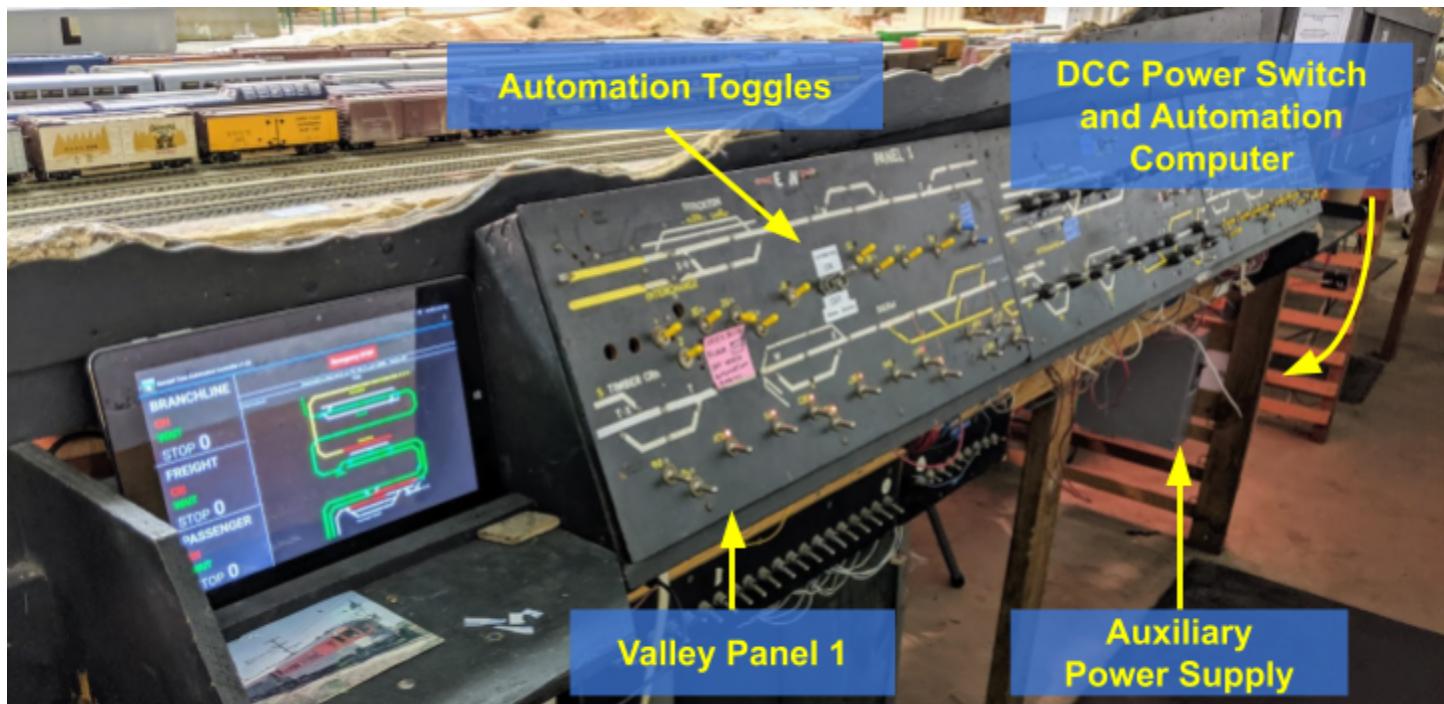


To turn on power, both switches must be flipped up. It is important that they both be in the same position. When turning on power, please also turn on all the lights, including the switch to the left of the “Layout & Outlet” Power.

The “Layout & Outlet” Power must always be the first one to be turned on, and the last one to be turned off.

4.2- Second Step, by the Valley Panel

The “Valley Panel” is a large black console with many switches and toggles. It is accessed by going through the locked side door on the right side of the room.



We encourage the Museum Staff to not touch the silver and yellow switches on the panel as doing so may prevent the automation from working properly.

It is important to notice that this was designed without safeguards and we, the train operators, are well aware that it is unfortunately too easy to flip a switch just by leaning or brushing against the panel. I have certainly done so myself. If you think that happened, it's no big deal, just let us know so that we can rectify the situation if needed.

This section will describe the parts that are designed for the Museum Staff to interact with safely.

4.2.1- DCC Power Switch

Once the “Layout & Outlet” Power has been turned on in the Pullman car, the second step is to turn on the **DCC Power Switch**. It is located under the layout, next to the Automation Computer. It is located in a gray box protected by a gray cover.



Important:

When powering ON the layout, always turn on the “Layout & Outlet” Power *before* the DCC Power Switch.

When powering OFF the layout, always turn off the DCC Power Switch *before* the “Layout & Outlet” Power.

⇒ The “Layout & Outlet” Power must always be the first one to be turned on, and the last one to be turned off.

4.2.2- Automation Computer

This is a step where the Museum Staff has no action to take. All you have to do is make sure the computer has started as expected.

Once the DCC Power Switch is turned on, the **Automation Computer** next to it will start automatically. Similarly, when powering off the train room, the Automation Computer will automatically shutdown by itself when the DCC Power Switch is turned off.

Staff members *should not interact* with the computer, both when powering on and when powering off. Doing so may interfere with the automated start up/shut down sequence.

It takes exactly one minute for the computer to start, and exactly one minute to shutdown.

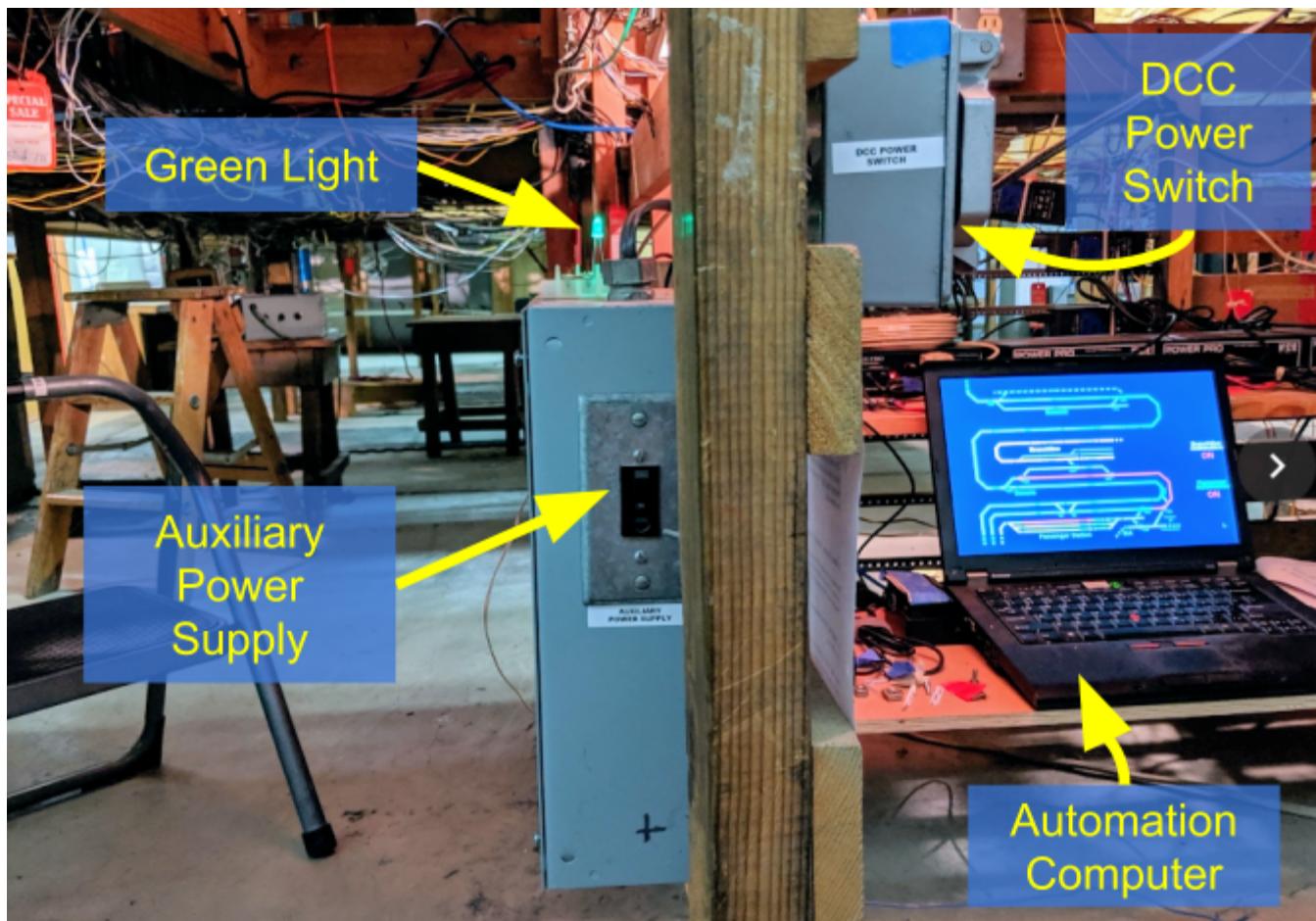


As part of the “powering on” routine, please **WAIT for the computer to finish booting**. That takes a full minute and the display changes, displaying some text then some boxes that come and go. It has finished once it displays a schematic map, as per the picture above. The display also clearly indicates whether the automation is enabled or disabled.

Important: Do not power off the layout while the computer is starting up. You must WAIT for it to finish booting and display the map. If you toggle the main power on/off/on while the computer is starting, it will then proceed to automatically shutdown, and you may end up with a situation where the computer is turned off while the power is on. In that case, please see section 4 for troubleshooting.

4.2.3- Auxiliary Power Supply

This is a step where the Museum Staff has no action to take. All you have to do is make sure the power supply is turned on as expected.



The “Auxiliary Power Supply” is a gray box mounted vertically on the other side of the support where the DCC Power Switch is located. On top of the Auxiliary Power Supply is a green light.

When the DCC Power Switch is ON, the green light should be ON.

If the green light is not on: Check the Auxiliary Power Supply. In the front is a black switch. It should be up.

Sometimes the power supply trips and the switch moves down. In that case, just flip it up again..

4.2.4- Automation ON / OFF Toggles

In the middle of the “Valley Panel 1” are located two switches which are purposely made for the staff and the train operators. There are two toggles clearly marked as “Automation ON / OFF”.



The left-side toggle enables the mainline automation.

The right-side toggle enables the branchline automation.

As part of the routine to turn on the automation, we ask the staff to simply visually validate that both switches are in the up position, to enable the automation of both train lines. If the switches are down, the staff must flip them up to enable the automation. Timing is not important here -- this can be done at any time, whether the power has been turned on or not.

Sometimes we may want to prevent one of the lines from running under automation if there's a known defect. When that is the case, we will place a post-it on the panel to clearly indicate that one of the lines should stay disabled.

It is important to know that the switches do not stop trains in they are already running. All they do is prevent trains from starting at the next automation cycle.

5- Troubleshooting Guide

5.1- What to Do When Automation Does Not Start

If the trains do not run after powering on the layout:

- First, don't panic!
- Use the **one-page laminated “cheat sheet”** and make sure you did not miss a step.
- If that did not help, please go through the next **section which has troubleshooting steps** for most common issues. Try to see if you can easily rectify the situation.
- ⇒ However, please **only do an action if you are comfortable with it**. If not, please don't do it.

⇒ If you got the situation rectified, congratulations! It is suggested that you notify Jim or Raphaël of what went wrong and how it was rectified. If something causes issues repeatedly, we'll want to address it. Our contact information is written down at the front desk.

⇒ **If you did NOT get the situation rectified** and the trains still do not run:

- **Take pictures** of anything that you can think is relevant (for example a train stopped at an unusual place, an odd message on the computer or tablet).
- **Send us the pictures and a description** of what you experienced via cell phone or email. Our contact information is written down at the front desk.
- **Turn everything off** by following the proper instructions (e.g. turn off at the DCC Power Switch first, wait for the computer to turn off, and turn off at the “Layout & Outlet” Power at the Pullman Car last).

5.2- What to Do When Automation Stops During the Day

If the trains were working in the morning and then **later stopped working during the day**, then it is important to **turn off power to the layout**.

It is possible for a train to derail, and this could create an electrical short that would damage the equipment if left ongoing for a while.

In this case, please take pictures of where the trains are stopped, and send us **the pictures and a description** of what you experienced via cell phone or email. Our contact information is written down at the front desk.

5.3- Common Troubleshooting Issues

This section lists common troubleshooting issues. For each issue, it gives a summary description of what to look for, and how you can rectify it. However we want to stress that you should only take action if you are comfortable with it.

The order of these steps matters a lot. Please check them in the provided order.

1	<p>Power to layout is on? -- do not power-cycle it, just check it is on!</p> <p>Check the “Layout & Outlet” Power switches in the Pullman Car.</p> <p>⇒ Both switches must be UP. A common mistake is to flip up only one of the two switches.</p>	
2	<p>DCC power is on? -- do not power-cycle it, just check it is on!</p> <p>Check the “DCC Power Switch” by the computer.</p> <p>⇒ The switch must be UP.</p>	
3	<p>Check the “Auxiliary Power Supply”, to the left of the DCC Power Switch.</p> <p>⇒ The green light on top of the Auxiliary Power Supply must be lit. ⇒ There’s a black switch in front. It must be UP.</p> <p>A common issue is that this power supply trips and the front black switch moves down. In that case, just flip it up again.</p>	
4	<p>Check the Automation Computer is ON. The computer should be displaying a layout map.</p> <p>Just above the keyboard there’s a little white label “POWER >”. Next to it, there’s a round button. ⇒ It must be lit green.</p> <p>If it is off, press the power button once to start the computer.</p>	
5	<p>Is the Automation Computer turned on and stuck on “TPM error”?</p> <p>See section 6.3- Computer “Stuck” on “TPM Error” when Starting below.</p>	

(continued on next page)

6	<p>Check the “Automation On/Off Toggles” on the Valley Panel 1.</p> <p>⇒ They must be both UP. If they are not, flip them up to enable automation.</p>	
7	<p>DCC power is on but Automation “doesn’t do anything”</p> <p>⇒ Check that trains are all located in their start position (station) and that the corresponding automation toggles are up (step 6 above). ⇒ Check trains are not derailed (e.g. all wheels look to be on the rails). ⇒ Check that the Automation Computer is turned on (step 4 above).</p>	

5.4- Commonly Reported Issues

"Nothing is working".

- This is not an issue, it's just an overstatement and it's fairly useless. Reporting this does not help as it provides no valuable information. Please don't say that.
- This statement is false. It is not even a paradox. Entropy theory currently teaches us that *something* has to be working *somewhere*.
- If you ever say this to me in a tone of indignation or utter despair, I will simply not help.
- Solution ⇒ Take time to understand what is not working and then restate the problem with a narrower scope. *Help me help you.*

"Power is on but Automation is not doing anything".

That is still quite vague but a bit better than issue #1. Things to look for, in that order:

- Passenger and Branchline automation toggles are on.
- Perform all the checks/steps in section [5.3- Common Troubleshooting Issues](#).

"My non-automated train running somewhere else stopped for no apparent reason".

- "It must be because of the automation".
 - ⇒ It most likely is not "because of the automation" since that one should be disabled when operators are running. Let's not blame the automation until all other culprits have been eliminated.
- Is the train stopped in front or on a turnout?
 - ⇒ **Check the turnout is aligned correctly.**
 - Do NOT randomly start toggling turnouts unless you know it's the one where your train is, as you may instead derail *another train somewhere else*. Take the time to figure which turnout it is and which toggle matches it using the map posted next to the Valley Tower or on the wall.
- Is one of the circuit-breakers activated?
 - ⇒ Check the corresponding layout section for derailed or shorting engine.
- Is one train or engine emitting the typical "sizzling" noise of a short?
 - ⇒ **Check *all* the wheels of your train** for one that is derailed.
 - ⇒ Is any part of the train on a turnout? Is the turnout properly thrown?
- Is the DCC block turned off?
 - ⇒ **Check the panels for the yellow DCC block toggles, which must be up.**
 - Do NOT randomly start toggling DCC blocks on/off unless you are sure it's the one where your train is. Take the time to figure on which block your train is located and which toggle matches it.

"The Yard is not working"

- Is one of the circuit-breakers activated due to a short?
 - ⇒ Check the corresponding layout section for a derailed or shorting engine or car or coach. A single mis-aligned wheel is enough to short the entire yard.

6- Special Cases

6.1- Automation After 4:50 PM

To make it easier for the staff to turn off automation during the week, the automation automatically stops at 4:50 PM. In a normal situation, that means when the staff goes in the room to turn the automation off, trains are already back at their station, and the motion detectors will not start the trains.

In rare cases, the museum may host an event that requires the trains to continue running past 4:50 PM. There is no way to prevent the automation from stopping the trains at 4:50 PM; however it is very easy to re-activate the automation just after, as this section will explain.

Step 1: Wait until 4:50 PM that the automation disables itself.

The tablet display by the entrance should report “Automation Stopped”.

Step 2: Wait at least a couple minutes, e.g. at least 4:52 PM.

The timing does *not* have to be very precise.

Technicality: The only thing that matters is that it be *past* 4:50 PM from the computer's clock point of view. Waiting at least a couple minutes ensures that the next action will work even if the clock is not perfectly synchronized.

Step 3: Once it is at least 4:52 PM, **flip down** both Automation ON/OFF toggles on Valley Panel 1.

Step 4: Wait a couple seconds and **flip up** both Automation ON/OFF toggles on Valley Panel 1:



That's all there is to do.

The automation is now re-enabled.

To verify, please move next to the Stockton Station. This should start a train.

You can check the tablet by the entrance, and it should indicate a train is either waiting or running.

6.2- Powering Off Automation With Visitors in the Room

To make it easier for the staff to turn off automation during the week, the automation automatically stops at 4:50 PM. You may have to power off the automation at other times, and this section explains how.

A very important requirement when powering off the automation is that both mainline trains *must* be idle at the Stockton Station. However, since the trains' automation cycle is triggered by the motion sensor in the room, anyone in the room, including you, may trigger the trains to start while you are trying to power the automation off.

Luckily, the procedure to turn the automation and power off in this case is very simple.

Step 1:

Go to the “Valley Panel 1” and turn OFF both “Automation” toggles.



Step 2:

If any of the trains are running, they will not stop instantly.

Instead you must **WAIT** for the trains to come back to the main Stockton Station.

For the branchline, you wait for it to park on the right side of the mountain.



Once no train is running anymore, you can proceed to the next step.

Step 3:

Turn off the DCC Power Switch next to the computer.

Wait one minute for the computer to fully shut down.



Step 4:

Go to the “Valley Panel 1” and turn ON both “Automation” toggles.

It sets up the automation to start normally the next day.



Step 5:

Turn off the “Layout & Outlet” Power in the Pullman Car. Flip both down.

Remember to also turn off all the lights, including the one “hidden” to the left of that switch box.



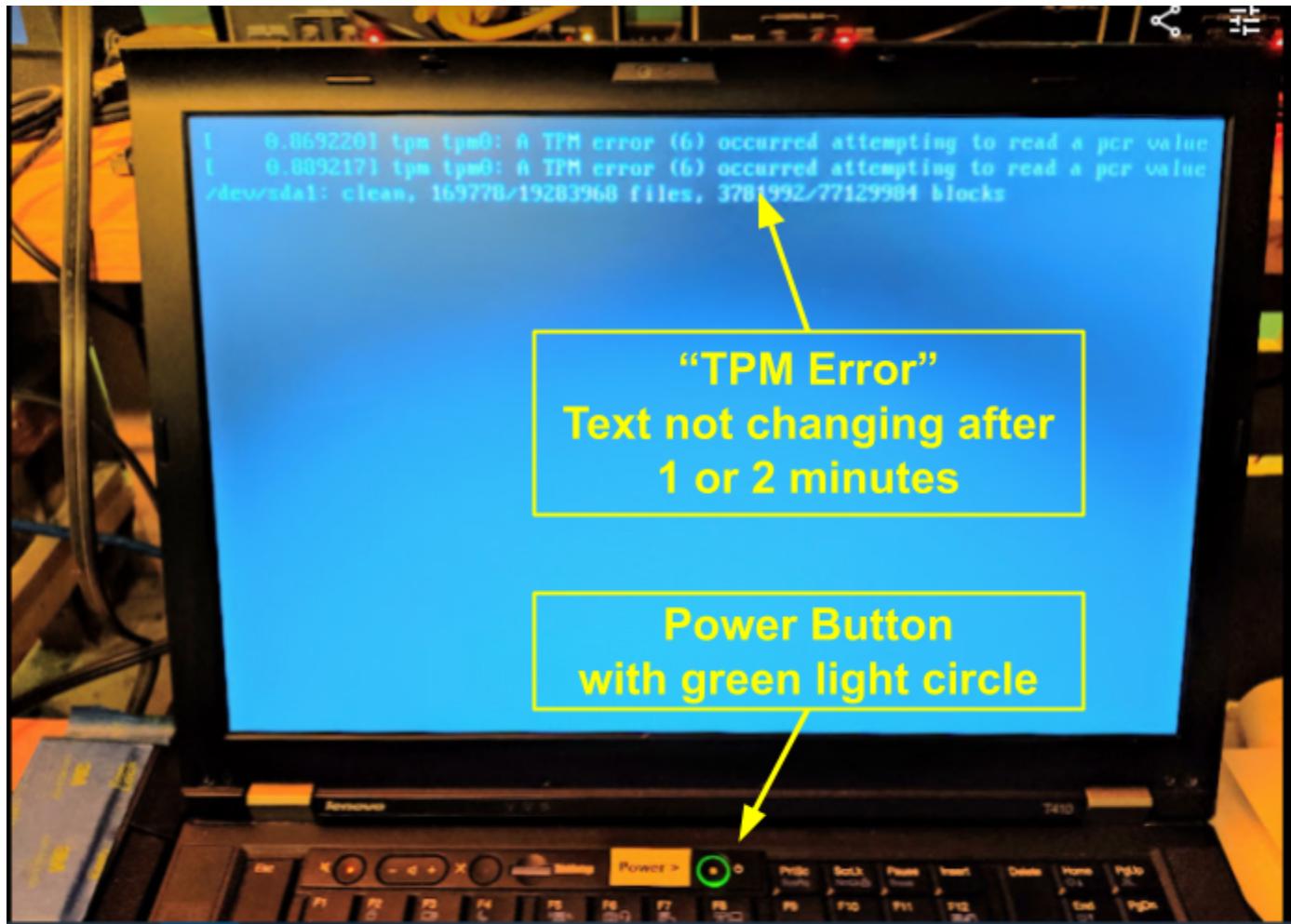
6.3- Computer “Stuck” on “TPM Error” when Starting

This scenario has been known to happen a few times:

- Power on the layout by turning on the “Layout & Outlet” Power followed by turning on the DCC Power Switch as usual.
- Computer starts, except it gets stuck on this black screen with a couple lines of text.

This case is identified by:

- 3 lines of text on a black screen on the computer indicating something about a “TPM error”.
 - Normally, these lines should disappear after a few seconds.
 - ⇒ Problem happens when the 3 lines are present for at least 1 minute or more.
- Power button is illuminated with a green light circle.



See next page on how to solve this problem.

How to solve this problem:

Step 1:

- a- **Do NOT turn off power** at the DCC Power Switch.
- b- **Press and hold the power button** (typically 10 seconds) till the screen goes off.
- c- Then **release** the power button.

Expected: There should not be a green light circle around the power button any more.

Step 2:

- a- **Briefly press the power button** (typically 1 second).
- b- Release it.

Expected: The green light around the power button should illuminate, and the screen should turn on. Computer should start as usual and display the train map within one minute.

~~ end ~~