

City of Hamilton Holiday Train Layout



Assembly Order – City of Hamilton Holiday Train Layout

Note * A map of the layout showing module names and numbers can be found on page 7.**

Note * Undo all buss connections and any pigtails so they are free and hanging before you stand them on their legs. Pull the legs out and tighten up the leg bolts as you set up each module.**

Note* Start all bolts and nuts by hand before tightening any nuts to the bolts to prevent cross threading.**

All modules are marked on their legs, underside, or both. Assemble modules in the following order by opening legs underneath. Once legs are open, placement on the legs right side up makes handling easier:

1. U1 – Undo the 9 pin pigtail attached to the module. This will be plugged into L2 when setting up L2.
2. U2 – Undo the 9 pin pigtail attached to the module. This will be plugged into L4 when setting up L4.
3. U3 – Undo the 9 pin pigtail attached to the module. This will be plugged into L6 when setting up L6.
4. Upper Bridge. For setup, insert one bolt in each end of the bridge for purposes of proper alignment. Once aligned, position the bridge on the L brackets found on each end. Push track in from U3 to U1
(Note * There is no pigtail on the upper level bridge.)**
5. Install all track on Upper level. Test two upper tracks and upper-level trolley. - I suggest that you use the pigtail on U2 to test the upper track by plugging the test cable into the 9 pin pigtail and the 12 pin end into the transformer cart. The transformer cart must be plugged into the wall socket and turned on. Press the Red test button to see if the three (3) upper tracks are hot. You should place engine on the two (2) loops of tracks and a bumper trolley for testing purposes. Once all three (3) are running simply turn off the main switch and continue with the directions.
6. Place and connect all upper-level buildings – After plugged in you would need to plug the test cable into each of the three (3) upper modules pigtails to check the lighting for each module as there is no buss on the upper modules.
7. Place the three (3) blue painted boards simulating a lake. They are placed between the upper bridge and U2. Last chance to reach any building on upper level without stretching. Check for buildings being lit if you have not done this already.
8. Place L1 - Stand up on legs in place.
9. Place L2 - Set up L2 and Connect buss cables from L1 to L2 and the 9 pin pigtail to the pigtail on L2 to U1 - This module has only three legs, must have bolt ready to stabilize table. Bolt all modules together as you go.
10. Place L3 - Set up L3 and Connect buss cables from L2 to L3
11. Place L4 - Set up L4 and Connect buss cables from L3 to L4 and the 9 pin pigtail to the pig tail on L4 to U2
12. Place L5 - Set up L5 and Connect buss cables from L4 to L5
13. Place L6 - Set up L6 and Connect buss cables from L5 to L6 and the 9 pin pigtail to the pig tale on L6 to U3
14. Place L7 - Set up L7 and Connect buss cables from L6 to L7
15. Place Lower Bridge by lifting up from below. Bridge should be kept as level as possible to slide up between L1 and L7. Secure with two bolts on each end. Place the imitation walls in place to hide the wood sides of the bridge board.
16. Plug the 12 pin female Molex cable into the Transformer Cart 12 pin male Molex plug located on the side.
17. Separate any two Molex buss wires between a pair of modules. Plug the Female Molex supply cable into the Male Molex Buss connector and the Male Molex Supply cable into the Female Molex Buss connection.

See next page for rest of installation

18. Install all Lower level track. Test for all 6 tracks to see if working properly. Now is the time to set the speeds of the trains for operation. If you did not check the Upper buildings for lighting now is a good time to see if they are all lit.

19. Install all lower buildings and then check to see the lights in them are lit.

20. Install plexiglass viewing panels starting at L1 with Plex 1 continuing around the layout in order with Plex2, Plex3, ... Plex 9.

21. Install the skirting around the layout.

(Note *** I do not have a starting location at this time.)

22. Push one of the 3 on board buttons to see how all works and looks.

Plexiglass Assembly Order

Note * A map of the layout showing module names and numbers can be found on page 7.**

Note * All modules are marked on their legs, underside, or both. Plexiglass pieces are numbered from Plex # 1 thru Plex # 9. Placement of plexiglass pieces should be installed in the following order in the locations listed:**

Note * Location of each section of Plexiglass as drawn on Page 7 Map.**

Note Start all bolts and nuts by hand before tightening any nuts to the bolts to prevent cross threading. No not over tighten the bolts so as not to crack the plexiglass.**

Plexiglass Location

Plex # ?

- Plex # 1. North West Side of modules L1 and L2
- Plex # 2. West Side of L2
- Plex # 3. Diagonal side of L3
- Plex # 4. South West side of modules L3 and L4
- Plex # 5. South side of L4
- Plex # 6. South East side of modules L4 and L5
- Plex # 7. Diagonal side of L5
- Plex # 8. East end of L6
- Plex # 9. North East side of L6 and L7

Skirt Assembly Order

Start the installation of the skirting as soon as the protective plastic is installed.

There is Velcro attached to modules without plastic sides L1 and L7 on the north sides next to the bridge.

There is Velcro attached to the lower edge of the plexiglass when installed on the rest of the modules.

Starting on L1 next to the Lower Bridge attach the skirt to the Velcro.

Continue around the layout going counter clockwise until you reach Module L1 attached tot he bridge.

The viewers are now ready to run trains.

TRANSFORMER CART

The Transformer Cart Should be ready to run.

Chose a location for the transformer cart to be installed.

The control switch, on the top shelf of the cart that is marked **Manual, Off,** and **Auto** on the top shelf should be in the off position.

The white 110 power cord located at the bottom of the cart is marked **plug into the wall duplex**. Plug it into the wall. This is the Power cord from the Horizontal power strip marked WALL POWER.

There is a 12 pin cable, stored on the bottom shelf of the cart, that makes a “Y”.

The bottom of the “Y” has a female Molex plug and it needs to be inserted into the is plugged into the side of the transformer cart.

The other two (2) legs are plugged into any pair of modules buss wires between them. You need to unplug the buss wires connectors and plug them into the Power “Y” cable. Male Buss to Female “Y” and Female Buss to Male “Y”

On the back of the cart are three (3) power strips.

The two (2) vertical strips have all transformers for operation of the trains and accessories plugged into them. Power bricks, one for each train control six (6) of them plugged into the power strip marked TRACK POWER.

There are two (2) more power bricks for each of the two (2) Accessory circuits that are plugged into the ACCESSORY POWER strip.

The TRACK POWER strip is also plugged into the ACCESSORY POWER strip.

The ACCESSORY POWER strip is then plugged into the COLLECTOR BOX on the bottom shelf of the cart. for the timer to turn on and off.

The third Horizontal power strip marked WALL POWER has three (3) items plugged into it.

The Power cord from the Timer Box.

The Power cord from the Circuit Breaker Box.

The Power cord from the 12 Volt DC power supply.

The WALL POWER strip is plugged into the wall outlet to operate the whole layout.

(Note This WALL POWER strip is always hot.)**

If anything is disconnected see page 12 & 13 for diagrams of how the rest of the Transformer wired.

Hamilton City Train Molex Colors



PINS AND HOUSING CONNECTORS .093

MALE HOUSING

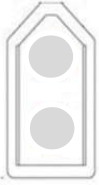
The housing is hollow and each pin sticks up within the outer wall that will encircle the female housing.



FEMALE HOUSING

The female pins are inset within the housing to maintain them from being separated when inserting the male pins.

Note this is the way that I started using the housings over 30 years ago.



The Hamilton City Train Layout Currently we are only using the 12 pin buss and the 12 V AC for Accessory Lighting.

All AC Common wiring is connected to the common WHITE wire no matter the voltage.

The colored wires assigned are to be used in the plugs to help identify the voltage by the installer and or the trouble shooter.

We have purchased LED bulbs that will work on either AC or DC installation.

The LED's can be wired to the AC accessory circuits either way. However for standardization it is best that they are wired with the Positive leads from the bulbs to the Hot lead in the female 4 pin plug that should be an ORANGE wire.

The Negative lead would be attached to the WHITE wire in the 4 pin female Molex plug.

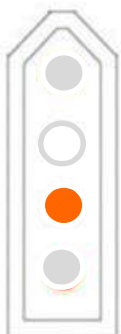
All accessory buildings and lights are attached to the female plug using the ORANGE Hot wire and the WHITE Common wire.

The female plugs will be used for either the upper or lower modules as there are two circuits for the accessories.

12 Volt AC Male Housing

Currently this is the only Molex Accessory voltage listed on the layout. Note the Male Molex is mounted to the module and the Female is on the building leads.

Circuit #2



White AC Common
Orange AC Hot



White AC Common
Purple AC Hot

Hamilton City Train Molex Colors

Buss Wiring Pin Number and Colors

This list Matches the current tracks Upper and Lower Level

Buss is complete around the modules on the lower level, (Full Circle). All upper level modules will be connected directly to the lower level buss with a 9 wire cable. No second buss on the upper level because there will never be a need to set up those 4 modules alone for any operation. All Buss wires are 14 Gauge including the 3 leads from the Buss to the Male connector going to the upper modules.

Pin 1 =	White	Common AC Ground
Pin 2 =	Red	Track 1 Upper Level Trolley
Pin 3 =	Blue	Track 2 Upper Level Inside
Pin 4 =	Black	Track 3 Upper Level Outside
Pin 5 =	Yellow	Track 4 Lower Level Trolley
Pin 6 =	Brown	Track 5 Lower Level Inside
Pin 7 =	Gray	Track 6 Lower Level Outside
Pin 8 =	Orange	Accessory 12 to 14 V AC #1
Pin 9 =	Purple	Accessory 12 to 14 V AC #2
Pin 10 =	Pink	Pos. Button Activation Wire
Pin 11 =	Tan	Neg. Button Activation Wire
Pin 12 =	Green	Not in use at this time



Male
Molex
Plug



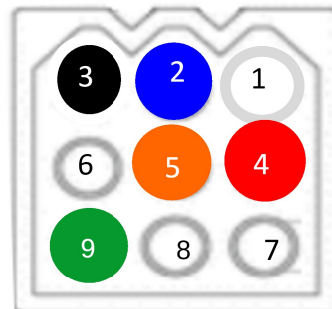
Female
Molex
Plug

Pin Number and Colors

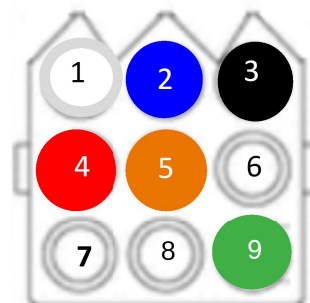
This list Matches the current tracks Upper Level

All connection are by cable from each upper module to the Buss on the lower level. All Buss wires are 14 Gauge.

Pin 1 =	White	Common AC Ground
Pin 2 =	Red	Track 1 Upper Level Trolley
Pin 3 =	Black	Track 2 Upper Level Inside
Pin 4 =	Blue	Track 3 Upper Level Outside
Pin 5 =	Orange	Accessory 12 or 14 V AC #1
Pin 6 =	Blank Pin..	This pin is not in use
Pin 7 =	Blank Pin..	This pin is not in use
Pin 8 =	Blank Pin..	This pin is not in use
Pin 9 =	Green	Not in use at this time



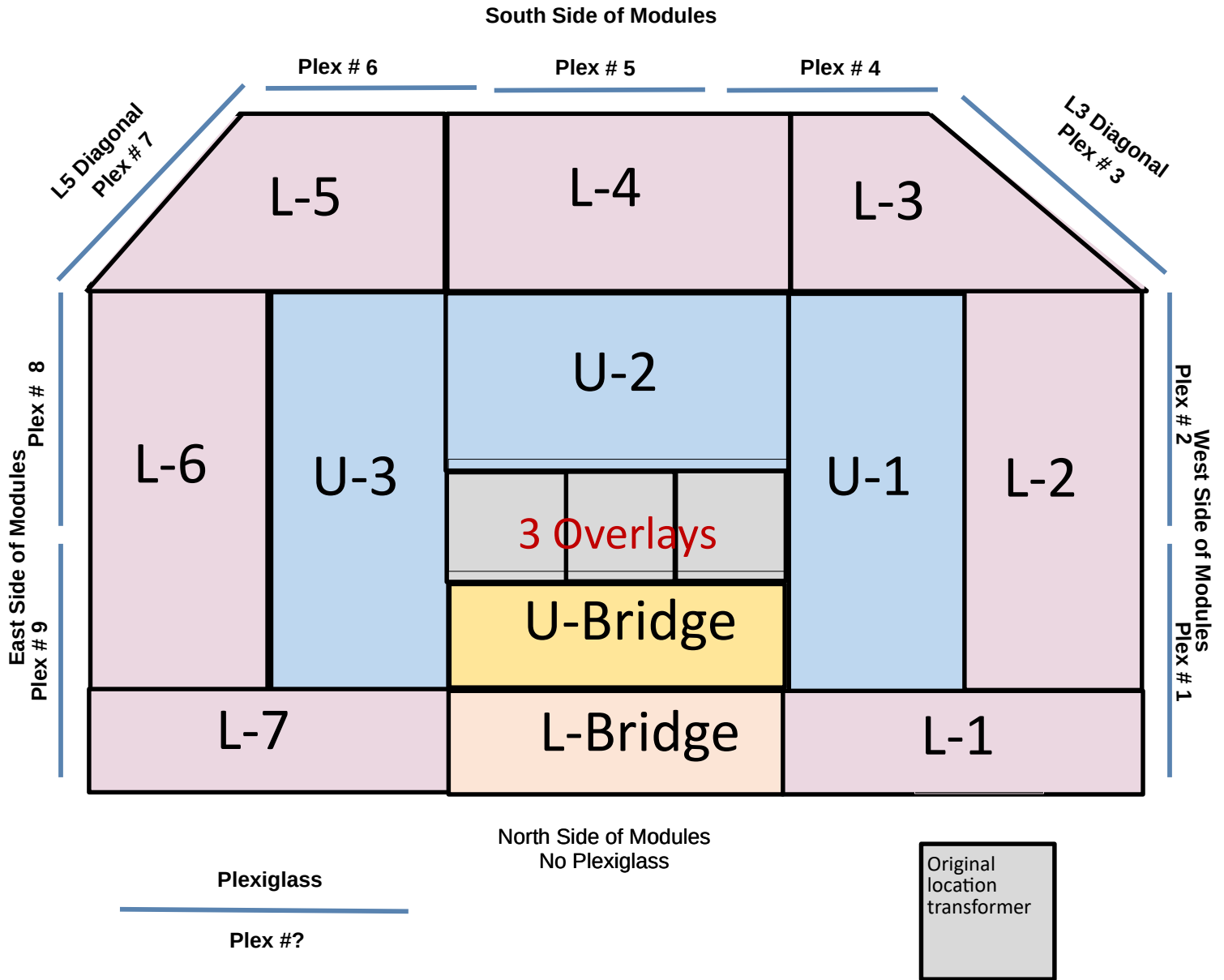
Male
Molex
Plug



Female
Molex
Plug

Hamilton City - Train Rewiring

This drawing is showing the identification numbers for the modules and the protective Plexiglass.
U is for UPPER Level and L is for LOWER Level



The Transformer was originally set up in the corner as shown.

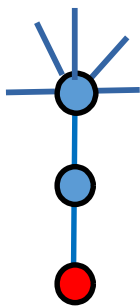
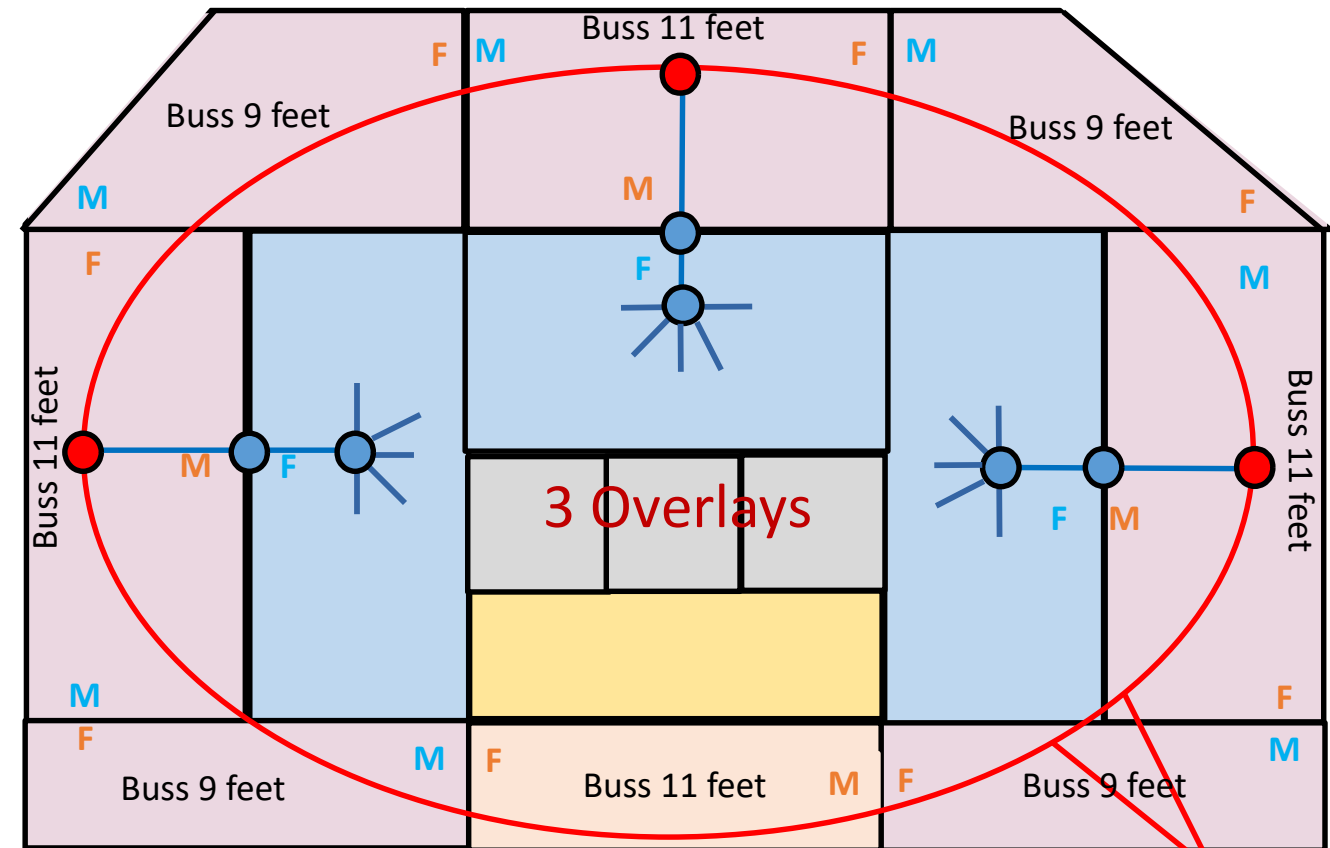
We started in that corner with L-1 (Lower Level 1) numbering Counter-Clockwise through L-7

Then the same for the U-1 (Upper Level U-1) numbering Counter Clockwise through U-3

The bridges are U-Bridge 3 Warren Truss bridges and L-Bridge a long girder bridge.

The Transformer cart can be set up anywhere attached too any two a joining lower modules. Simply plug in the 2 leads from the transformer cart to the jumper plugs between any adjacent set of modules.

Buss wiring for the modules



Pigtails from Buss to Male Molex then Female Molex to the distribution of contacts on the upper modules

Transformer lead to Buss is a 6 foot "Y". Bottom of "Y" attached to the transformer cart and the other 2 legs attach to any set of buss jumpers between any pair of modules.

Original location transformer

Note * See Page 9 for diagram of colors of the buss and pigtails**

LOWER LEVEL

Red Oval is a buss with all 12 current wires 14 gauge.

Transformer cart attached by a cable to the buss wire. Built to plug into any two connecting modules. Each M and F are the jumper connections between all of the lower modules including the bridge.

UPPER LEVEL

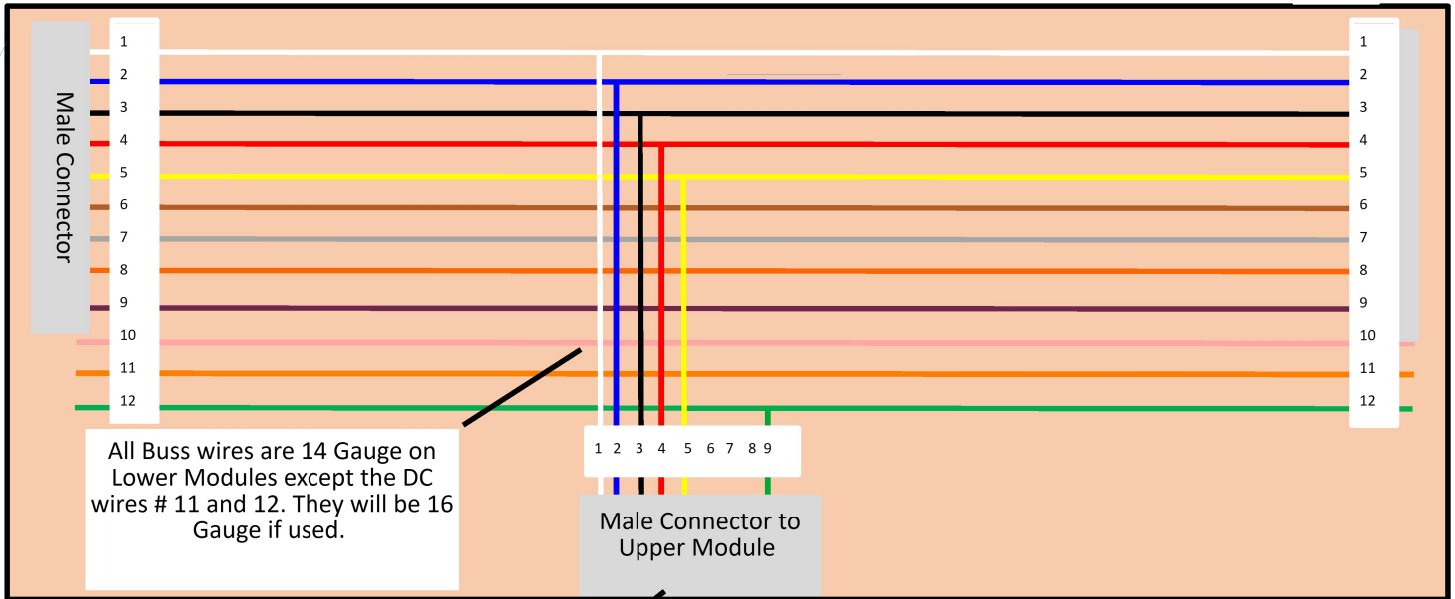
No Buss wires just pigtail cables from U1, U2 and U3 are plugged into the Buss on the lower modules

All tracks and accessory wiring has drops attached to the pigtail for all connections on each module. All are wired together with 9 pin Molex connection (Color Coded) under the board and wired to the jumper cable to go to lower level with a jumper cable (pigtail) from the upper to lower modules.

Hamilton City - Train Rewiring



Visitors Viewing Outside of Lower Module

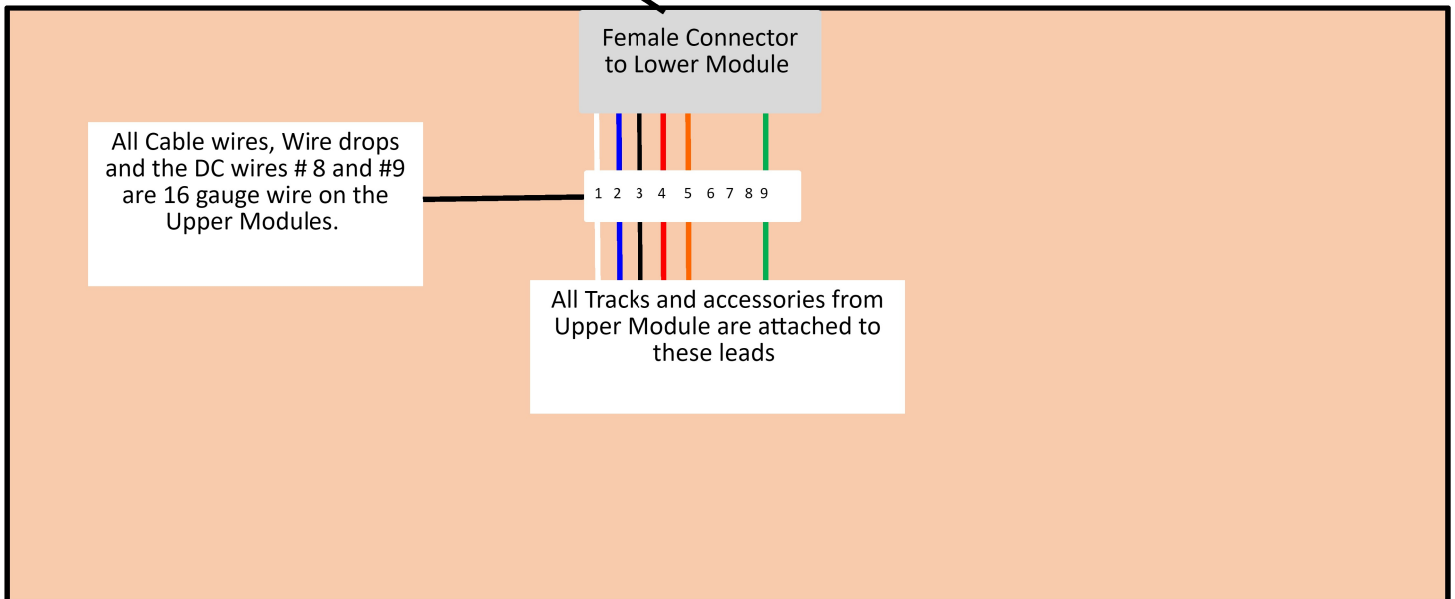


Inside of the Lower Module

The two modules are connected with a pair of 9 Pin (0.093) Molex Connectors

There are 3 modules and the Upper Bridge. All 4 will have connectors to the Lower Modules.

Visitors Viewing Outside of Upper Module

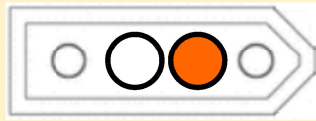
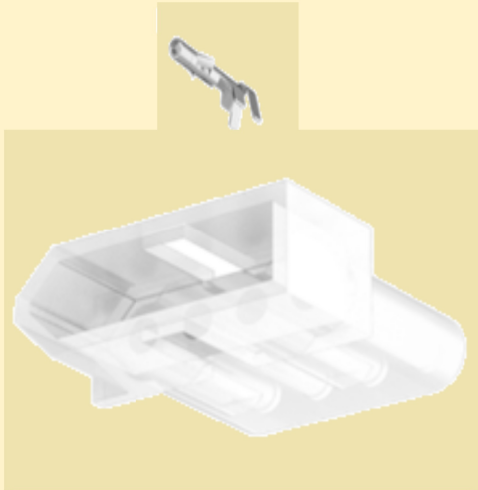


Inside of the Upper Module

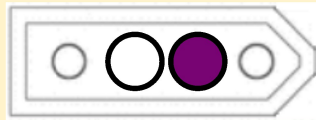
0.093 - 4 Pin Male Housing

&

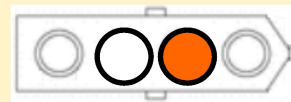
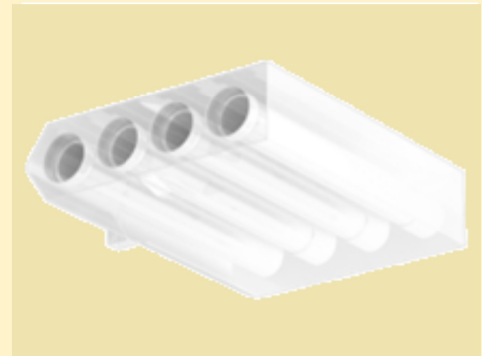
0.093 4 Pin Female Housings



Pin Location # 1 2 3 4
Male Molex Plug Accessory Circuit #1
on Upper Modules Orange Hot



Pin Location # 1 2 3 4
Male Molex Plug Accessory Circuit #2
on the Lower Modules Purple Hot



Pin Location # 1 2 3 4
Female Molex Plug All Accessory Items
to attach to either Circuit #1 or #2 shall
have an orange and white colors for
the female Molex plug.

Wire colors for the Pin Locations both Male and Female 4 pin Molex Connectors:
All are wired for 12 V AC and will have LED bulbs and Incandescent attached

- 1 Is Blank
- 2 Is the White Common Wire for both Circuit #1 and Circuit #2
- 3 Is the Orange Hot Wire for Circuit #1 Purple color Hot Wire for Circuit #2
- 4 Is Blank

The male housing will be attached to whatever board needed and the White and Orange or Purple wires will be attached on the underside of the Modules to the buss wires.

The Female housing will be attached to the leads coming from the accessory and will not be able to be detachable. Incandescent bubs and LED bulbs will be wired alike.

Common or Negative wires will be attached to the White wire coming from the Molex Plug.
Hot or Positive wires will be attached to the Orange wire coming from the Molex Plug.

All Molex connections listed are from the power source

THE ONLY VOLTAGE USED AT THIS TIME IS 14 V AC FOR ALL ACCESSORIES

THERE ARE 3 ACCESSORY CIRCUITS USING ORANGE GREEN AND PURPLE.

VOLTAGE

MOLEX PINS

HOT / POS

COM / NEG

COLORS

All six (6) train tracks are Alternating AC Current

Up to three 12—14 V AC Accessory lines ORANGE PURPLE and maybe GREEN.

COMMON	ALTERNATING	WHITE	WHITE	WHITE
12 V AC	ACCESSORY #1	ORANGE	WHITE	ORANGE
14 V AC	ACCESSORY #2	PURPLE	WHITE	PURPLE

One 12 Volt DC line for one DC operated items.

Negative	Direct	Black	Black	Black
12 V DC	4 Female	Red	Black	Red

12 Volt AC Male Housing

Currently this is the only Molex Accessory voltage listed on the layout. Note the Male Molex is mounted to the module and the Female is on the building leads.



There are 12 Circuits on the Board. Circuit #1 on the Upper Level and Circuit #2 on the Lower Level

White AC Common

Orange AC Hot

White AC Common

Purple AC Hot

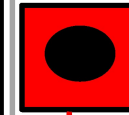
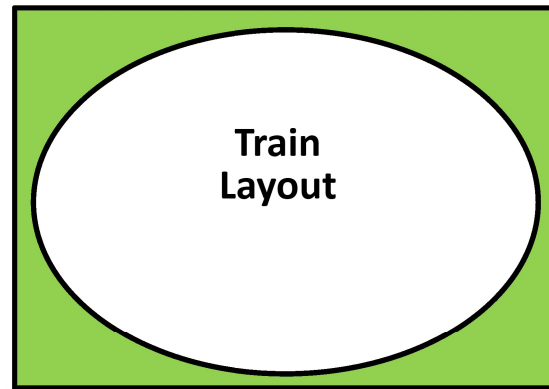


We have converted all bulbs, as much as possible, from 12 to 14 V AC to LED's that will operate on 12volt DC.

Button / Timer Control

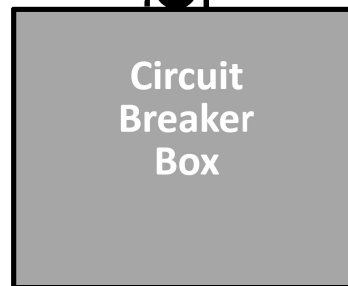
All Wires are 12 gauge extension cords, BLACK in color. The **colors** are simply for tracing the wiring if there is a problem.

We have installed on the transformer cart all of the large Circuit Breaker and Collector timer boxes on a lower shelf of the Transformer Cart and the six (6) track transformers on a top shelf along with the on off switch (RED).



Mount the 3 Way Switch next to Track Transformers

From Transformer Cart
The WALL POWER strip
Is plugged into the circuit
breaker box.

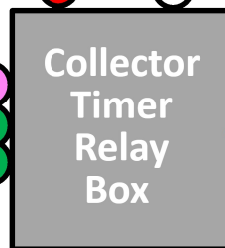


To the WALL POWER STRIP

To Rec
#1

To the WALL POWER STRIP

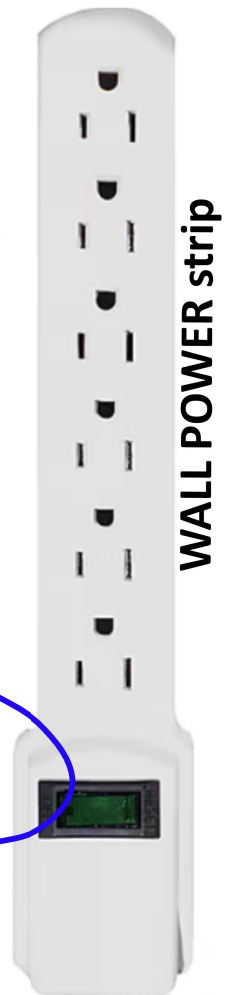
To the 3 Way Switch



Rec #1

To the WALL POWER STRIP

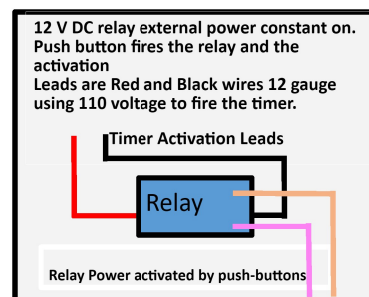
12 V
DC



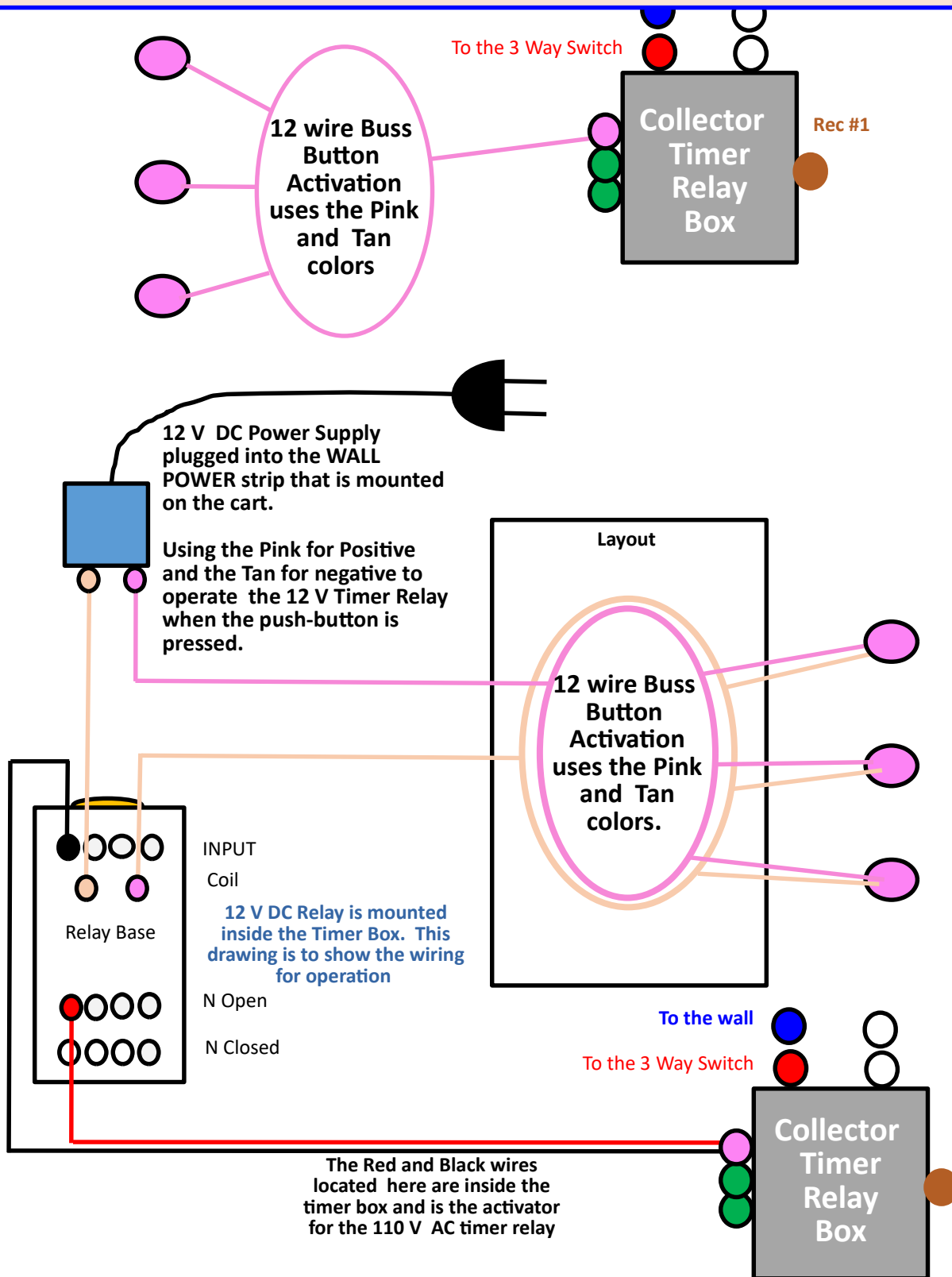
To the wall

12 wire Buss
Button
Activation
uses the Pink
and Tan
colors

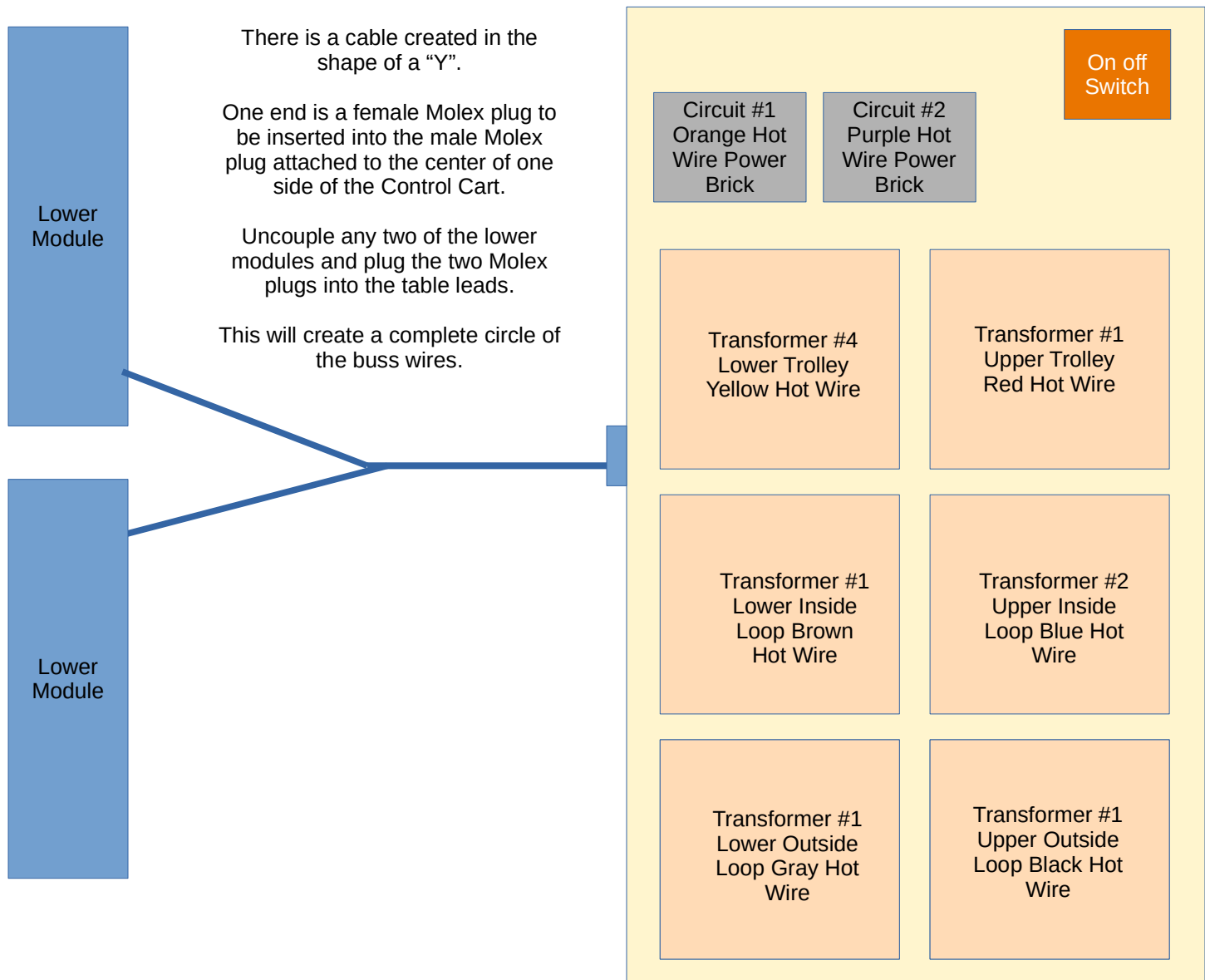
**3 PUSH-BUTTONS ATTACHED
TO THE FRONT OF THE LAYOUT**



12 V DC Timer Control Wiring



Power Connection from the Transformer Cart to the layout



All 6 transformers are plugged into the TRACK POWER strip

Both Accessory power bricks and the TRACK POWER strip are plugged into the ACCESSORY POWER strip

Upper Shelf on the Transformer Cart



On off
Switch

Circuit #1
Orange Hot
Wire Power
Brick

Circuit #2
Purple Hot
Wire Power
Brick

Transformer #4
Lower Trolley
Yellow Hot Wire

Transformer #1
Upper Trolley
Red Hot Wire

Transformer #1
Lower Inside
Loop Brown
Hot Wire

Transformer #2
Upper Inside
Loop Blue Hot
Wire

Transformer #1
Lower Outside
Loop Gray Hot
Wire

Transformer #1
Upper Outside
Loop Black Hot
Wire

The Transformer Cart Should be ready to run.

There is a white cable that is marked to plug into the wall duplex.

There is the control switch marked Manual, Off, and Auto. Should be in off position.

There is a 12 pin cable on the top of the cart that makes a "Y" The bottom of the "Y" is a female Molex plug and it is plugged into the side of the transformer cart.

The other 2 legs are plugged into any pair of modules buss wires between them. You need to unplug the buss wires connectors and plug them into the Power "Y" cable.

Run the trains and adjust the speed for operation.

If anything is disconnected see page 10 for diagram of how the rest of the timer is connected

Middle Shelf on the Transformer Cart



On the shelf below the Power Transformers are the power bricks that have a circuit breaker.

If a track loses power the first place to check is for something off the track.

Reset the train and look for the Power brick directly under the transformer that is shorted.

Reset the circuit breaker by simply throwing the switch so the white of the reset switch is pushed in.

You should then be ready to run again.

Bottom Shelf on the Transformer Cart

On the lower shelf are two large electric boxes. One is called a collector and the other is the Circuit Breaker to operate the train set by pushing one of the 3 buttons attached to the front of the layout.

You must plug the white power cord from the 2 power strips into the outlet on the timer box.

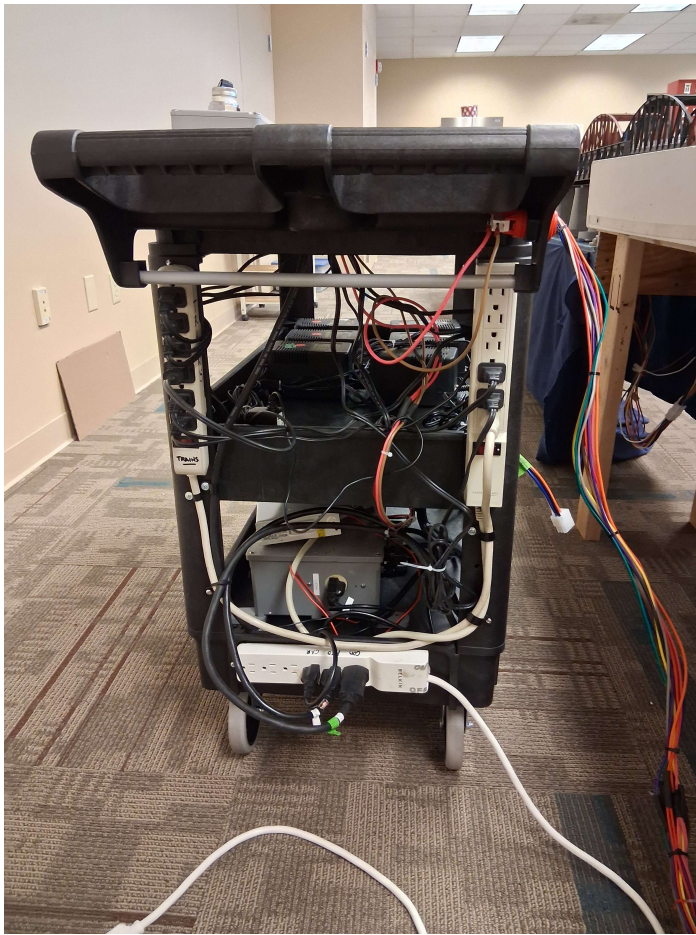
There are 2 black cords wire tied together and both are plugged into a double wall outlet.

At this point you may turn on the power switch to run the trains

Get all trains operational at a reasonable speed and turn the switch to automatic.



POWER strip locations at the rear of the Transformer Cart



TRACK POWER strip

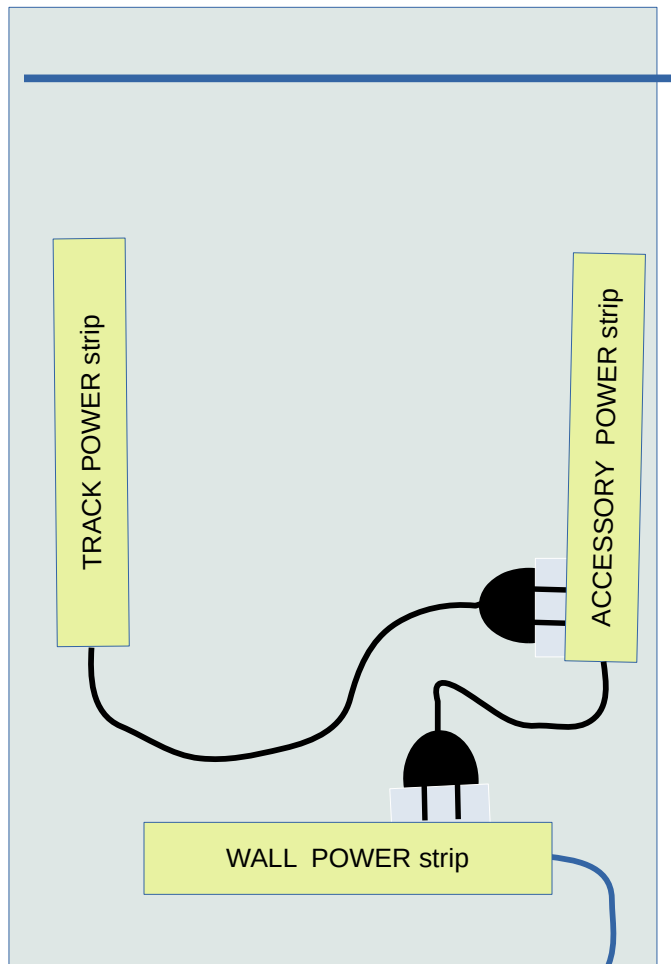
All six transformers are plugged into this TRACK POWER strip.

ACCESSORY POWER strip

The TRACK POWER strip and the two accessory power bricks are plugged into this ACCESSORY POWER strip.

WALL POWER strip0

The ACCESSORY POWER strip along with the Circuit Breaker box and the Collector box are plugged into this WALL POWER strip.



Plug WALL POWER strip into the wall outlet.

Various Views of buildings



Buildings on view from L3



Buildings on view from L5



Buildings on view from L3



Buildings on view from L6



Buildings on view from L7



Buildings on view from L1