

***OPERATING MANUAL
OF THE
MIAMI VALLEY “S” GAUGER’S
MODEL RAILROAD***



©2017 Miami Valley “S” Gaugers

Introduction

In 2010 Ray Garbee wrote the first version of this manual based on his experiences as a new member of the Miami Valley S Gaugers. Early on he came to the realization that no matter how willing he was to participate there were always more questions than answers. Very little information was documented and few members had the time or knowledge to deal with his queries. How was the club organized and governed, what were the activities, how did the layout go together, what made it work and most importantly how do I fit in? Ray's effort to resolve his frustrations resulted in the club's first manual. Using this updated 2016 version, a new member can quickly be at home, contribute his or her skills and talent, and enjoy the fun of our club's fellowship. Even the "old dogs" might learn a new trick or two. The most important piece of advice is that after consulting the guide and you are still not sure what needs to be done or how to do it...ASK FOR HELP...we promise to oblige!



The Basics: Club Charter, State Charter, and Insurance

Charter

- The Club is governed by an elected Board of Trustees and slate of officers under the rules of a Charter adopted December 1999.
- The club is open to anyone with an interest in the MVSG and S Gauge model railroading.
- A copy of the charter is provided to each new member.
- Club dues are \$10 per year payable not later than 1 March each year to Club Treasurer.
- Monthly meeting minutes are published electronically and hard copy upon request.
- The Charter is held by the Club Recording Secretary.

State Charter

- MVSG was established by the State of Ohio as a non-profit 501(c)3 entity 15 Jan 2000 under charter number 114-0454.
- Current charter issued 6 Jan 2015.
- Charter expires every 5 years; the next expiration date is 6 Jan 2020.
- Sales and Use Tax Blanket Exemption Certificate number is 31-168 5489.
- State record of the corporation is at www.sos.state.oh.us/sos/
- Tom Hartrum is the current statutory agent (point of contact).
- Charter and Tax exemption Certificate is held by Club Treasurer.

Commercial Liability Policy

- Ohio Mutual Insurance Group policy, CPP5027235, expires yearly on 1 December.
- Simon Insurance Agency, 108 East Main Street, PO Box 118, Eaton, OH, 45320
- Policy possessed by club Treasurer.
- The purpose of the policy is to protect past, present, and future officers, members and invited guests of the club in the event of a lawsuit.

Trailer comprehensive policy

- State Farm policy, 438 2353-A30-35A, expires every 6 months, next expiration 30 Jan 2017.
- James F Amburn Insurance Agency Inc., 3430 South Dixie Drive Suite 204, Moraine, OH, 45439.
- Policy, registration and license are in club member Larry Beam's name and are possessed by him.
- Purpose of this policy is to insure the trailer at current value against damage or theft.

Trailer liability coverage

- Liability coverage is the responsibility of the individual towing the trailer.

Club Operating Manual

- Operating procedures and essential Club information were documented in 2010 and are updated yearly or as required. Next scheduled update 31 August 2017.

- A copy of the Operating Manual is provided to each new member and upon request to any current member.
- At least one hard copy is kept in the club trailer with the layout.
- The master copy of the Operating Manual is held by club member Walt Schnee.

Operation Overview

The MVSG layout consists of 21 sections or modules that connect together to form a large oval. Currently the layout has 11 four-foot modules, 4 corner modules, 5 eight-foot modules, and a hinged four-foot bridge to allow easy entry and exit without the need to "duck under." When fully assembled, it covers a 20-foot by 32-foot area. The layout has three parallel tracks, two of code 148 rail and one of American Flyer and Gargraves track. The American Flyer line, added in 2003, is a real crowd pleaser for the "children" who grew up with American Flyer trains. In 2010 a 16-foot staging yard with 6 tracks was added to minimize down time and keep the trains running. Understanding the following information should enable a group of relatively inexperienced members to unpack, setup, operate, teardown and re-pack the Club layout with reasonable success.

The Modules

The following are guides to each module and its manager. If you see a problem with a specific module or have a question on how a feature works ask the manager.

1. **Union Station (Mike Mitter):** An AF vintage Union Station set over mainline traffic and two small factories depict the outskirts of Gilbert.
2. **Down on the Farm (Bob Guckian):** Depicting typical farm activities in Ohio including a cow-on-track operating accessory.
3. **Country Living (Bob Guckian):** The house of a farmer fronting a country road and busy rail line complete with operating track signal.
4. **Harvest Time (Bob Guckian):** A harvester works its way through a field of grain. A bubbling water tower sets in the field.
- 4A. **Farm Equipment Sales (Bob Guckian):** Home of our local John Deere dealership. Also has an operating track maintenance gang.
5. **MVSG Club Neighborhood (Tom Hartrum):** The neighborhood consists of two modules. There is lots of action here at the Eaton station. Trains roll through town while the station baggage smasher beats up luggage. The MVSG Club house and trailer are located right off the highway and next to the mainline! Paul's Garage perpetually works on a '57 Chevy and the steam whistle billboard warns everyone of approaching trains.
6. **MVSG Club Neighborhood**

7. **Bridge (Tom Hartrum):** Trains roll over the bridge between the club neighborhood and the junk yard on the outskirts of Plasticville. The junk yard end of the bridge lifts up, allowing members to walk into the center of the layout. Before lifting the bridge, **LOOK BOTH WAYS** and check for oncoming trains. The power does **not** stop when the bridge is lifted. After you pass through, be sure the bridge is snugged down and the tracks are in alignment.
8. **Junkyard (Available):** Wreckage and rust is the theme of this module. The junkyard is home to the American Flyer magnetic crane. The crane loads scrap sheet metal into a mill gondola spotted on a spur track. There is always a pile of rusted cars on site.
9. **Plasticville (John Clifford):** The largest town on the layout consists of three modules and is a collection of Plasticville buildings of the classic American Flyer era. This is a busy place, traffic jams are common and a streamliner frequently sets on the station siding.
10. **Plasticville**
11. **Plasticville**
12. **Tunnel Mountain (Jay Reese):** The tracks cut through two short tunnels as they transit the curve on this module. A rotating beacon sits on the summit. **Caution:** the AF Brownhoist wrecking crane is a very tight fit if the boom is down. The newer Challenger locomotives will not pass through.
13. **Foothills (Larry Beam):** An automatic log loader provides plenty of entertainment as trains pass by. Another operating track signal exists at this location.
- 13A. **Staging Yard Junction (Available):** Here the inner mainline ties to the staging yard with a talking passenger station tucked into the hillside.
14. **Fishin' Hole (Paul Rinehart):** A stream flows over a small waterfall and feeds a large pond. The road which started on the other side of Plasticville ends here.
15. **Stockyard Corner (Joe Green):** This corner module is home to a large stockyard complete with cowboys, cattle and cattle cars on the spur track.
16. **Accessory Row (Available):** A classic saw mill, vintage barrel loader, ice house and coal loader share an industrial spur. All accessories except the ice house are controlled by the accessory computer.
17. **Gabe the Lamp Lighter (Available):** Gabe climbs the tower and lights up the yard of the adjacent factory. Gabe's trips are controlled by the accessory computer. A mail pickup and discharge station on the outer mainline serves the Union Station on module 1.

18. Staging Yard (Available): The Staging yard consists of two modules connected to the inner mainline at module 13A. Six 12-foot long staging tracks funnel down into two interchange tracks and pass under a classic early 20th century control tower. One interchange track exits counter clockwise onto the inner loop while the other exits clockwise onto the inner loop. A master power switch controls power from the inner track transformer to the staging yard. A track selector knob controls which track is powered.

Unloading

Unloading the trailer is actually easy. However working with an experienced club member can ensure a smooth operation.

- Trailer must remain hitched to towing vehicle (in park/gear and brakes set) and have the trailer wheels chocked to prevent movement during unloading.
- Unlock both doors (Usually, whoever towed the trailer has the key)
- Open the side door.
- Dropping the back ramp.
 - Unlatch the door
 - Pull the ramp down, it is counter balanced but watch your toes!
 - Fold out the ramp extension.
 - Pull out the door ramp gap filler from under the module racks. The gap filler is a piece of wood about 5” wide and almost as long as the trailer is wide. It is used to ‘bridge’ the gap between the ramp and the trailer floor.
 - Slide the gap filler into place.
 - Pull any loose items out from under the racks and set aside.
- Unlock the wheels on the long cart located in the center of the trailer, pull from the trailer and wheel to assembly area. This cart is very heavy and should be handled by at least three people when coming off the trailer.
- Remove the tie-down straps that keep the racks in place.
- Remove the racks and wheel into the area where the layout is to be set up. At least two people should handle each rack.
- Remove the boxes from the front of the trailer using either door. Take boxes inside.
- Return racks to trailer when emptied of modules. If the trailer is to be moved the racks need to be reattached to the walls to keep them from rolling around.
- Remove gap filler from between trailer and door and store in trailer.
- Place all items not needed back in the trailer.
- Close and lock trailer doors.
- Park trailer away from loading dock or doors. Chock the wheels, place a board under the jack wheel and lock the hitch. The door key fits the hitch lock.
- Proceed to setting up the layout.

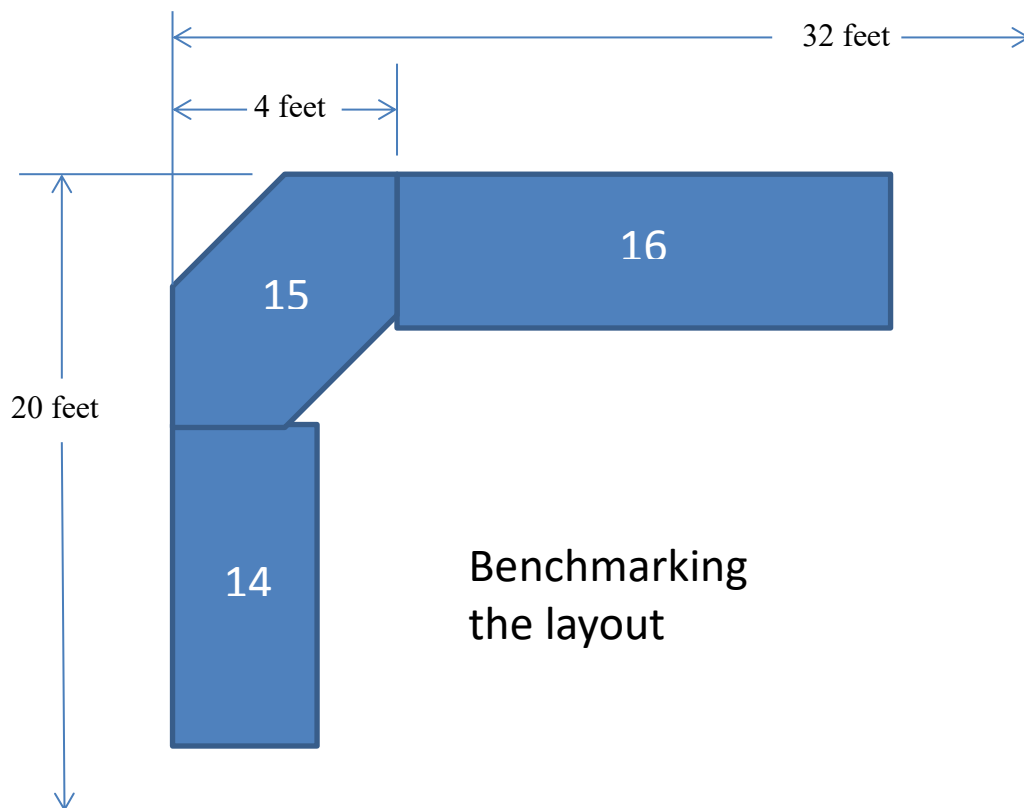
Set Up

Setting up the layout requires a number of sequential tasks be accomplished, although several can be performed simultaneously if there are sufficient members available.

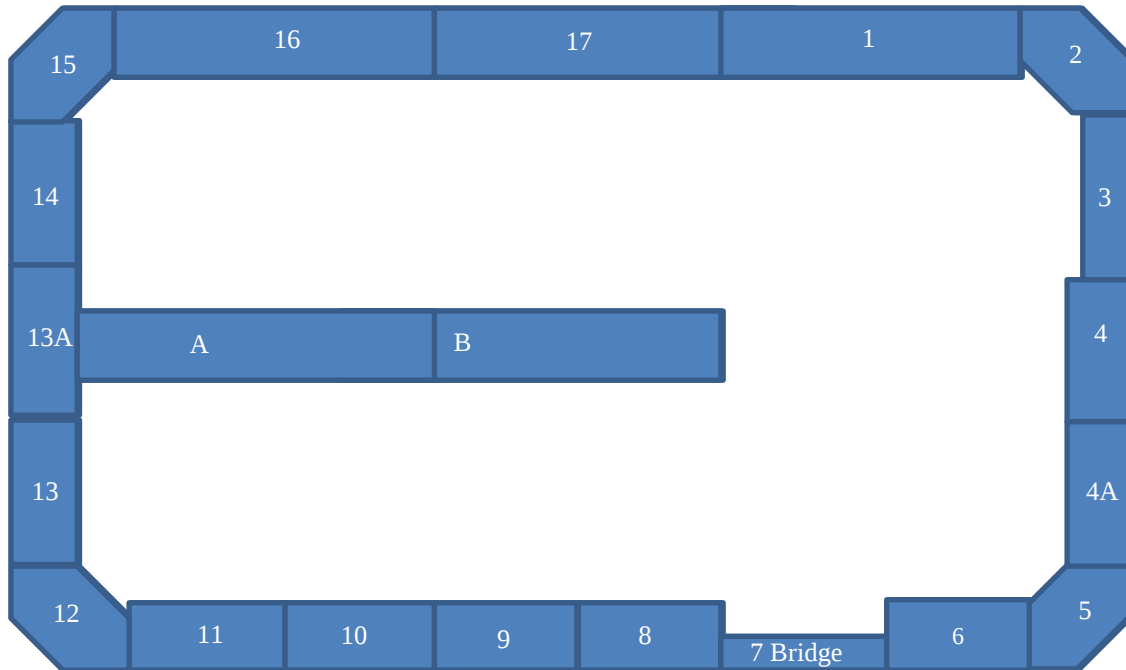
Physical Set Up

A minimum of four-persons is required to safely set up and tear down the layout. To safely set up and be ready for public viewing within two hours requires eight to ten club members.

First mark on the floor the desired location of the corner of the layout formed by modules 15 and 16. Setup module 16 (it has 4 legs), attach corner module 15 and align both to the floor mark.



Next remove the remaining modules from the racks and set them out according to the layout assembly plan below. Set the modules on their sides with the tops facing IN to the center of the oval so that the wood channel used to hold the Plexiglas guard is not cracked by the module weight.



Layout assembly plan

Unfold and lock the legs, **do not jerk** the legs to lock them. Extend the legs until the red paint mark appears. The red paint marks are based on using a flat floor. An uneven floor may require different extension lengths or shims.

Release the various jumper wire connectors from their transporting clips or Velcro straps.

Lift and rotate the module, this is a **two-person task**.

Mate adjacent modules according to layout plan and lock together with vise grip style C clamps. Make certain you do not crush wires or connector blocks when installing the C clamps.

With sufficient members the layout can be assembled simultaneously in both directions from the corner formed by modules 15 and 16. Module 7, the bridge, must be installed last.

Align the modules. The module locating pins and C clamps will establish basic alignment on the straight runs, the 90-degree corner turns may need adjustment at bridge installation.

Install bridge. The distance between modules 6 and 8 needs to be 48 inches. Bridge assembly hardware is located on bottom of the bridge.

Check overall alignment and adjust as necessary. Adjustments to track alignment will require the help of multiple members positioned on both sides of the modules to be moved. Adjust with care. Ensure bridge operates smoothly and locks firmly in place when down. The bridge crutch should be installed only during set up or tear down. Never use the crutch during operations as the bridge does not have a power cut off switch – a train could be driven straight off the layout.

Install module fillers. Corner fillers 2 and 3 are stored with modules 2, 16, 17, A and B on the long cart. Corner filler 12 is stored on module rack x. Corner filler 5 has its own container.

Setup staging modules A and B **after** the layout perimeter is aligned. These modules are very heavy and require four people to handle safely. Place a white folding table under each staging module.

Install connector tracks between modules. Connectors are marked indicating the modules they connect and whether they are outer, middle or inner tracks. It is a best practice to layout all of the connector tracks at their proper location before starting to install them. The brass retaining pins are stored in plastic containers located in the same container as the connector tracks.

Remove track selector switches on module 6 from their stowed position underneath the module and clamp to the inside module face.

Install mail pickup and discharge accessory on outside of module 17.

Clean the tracks. A light abrasive pad followed by alcohol on a clean cloth works best. Remove loose ballast and other debris seen between the rails. Dark electrical arc marks especially around turnouts require elbow grease. Do not use Goo-Gone or similar products, they dissolve the rubber tires on locomotives very quickly.

Install Plexiglas guards on all modules. The guards are numbered to match the module they go with. Clean dirty or smudged guards with a damp cloth.

Hang module skirts. The skirts, stored in one of the three gray plastic containers, attach to the modules by Velcro. The entire outside of the layout is covered. Start on the inside of module 6; go under the bridge and work counter clockwise all the way around. Use the skirt with the large button hole first. The track power connector cables for the bridge go through the button hole.

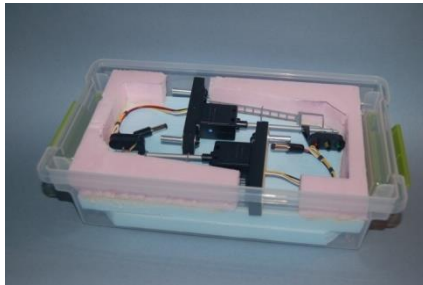
Install backdrops. Hand-painted backdrops for modules 3-11 are stored on the bottom of module rack xx. The backdrops are wrapped in large pieces of protective cloth and must be handled with care. Each one attaches to a specific module with plastic hand clamps. They are numbered to match the modules, ask for help if you do not know where one goes. Installation and alignment are best done with 3 members; two inside adjusting and clamping the backdrop and one outside judging alignment.

Assemble frame for club banner. The club banner goes in the top space and the NASG banner below. The frame attaches to modules 4 and 4A with threaded knobs as the backdrops are installed.

Place operating accessories and buildings. The general location of each accessory or building is marked on module surface. Precise location may require use of a specific railroad car or running train. Electrical connections are covered below in the Accessory power section of Electrical Set Up.

Operating Accessories

- Log Loader (module 13)
- Barrel Loader (module 16)
- Gabe the Lamplighter (module 16)
- Coal Loader (module 16)
- Cow on Track (module 2)
- Whistling Billboard (module 6)
- Baggage Smasher (module 6)
- Magnetic Crane (module 8)
- Sawmill (module 16)
- Rotating Beacon (module 12)
- Staging Yard Control Tower (module A)
- Track signals (modules 13 and 4A). The two signals are stored in a small plastic container, shown below left. Module 13's signal is placed as shown below right.

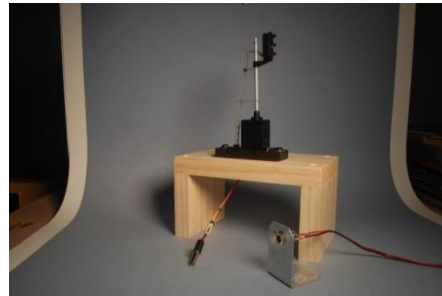
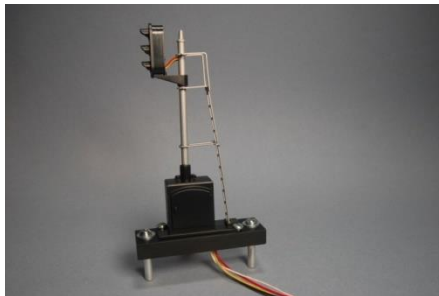


Signal storage container



Placement of signal

Each signal has two posts and a set of wires coming from the bottom, as seen below left. Note that the wires are not centered between the posts, so be sure to match the spacing when inserting the signals into the holes on the layout. Under the layout there is a socket into which the signal is plugged. These connectors can be seen below right.



Signal posts and leads

Signal connectors

When tearing down, first unplug the connector under the layout. Then carefully lift the signal straight up from the holes. Be careful, it is a tight fit removing the connector. Then place the signals in the container inside the black outlines.

- Ice House (module 16) is the personal property of club member and is not packed in the trailer.
- Mail car pickup and discharge (module 17)
- Water Tower (module 4)

Main Buildings

- Union Station (module 1)
- Large Factory (module 17), both buildings are stored in a custom container with several small roof mounted accessories; the main building lights plug into a permanently installed receptacle, the smaller building's light circuit plugs into the right side of the main building.
- Plasticville buildings (modules 9-11)
- Stockyards (module 15), all stockyard items are personal property of a club member and are not packed in the trailer.
- Two small factories (module 17)
- Hand built and Plasticville buildings (module 17). In 2016 several buildings were added to Module 17 to form a small town. They are stored in a large plastic container, shown below left. They are to be placed as shown below right.



Building storage container



Placement of buildings

Many of these buildings have interior lighting. It is important to plug in the lights when setting up and critical to carefully unplug the lights during teardown to avoid damaging the wiring or the buildings themselves. Plugged and unplugged connectors are shown below.



Plugged connector



Unplugged connector

When tearing down, carefully lift each building just enough to enable unplugging the connector. There is a specific, marked location for each building in the container. The buildings in the bottom level should be stored first. Then the second shelf should be carefully inserted. Then the top level buildings can be loaded. Just remember, handle the buildings carefully to avoid damage.

Detail the layout. A large collection of trees, motor vehicles, people, telephone poles, etc. are available to place throughout the layout.

- The telephone poles have permanent sockets installed on the outside of the outer mainline. Do not attempt to force the poles into the layout surface.
- Use care when installing and removing trees. Do not force them; there are three different sizes of tree trunks. Tree trunks consist of brass tubes that fit into other brass tubes that are installed on the layout. They are small, medium, and large in size and color coded green, brown, and black respectively. The “holes” in the ground are painted a corresponding color. Plant the trees by inserting them into a hole of the matching color. The tree should fit smoothly without forcing, if not, you have a mismatch. Trees are removed in a straightforward manner and stored in a marked box. Again, no force should be necessary. Be sure you are removing a removable tree. There are a few small permanently installed trees.
- The remaining items can be placed as desired.

Electrical Set-up

Electrical set up is divided into three sections: main power, track power, and accessories. There are many connections to be made between modules and many can be made simultaneously; however, for clarity they are separated into the following categories.

Main Power

Connect the power cord on module 6 to a standard 120vac outlet. An extension cord is usually required. If the extension cord is exposed to foot traffic secure it to the floor with duct tape and cover with a floor mat.

Connect the permanently installed extension lines between each module. These lines pass the main power counter clock wise from module 6 to module 8. Every module except the bridge has at least one standard 120vac outlet.

Track Power

Power is fed from two transformers to all tracks through three connections. The main connection is at module 17 with two additional jumper lines connected to modules 4 and 11. These jumper lines help prevent voltage drop on the tracks. Power is fed from module to module through several different types of connectors that are keyed to ensure proper voltage polarization. The level of track voltage (i.e. speed of a locomotive) is controlled by a Lionel Legacy Command Control (Legacy) or Lionel Trainmaster Command Control (TMCC).

Set track power selector switches. The turnouts do not reroute track power when moved. Track power selector switches are installed on modules 6, 9, 16 and 17. Ensure that during set up the switches on module 6 are removed from their stowed position underneath and clamped to the inside face of the module. The switches on modules 9, 16 and 17 are permanently installed on the inside module faces.

Initial setting of track selector switches

- Module 6
 - Inner – on
 - Middle – on
 - Outer – on
- Module 9
 - Inner – on
 - Inner siding – off
- Module 17
 - Inner – on
 - Middle – on
 - Outer – on
 - Outer siding – on
- Module 16
 - Lead track – off
 - Inner siding – off
 - Middle siding – off
 - Outer siding – off

Set all mainline turnouts to mainline.

Connect all module to module track power cables.

Set Up Train Control Center

- Install volt meter panel on to the face of module 16.

- Position control center table in front of volt meter panel.
- Place control box on center of table. The control box contains a reverse unit cycle switch, AC/DC selector switch and DC direction control switch for each main mainline and the accessory sidings on modules 16 and 17.
- Connect volt meter panel wiring harness to the control box.
- Connect control box harness to module 17-orange dot to orange dot. Adjust position of control center table to eliminate any strain on control box harness.
- Place the 18B AF transformer (one without gauges) to the right of control box and connect to control box harness.
- Place the 30B AF transformer (one with gauges) to left of control box and connect to control box harness.
- Run the heavy gauge orange jumper lines counter clockwise from module 17 to module 11 and connect. Ensure the color codes match.
- Run the heavy gauge black jumper line clockwise from module 17 to module 4 and connect.
- Connect mail car power wire to connector on right side of control box base. Connect other end of mail car wire to mail bag post on outside of module 18.
- Lay 120vac outlet strip on floor, do not connect and ensure strip is turned off.
- Plug both AF transformers into the power strip ensuring the red dots on the plugs face the same way. If you don't do this, the transformers will be out of phase and will cause operating problems.
- Locate and unpack Lionel controllers.
- Ensure that the battery charger switch on the bottom of the Legacy Base unit is turned on. We currently use rechargeable batteries.
- Place the Legacy Base and the TMCC base units on the Control Table in front of the Control box; Legacy Base on the right and the TMCC unit on the left. Connect the Legacy Base unit "Y" cable to the TMCC Base unit. The "Y" cable should always be connected to the Legacy Base unit to prevent loss.
- Connect the Legacy Base unit signal wire to the control box.
- Plug the two small Legacy and TMCC transformers into the 120vac power strip. Connect the larger transformer to the Legacy Base unit. Connect the smaller one to the TMCC Base unit.
- Place the 3 board mounted Power Master units under the table and on top of the plastic Legacy/TMCC storage box.
- Connect Power Master unit cable Yellow 1 to AF 18B transformer cable Yellow 1.
- Connect Power Master unit cable Yellow 4 to AF 18B transformer cable Yellow 4.
- Connect Power Master unit cable Yellow 2/5 to AF 30B transformer cable Yellow 2/5.
- Connect Power Master unit cable Yellow 3 to AF 30B transformer cable Yellow 3.
- Connect Power Master unit cable Yellow 6 to harness cable Yellow 6.
- Install standard AA batteries in the remote controllers.
- Set both of the 30 B transformer throttles to the 90 mph mark and the left hand throttle on the 18B transformer also to 90 mph. The right hand throttle of the 18B should be set at zero mph until a train is operated on the sidings of modules 16 and 17. All handles should be in up position until time for functional tests.

- Plug outlet strip in one of the 120vac outlets under module 16 and turn the strip on. The green lights on the two AF transformers should be on along with the green lights on each of the three Lionel Power Master units.

Accessory Power

The operating accessories run off of a computer housed in a gray box mounted to a two-wheel cart. The cart must be located to the right of the Train Control Center. This computer is permanently plugged into a power strip and has an on/off switch on the lower center face of the unit. At the bottom right is a pair of wires for accessory testing. They provide 0-17 vac from the 12B transformer right throttle. The 12B transformer is plugged in to the same power strip. Do not connect power strip to 120vac outlet at this point.

The accessory cables are permanently attached to the computer. To hook up the accessories, perform the following steps;

- Position the Accessory Control Computer to the right of the Train Control Center table.
- Ensure computer power switch is off.
- Verify the computer controlled accessories are set up.
- Unwind the connection cables from the computer.
- Run each labeled cable to its connection. (Each cable is labeled at its connector). The cables are;
 - Log Loader (module 13)
 - Barrel Loader (module 16)
 - Gabe the Lamplighter (module 17)
 - Coal Loader (module 16)
 - Cow on track (module 2)
 - Whistling billboard and Baggage Smasher (module 6)
 - Magnetic Crane (module 8)
 - Sawmill (module 16)
- Check the labels to ensure that the correct cable is being attached.
- When routing the accessory cables, use the small modified clamps to run the cables along the inner edge of the layout. This will keep the cables off the floor and out of the way.
- The magnetic crane and the baggage smasher require that the left hand throttle of the 12B AF transformer located under the accessory computer is on and set at 10 volts or about half way open. This throttle determines the accessories operating speed once they are activated by the computer.
- Verify all computer controlled accessories are connected.
- Plug power strip into 120vac outlet located under module 16 and turn the strip on.
- Turn the computer power and the 12B transformer power switches on.
- Observe the performance of each operating accessory and adjust as required.

Things to watch for:

- The saw mill will easily jam. Be very careful when loading lumber and watch it carefully. If it jams TURN IT OFF immediately using the small toggle switch on the back of the mill. Remove the jammed board and restart. If mill does not start within the next minute turn off the accessory computer and restart it.

In addition there are accessories that do not run through the computer.

- The rotating beacon, talking station, track signals and ice house connect to small platform mounted AF transformers that plug into the 120vac outlets under the modules.
- The mail pickup and discharge station operates off of a connection to the 30B transformer and is operated by a switch permanently installed on the outside face of module 17.
- The IGA sign on top of the Plasticville grocery store operates off of a battery located in a box that sits behind the store. It must be turned on at the beginning of each operating session and off at each sessions end.

Functional check

Once the layout is assembled it requires a functional test.

- Ensure bridge is down and all Plexiglas guards are installed
- Run a reliable DC locomotive on each track and correct any deficiencies.
- Run a reliable AC locomotive on each track and check the power interrupt function. Correct any deficiencies.
- If time is available run locomotives through the crossover turnouts and the staging yard to main line turnouts.
- Possible problems.
 - Failure to run indicates power is turned off, transformer handles are not down, AC/DC selector switch is set to center-off , batteries are not installed in the controller, the transformers are not in phase, a short exists or there is improper wiring.
 - A short will activate the Power Master unit's internal circuit breaker and show a red light on the top of the Power Master unit. In the case of a momentary short the circuit breaker will reset itself automatically and show a green light. The reset may take a few seconds. The Power Master WILL NOT automatically reset if the short is a dead short. To reset the Power Master after a dead short is cleared you must push the AUX1 then 0 on the remote. The remote has to be set to the particular track that shorted. To do this, press TR (1, 2, or 3) then AUX1 then 0.
 - The AF transformer internal bimetal circuit breakers will probably never pop due to the much higher sensitivity of the Power Master unit's circuit breakers.
 - Legacy failure
 - **To bypass Legacy capability and control train speeds directly from the AF transformers follow the next two steps.**

- Left transformer (30B) connect plug 2 to plug 2/5 and plug 3 to plug 6.
- Right transformer (18B) connect plug 1 to plug 4. Connections for the sidings on modules 16 and 17 do not change.
- Stopping on modules 6,9,10, 11 and the sidings on 16 and 17 indicate the track selector switches are not properly set.
- Dead tracks in the staging yard indicate the power switch on module A is off or track selector switch is not properly set. Failure to run on module B staging tracks indicates loose connector tracks. There are no track jumper wires between modules A and B.
- A slow-down may indicate dirty track or wheels, loose connections or track jumper wire disconnects.
- Derailments or shaking side-to-side are indicative of wheels out of gauge, bad track or module misalignment.

Operation

It is Club policy that trains will be running when a show opens and that maximum use of all tracks will continue until the closing hour.

The following information covers basic operation of the club layout. The intricacies of Lionel Legacy and TMCC capabilities can be found in the respective instruction manuals.

Key Responsibilities

- **DO NOT OPERATE ANOTHER MEMBER'S LOCOMOTIVE WITHOUT HIS OR HER PERMISSION.**
- **NEVER LEAVE THE BRIDGE IN THE UP POSITION DURING OPERATING SESSIONS.**
- **ENSURE THAT AC CURRENT IS NOT APPLIED TO A DC LOCOMOTIVE.**
- **ENSURE YOUR TRACK IS CLEAR BEFORE STARTING YOUR TRAIN.**
- **VERIFY CROSSOVER TURNOUTS ARE PROPERLY SET.**
- **DO NOT LEAVE THE IMMEDIATE AREA OF THE LAYOUT WHILE YOUR TRAIN IS RUNNING.**

Things to Consider

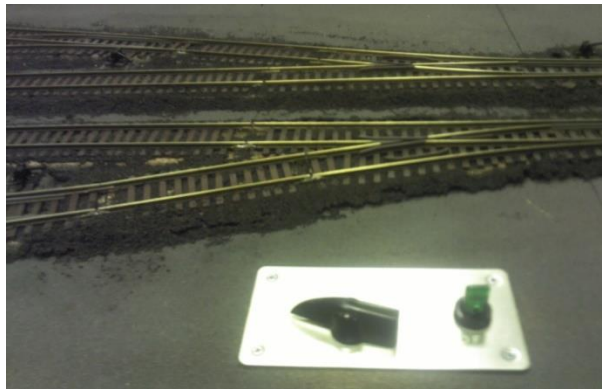
First and foremost ensure your locomotive and cars are ready to run. Clean pickup wheels are essential. If you haven't run for several weeks a checkup at home is in order. Trying to resolve your problems at the expense of the viewing public and other club members is not professional.

Keeping the layout track clean is very easy and most critical. Lubricate your locomotives and cars carefully and spare the oil. Be careful when adding smoke fluid to locomotives. Both of these petroleum derivatives leave a residue that adheres to the rails, collects dirt and through electrolysis creates that black 'insulation' on the rails and your wheels. When you see the trains slowing down, rails turning oily or black take a moment and clean them!

The MVSG layout is configured to run either AC or DC trains. All tracks can be configured differently as long as you do not try to use the connecting turnouts with one loop on AC and the other on DC.

There are two transformers for the layout, a 30B and an 18B. Both have two throttles. Each mainline track is powered by a single throttle. When properly assembled from left to right the throttles provide power for the outer, middle and inner loops respectively. The far right throttle provides power to the sidings on modules 16 and 17.

The staging yard is powered by the inner loop throttle with track selector and on/off switches on module A.



Staging yard track selector and power switches

The transformers are 'on' when they are plugged into the power strip and it is turned on. A green light on top of each transformer should be illuminated. The transformer throttle feeds power to the Lionel controllers. When the throttle handle is in the 'up' position the controller receives no power. When the throttle is in the 'down' position, the controller is powered up. The throttles for the three main loops are set at the 90 mph marks on the transformers. The voltage level delivered to the tracks is controlled by the Lionel controllers and is indicated on the volt meters. Once set, the mainline transformer throttles should not be moved during operating sessions. The only exception would be executing an emergency stop by lifting the appropriate throttle handle.

To change the direction of travel of a train always bring it to a complete stop before reversing it.

When entering or leaving the staging yard or siding or switching between loops it is imperative to check your turnouts before and after your train move. The manual throw turnouts are relatively easy to move. If a turnout is difficult to move check for debris and remove. Do not

lubricate. The two turnouts for the inner mainline siding on modules 9-11 are electric with the switches clearly marked on the inside of module 9.

When exiting the staging yard and moving your train from the inside mainline to the middle or outside line you can trap other trains at modules 6 or 9-10 using the track selector switches. This operation requires the help of at least one member for each train operating. Experience is very important, please do not attempt alone.

Improper turnout settings are the leading cause of derailments on the layout. After you have used a turnout, reset it and monitor it until your train successfully passes through. At that point you are done with the movement.

Basic Operation

- General rules
 - Operate with the checklist.
 - Once your train is on the mainline it is your only responsibility; do not undertake any other task
 - Control your train from outside the layout. Visibility is excellent and interaction with visitors is much improved. You may need inside assistance when leaving or entering the staging yard.
 - Remove deficient locomotives or rolling stock immediately. Do not attempt to resolve problems at viewer expense.
 - Stage on tracks 1, 2, 5 and 6 in the Staging Yard, Plasticville siding, or outside mainline siding on modules 17 and 1. Do not stage on tracks 3 or 4 of the Staging Yard; they must remain open to receive trains exiting mainlines.
 - When run is completed exit to Staging Yard tracks 3 or 4 and remove your train from track and tables under the staging yard. Staging Yard tracks 3 and 4 and the tables below must remain open to facilitate a smooth operation.
- Startup Staging Yard to Inner Main Line
 - Select a track in the staging yard to assemble your train. Do not use tracks 3 or 4.
 - Ensure power to your track is off. See staging yard power track selector switch on module A.
 - Place locomotive and train on selected staging track. Do not try to back a train out of the staging yard. Tracks 1 and 2 will run clockwise. Tracks 5 and 6 will run counter clockwise.
 - Verify inner mainline is clear and power off, ensure by looking at volt meter 1.
 - Verify or set all turnouts to the position you desire.
 - Verify or set staging yard power selector switch to the track your train is on.
 - Turn on staging yard on/off switch.
 - Set AC/DC switch for your locomotives requirements. **Note:** this switch has a center off position.

- If you are running DC set direction switch to clockwise or counter clockwise.
- Key track 1 into the Lionel controller.
- Advance throttle.
- Exit staging yard.
- Return turnouts connecting the staging yard to mainline to the mainline setting.
- Closely follow your train for at least two complete loops.

- Startup Plasticville Siding to Inner Main Line
 - Ensure inner mainline siding track power is off by checking power selector switch on module 9.
 - Place locomotive and train on inner mainline siding track. You can run in either direction.
 - Verify inner mainline is clear and power is off, ensure by looking at volt meter 1.
 - Verify or set all turnouts to the position you desire.
 - Set siding power selector switch to on.
 - Set AC/DC switch for your locomotives requirements. **Note:** this switch has a center off position.
 - If you are running DC set direction switch to clockwise or counter clockwise.
 - Key track 1 into the Lionel controller.
 - Advance throttle.
 - Exit siding.
 - Return siding turnouts to inner mainline setting.
 - Closely follow your train for at least two complete loops.

- Startup on Union Station Siding to Outer Main Line (The siding passes through the triple track portal)
 - Ensure Union Station outer mainline siding track power is off by checking power selector switch on module 17.
 - Place locomotive and train on siding track. You can run in either direction.
 - Verify outer mainline is clear and power is off, ensure by looking at volt meter 3.
 - Verify or set all turnouts to the position you desire.
 - Set siding power selector switch to on.
 - Set AC/DC switch for your locomotives requirements. **Note:** this switch has a center off position.
 - If you are running DC set direction switch to clockwise or counter clockwise.
 - Key track 3 into the Lionel controller.
 - Advance throttle.
 - Exit siding.
 - Return siding turnouts to outer mainline setting.
 - Closely follow your train for at least two complete loops.

- Startup on Mainline. (Usually done to expedite setup at the start of a show)
 - Ensure mainline is clear and track power is off by checking appropriate volt meter.

- Be aware of trains running on the other mainlines.
- Place locomotive and train on selected mainline track. You can run in either direction.
- Verify or set all turnouts to the position you desire.
- Verify or set track power selector switches as required.
- Set AC/DC switch for your locomotives requirements. **Note:** this switch has a center off position.
- Set direction clockwise or counter clockwise if you are running DC.
- Key the track you are on into the Lionel controller.
- Advance throttle.
- Closely follow your train for at least two complete loops.
- Other operating rules
 - Operating accessories need attendants assigned to reload and keep performing correctly.
 - A single individual is assigned to perform maintenance during an operating session.
 - All deficiencies and fixes will be documented.
 - No meetings or bull sessions will be held when viewers are present.

Housekeeping

Let's look professional! Real railroading is a very dirty business and fun to model but our operating area should be very presentable to the public. Once the layout has been assembled and tested, it's time to look sharp!

- Keep as many storage items as possible in the trailer.
- Store as many other items as possible under the modules.
- Clean up after eating.
- Keep the tables and chairs clean and organized.
- Use and empty the trash container.
- Let's be a good tenant to whomever is hosting the layout.

Tear-Down and Loading

Once we're done operating, it's time to put the layout away. This is essentially the reverse of the unloading and set up operations. The following steps should be performed.

- Turn off power to the tracks and unplug the main power line.
- Remove all trains from the layout.
- Remove the bridge to facilitate teardown.
- Bring trailer as close as possible to operating site and leave hitched to tow vehicle.
- Retrieve storage racks and other storage containers from the trailer.
- Disconnect all operating accessories and put them back in their boxes.
- Pull the operating accessory wires back to the computer and coil them on the computers posts.

- Move computer out of the way.
- Put all buildings and decorations back in their storage boxes.
- Remove club banners and frame from modules 4 and 4A. Disassemble frame and store with threaded knobs in the long white bag. Roll up the banners, never fold them, and store along with the small bungee cords in their container.
- Remove Plexiglas guards and wrap in large sheets. Always have a cloth between each guard. Try to keep the guards in reasonable order, the next setup person will thank you.
- Remove backdrops from the layout and bundle up in their storage cloth. Never put the painted sides of the backdrops against each other without a towel or cloth between them.
- Remove the skirting starting at module 8 and work clockwise. Fold each one and return it to its box. Skirt on module 6 with large button hole should be last one placed in storage box.
- Disconnect all inter module and control center wiring. Grasp the plugs or connectors not the wires when disconnecting.
- Pull the heavy orange and black jumper lines from under the modules and coil for storage.
- Remove bridge tracks between modules, secure each set with rubber bands and place in storage box. The brass retaining pins are stored in small plastic containers and are stored with the bridge tracks.
- Tear down control table.
 - Disassemble transformers and return to box. Do not remove the wires connected to the transformer terminals.
 - Remove batteries from Legacy and TMCC controllers.
 - Put control panel in box.
 - Fold up table and set aside.
- Begin disassembly of the modules.
 - **Caution: Never remove a module's C clamp until you are ready to take it down. A string of modules standing without their C clamps are a danger to spectators and club members.**
 - Starting with modules 6 and 8, work around the layout. Remember module 16 is the only module that can stand by itself and needs to be the last one taken down.
 - Modules 1, 16, 17, A, and B require at least four members to handle safely. All other modules can be handled by three member teams.
 - Ensure all wiring is disconnected then remove the c clamp.
 - Rotate module so the inside edge faces down and set on floor.
 - Secure wiring on all modules. Nothing should hang below the module frame.
 - Collapse, fold legs and load on rack or set module flat on floor.
 - Repeat until all modules are separated and ready for storage.
- Place modules 2-15 on racks using three member teams.
 - Each module has a specific numbered rack location. The track side of the module goes to the open side of the rack. Loading is best performed from bottom to top, especially with the corner modules.
- Latch modules A and B together
- Place modules 1, 16, 17, A and B on the rolling cart along with the club banner case and corner modules 2 and 15 filler pieces.
- Complete top loading of the racks.

- Secure items on top of the racks with expandable netting. Ensure that no knots are on the sides of the rack. The rack must be flush with the sides of the trailer.
- Load racks into the trailer. This step is best done with an experienced club member. Racks must go in the following order: 1- front left, 2 – front right, 3- rear right and 4 – rear left. There are alignment marks, locating blocks and tie down straps on the right and left trailer walls. The large rack numbers must be visible from the rear of the trailer. The long rolling rack fits down the center of the trailer with its wheels locked.
- After the racks are loaded the computer, all remaining containers, white tables and stools are placed in the front of the trailer. Pack everything tight to inhibit movement while trailer is underway.
- Remove the ramp gap filler and store under one of the module racks.
- Place both brown tables directly behind the long rolling rack.
- Stow trailer chocks and jack wheel board.
- Fold up back ramp extension.
- Close rear door and lock.
- Make one last visual inspection of the area to ensure all items have been loaded.
- Close and lock side door.
- DONE!

Trailer Data

- Make: KZ KARGO
- Model: 7x12, Tandem Axles, red with aluminum trim
- License Plate: RK26BE, Ohio, expires xx xxx 2017. Registration is located on front interior wall of trailer.
- Registered and licensed in club member Larry Beam's name.
- Vehicle Identification Number (VIN): SJXCT122945125085
- Purchased: 6 Jul 2005 from the Rodeo Shop, Enon, OH
- Purchase price: \$4300 (minus \$1050 trade-in)
- Hitch: 2 5/16 ball
- Length: 15ft 10in (interior 12ft 7in)
- Width: 8ft 6in (interior 6ft 8in)
- Height: 8ft 6 in (interior 6ft 9in)
- GVWR: 7000 lbs.
- Curb weight: 2100 lbs.
- Payload: 4900 lbs.
- Weight loaded: 4310 lbs. (Jun 2016)
- Tongue weight loaded: ~ 250 lbs.
- Wheels: 5 bolt
- Tire size: 205/75D15C
- Tire pressure: 35psi
- Brakes: Electric
- Locks: Two doors, one hitch with common key. Keys held by Bob Guckian, Larry Beam and Paul Rinehart

- Insurance value of trailer: Current market value
- Comprehensive trailer content insurance coverage: \$xxxxxxx
- Liability insurance is responsibility of club member towing trailer.

Towing Checklist

- You must use a vehicle capable of towing a 7000 lbs GVWR trailer with a tongue weight of at least 300 lbs.
- You must have a vehicle liability insurance policy that covers towed trailers in addition to your towing vehicle.
- Check and correct tire pressure on the tow vehicle and trailer, including the spare tire.
- Make sure the wheel lug nuts/bolts on the tow vehicle and trailer are tightened to the correct torque.
- Be sure the hitch, coupler, draw bar and other equipment that connect the trailer and the tow vehicle are properly secured and adjusted.
- Make sure the safety chains are properly crossed and connected, not touching the road but with enough slack to make turns.
- Check that the wiring is properly connected; not touching the road, but loose enough to make turns without disconnecting or damaging the wires.
- Make sure all running lights, brake lights, turn signals and hazard lights are working.
- Verify that the brakes on the tow vehicle and trailer are operating correctly.
- Check that all items are securely fastened on and in the trailer.
- Be sure the trailer jack and tongue support is raised and locked in place.
- Check load distribution to make sure the tow vehicle and trailer are properly balanced front-to-back and side-to-side.
- Check side- and rear-view mirrors to make sure you have good visibility.
- Check routes and restrictions on bridges and tunnels.
- Make sure you have wheel chocks and jack wheel board.

Trailer Maintenance Schedule

The following items will be accomplished yearly in the month of May, unless otherwise noted. Corrective action will be performed immediately. Deferral of corrective actions requires the approval of club President.

- Brake operating clearance adjusted.
- Brake lining inspected for wear and contamination.
- Brake cylinders inspected for leaks and sticking.
- Brake controller amperage and modulation checked.
- Trailer light wiring inspected for loose connections and wear.
- Trailer brake wiring inspected for loose connections and wear.
- Hubs/drums inspected for abnormal wear and scoring.
- Wheel bearings and cups inspected for wear and corrosion.

- Wheel bearing grease repacked.
- Bearing seals replaced if removed or leaking.
- Springs inspected for wear or loss of arch.
- Suspension hangers inspected for weld cracks or abnormal wear.
- Wheels (including spare) inspected for deformities and cracks.
- Wheel studs and lug nuts inspected for distortion, cracks or abnormal wear.
- Lug nuts tightened to proper torque.
- Tires (including spare) inspected for wear, cuts, punctures, bulges, etc.
- Tires (including spare) inflated to proper pressure.
- Trailer jack and tongue support lubricated and inspected for cracks and abnormal wear.
- Door hinges and latches lubricated.
- Rear door counter balance inspected for proper operation and frayed cables.
- Overall body inspected for leaks and structural integrity.
- Trailer washed as required to retard corrosion and maintain appearance.