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**Item I – Maximum Membership Numbers**

Regular – 25

Seasonal – 10

Junior **(Between 12 and 17 yrs. of age)** - 5

**Item II – Membership Fees and Dues**

Regular Members: $10/Mo. or $110 annually if paid by the January membership meeting.

Seasonal Members: $15/Mo. while active or $110 annually if paid by the January membership meeting.

Junior Members: No monthly/annual fee. Must be accompanied by a Regular or Seasonal Member.

**Item III – Expenditure Levels**

The Board can approve by a majority vote, expenditures of $150 or less. Individual board members do not have authority to spend club moneys. All expenditures greater than $150 requires a majority vote by the club membership.

**Item IV – Power Tool Usage**

Regular and Seasonal Members may use the Club’s power tools at their own risk. If a member is unfamiliar with the proper use of a tool, they should have someone knowledgeable with that power tool give them instructions on the proper use of the power tool.

For SAFETY reasons, club members are advised not to use the power tools in the shop when they are alone in the building. If you are alone and get injured, you may not be able to call for the medical assistance you need.

For SAFETY reasons, Junior Members may NOT use the Club’s power tools.

For SAFETY reasons, club members must wear eye protection when performing any work that has the potential for causing injury to the eyes, typically, but not limited to, soldering and the use of power tools. Club members must wear eye protection when in the area around someone who is soldering or using power tools.

* There is one club provided face shield hanging on the wall in the shop room.
* Members are encouraged to purchase their own personal safety glasses.

For SAFETY reasons, members must wear hearing protection when using or in the general area of tools and equipment that make a loud noise.

* Disposable ear plugs are available in the club’s shop room.
* Members should consider purchasing their own personal hearing protection.

**Item V – Standard Meeting Schedule**

* **Operating Sessions**: These sessions will start at 7 PM and are scheduled for:
* The 2nd Tuesday of the month.
* The Thursday of same week as the Membership Meeting.
* A club member or a guest who wants to run their personal equipment during an operations session must first have their equipment QC’ed as described in the Quality Control section.
* The Operations Team will have the layout staged and ready for operations by the end of the previous Thursday night club session.
* Visitors may be allowed to operate trains only with an experienced member’s supervision.
* **Officer’s Board meetings**: These meetings will start at 7:30 PM and are scheduled for the 3rd Tuesday of the month.
* **Membership meetings**: These meetings will start at 7:00 PM and are scheduled for the 4th Tuesday of the month.
* **Train Running Sessions**: These sessions are scheduled for Saturday mornings when the Museum is open so that museum visitors can observe. Club members can run their own personal rolling stock. Museum visitors are not allowed to run any club rolling stock or use club equipment including throttles under any circumstances.
* Key holders are requested to sign up in advance using “signup.com” to maintain continuous Saturday coverage. Non-key holders are encouraged to assist key holders with Saturday sessions.
* Members should be fully knowledgeable with the NCE control system in use on the GMRC layout. Experienced members are available to provide short briefings if needed.
* Members should stage their trains using the staging yard located just outside the train room. Members running trains are responsible for validation of turnout settings and right-of-way management.
* Rolling stock used for club operations must not be moved from its ‘on spot’ location as this will disrupt upcoming operations sessions. The only exception would be a brief demonstration of Thomas the Tank and running of the POW train. These should be returned to their original starting places.

The primary responsibility of the club member host is to escort museum visitors in the layout room. The number of museum visitors allowed in the layout room should be limited so that proper control can be maintained. This is especially important when visitors are accompanied by young children.

* Typically**,** five guests per club member.
* Guests must be advised that touching of the trains and the layout is NOT permitted.
* Unruly or disruptive guests should be kindly asked to leave the layout room.

**Item VI – Access to GMRC Train Layout**

* **Access and operation** of the GMRC layout by other than GMRC membership, will require review and approval by the GMRC Board prior to the event.
* Members, other than Club Officers, of the GMRC (Gilbert Model Railroad Club) may obtain keys to the club facility under the following criteria:

Request:

* Member must enter a request for keys to the layout.

Membership:

* Member must be and remain in good standing and current with dues.

Layout Management:

* Member must understand and demonstrate to the satisfaction of at least two club officers the ability to run trains on the layout by using the club’s equipment without the assistance or guidance of other club members.
* Member must understand and demonstrate to the satisfaction of at least two club officers the skill and ability to perform routine maintenance and improvement work on the layout.
* Member must understand and demonstrate to the satisfaction of at least two club officers the ability to use the club’s power control system, setup the display train for Museum operation and close up and secure the building when leaving. There is a written club procedure for this.
* **Rules:**
* No food or beverage will be allowed in layout room.
* Members must use the sign in/out log sheet and document any improvements they made or any problems they have encountered.
* Should a member cause damage to the club layout or another member’s equipment, the member is responsible to notify the equipment owner and repair or replace the equipment in order to make the club and/or the club member whole. If the item is club owned, the member needs to notify the GMRC President or Vice President.
* When leaving the premises, members are responsible for ensuring that the display train is working and for securing the building to include locking the train room door, the shop door and the entrance door at the top of the stairs. If there is a problem that the member cannot resolve, they must notify a club officer for assistance.
* **Consequences:**
* Any member found out of compliance with these rules, regulations, standards and procedures will lose their privilege to have keys to the club and will forfeit their keys.

**Item VII – Train Layout Conformance & Performance**

In order to ensure compliance with the 1950-1965 era of the GMRC layout and the GMRC’s written mission statement, five compliance/performance teams will approve all modifications, improvements and maintenance of the layout. The five compliance/performance teams are Electrical, Operations, Construction, Scenery and Maintenance.

1. **Electrical Team:** Responsible for the general electric systems, including but not limited to:
   * General electrical service to layout room, layout, accessories, and lighting.
   * DCC control system.
   * Track layout wiring, track maintenance and replacement..
   * All other electrical devices on the club layout.

2. **Operations Team:** Responsible for all train operations, including:

* + Setup and Management of all Operations sessions, both internal and external
  + Management of engine/locomotive programming and establishment of a club standard for such programming.
  + Management of engine/locomotive power and rolling stock inventory, with support of the Club Archivist.

1. **Construction Team:** Responsible for overseeing that active projects are being accomplished in accordance with the approved ‘Layout Improvement Request Form’ along with meeting all standards set forth by the club.
2. **Scenery Team:** Responsible for seeing that the scenery and structures on the layout conform to the 1950-1965 era of central Arizona and the club’s mission statement.
3. **Maintenance Team:** All club members in good standing are part of the Maintenance Team.
   * Responsible for the general upkeep of the layout, including but not limited to:
     + Track maintenance, including cleaning, repair, and replacement, with support from the Electrical Team.
     + Engine maintenance, including cleaning, lubrication, repair and replacement.
     + Rolling stock maintenance, including cleaning, lubrication, repair and replacement.
     + Should a bad order car or engine not be repairable prior to the next operations session, the Operations Team must be notified.
     + Scenery cleaning and upkeep.
     + Benchwork maintenance.
     + General room cleanliness and upkeep. This includes the two work room areas.

**Modifications and improvements to the layout are to be submitted in writing using the club’s ‘Layout Improvement Request Form.**

The compliance teams will review the request and either approve or disapprove the request. Sometimes the compliance teams may make suggestions to the requestor that would make the request approvable.

If an Improvement Request is disapproved by the compliance teams, the requestor can present the request to the club membership at the regular monthly membership meeting. The club membership can then discuss and vote to approve or disapprove the request.

All completed “Layout Improvement Request Forms” will be dated and filed in the Club improvement folder in the work room.

**Most electrical problems** arise during Saturday and operating sessions. It is imperative to inform the GMRC Electrical Team so that a repair can be made in a timely manner. When any club member detects an electrical problem, it should be logged on the ‘Electrical Team – Bad Order Log’ sheet and a bad order ticket placed on the layout where the problem exists. Electrical Team members will check this log at the start of each shift and work to resolve the problem.

**Item** **VIII – Rolling Stock Standards and Procedures**

The term ‘rolling stock’ will include locomotives, freight cars and passenger cars. In order to maintain the quality of the rolling stock and an accurate inventory of equipment on the GMRC layout, the following procedure needs to be followed:

All rolling stock that resides on the GMRC layout will be documented on an inventory roster that will be kept on the club’s computer. The equipment roster will be maintained by the Operations Team.

An approval from the Operations Team must be obtained prior to removing and before returning any rolling stock on the layout. This is necessary to ensure that club operating sessions are not impacted by equipment removal or additions.

* Whenever a club member removes from the layout their personal rolling stock that is used for club operations, it must be checked out on the club’s Inventory Check Out/Check In log. On its return it will be checked back in on the log. The Operations Team will monitor this log.
* The Operations Team will oversee the equipment check in/check out log and process.

**Rolling Stock in Need of Repair** will be removed from the layout and placed in the Bad Order box located in the club’s clean room.

* A description of the defect is to be written on a bad order ticket and placed with the rolling stock.
* The bad order ticket will accompany the rolling stock throughout the repair process.
* The layout location of the bad order car will also be noted on the bad order ticket.
* “Off-layout” ticket shall be put in the car card with the waybill and placed at the original location of the car.
* During repair, the Quality Control standards and procedures noted below should also be performed.
* When repaired, the rolling stock is to be returned to the layout.

**Quality Control- Freight and Passenger Cars**

* **Weight:** Check the car weight and add weight in accordance with NMRA standards using self-adhesive wheel weights, lead shot with white glue if practical, or other flat metal objects. Weight should be centered in the car or equal amounts of weight centered over the trucks. Exposed weight should be concealed with matching paint or camouflaged with weathering.
* **Wheels:** Non-magnetic metal wheelsets with plastic side frames are the standard.
  + Exceptions can be made on a case-by-case basis.
* **Couplers:** Kadee knuckle couplers are the standard.
  + - Exceptions can be made on a case-by-case basis.
    - If a non-Kadee coupler fails during operations, it must be replaced with a Kadee coupler
  + Make sure the knuckle moves freely, the knuckle spring is in place and has proper tension.
  + Make sure the coupler swivels easily and returns to center position. If the coupler does not return to center position and is equipped with a Kadee brass centering spring, replace the brass centering spring or replace the coupler with a Kadee “whisker coupler”. If the centering issue cannot be resolved, escalate to the car maintenance lead.
  + Check the coupler pocket cover.
    - Ensure that the coupler is properly installed, snug, not drooping, etc.
    - Metal coupler covers and pockets on Athearn rolling stock should be modified to accept a screw.
    - Plastic press fit coupler covers may need to be modified to accept a screw.
  + Check the coupler height and trip pin clearance using the Kadee height gauge.
    - Adjust height as needed with washers (fiber or metal) or Kadee offset couplers.
    - Adjust the trip pin with Kadee pliers.
* **Roll Test:** the car should roll freely for about 5’-6’. If not:
  + Check the trucks:
    - If the trucks are metal, consider replacement.
    - If the wheels are not Intermountain brand, consider replacement.
    - If the trucks are plastic, clean out the wheel point pocket with the “truer” tool.
    - Check the pivot screw. It should not be too tight or too lose. The truck should have play in all 4 directions and should sit flat.
    - The car should not lean to one side. Consider replacing the pivot screw with a tapered head screw.
    - Wheels should be cleaned.
* **Detail parts:**
  + Consider replacing any missing detail parts, more commonly, the brake wheel.
  + Consider touching up with paint any car parts that’s don’t match the car. Examples include brake wheels or box car door rails.
* All freight and passenger cars must be reviewed for proper weight, wheelsets, coupler type and coupler height prior to placement on the layout. Once approved, a ‘QC’ sticker will be added to the bottom of the car indicating that it has passed all tests. The owner’s initials will also be added to the bottom of the car. Make sure car is logged into the Inventory list found on the club’s computer.

**Quality Control- Locomotives**

* All locomotives must be reviewed for proper couplers along with their programming and compatibility with the NCE control system. Once approved, a ‘QC’ sticker will be added to the bottom of the locomotive indicating that it has passed all tests. The owner’s initials will also be added to the bottom of the locomotive.
  + Locomotives will be entered in the JMRI program that resides on the club’s computer.
  + JMRI can be used to program the locomotive and to record the CV settings of a locomotive.
* When a ‘QC’ sticker is applied to rolling stock, its information is then entered into the GMRC inventory roster by the Operations Team and so noted that it is ‘on the layout’.

**Locomotive Programming**

The GMRC has adopted the use of SoundTraxx DCC decoders for all new DCC installations in our club locomotives. They can be sound or mobile (non-sound) decoders. The reasons for choosing SoundTraxx is for their lower cost, independent brake feature, ease of installation and ease of programming using Decoder Pro (JMRI). Select the Econami model for its lower cost. It has the desired features for our club operations. Select the Tsunami2 model if an appropriate prime mover is not available on an Econami.

This is a ‘Standard Practice’ for certain features and functions for the locomotives used for ‘Operations’ on the GMRC layout.

**Function Key Standards:**

* For Sound Decoders:
* F0: Lighting, typically headlight, backup light and other lights such as beacons and mars lights.
* F1: Bell
* F2: Airhorn or Whistle – Long
* F3: Airhorn or Whistle – short
* F4: Airhorn or Whistle – Grade Crossing
* F5: Econami = Not used; Tsunami = Dynamic Brake
* F6: Independent Brake – On/Off
* F7: Not Applicable
* F8: Mute
* F9: RPM+, run RPM’s up, also used to start prime mover
* F10: RPM-, run RPM’s down
* For Mobile Decoders (non-sound)
* F0: Lighting features
* F6: Independent Brake – On/Off

**Sound Decoder Programming Standards:**

Use Decoder Pro to program all GMRC decoders. Using Decoder Pro documents, the CV (Configuration Variable) settings for each locomotive so they can easily be re-installed if the programming is lost due to a malfunction. The tabbed pages make it easy to program features that require the setting of multiple CV’s.

Note:

* If you use only the Power Cab to program, the changes you make will not be documented.
* Only change the stated features in each tab. The rest of the default settings apply.

**Motor Tab:**

* Momentum (Locomotive’s Inertia) is used to provide a more prototypical starting and stopping of club locomotives and to eliminate that ‘slot-car’ start and stop.
  + Acceleration: (CV 3), start at a setting of 30. Adjust higher or lower to obtain desired performance.
  + Deceleration: (CV 4), start at a setting of 15. Adjust higher or lower to obtain desired performance.
    - * Note: The higher the value, the longer it will take the locomotive to reach the speed setting and also to come to a stop.

**Functions Map Tab** - Change only the following functions

* Dimmer: to Disable.
* Brake: to F6.
* Grade Crossing: to F4.
* RPM+: to F9.
* RPM-: to F10.
* Dynamic Brake (Econami): to F6.
* Straight to Idle (Tsunami): to F6

**Lights Tab**

* Head light F0(f) - Set for Auto dimming reverse.
  + Directional Controls – Forward and Reverse.
* Backup light: F0(r) - Set for Auto dim forward.
  + Directional Controls – Forward and Reverse.
* Note: Set FX3 thru FX6 as appropriate for any additional lighting features.

**Advanced Tab**

* Independent Brake Sign – set to ‘*subtract value from baseline braking rate’.*
  + The locomotive will come to a stop faster with the brake on than it would if it just coasted to a stop.
* Independent Brake Rate - start at a setting of 17 – adjust higher or lower as desired.
* Note: the higher the setting, the faster the locomotive will stop when the brake is applied.

**Sound Tab**

* Engine Notch Rate – set to every 15 speed steps.
  + The prime mover will notch up one notch with each press of the FAST INC button.
  + The prime mover will notch down one notch with each press of the FAST DEC button.
* Engine Auto Start – set to Disable.
  + To start the prime mover, you must press F9 or increase the speed step to 1.
  + This keeps the locomotives quiet until they are to be used.
* Dynamic Brake Override (Econami) – set to ‘*RPM’s drops to idle’.*
  + When the Independent brake, F6, is applied, the prime mover RPM’s will drop to idle.
  + Prototypically, the engineer would notch down to idle when the independent brake is applied.
* Dynamic Brake Override (Tsunami) – set to *“Normal”.*
  + Dynamic Brake is assigned to F5.
* Straight to Idle (Tsunami) is set to F6.
* Make other selections as appropriate for the locomotive type.

**Sound Levels Tab**

* Dynamic Brake Volume – set to zero (0).
  + Eliminates the dynamic brake sound when the independent brake is applied.
* Set the remaining volume controls as necessary so the locomotive sound is not obnoxiously loud. The locomotive should not be heard from more than 5 to 10 feet away.

**Equalizer Tab**

* Equalizer Control – set to small speaker (1-2 inches).
  + Provides a standard compensation for small speakers.

**ASC Tab**

* Automatic Brake Squeal Enable – set to on (check the box).
  + Brakes will squeal when the locomotive is braking.
  + Adjust the sensitivity setting to keep squealing from being annoying.

**Basic Speed Control Tab**

* Ensure all other programming features have been set before programming the Speed Control.
  + The programming track is not long enough to do speed control using Decoder Pro.
  + You will have to do this on the layout using a Pro Cab in ‘Ops Mode’.
* In the Basic Speed Control tab, set the ‘Don’t use Speed Table’ to on.
* Save your current settings in Decoder Pro.
* Take the locomotive and the speedometer out to the club layout.
* Set the speedometer up mid-way on a long stretch of track on the layout – suggest the stretch of track at Sacaton.
* Use a Pro Cab to do ‘Ops Mode’ programming.
  + Set CV 3 and CV 4 both to zero (0) to remove the momentum.
* Run the locomotive both forward and in reverse thru the speedometer at speed steps 1, 14 and 28.
  + Set CV 2, Vstart, motor starting voltage for a speed of 2 mph at speed step 1 and note the CV value.
  + Set CV 6, Vmid, motor middle voltage for a speed of 33 mph at speed step 14 and note the CV value.
  + Set CV 5, Vhigh, motor high voltage for a speed of 66 mph at speed step 28 and note the CV value.
* Once you are satisfied with your results, return the locomotive to the Decoder Pro track.
  + Return the speedometer to the programming room.
* Use the Motor tab page in Decoder Pro to re-write the original momentum settings.
* Use the Basic Speed Control tab to ‘read’ in the new settings for the Vstart, Vmid and Vhigh. values into Decoder Pro. These should agree with your notes.
* You are now finished – be sure to save your work as you exit the locomotive file.

**Item IX – Track Standards and Procedures**

In order to ensure good layout operations, it is important that the track work conform to the following standards.

**Flex Track:**

* Every rail will have an electrical wire drop. NEVER rely on a rail joiner for power.
* Track segments may be soldered together not to exceed six feet in length.
* Track connections on curves will be soldered in order to prevent kinks in the curve.
* Tracks will be fastened to the layout using standard ‘track nails’.
* Straight tracks will be laid straight and curves will be smooth. ‘KINKS’ cause derailments and will NOT be permitted.
* Mainline radii should be as wide as possible.
  + Mainline radii less than 24-inches will NOT be permitted.

**Wire Drops:**

* Use AWG 20 or 22 solid wire, red and white in color.
* Solder the RED wire drops to the outside of the rear rail.
* Solder the WHITE wire drops to the outside of the front rail.
* Solder the wire drops to the district sub-buss, white-to-white & red-to-red.

**Turnouts:**

* Turnouts are NEVER soldered to track segments.
* The standard turnouts used are ‘DCC friendly’ turnouts, Peco ‘insulfrog’ code 100.
  + It is not possible to power the frogs on these turnouts.
* Other turnouts used are Shinohara code 100.
* Shinohara turnouts are NOT DCC friendly and require special wiring and insulation.
  + Do not cut gaps in these turnouts. Use a plastic rail joiner to insulate the turnout at the ‘frog rails’.
  + The frogs on these turnouts should be powered in one of two ways using:
    - A Caboose Industries 220S ground throw with SPDT contacts.
    - A Tam Valley Frog Juicer.
* In order to make a turnout easy to remove and replace, the ties should be cut back on the track section that connects to the point-end of the turnout. This allows the rail joiners to be slid back completely off the turnout’s stock rails. The turnout can then be lifted up at the point-end and then pulled back to disconnect it from the tracks at the frog-end.
* Most turnouts on the layout will be by manual operation in order to provide more operator interaction during an operating session.
* Crossover and Wye configurations shall be automated to minimize derailments.
* Hard to reach turnouts will be automated to prevent inadvertent damage to scenery and equipment.

**Turnout Control**

* Ground Throws:
* A Caboose Industries 218S ground throw is the recommended model for turnouts with non-powered frogs.
* the 218S ground throw comes with selectable end connectors.
* for Peco turnouts, use the connector with the ‘hole’ that fits over the pin on the turnout’s throw-bar.
* for Shinohara turnouts, use the connector with the ‘pin’ that fits into the hole in the turnout throw-bar.
* A Caboose Industries 220S ground throw with SPDT switch contacts is the recommended model for turnout.
* with frogs that can be powered.
* where power is routed to a section of track.
* the 220S ground throw comes with selectable end connectors.
* select the end connector that fits the brand of turnout.
* Installing the ground throw:
* To prevent the throw handle from going all the way to the base, the anchoring track nails will go through a 4 mm ‘spacer’ bead.
* Occasionally it is necessary to put a bead of ‘Fix-All’ adhesive on the bottom of the ground throw to keep it fastened in place.
* Automated Turnout Motors:
* Use the pre-assembled Tortoise units.
* the telco jack is for use with the fascia control panels.
* the 3-pin euro-connector is for use with SPDT control switches such as on a 220S ground throw.
* The pre-assembled Hankscraft motor units with the micro-switches and telco jack are to be phased out.
* The plastic paddle ‘swing-arm’ on these units frequently crack causing the motor to continuously spin. They should be replaced with Tortoises rather than repaired.
* Turnout Control Boxes:
* Custom ‘Control Boxes’ with toggle switches, diagram, indicator lights and telco jacks are used to control automated turnouts.
* A custom-made length of 6-conductor telco cable is used to connect the turnout panel to the turnout motor.
* see ‘GMRC – Turnout Control Boxes’ for design and construction of these units.
* Hybrid Crossover Control.
* Crossovers can be controlled using one 220S ground throw and one Tortoise motor with the euro connector.
* The front turnout is manually controlled by the 220S ground throw.
* The back turnout is electrically controlled by a Tortoise motor.
* See ‘GMRC – Turnout Control – SPDT Switch’ for design and wiring of this practice.

**Item X – NCE Power Distribution**

The GMRC Power Distribution System consists of one NCE PH1 combination command station and five amp power booster plus three NCE PB5 five amp power boosters: one each for the three zones, north side, yard and south side peninsulas.

1. Additionally, each booster zone has a dedicated 12Vdc power supply for accessories such as building lighting and turnout motors.
2. Each booster zone has a main DCC bus (red & white wiring) and a main 12Vdc buss (green & white wiring) running under the lower deck of the layout.
3. Connecting to the main buses are Power District Panels that provide circuit protection for individual cities, towns and yards.
   1. The 12Vdc accessory bus is protected by a 2-amp slo-blow fuse.
   2. The district DCC buses are protected by either a current limiting 2-amp bulb or an electronic circuit breaker. The panels are designed to accept the bulb, an NCE EB1 breaker, a DCC Specialties PSX-1 breaker, or a DCC Specialties PSX-AR polarity reverser.  The 1156 taillight bulb is the default circuit protection.  Optionally, an electronic breaker can be substituted for better protection.
4. The outputs from a Power District Panel are a DCC district bus and a 12 Vdc accessory buss. The district buses run under the section of the layout that it is protecting.   All layout connections go to one of these buses.   Wire drops from the tracks go to the DCC district bus and lighting and turnout motors connect to the accessory bus.

**Item XI – Scenery / Landscaping Standards and Procedures**

* The GMRC models southern Arizona in the 1950-1965 era:
  + Including but not limited to, buildings, automobiles, construction and farming type equipment, etc. should fit this time period. “Fitting the 1950-1965 time period” can include items from earlier than the 1950-1965 assuming that the scenery item has a reasonable expectation of “being around” in the 1950-1965 era.
* Buildings / structures
  + As mentioned above, buildings / structures should fit the 1950-1965 time period.
  + When possible, buildings / structures and industries should represent actual buildings / structures and industries in the town being modeled.
  + Free lanced buildings / structures and industries need to have a reasonable expectation of existence in the area being modeled.
  + Buildings / structures should not be crowded.
  + Buildings / structures need proper track clearance. Use an NMRA gauge.
  + Buildings / structures should not hinder operations.
  + “Place holder” buildings / structures
    - Need to be designated as such and should be replaced by permanent structures as soon as possible.
    - Should be reasonable representations of the era and location.
  + Permanent buildings should be reviewed by the Scenery Team via the GMRC Building Score Form to ensure the building conforms to the layout.
  + All buildings (permanent and placeholders) should be painted and/or weathered. No unfinished plastic allowed.
* General landscaping
  + Plant vegetation
    - Should represent southern AZ.
    - Should be sparse.
    - Should not be dark green unless the vegetation represents well-watered lawns or crops.
    - Vegetation size should be reasonable. Remember: 1 inch represents 8 feet in HO scale.
    - Vegetation placement should have a reasonable expectation of existence in the area being modeled.
  + Earth colors should represent the area being modeled with a predominate color being reddish brown.
  + Topography and landmarks should have a reasonable expectation of existence in the area being modeled.
* Roads
  + Main paved roads should be at least 3 inches wide.
  + Unpaved secondary roads should be at least 1 ½ inches wide.
    - Since the predominate rock & dirt color in southern AZ is reddish brown or tan, unpaved roads should be similar in color. Although gray “limestone” gravel/ballast is easy to obtain for modeling purposes, limestone is not prevalent in southern Arizona and should not be used to model gravel roads.
    - Material used to model gravel should be proper scale. Example: track ballast is too big or coarse to be used to model gravel roads.
  + Railroad crossings cannot exceed the rail height.
  + Roads and approaches to crossings should have proper profile.
* Scenery Team and/or GMRC board has final ruling on all dioramas to ensure that the quality of modeling meets the club’s mission statement.

**Item XII – Ballast Standards and Procedures**

**Prior to any ballasting on the GMRC layout, an ‘Improvement Request’ must be submitte**d for approval to ensure the following:

* That there are no pending, proposed or perceived track changes in the area.
* All turnouts are ‘removable’ ready.
* The rail joiners on the point-end of the turnouts are installed such that they can be slid back onto the connecting track and the turnout can be lifted out at the point end.
* All wire-drops have been installed.
* Rails have been blackened with Micro Engineering blackening agent or paint.
* Mainline ballast color should be the approved color for the railroad you are ballasting (yard ballast has not yet been determined):
* Southern Pacific: CSX/SP Gray, AZ Rock & Mineral, P/N 1382
* Santa Fe: Santa Fe Mauve, AZ Rock & Mineral, P/N 1172
* Arizona Magma: Dark Gray, Timber Products, P/N 104-1
* Sidings in rural areas should reflect the usage in that area. They may be dirt or whatever material was available. A basis for your selection should be submitted on your improvement request.

**General Instructions for Ballasting:**

* Ballast should be spread evenly over the track. The ties should not be covered over.
* Turnouts should be lightly ballasted in order to facilitate removal and replacement should the need arise.
* Soaking ballast with 70% alcohol will soften the glue and make removal/replacement easier.
* Turnout points should be *very-lightly* ballasted to ensure free movement of the points.
* The preferred method of ballasting is to spread the ballast over the track by brushing the ballast to an even coat with the ties showing.
* Soak the ballast with 70% alcohol using a pipette. The ‘wicking action’ of the alcohol will permeate the ballast.
* Do not spray alcohol on track ballast because the overspray can get on painted surfaces of structures and ruin the finish.
* Spread a 50/50 mixture of white glue and water over the ballast using a pipette.
* Adding a drop or two of liquid detergent to the mixture can also help with dispersing the glue.
* Caution – be especially careful to not get glue into any moving parts such as turnout points.

It will take at least 24 hours for the glue to thoroughly dry. Once dry:

* Use a wire brush to clean and burnish the track and ties. This will loosen rogue pieces of ballast and dull/weather the ties.
* Vacuum the track to remove loose ballast and debris.
* Touch up as necessary.

Caution: Do not do ballasting within 24 hours of an ops session or before a Saturday hosting.

**Item XIII – Key Holder Open and Close**

This procedure provides guidance for opening up and closing up the Gilbert Model Railroad layout.

**Opening:**

* Unlock the upstairs entrance door and turn on the stairwell light.
* The light switch is to the right as you enter.
* The hallway light will come on automatically as you move down the stairs and into the hallway.
* At the bottom of the stairs, push the ‘Display Train’ button to start the display train moving.
* The push button is located high on the window wall.
* Unlock the shop room door and turn on the lights.
* The hall light switch is on the left as you enter.
* The shop room switch is on the post in the center of the room.
* Unlock the layout room door and turn on the lights.
* The overhead light switch is on the wall just to the left of the entrance.
* Sign in on the Sign-In sheet located on the wall to the right of the door.
* There is a layout light switch to the left under the Queen Creek Interchange track.
* There is a second layout light switch under the layout to the right of the bridge under Mesa.

**Closing:**

* Reverse the opening procedure turning out the lights and locking the doors.
* Double check yourself to ensure all the lights are off, all the doors are locked, and you have signed out on the log sheet.
* The hallway light will automatically go out several minutes after you leave.

**Saturday Hosting sessions:**

* The same opening-closing procedures apply.
* In addition:
* Inform the museum docent that the layout is open for quests.
* Place the ‘To Trains’ sign at the top of stairs near the layout entrance.
* Visitors must show their admission receipt to enter the layout room.
* Procedures for hosting museum guests is outlined in the RRSP’s.
* When closing up:
* Inform the museum docent that the layout is closed.
* Bring in the ‘To Trains’ sign and place in the alcove at the bottom of the stairs.

**Starting up the layout:**

* The display train is always under power.
* Just to the right of the bridge is at Gilbert is the display train operation control box.
* The toggle switch must be in the ‘relay’ position when you close up the layout.
* In Relay, the train will run when the pushbutton is pressed for about 5-minutes and then stop in Gilbert.
* In Operate, the train will run continuously.
* The layout command station is located under the layout just to the right of the door.
* The booster for the display loop is located in the same place.
* The three boosters for the rest of the layout are located in a rack under the layout at Glendale.
* These boosters are turned on and off using the remote attached to the fascia just above the booster rack. There is a second remote on the Gilbert fascia.

**Shutting down the layout:**

* Turn off the layout boosters located under Glendale.
* Walk the display train track to ensure the turnouts are in the proper position.
* Ensure the display train control box is in the ‘Relay’ position.
* Ensure the door bridge is closed and the slide bolt is engaged.
* Press the pushbutton to start the display train running.
* Watch the display train to ensure it runs the loop without derailing and stops in Gilbert when timed out.
* After you’ve ensured the display is operating properly, close up the shop using the ‘Closing’ procedure.
* On Saturdays, bring in the ‘To Trains’ sign and notify the museum docent that the layout is close.

Checklist

Opening

\_\_\_\_ Unlock doors and turn on lights

\_\_\_\_ Is Display Train operable

\_\_\_\_ Sign in on the Sign-in log

\_\_\_\_ Turn on Layout boosters and layout lighting

Closing

\_\_\_\_ Turn off the power to the layout

\_\_\_\_ Walk the display loop track to ensure turnout positions are correct

\_\_\_\_ Put the layout switch in the ‘Relay’ position

\_\_\_\_ Ensure the door bridge is closed and the slide bolt is engaged

\_\_\_\_ Start the display train running by pressing the start pushbutton

\_\_\_\_ Ensure the train runs without derailing and stops in Gilbert at time-out

­\_\_\_\_ Sign out on the log

\_\_\_\_ Ensure all lights are off

\_\_\_\_ Ensure all doors are locked

