Standards
&
Operating Rules

Los Angeles Model Railroad Society

Adopted February 4, 2003
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INTRODUCTION

The LAMRS layout covers about 2,100 sq. ft. The mainline is approximately 700 feet long with a minimum radius of thirty inches. The layout also features a HOn3 Narrow Gauge branch line with several hundred feet of track, with was added in 1987. The wooden benchwork utilizes the standard open grid type design. Code 83 flex track is laid on Tru-scale® roadbed, which is in turn laid on spline sub-roadbed. The scenery on the GL&W is hard shell plaster. The GL&W Railroad basically is a point-to-point layout. The single track mainline runs between the hidden staging yards of Alamosa and Langevin.

In addition to the six mainline walk-around throttles and the two staging yards, there are eight additional locations on the layout. They are Baldwin, Ford Yard, Ford Yard Engine Facilities, Hannibal, and Itasca Logging, Harbor East, Harbor West and Harbor Engine Facilities. The non-mainline throttles represent distinct switching and operational areas and are operated with their own control panels and power supplies, the GL&W dispatcher does not control them. When necessary, the non-mainline throttles share joint use blocks/track with the mainline dispatcher so that control of a train may be passed from a non-mainline throttle to a mainline throttle. Ford Yard represents the halfway point between the two staging yards and serves as the division point for the GL&W.

The mainline throttles used on the layout are cordless infrared throttles designed and built by members of LAMRS. These throttles are controlled by a computerized dispatching station. The dispatcher sits at the computer console and directs railroad traffic via two-way radio to six train engineers. The monitor screen controls train routing and switching. This unique software was developed in 1995 by members of LAMRS.

The following pages spell out the recommended standards and practices for the LAMRS layout, GL&W paint schemes, the requirements for operating on the layout, and the rolling stock certification procedures.
PART 1. BASIC CONSTRUCTION

SECTION 1. Planning and Drawings

A. A complete set of track drawings are to be submitted to the membership for approval. This includes plans for new railroads as well as any additions to an existing railroad.

B. A complete set of electrical schematics, circuit descriptions and drawings are to be submitted to the membership for discussion and approval before any electrical work is done to any part of the layout.

SECTION 2. Benchwork

All benchwork is to be constructed using the ‘open grid frame’ or the ‘L-girder’ method, from 1x4 Fir wood. The legs are to be made of 2x4 Fir wood, cross-braced and long way braced with 1x2 Fir wood; which are affixed to the leg bottoms, no higher than 4 inches from the floor. Triangular gussets made of ½” thick Fir plywood 10”x10” are to be placed between the long way brace and the 2x4 leg. The legs are to be spaced 1/5th of the way in from the ends of the ‘L-girders’ to give the best support. Four (4) legs placed in this manner will support up to 16 feet of ‘L-girder’. The legs should be high enough to adjust the level of the ‘L-girder’ and Joist, which is affixed to the top of the ‘L-girder’. After leveling the framework, affixing the ‘L-girder’ to the legs at the desired height - typically 40 inches - and the 1x3 Joists are affixed to the legs, the excess tops of the legs may be cut off. Both angle flanges of the ‘L-girder’ are to be turned so as to face the outside of the bench-work when affixed to the legs. Except for narrow benchwork, the spread of the legs should be 12 inches LESS than the narrowest part of the benchwork; i.e. the 1x3 Joist should hang over the ‘L-girder’ at least 6 inches on each side. The 1x3 Joists are now added one at a time as needed, and where needed typically at no more than 24-inch intervals - to avoid being inconveniently placed, and wasting lumber. The 1x3 Joists are to be secured to the ‘L-girder’, on their edge, with glue and #6 x 1-1/4” screws. One screw placed so as to go up through the ‘L-girder’ flange first, and then into the edge of the Joist will be sufficient to hold it in place.

SECTION 3. Roadbed

A. SUB-ROADBED

Sub-Roadbed is the foundation upon which the trackage is placed. A firm foundation is as important as carefully laid track is to reliable operation. In addition to rigidity, sub-roadbed structure should allow for easy blending of scenery to the track base, and allow for the locating of such auxiliaries as switch machines, bridges and overpasses. It should be at least ¾” thick kiln dried White Pine, and wide enough to suit the track plan. A 3-inch width is fine for single track, and a 6-inch width is good for double track set at 2-1/2 inch centers. The sub-roadbed is elevated above the benchwork by means of Risers. The Risers should be 1x4 (3-1/2”) for single track, and 1x8 (7-1/2”) for double track, and of sufficient length so as to hold the roadbed at the desired elevation and be fastened to the Joist. The Risers are then fastened to the Joist using glue and #6 x 1-1/4” screws. Provisions for bridges should be
made at the time the sub-roadbed in installed. If the abutment for a bridge is not more than 4 inches from a Riser, the sub-roadbed can be cantilevered. In this case, the scenery abutment and the bridge itself are supported by the sub-roadbed. In ALL other cases, supports should be added near the abutments. These supports can be additional Risers, supported either from an added benchwork member or from a lower level of sub-roadbed. For deck plate-girder bridges, particularly those with a ballasted floor, it is desirable to narrow down the sub-roadbed to the width between the girders and leave the board continuous across the bridge.

B. STRAIGHT SUB-ROADBED
Straight Sub-Roadbed will be constructed from ¾” thick kiln dried White Pine, cut to the appropriate lengths, and secured to each Riser with #6 x 1-1/4” screws. The joints of the sub-roadbed can be made at the Risers with ‘Cap Strips’ screwed to each side of the Riser to increase its effective width; or, by gluing and screwing a splice block under the two pieces of sub-roadbed.

C. CURVED SUB-ROADBED
Curved Sub-Roadbed will be formed by using laminated strips of ¾” thick kiln dried White Pine. These strips are made by ripping the White Pine into ¼” wide pieces. These strips are then placed vertically - set on edge - and glued together side by side, on top of the Risers, to the desired width. The laminated sub-roadbed may be used as the ‘Finished Roadbed’ if desired, and may be spliced to the flat-board sub-roadbed when special requirements of vertical curves combined with horizontal curves make 100% flat-board sub-roadbed impractical. Splice blocks under the flat-board sub-roadbed are used to join it with the laminated roadbed. If the laminate is to be used, insure that when it’s spliced together with the flat-board sub-roadbed, it is higher than the flat-board. This way, when the ¼” ‘Tru-Scale®’ milled roadbed is placed on top of the flat-board, the top surfaces of both are flush across the tops - given a small amount for sanding or planing to make them smooth. If the ‘Tru-Scale®’ milled roadbed is not going to be used, make sure the tops of both the laminate and the flat-board are sanded flush to accommodate FLAT track-work.

D. VERTICAL CURVES
Vertical Curves are formed by bending the flat-board sub-roadbed. Because of its rigidity the ¾” thick Pine will insure that the vertical curve will be gradual transition rather then stepped in nature.

E. FINISHED ROADBED
Finished Roadbed on the Main Line shall be ‘Tru-Scale®’ milled straight roadbed for straight sections and the milled flexible roadbed for curved sections. In yard areas, the track shall be laid directly on the flat-board or plywood provided in those areas.
F. ROADBED STANDARDS

1. The roadbed shall NOT be placed closer than 6 inches to ANY inside/outside wall.
2. The centerline measurement for ALL parallel tracks shall be 2-1/2 inches.
3. The foundation for trackwork in ALL yard areas shall be constructed from ¾” thick ACx grade Douglas Fir plywood in 4’x8’ sheets, with 1/8” thick x 4’x8’ Lauan (Mahogany) doorskin glued and nailed to the top. This 7/8” thick assembly is then secured to the basic Riser and crosspiece supports off the benchwork.
4. Roadbed turnouts on the Main Line are to be cut in the configuration of a #8 frog, from ¾” thick white pine and inserted into and in line with the sub-roadbed.
5. The MINIMUM Main Line radius shall be 30 inches.
6. The Main Line grade shall not exceed 2%.
7. All roadbed for ‘set out’ tracks will be level.
8. A minimum of at least 8 inches of straight track is required when passing by ALL served structures; i.e. DO NOT place any structure on a curved section of track.
9. Stub ends off the Main Line shall be at least 24 inches long past the frog of the turnout.
10. For passing sidings or setout tracks which go around, or feed any structure shall be made from a single piece of white pine, wide enough to accommodate the trackage and the structure. If the board is not wide enough to accommodate the track and structure, then the structure(s) may be placed on a separate piece of ¾” thick Fir plywood. This shall be edge-glued to the roadbed, and a splice block glued underneath so as to keep both pieces flat and flush across the top.

PART 2. TRACKAGE

SECTION 1. Rail and Turnouts

A. RAIL

2. Narrow gauge rails shall be ‘Shinohara’ (Walthers) or ‘Micro Engineering’ Code 70, Nickel Silver, flex track.
3. All rails shall be spliced together using Nickel Silver rail jointers, which shall be soldered on the outside of the rails. Solder materials are limited to non-acid flux solder paste and 60/40 Rosin Core solder.
4. All trackage shall be kept at least 4 inches from ANY edge of the layout.
5. All S-curves MUST be separated by a section of straight track at least 4 inches long.
6. All sections of flex track will be laid by at least 2-man crews, using the 'master' NMRA track gauge to check for proper gauge of all flex track.
7. All flex track shall be affixed to the roadbed using a small amount of glue to hold it in position, and then 'spiked' in place through the holes provided in the ties.
8. Ballasting of the flex track in all exposed areas shall be done ONLY after it has been ascertained that ALL new or modified trackage is in perfect running order, and any necessary corrections or changes have been made.
9. Easement templates are to be used for transitions between curved and tangent track.
10. All completed sections of track work are to be inspected and approved by the Superintendent of Construction.
B. TURNOUTS

1. All Main Line turnouts shall be ‘Shinohara’ (Walthers) Code 83, Nickel Silver, #8 frog.
2. All Yard turnouts shall be ‘Shinohara’ (Walthers) Code 83, Nickel Silver, #6 frog.
3. All HOn3 turnouts shall be ‘Shinohara’ (Walthers) or ‘Micro Engineering’ Code 70, Nickel Silver, #6 frog - point type turnouts. No stub point type or #4 turnouts shall be permitted.
4. All Risers shall be a minimum of 2 inches clear of any turnout switch point.
5. A 6" length of straight track will be required, leading into the points of all turnouts on the Main Line, and a 4” section of straight track leading into the points of all Branch Line turnouts.
6. The points of all facing turnouts shall be no closer than 6 inches.
7. Rail joiners splicing turnouts and flex track shall be soldered as cleanly as possible. File smooth the top and insides of the web so as to create a smooth splice, thus, eliminating the possibility of wheel flanges 'catching' on any rough solder joints.
8. No turnout shall be placed closer than 6 inches from the start of any rise in elevation neither of trackage, nor from the entrance or exit of any tunnel.
9. The frog to point distance of all ladder track configurations, for turnouts, shall be placed no closer than 4" from each other; i.e. - the points of a turnout must be at least 4" from the frog of the preceding turnout.
10. Turnouts shall be electrically operated by utilizing "Switch-Master" or “Tortoise” 12VDC powered switch machines.

PART 3. SCENERY

SECTION 1. Construction and Materials

A. Basic construction shall be 'contoured' chicken wire - or lath type screen - overlaid with Hydracal ® (plaster) soaked paper towels.
B. Regular 10-30 minute casting plaster or equivalent shall be used for rock castings and other such moldings as are necessary to complete the scenic effect.
C. Scenery shall be stained with a water base tinting color: i.e. - Sinclair Paints® 'All Tint' universal concentrated tinting colors for paint. Only the following basic earth colors of Raw Sienna, Burnt Sienna, Raw Umber, Burnt Umber, Van Dyke Brown, Lamp Black, Ultramarine Blue, Yellow Ochre, and White shall be permitted.
D. The chicken wire - or lath type screen - shall be fastened to the roadbed with at least 1/2" staples, and then 'drooped' in such a way as to form a ditch on each side of the roadbed.
E. Small 'knolls' and the like are not required to use chicken wire or cardboard under frame, providing such scenery is placed on a flat surface. These ‘knolls’ and the like should be formed by sifting dry casting plaster onto the flat surface until the desired shape and height is obtained. The 'knoll' of dry plaster is then sprayed with a fine mist of water so as to set up the plaster. In spraying water onto the dry plaster, small cracks will naturally form in the dry plaster creating a rain-eroded look in the 'knoll'.

SECTION 2. Scenery Breaks
A. Scenery breaks are to be constructed using 1/8" thick x 4' x 8' sheets of non-tempered Masonite®.
B. Non-tempered Masonite® sheets of 1/8" thickness are to be used for the profile boards on the outside edges of the layout, and will be painted with a Latex type paint, in a flat green color.

SECTION 3. Scenic Materials

A. Lichen of various colors shall be used for small brush, weeds, and small trees.
B. Pine trees will be made using dried Caspia and finely ground foam rubber for the boughs. The trunks are to be made from regular Cedar shingles, cut to width, and then carved or sanded into a rounded shape. Diameter of the trunks is typically 3/8" to 5/8". The length shall be typically a HO Scale 80' to 120' - however pine trees do grow to heights in excess of 200 feet. Small holes are then drilled in the trunks, and then the boughs of Caspia are glued into the holes. When the boughs are dry, cheap hair spray (containing Lacquer), or a spray type adhesive, is sprayed at a downward angle so as to cover the tops of the boughs. Quickly sprinkle the desired color of ground foam rubber on the wet adhesive. Repeat the process of spray and foam rubber to 'build-up' the thickness of the boughs. Small commercially manufactured trees may also be used for background effect.
C. Grass material will be the 'static grass' available in a variety of colors, produced by various manufacture’s, and is available in most hobby shops. Woodland Scenics® fine ground foam grass may also be used, as well as their 'Earth Blend' ground foam. Real dirt (which has been sifted clean) shall be used as much as possible - where dirt is required - to create as natural looking scenery as possible.
D. Small, real pebbles and rocks will be used wherever applicable, i.e. streams or riverbeds, rock slides, etc.
F. Water shall be made using clear resin. The basic lake, river, stream, pond, etc. shall be formed via the chicken wire and plaster method. The plaster may be stained or painted to the desired color, and then the clear resin is mixed per instructions, and poured over the colored plaster. Use a cheap paintbrush to move the resin around to cover the area desired to create the 'wet' effect. Small rocks, branches, etc. should be placed into the wet resin before it sets-up.

PART 4. MOTIVE POWER and ROLLING STOCK

SECTION 1. Standard Gauge

A. STEAM LOCOMOTIVES
1. All steam locomotives (except Unit Train Engines) are required to have operating magnetic Kadee couplers on both the pilot of the engine, and the rear of the tender. The tender coupler must be insulated from the metal parts of the tender. In the event, a coupler cannot be adapted to the pilot of a locomotive, then that locomotive must be consisted with another locomotive and shall be the lead unit in the double head consist.
2. All steam locomotives will be tested for their tractive effort, at a designated club meeting night, under the supervision of the Superintendent of Operations. Locomotives and their tractive effort shall be cataloged and stored by road name and engine number on the clubs computer data file by the Superintendent of Operations. The tractive effort shall
be ascertained by using the chart at the end of this Section. (This chart needs to be
developed)

3. *All* locomotives will be re-inspected and re-tagged annually, in accordance with Part 4,
Section 1, Paragraph A, Item 2.

4. Members are solely responsible for the general maintenance and run ability of their own
equipment.

B. **DIESELS**

1. Diesel units may be draw bared, if so, those units shall be tested and classed as *one unit*
for the tractive effort rating.

2. Single or multiple units shall still be required to have operating magnetic couplers on
*each* end. The only exception to this rule will be the Unit Train classification. Passenger
locomotives having coupler cover plates, such as ‘E’ Units, *must be* consisted with
another powered locomotive.

C. **UNIT TRAINS**

1. *All* Unit Trains are to be cataloged as such, and will be required to comply with the
maintenance and run ability standards as follows.

2. A Unit Train shall be construed as locomotive(s) and either freight or passenger cars
attached to each other by means other than operating couplers. That is, by means of draw
bar or non-operating couplers only. *Talgo* trucks are not permissible.

3. The operation of such Unit Trains on the layout shall not in any way impair or slow any
existing operations by any other engine or train.

4. *All* Unit Trains are required to have one operating magnetic Kadee coupler on the last car
of that train.
D. WEIGHTS, STANDARDS and CERTIFICATION

1. *All* cars must comply with the following *Minimum* standard weight:

**HO Scale Car Weights**

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<th>Weight Ounces</th>
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2. *Minimum* weight requirements for *empty* TOFC & COFC flat cars are as follows:
   a. Athearn 50' TOFC Impacts: 1.2 ounces or 34 grams
   b. Walthers 70' COFC Wells: 2.9 ounces or 82 grams
   c. Walthers 57' COFC Wells: 2.4 ounces or 68 grams
   d. Con-Cor 45' TOFC Ten Pack: 1.5 ounces or 43 grams each car
   e. A-Line 57' COFC Wells: 1.4 ounces or 40 grams.

3. *All club* owned TOFC/COFC cars *must* have “Intermountain” or “Jay-Bee” wheel sets.
4. *All* cars, except those with electrical pick-ups *must* roll freely on a 2% grade.
5. *All cars* *must* be equipped with an operating Kadee magnetic coupler on BOTH ends of the car, and adjusted to within plus or minus 1/64" of a Kadee coupler height gage. Couplers *must* be self-centering with knuckle opening and springing closed when rolled over an uncoupling magnet.
6. *No* Talgo type trucks will be allowed!
7. *All* car weights *must* be firmly affixed to the car body.
8. *All* equipment will be marked in such a manner as to be distinguished, by its owner, from another members car, especially in the case of identical looking equipment.
9. *All* wheels *must* meet NMRA standards as to gage and depth of flange, using a NMRA MK-4 gage. It is the responsibility of each member to keep them in proper operating condition.
10. Diaphragms between passenger cars are to be free sliding.

11. Run ability of any car shall not be beyond the reproach of a club member, who thinks it questionable. In such a situation, the unit in question shall immediately be removed from operation and tested. Any defects found shall be corrected, and the car must be re-certified.

12. All cars with plastic wheels will be subject to an annual inspection and re-certification. Rolling stock with metal wheels needs to be tested only once. The inspection and tagging shall be tested by a group of members, approved by the Superintendent of Operations, on designated meeting nights. The color for the 'Passed' inspection shall be chosen by the Superintendent of Operations. A new color of stick-on Avery Label dot shall be chosen each year, prior to the new years inspection process.

13. All Athearn manufactured rolling stock with spring metal type, snap on, coupler covers, must be modified by drilling through the coupler post in the coupler pocket with a #51 drill, and then tapping the hole with a 2-56 tap. A 2-56 x 1/8” screw shall then be installed to hold the coupler cover securely in place, and allowing the coupler to operate freely. It is strongly recommended that all coupler covers be installed using screws to hold them in place.

14. The maximum length of any train running on the club layout shall not exceed thirty (30) units - including the engine(s) - during regular operating sessions or any other time when three (3) or more trains are operating on the railroad.

NOTE: - one unit is equal to 6”

**Unit Formula** -
- One (1) forty foot car = 1 unit
- One (1) ‘F’ Type Diesel = 1 unit
- One (1) ‘E’ Type Diesel = 2 units
- One (1) large steam engine = 2 units
- One (1) articulated steam engine = 2 units

**SECTION 2. Narrow Gauge**

A. **STEAM LOCOMOTIVES**

1. All HO3 locomotives shall have operating Kadee #714 HO3 magnetic couplers installed on both the engine pilot and the rear of the tender. In the event a #714 cannot be installed, then a Kadee #1023 N scale coupler may be installed as an accepted replacement. These couplers are to be installed in such a manner as to maintain a centerline height above the railhead of 9/32". In the event, a coupler cannot be adapted to the pilot of a locomotive, then that locomotive must be consisted with another locomotive and shall be the lead unit in the double head consist.

2. All HO3 engines must be able to pull at least three (3) thirty-foot (30’) HO3 cars.

3. Members are solely responsible for the general maintenance and run ability of their own equipment.
B. FREIGHT and PASSENGER CARS

1. All car weights must be firmly affixed to the car body.
2. All equipment will be marked in such a manner as to be distinguished, by its owner, from another members car, especially in the case of identical looking equipment.
3. Run ability of any car shall not be beyond the reproach of a club member, who thinks it questionable. In such a situation, the unit in question shall immediately be removed from operation and tested. Any defects found shall be corrected, and the car must be re-certified.
4. All rolling stock must be outfitted with metal wheels and shall be subject to a one time inspection and tagging process, which will be held at the club. The inspection and tagging shall be tested by a group of narrow gauge members, approved by the Superintendent of Operations.
5. All HOn3 rolling stock shall be equipped with operating magnetic Kadee #714 or #1023 N scale couplers, and are to be installed in such a way as to maintain a centerline height above the railhead of 9/32".
6. All HOn3 rolling stock should weigh no less than 1.5 grams/ft and not exceed 2.0 grams/ft.
7. Passenger car truck standards for D&RGW named cars shall be Pullman Composite Wood and Steel (or equivalent) trucks with a 5’ wheelbase and 26” diameter wheels.
8. Freight car truck standards for D&RGW named cars shall be:
   a. Stock Cars 5900 series - Andrews trucks with a 4’8” wheelbase and 26” diameter wheels.
   b. Flat Cars 6400 series - Andrews trucks with a 4’8” wheelbase and 26” diameter wheels.
   c. 40’ Reefers #150-169 - Andrews trucks with a 4’8” wheelbase and 26” diameter wheels.
   d. All other freight cars – Arch Bar trucks with a 3’7” wheelbase and 26” diameter wheels.

SECTION 3. Color Standards

A. COLORS for GL&W ENGINES and ROLLING STOCK

1. STEAM LOCOMOTIVES:
   Engine & Tender 'Faded' Blue/Black
   Lettering White

2. DIESEL LOCOMOTIVES:
   a. Early Passenger
      Body Color Gray
      Frame Color Black
      Truck Color Platinum Mist
      Body Stripe Orange/Green
      Lettering White
### b. Early Freight

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<tr>
<td>Grab Irons</td>
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</tr>
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### c. Modern

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#### b. Bay-Window

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<td>Green Pin Stripe</td>
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6. PASSENGER CARS:
   a. Heavyweights
      Body: Tuscan Red
      Frame & Roof: Black
      Lettering: Gold
      Stripping: 1/16" wide stripe above & below window
   b. Streamlined
      Body: Silver
      Frame: Black
      Trucks: Silver
      Lettering: Black
      Stripping: 3/16" wide S.P. Scarlet stripe on the bottom edge of the car.

7. FREIGHT CARS:

LAMRS Operation Rules (15) 2/07/03
<table>
<thead>
<tr>
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<th>Frame</th>
<th>Lettering</th>
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<td>b. Reefers</td>
<td>RA-RP-RPM-RS -RSTC-RT</td>
<td>Reefer White</td>
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<td>White on ends</td>
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<td>c. Ventilated Box Cars</td>
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<td>TBD</td>
<td>TBD</td>
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<td>g. Gondolas</td>
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<tr>
<td>h. Hoppers</td>
<td>HM-HT</td>
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<td>i. Covered Hoppers</td>
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<td>k. Flat Cars</td>
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<td>l. 89' Auto-Racks</td>
<td>FA</td>
<td>Silver</td>
<td>S.P. Scarlet</td>
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<td></td>
</tr>
</tbody>
</table>
 Frame  Black  Black letters on Silver paint  White letters on Scarlet paint
 Lettering

B. COLORS for *D&RGW Narrow Gauge* ENGINES, STRUCTURES and ROLLING STOCK

1. **Engines**
   a. Engine & Tender   TBD
   b. Lettering   TBD
   c. Lettering Style   TBD

2. **Structures**
   All structures owned and/or operated by the D&RGW railroad shall be as follows:
   - Walls  D&RGW Cream (PollyS #414257)
   - Trim  D&RGW Brown (PollyS #414256)

3. **Rolling Stock**
   a. Box Cars   TBD
   b. Cabooses   TBD
   c. Flat Cars   TBD
   d. Gondolas   TBD
   e. MoW Equipment   TBD
   f. Reefers   TBD
   g. Stock Cars   TBD
   h. Passenger Cars   TBD

C. COLORS for *Sequoia Pacific Lumber Company* ENGINES and ROLLING STOCK

1. **Steam Locomotives**
   a. Engine & Tender  Black
   b. Lettering  White
   c. Lettering Style  Southern Pacific Steam

2. **Rolling Stock**
   a. Box Cars  TBD
   b. Cabooses  TBD
   c. Flat Cars  TBD
   d. Gondolas  TBD
   e. MoW Equipment  TBD
   f. Reefers  TBD
### SECTION 4. Speed Calculations

CALCULATING HO SCALE SPEED in M.P.H. over a Distance of 10 feet

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<td>97</td>
<td>6.14</td>
</tr>
<tr>
<td>50</td>
<td>11.86</td>
<td>98</td>
<td>6.05</td>
</tr>
<tr>
<td>51</td>
<td>11.63</td>
<td>99</td>
<td>5.99</td>
</tr>
<tr>
<td>52</td>
<td>11.40</td>
<td>100</td>
<td>5.93</td>
</tr>
</tbody>
</table>
PART 5. OPERATIONAL STANDARDS and DESCRIPTIONS

SECTION 1: Layout Description and Purpose

A. The Los Angeles Model Railroad Society’s layout shall be known as the Great Lakes & Western Railroad.
B. The GL&W operates as a point-to-point "Belt Line" railroad.
C. For club scheduled standard gauge operating sessions, the GL&W will run four different time periods. These four periods shall be:

<table>
<thead>
<tr>
<th>Period</th>
<th>Time Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pre World War II (steam only)</td>
</tr>
<tr>
<td>2</td>
<td>1945 to 1959 (late steam to early diesel)</td>
</tr>
<tr>
<td>3</td>
<td>1960 to 1980 (2nd generation diesels)</td>
</tr>
<tr>
<td>4</td>
<td>1981 to present (modern diesels)</td>
</tr>
</tbody>
</table>

For club scheduled narrow gauge operating sessions, the D&RGW will run one time period. This period shall be:

<table>
<thead>
<tr>
<th>Period</th>
<th>Time Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1924 to 1956</td>
</tr>
</tbody>
</table>

D. The GL&W’s primary source of revenue is Ore and Grain that is shipped to Joliet Harbor.
E. The Ford Division of the GL&W operates between the western terminal at Alamosa, and the eastern terminal at Langevin. The GL&W also has a branch line serving the Joliet Harbor. Other industrial areas served are Baldwin, Hannibal and Itasca.
F. The GL&W inter-connects with the Denver & Rio Grande Western narrow gauge railroad at Hannibal, and the Sequoia Pacific Lumber Company logging railroad at Itasca.
G. The GL&W will operate as close to prototypical railroad operations as practical.
H. All mainline engineers (there are to be six maximum) will use walk-around throttle control for their trains. The industrial switching complexes will have 'local' control panels and fixed or tethered throttles.
I. The control panels and operating positions are as follows:

<table>
<thead>
<tr>
<th>Number of Panels</th>
<th>Operating Position</th>
<th>Number of Operators</th>
</tr>
</thead>
<tbody>
<tr>
<td>n/a</td>
<td>Brakeman (one per Engineer)</td>
<td>6</td>
</tr>
<tr>
<td>1</td>
<td>Alamosa Yard Engineer</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>Baldwin</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>Ford Yard Engineers</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>Ford Engine Facilities Hostler</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>Hannibal</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>Itasca</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>Joliet Harbor Engine Facilities Hostler</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>Joliet Harbor - east</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>Joliet Harbor - west</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>Ore Dump Operator</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>Langevin Yard Engineer</td>
<td>1</td>
</tr>
<tr>
<td>n/a</td>
<td>Main Line Engineers</td>
<td>6</td>
</tr>
<tr>
<td>n/a</td>
<td>Trainmaster</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>Logging Engineers</td>
<td>1-4</td>
</tr>
<tr>
<td>n/a</td>
<td>Narrow Gauge Engineers</td>
<td>1-8</td>
</tr>
<tr>
<td>1</td>
<td>Dispatcher</td>
<td>1</td>
</tr>
</tbody>
</table>
SECTION 2: Operations

A. GREAT LAKES & WESTERN

The job description and the duties prescribed in Part 5, Section 1, Paragraph I for the GL&W are as follows:

1. **Brakeman** works in conjunction with the Road Engineer maintaining smooth train operation.
2. **Itasca Engineer** switches cars in between mainline lumber and SPLC logging railroad.
3. **Ore Dump Operator** shoves full ore cars up through the rotary ore dump facility, and spots empties for westbound unit trains.
4. **Baldwin Switch Engineer** operates the local between Ford Yard and Baldwin servicing Union Ice, Petroleum Unloading Facility, Richmond Barrel, and the Sugar Beet Loading Facility.
5. **Main Line Engineer** operates trains over the railroad to a final destination.
7. **Ford Yard Engine Facilities Hostler** services all steam and diesel locomotives for Ford Yard operations.
8. **Alamosa/Langevin Yard Engineer** builds outbound trains for mainline operations, aligns turnouts and assists the mainline engineers on inbound trains.
9. **Hannibal Switch Engineer** operates the local between Ford Yard and Hannibal servicing Popo-Agie Canning, Farmers Union Creamery, Flaherty’s Irish Stew, R.G. Iron Foundry, Bret’s Brewery, Montgomery Feed and United Grain Growers. In addition, interchange with the following HOn3 facilities, Union Sand, American Coal Co, Antonito Transfer and Storage and Antonito Fuel Oil/Chemical Transfer Platform.
10. **Harbor Yard West Engineer** operates classification yard and Joliet Harbor Union Passenger Terminal, “Turns” trains and breaks up inbound trains and assembles outbound trains as directed by work orders or Trainmaster. Switches tank cars in and out of gasoline and propane facilities. In addition, switches local industries such as Bekins Storage, Duncan & Duncan, Atlantic & Pacific Tea Co. and Rail Truck Terminal.
11. **Harbor Yard East Engineer** operates classification yard, “Turns” trains and breaks up inbound trains and assembles outbound trains as directed by work orders or Trainmaster. Switches tank cars in and out of gasoline, crude and propane facilities. Maintains diesel service facility as well as all Intermodal traffic within the Harbor.
12. **Ford Yard Engineer** operates classification yard, “Turns” trains and breaks up inbound trains and assembles outbound trains as directed by work orders or Trainmaster. In addition, switches cars between Ford Yard and Ford Iron Works.
13. **Dispatcher** moves trains over the railroad by selecting routes and aligning turnouts through the use of the computer. Communicates with all train crews and yards by radio and keeps track of their progress.
14. **Trainmaster** assigns trains to mainline engineers, as they become available. Works with the Dispatcher when unusual conditions arise to coordinate efforts.
B. SEQUOIA PACIFIC LUMBER COMPANY
The job descriptions and the duties for the SPLC are as follows:
1. Logging Brakeman works in conjunction with the Road Engineer maintaining smooth train operation.
2. Logging Engineer operates trains over the SPLC railroad as dictated by the master schedule.
3. DCC Programmer programs locomotive addresses and speed steps, PM4’s and PM42’s.

C. DENVER & RIO GRANDE WESTERN
The job descriptions and the duties for the D&RGW narrow gauge are as follows:
1. Narrow Gauge Brakeman works in conjunction with the Road Engineer maintaining smooth train operation.
2. Narrow Gauge Engineer operates trains over the HOn3 railroad as dictated by the master schedule.
3. DCC Programmer programs locomotive addresses and speed steps, PM4’s and PM42’s.
4. Master Scheduler prepares operating schedules utilizing all aspects and industries incorporated within the D&RGW railroad.

D. TRAINING, TESTING and CERTIFICATION REQUIREMENTS

1. GREAT LAKES & WESTERN
New LAMRS members, desirous of participating in scheduled operating sessions, shall be required to go through a training and testing period for each of the operating positions he/she would like to operate. Members shall be "Certified" by the Membership/Operations Committee, as to their being qualified to operate any position. The Membership Committee shall notify the Superintendent of Operations of any members completion of certification.

Testing and Certification criteria for Standard Gauge Operating Positions are as follows:

a. Brakeman -
   All new members, or members not qualified in any GL&W position, begin as Train Conductor/Brakemen. This level introduces the member to geographic locations, station names, train operations, equipment compatibility, throttle control and radio protocol. Members will work alongside a Qualified Road Engineer.

b. Ford Yard or Harbor West Yard Locomotive Hostler -
   • Must have received instruction on model locomotive compatibility, turnout control, block and throttle control as well as the functionality of turntable operation
   • Must have a working knowledge of steam and diesel service facilities

c. Road Engineer -
   • Must have operated as a Conductor/Brakeman during a minimum of three regular scheduled operating sessions or have been trained by their mentor and reported ready for testing
   • Must have received instruction on train handling, and general operating rules
   • Must observe Train Dispatcher for at least one full operating session
   • Must solely operate trains under the supervision of a qualified Locomotive Engineer for at least one full operating session

d. Yard Engineer -
• Must be a qualified Locomotive Hostler  
• Must have received instruction on switchlists and train makeup  
• Must be familiar with the operation of all turnouts and toggles  
• Must have specific instructions on the operation of each yard panel including the operation of any "dual-use" features  
• Must have operated the yard solely during at least one complete operating session under the supervision of a qualified Yard Engineer or Yardmaster  

e. **Yardmaster** -  
  • Must be a qualified Yard and Road Engineer  
  • Must work as an assistant Yardmaster during one operating session in each of the three yards, Ford, Harbor and Alamosa/Langevin  

f. **Train Dispatcher** -  
  • Must be a qualified Road Engineer and Yardmaster  
  • Must be able to make quick decisions under pressure and maintain smooth train operation(s)  
  • Must demonstrate a thorough understanding of the GL&W track and switch diagram/schematic  
  • Must work as an Assistant Dispatcher during at least two operating sessions, at which time topics such as dispatching skills, train priority and radio protocol is taught by a qualified Train Dispatcher  

g. **Trainmaster** -  
  • Must be a qualified Train Dispatcher  
  • Must work as an Assistant Trainmaster during at least two operating sessions while receiving instruction on the handling of paperwork and assignment of trains  
  • Must prepare operating schedules to include locomotive numbers, train consists, arriving and departing times, train orders and switch lists for a complete operating session based on industry requirements  

2. **DENVER & RIO GRANDE WESTERN**  

Every LAMRS member, desirous of participating in scheduled Narrow Gauge operating sessions, shall be required to go through a training and testing period, for each of the operating positions he/she would like to operate. Members shall be "Certified" by the Membership/Operations Committee, as to their being qualified to operate any position. The Membership Committee shall notify the Superintendent of Operations of any members completion of certification.  

**Note:** LAMRS members wishing to operate the Narrow Gauge railroad at any time must be certified as a narrow gauge Brakeman.  

Testing and Certification criteria for Narrow Gauge Operating Positions are as follows:  
a. **Brakeman** -  
  All new members, or members not qualified in any narrow gauge position, begin as Train Conductors/Brakemen. This level introduces the member to geographic locations, station names, train operations, equipment compatibility, and radio protocol. Members will work alongside a Qualified Road Engineer.  
  • Must learn complete system powering up and down techniques  
  • Digitrax® throttle control, including how to acquire and dispatch locomotives, assemble and release multi-unit (MU) lash-ups, and controlling turnouts  

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b. **Narrow Gauge Engineer** -
   - Must have operated as a Conductor/Brakeman during a minimum of three regular scheduled operating sessions or have been trained by their mentor and reported ready for testing
   - Must have received instruction on train handling, and general operating rules
   - Must solely operate trains under the supervision of a qualified Locomotive Engineer for at least two full operating sessions

c. **DCC Programmer** -
   - Must have received instruction in Locomotive address programming (two and four digit)
   - Must have programming knowledge of Digitrax® throttles including DT100, DT300 and DT400 models
   - Must have working knowledge of speed step tables and CV’s (configuration variables)
   - Must be able to program Digitrax® PM4/PM42’s, DS44 and DS54’s
   - Must have a good working knowledge of LocoNet

d. **Master Scheduler** -
   - Must be a qualified Engineer
   - Must have knowledge of prototypical operations for the D&RGW including consisting and train blocking
   - Must have a good working knowledge of all industries located within the D&RGW as well as standard gauge operations within Hannibal
   - Establish consignee/shipper requirements for all industries
   - Must prepare operating schedules to include locomotive numbers, train consists, arriving and departing times, train orders and switch lists for a complete operating session based on industry requirements

E. **TRAIN MOVEMENTS**
   All GL&W train movements shall be under the complete control of, and authorized by, the GL&W Dispatcher.

F. **END OF SESSION**
   At the end of each scheduled operation session, all rolling stock shall be removed from the layout and properly stored away.

G. **COMMUNICATIONS**
   During all scheduled operating sessions, the means of communications between the Dispatcher and all other operators shall be via wireless headsets.

H. **SCHEDULE CHANGES**
   Scheduled changes for operating sessions shall be posted on the club's bulletin board at least two (2) weeks in advance of the change taking place.

I. **OPERATIONS on the NARROW GAUGE or LOGGING RAILROADS**
   Operations on the narrow gauge or logging railroads are not under the control or jurisdiction of the GL&W Dispatcher. However, they shall be operated as close to prototypical as practicable and keeping in line with the rules that governs the GL&W train movements.
J. DONATED ROLLING STOCK and LOCOMOTIVES

All rolling stock and locomotives donated to LAMRS for running on the GL&W shall become the property of LAMRS and be maintained by its members. All donated cars will be the usual cars that are slated for switching movements during our "Normal" operating Time Period of 1945 to Present. With the concurrence of the membership, any donated item not falling within the GL&W operating time frames shall be sold for profit depositing those funds in the organizations general operating account.

K. COMPUTER DATABASE

Only those pieces of rolling stock falling within the operating time frame and scenario of the GL&W shall be inventoried and maintained in the database of the computer.
SECTION 3: Radio Communications

A. DEFINITIONS
1. Call Sign – How you identify who you are (Example: Engineer Red; SP5854 West; Ford Yardmaster, etc.)
2. Communication dialog – What information you are asking or what information you are giving. Be brief!
3. “Roger” - Means you understand what was communicated to you and/or you will comply
4. “Out” - Means you are done with this communication dialog
5. “Code Red” - Means you need to interrupt the current dialog for something more important such as an emergency. All other radio communications should cease.

B. GENERAL RADIO PROTOCOL
1. Wait for radio silence before initiating communications
2. Identify yourself on initial contact using your call sign and wait for a response before proceeding
3. End communication dialog with your call sign and the word “out” or “roger out” to signal you are done. “Roger” should be used when you acknowledge a clearance or other request.
4. If unable to respond to a call, say your call sign and then say “Stand By”.
5. You should only use your throttle color on initial contact with dispatch or the trainmaster.

C. INITIAL CONTACT to DISPATCH by ROAD ENGINEER
1. With Trainmaster Functioning
   a. Request: “Dispatch this is Engineer Red”
   b. Dispatch: “Go ahead Engineer Red”
   c. Road Engineer: “BNSF 5233 West is staged at Harbor East requesting clearance to Ford Yard”
   d. Dispatch: “BNSF 5233 West you are cleared to Itasca, hold in Itasca, report clear of Joliet Junction”.
   e. Road Engineer: “Roger, BNSF 5233 West cleared to Itasca, Out”
2. Without a Trainmaster
   a. Request: “Dispatch this is Engineer Red” (Do not contact dispatch until ready to roll)
   b. Dispatch: “Go ahead Engineer Red”
   c. Road Engineer: “Engineer Red with BNSF 5233 West in Harbor East”
   d. Dispatch: “Engineer Red, what is your request”?
   e. Road Engineer: “BNSF 5233 West requests clearance to Ford Yard”
   f. Dispatch: “BNSF 5233 West cleared to Itasca” or the response may be “BNSF 5233 West hold in Harbor East until I contact you again”
   g. Road Engineer: “BNSF 5233 roger, out”
   h. If the Dispatcher can give immediate clearance the dialog would continue as if the Trainmaster had been in place

D. DIALOG WHILE UNDER WAY
1. Road engineer maintains radio silence unless called by dispatch or is telling dispatch what blocks the train has cleared.
   a. Example: Road Engineer: “Dispatch, BNSF 5233 West”
b. **Dispatch:** “BNSF 5233 West this is dispatch go ahead”

c. **Road Engineer:** “BNSF 5233 West is clear of Harbor Lead and Joliet Junction, holding in Itasca”

d. **Dispatch:** “BNSF 5233 West continue to hold in Itasca” or “BNSF 5233 West, you are cleared to Hunter Siding, hold in Hunter”

e. **Road Engineer:** “BNSF 5233 roger, out”

E. **DIALOG WITH A YARD**

1. When a train reaches a block that is the entry point for a yard, the road engineer shall contact the dispatcher.
   a. **Example:** **Road Engineer:** “Dispatch, BNSF 5233 West holding in Hunter for Ford Yard”
   b. **Dispatch:** “BNSF 5233 West, contact Ford Yardmaster on the yard frequency for entry into Ford Yard, report clear of main line”
   c. **Road Engineer:** “BNSF 5233 West, roger, out”
   d. **Dispatch:** “Dispatch out”
   e. **Road Engineer:** “BNSF 5233 West to the Ford Yardmaster”
   f. **Ford Yardmaster:** “BNSF 5233 West this is Ford Yardmaster”
   g. **Road Engineer:** “BNSF 5233 West request clearance into Ford Yard for a power switch”
   h. **Ford Yardmaster:** “BNSF 5233 West, what is your throttle color?”
   i. **Road Engineer:** “BNSF 5233 West is Red”
   j. **Ford Yardmaster:** “BNSF 5233 West, you are cleared into Ford Yard, maintain yard speed”
   k. **Road Engineer:** “BNSF 5233, roger, out”
   l. **Road Engineer:** “Dispatch, BNSF 5233 West”
   m. **Dispatch:** “BNSF 5233 West this is dispatch go ahead”
   n. **Road Engineer:** “Dispatch, BNSF 5233 West is clear of the mainline in Ford Yard”
   o. **Dispatch:** “Roger, contact the trainmaster for further assignment, out”

2. Similar transmissions would take place for entrance into staging or other yards.

F. **CLEARING BLOCKS**

   A road engineer must clear each electrical track block that their train has past through by notifying the dispatcher.

1. Call dispatch when the last car of the train has passed the end of the block.
2. Example: “Dispatch, UP4497 East is clear of Eagle Canyon”.

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**SECTION 4: Procedure for Facilities Shut Down**

A. Exit Dispatcher program and Windows 98 software, turn off computer and cover the monitor and keyboard.

B. Insure all road throttles are off (switch in down position) and placed in the desk drawer.

C. Shut-off master power switch (switch in down position) located under Joliet Junction.

D. Double check that all power packs are turned off: (Baldwin, Ford Yard, Ford Engine Facility, Narrow Gauge DCC, Hannibal, Logging DCC, Harbor West Yard, Harbor West Engine Facility, Harbor East Yard, master switch for Alamosa/Langevin).


F. Shut-off master power switch (switch in down position) for dual use relays under Harbor East Yard.

G. Check to insure the downstairs door is locked.

H. Close and secure all windows.

I. Shut-off TV, radio and VCR.

J. Shut-off ceiling fans at the breaker box, unplug all other floor fans.

K. Replace the lid on the wheel cleaning (alcohol) station supplies.

L. Listen for anything on or running; (i.e. toilets, fans, etc.)

M. Turn off all overhead interior lights.

N. Close front door, turn cipher lock dead bolt, close and lock the security door with the key.
PART 6. TESTING and CERTIFICATION PROCEDURES