Allegheny Western Lines – Specifications and Standards

Revised 11/12/23

1. Standards

1.1. The base standards are based on the module standards from the NMRA. Based on experience from our group and others, changes have been made to match our current standards. The goal is to provide information to construct modules that exhibit high quality and work well in our display layouts. This document is the background detail for the module certification checklist.

1.2. Modules not in compliance with these standards may not be eligible for inclusion in a show.

1.3. Another of AWL goals is: Modules must progress and then be maintained.

1.4. Minimum compliance is needed for inclusion, the show boss or superintendent may forgo some standards to have the module included, but it is expected that more items will be brought into compliance at each successive show.

2. Design

2.1. The design of each module is up to the owner. The requirement is that the mating ends of a module; or in the case of a module set; meet AWL connecting standards.

2.2. Modules should be designed for operations where possible.

2.3. Members and Potential members are encouraged to consult with other AWL members on the design to take advantage of their experience, build a better module, have a better track plan, not repeat an existing design and make a compliant module.

2.4. Review

2.4.1. Modules for use with AWL are subject to review for Certification and Operations.

2.4.2. Review is intended to provide constructive criticism, reduce problems and speed completion.

2.4.3. A reasonable scale drawing is sufficient to understand the plan.

3. Construction

3.1. Modules should be constructed for quick set up, easy connection, flexible leveling, and quick break down.

3.2. Module Size

3.2.1. Standard Linear Module size – 2’ by 4’

3.2.2. Module sets may vary in length in 2’ increments, with module sets that are multiples of 4’ preferred.

3.2.3. Module may exceed standard width on front by up to 6”, but must be tapered back to standard width at end of module set.

3.2.4. Non Standard dimensions by approval of AWL standards committee.

3.3. Frames – square and dimensions

3.3.1. Frame height at interface ends is 3.5” (dimensional 1x4’s may not be 3.5”)

3.3.2. Frame Lumber should be ¾” thick, permission for special cases can be made.

3.3.3. Cross bars should exist and be approximately 16” on center

3.3.4. Space must exist in end frame for spring clamps, with only ¾” thick end plates

3.3.5. Frames will be made of wood – preferably Poplar and be of straight grained wood with solid knots.

3.3.6. Pine from big box home supply is strongly discouraged as it bends and twists easily.

3.3.7. Exposed frame must be painted AWL frame color – See Section 6.4.1

3.4. Connection

3.4.1. Connection Via 2” spring clamps

3.4.2. Pins and bolts will work within module sets only – but are not generally used.

3.4.3. Modules requiring alternative clamping, clamps must be provided by owner.

3.5. Height

3.5.1. Height of module to top of rails must support 40” at module ends

3.5.2. Should have adjustable feet for at least 1.75” of adjustment

3.5.3. Minimum height is 38.75” and Maximum height is 40.50”

3.6. Legs

3.6.1. Legs should assemble easily into the module – slide in pockets preferred

3.6.2. Use of bolts that require power driver are not acceptable

3.6.3. Cross bars should be across each end pair of legs for stability

3.6.4. Typical dimension of a leg is 1½ by 1½". Use of 2x2 stock is strongly discouraged. It is better to rip pieces from a 2x8 or 2x10

3.6.5. Leg bottom bolts.

3.6.5.1. A Threaded Insert is preferred or a "T" nut that is permanent attached will be in the bottom for the elevator bolts.

3.6.5.2. ¼"-20 is the standard size, but larger is acceptable

3.6.5.3. You will need to bring your own spare Tnuts and bolts.

3.6.6. Floor Conatact

3.6.6.1. An elevator bolt is preferred over a carriage bolt due to the large contact area to the floor.

3.6.6.2 Using PVC pipe caps are an acceptable alternative. (advantage – adjustable by hand)

3.7. Deck

3.7.1. An extruded Styrofoam deck is preferred, light weight and easy to glue onto.

3.7.2. The Styrofoam should be supported underneath by a sheet of masonite or plywood support deck- cross bars along will tend to dig in and foam can flex, crush and sag.

3.7.3. Top Deck should be securely fastened to module – liquid nails foamboard adhesive works well

3.8. Non-Standard Modules

3.8.1. Drop modules are acceptable as long as the interface ends of a module set meet AWL standards

3.8.2. Oversize modules are permissible, but the front must taper to 24" at the interface ends of a module set, see also 3.2.3 & 3.2.4.

4. Track

4.1. Woodland Scenics track bed recommended with foam tack glue from same, is used to secure track bed to base and also to affix track to track bed. (Track size and sheets are available. Use Foam nails.)

4.2. Mainline

4.2.1. 2 Main Lines – Mandatory through module and at connection to other modules

4.2.1.1. 5" from front edge to center line – Red Line

4.2.1.2. 7" from front edge to center line – Yellow Line

4.2.1.3. 2" on center spacing minimum throughout mainline

4.2.2. Code 100 – at mainline interface

4.2.3. Other codes of track are permitted on the modules, but the transition from Code 100 to *x* must be a permanent transition on the module

4.2.4. 24" minimum radius

4.2.5. Centerline spacing should be slightly wider than 2" on center at apex of corners, recommend 2.25" min.

4.3. Non Main Line

4.3.1. May drop to small code rail

4.3.2. Minimum radius 18" recommended

4.4. Turnouts

4.4.1. Peco turnouts strongly recommended.

4.4.2. Peco Mediums are preferred minimum on main line, especially for crossovers.

4.4.3. Electrofrog strongly recommended. (reduces dead spots on frogs)

4.4.4. All frogs need insulating joiners on 2 inside frog rails

4.4.5. Crossovers need insulating joiners on 4 of 6 rails

4.5. For every 8' of conventional modules, at least 1 crossover between main lines should exist

Allegheny Western Lines – Specifications and Standards

4.6. Joiners
- 4.6.1. All tracks must be joined with rail joiners to maintain alignment
- 4.6.2. Mainline – at End of Module Set
  - 4.6.2.1. 9” track to be used as connecting track for mainline
  - 4.6.2.2. 4.5” setback at each end
  - 4.6.2.3. Rail joiners on connecting track
- 4.6.3. Non-Mainline
  - 4.6.3.1. Other lengths can be used
  - 4.6.3.2. 6” preferred alternative
  - 4.6.3.3. Rail joiners on connecting track

4.7. Clearance
- 4.7.1. Tunnels, buildings, platforms must clear NMRA Mark IV gauge outline

4.8. All track must be securely anchored, excepting joiner tracks

5. Electrical

5.1. Main Bus
- 5.1.1. 14 gauge minimum, 12 ga preferred, stranded for main bus lines if THHN, MTW is preferred, and should go end to end.
- ~~5.1.2. 2 Prong Cinch-Jones connectors, P302cct, S302cct~~
- ~~5.1.3. Large pin for near rail to front of module~~
- 5.1.4. Red connector for 5” line
- 5.1.5. Yellow connector for 7” line
- ~~5.1.6. Male CJ connect goes to right~~
- 5.1.7 Blue connector for 9” line
- 5.1.8 30 Amp Power pole connectors between module sets – as Per N Trak standards.
- 5.1.9 Power poles use a vertical stack with Red over Black to Right Side – Hood Up, Tongue Down. (Black over Red to Left),
- 5.1.10 Yellow/Black for 7” Track and Blue/Black for 9” Track
- 5.1.11 At Least 12” Pigtail EXTENDING beyond the end of the module.

5.2. Wiring
- 5.2.1. All rails have drops soldered to rails not joiners
- 5.2.2. Rail joiners are not to be relied upon to carry power
- 5.2.3. Track bus should be separate from main bus where possible
  - 5.2.3.1. If track bus is not main bus – can be 18 ga

5.3. Terminal Strip - Single Center Terminal strip preferred, but Terminal Strips at end are acceptable.
- 5.3.1. Bus - 3’ leads need to extend at least 1’ beyond end of module
- 5.3.2. 1 set male lead for each line
- 5.3.3. 1 set female lead for each line
- 5.3.4. 5” line (Red) powers itself and any track to the front of module
- 5.3.5. 7” line (Yellow) without 9” line - powers itself and any branch or yard trackage to the back of the module
- 5.3.6. 9” line Blue - powers itself and any branch or yard trackage to the back of the module
- 5.3.7. Wire should be connected to terminal strips with Lugs that are soldered (not just wrapped around screws).
- 5.3.8. NMRA style of separate terminal strips acceptable, but wiring must meet standards

5.4. DCC
- 5.4.1. Each member is required to provide a Digitrax Booster & appropriate power supply

5.4.1.1. Appropriate cables should be included to connect the booster to any module

5.4.1.2. Hard wiring is discouraged as boosters may be moved to meet power needs

5.4.1.3. A Double "Y" cable as a minimum should be constructed

5.4.1.4. A Single "Y" with 2 leads ~~connected to 1 male and 1 female CJ connector~~ should also be constructed

5.4.1.5. Adding a PM42 or other Power Protection is recommended to improve ops

5.4.1.6 Recommend Making a Power Center with Booster, power supply, REVERSING Switch, and interface cables as a unit – reduce setup time – reversing switch helps in phase alignment. (Ask to see other members solutions).

5.4.2. Each member should bring a throttle to the show

5.4.3. Short Protection is recommended for switch areas

5.5. LocoNet

5.5.1. Each owner is responsible to provide LocoNet connections through their module

5.5.2. LocoNet jacks on front & back should be provided every 8'

5.5.3. LocoNet is 6 conductor – uses RJ 12 connectors

5.5.4. Preferred – mount UP 3/5 in front and back of module (do not mount 1 only)

5.5.4.1. If UP is in front side of module, a UP should be installed in rear for operations and ease of finding jacks.

5.5.4.2. Front side – centerline 10" from left end (when facing front)

5.5.4.3. Rear – centerline 10" from left end (left when facing back)

5.5.5. Have LocoNet cable affixed to module

5.5.5.1. 16" male lead to right hand side min

5.5.5.2. Needs to reach 12" min from 12" from front (generally center of module)

5.5.6. Alternative – Mount junction box with 2 jacks on modules without UP panels

5.5.7. Should be strain relief on cables – cable clamps or screw on zip ties

5.5.8. Color Code – for box and RJ12 connector with Cat 3/5/6 wire (satin colors)

5.5.8.1. 1- White/green tracer (White) – Pin 1

5.5.8.2. 2- White/orange tracer (Black)

5.5.8.3. 3- Blue/white tracer (Red)

5.5.8.4. 4- White/Blue tracer (Green)

5.5.8.5. 5- Orange/White tracer (Yellow)

5.5.8.6. 6- Green/White tracer (Blue)

5.6. Power

5.6.1. Required – 110V lines to carry power distance of modules brought to show

5.6.2. This is not to be hard wired

5.6.3. Power strip, UL rated 15 amp minimum, must be provided

5.7 Ground Line – a green ground line may be a permanent line or ad hoc to connect to boosters.

6. Scenery

6.1. Ballast - Woodland Scenics

6.1.1. Main – medium grey blend B1394

6.1.2. Branch/Yard – 50-50 mix of fine grey & cinders

6.1.3. Floquil Rail Brown to weather rails

6.1.4. All ballast shall be clear of flangeways

6.1.5. Remove any scenic element or glue from rails

6.2. Ground Cover

6.2.1. Scenic Express – at least in transition areas

Allegheny Western Lines – Specifications and Standards

6.2.1.1. Summer lawn blend
6.2.1.2. Farm pasture blend
6.2.1.3. Earth blend
6.2.1.4. Woodland Scenics – Acceptable for accents and detail work
6.2.1.5. More to be added…
6.2.2. Other Similar appearing Compatible blends or materials to be added

6.3. Buildings

6.3.1. Stations and Railroad structures– Cream and Dark Green

6.4 Paint Colors
6.4.1 Frame Color – Ground Cover (Green) – Behr 400F-7 - Flat
6.4.2 SkyBoard Color – Galactic Lite – Sherman Williams HGSW1347

7. Backdrops
   7.1. Backdrops should be provide for all modules
   7.2. Top edge is 14.5" above standard module. An 18" wide piece of Gatorfoam works well
   7.3. Backdrops are typically clamped to modules with 2" spring clamps
   7.4. Cutouts for handles and UP panels need to be made.
   7.5 Color – see 6.4.2 above.
8. Skirting
   8.1. Club provided material
   8.2. Velcro & sewing costs are members' responsibility
9. Equipment – Gatsme's 96 Inspection Standards shall be adopted for use by AWL
   9.1. <u>All motive power shall meet AWL standards and can be inspected at GATSME or by AWL inspector</u>
   9.2. <u>All rolling stock shall meet AWL standards and can be inspected at GATSME or by AWL inspector</u>