The “L-Gauge Modular System” Standard V1.5

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S1. Introduction

S1.1. The objective of the L-Gauge Modular System (LGMS) is to provide a platform for realistic group layouts where a number of participants can bring LGMS modules to an event and assemble a coherent, reliable, and plausible layout suitable for public display, realistic operations and switching, or loop running where applicable.

S2. Definitions

S2.1. **Ballast** – An assembly of plates and tiles upon which the track is attached or rests.

S2.2. **Baseplate** – A thin sheet of LEGO® studs, measuring 10 x 10 inches (25.6 x 25.6 cm) or 32 x 32 LEGO studs. The term “baseplate” is also used as a measurement of the same dimensions.

S2.3. **Benchwork** – A table or other structural surface upon which a module is placed.

S2.4. **Brick** - A basic building block within the LEGO System, measuring ⅜ inches (9.6 mm tall).

S2.5. **Crossover** - A pair of turnouts used to change from one track to another.

S2.6. **Divergent Route** - The curved route of a turnout. Wye type turnouts have two divergent routes.

S2.7. **Ground Level** - The top surface of a module that represents the ground upon which scenic elements (trees, buildings, etc) are placed.

S2.8. **Guest** – A person attending the LGMS event that does not bring a module but may bring trains to run on the layout.

S2.9. **Layout Coordinator** - A participant in charge of venue relations, layout design, and supervising/overseeing an LGMS layout.

S2.10. **Mainline** – Track intended for continuous, unobstructed operation of trains, for use by all participants and guests.

S2.11. **Module** – A dimensional portion of the layout contributed by the participant(s) which conforms to the standards defined in this document.

S2.12. **Module Connecting End** - A side of a module that includes two Mainline Track connections as illustrated in Figure 2.

S2.13. **Participant** – A person or group that brings a module for the LGMS event.

S2.14. **Plate** - A thin building block within the LEGO System, measuring ⅛ inches (3.2 mm) tall.

S2.15. **Rail** – Protrusion from the track assembly on which the wheels of a train sit.

S2.16. **Rail Height** – Distance from floor to the top of the rail; typically 32 inches (81.3 cm).

S2.17. **Secondary Track** - Any track that branches away from the Mainline (Branchlines, Spurs or Sidings). Secondary Track specifications are not provided in this document.

S2.18. **Stud** - The interlocking knob on a LEGO element. A single stud square element measures 5/16 x 5/16 inches (8 x 8 mm).

S2.19. **Tile** - A thin building block within the LEGO System, measuring ⅛ inches (3.2 mm) tall, but with a smooth top surface.

S2.20. **Track** – An assembly consisting of two rails and cross ties.

S2.21. **Track Center** –The centerline of the track, located equidistant between the two rails, used as a reference point for measurements.

S2.22. **Turnout** – Also referred to as a Switch. A type of track used to guide a train from one track to another.

S2.23. **Viewing Side** - The side(s) of the module that will face the public, as determined by the participant.

S3. Benchwork Specifications

S3.1. Benchwork shall be free from defects and structurally solid so as to not wobble or fail during usage. Venue-provided or rental tables shall not be used.

S3.2. Benchwork shall have at least 4 legs and be freestanding.

S3.3. Benchwork legs shall have adjustable feet for +/- 1 inch (2.5 cm) height adjustments. Simple blocks or shims shall not be used for adjusting table heights.

S3.4. Leg risers may be used if the leg is captured in such a way that prevents the table from being dislodged from the risers. Leg risers shall not prevent the use of adjustable feet.

S3.5. Table feet or riser feet shall be of a material as to not damage the floor..

S3.6. The edges of a module may overhang the benchwork edge by no more than half (½) an inch. The benchwork dimensions shall not exceed the module dimensions.

S3.7. Benchwork shall be completely covered by LEGO components. No bare benchwork top shall be exposed.

S3.8. All benchwork sides facing the public shall use solid dark-color skirting extending from benchwork top down to 1 inch (2.54 cm) above the floor.

S4. Module Specifications

S4.1. Module minimum size shall be 3 x 3 baseplates.

S4.2. Module size can be increased by length in 3 baseplate increments and increased by depth in 1 baseplate increments. Lengths are perpendicular to Module Connecting Ends.

S4.3. Each module shall have at least one Module Connecting End to pass or return the Mainline tracks to adjacent modules. The Module Connecting End shall follow the spacing requirements in Figure 2.

S4.4. Module Connecting Ends shall be aligned on a 3 x 3 square baseplate grid (see Appendix A).

S4.5. Ground level within two studs of any Module Connecting End shall be 4-5 plates below the Mainline Rail height along the full length of the Module Connecting End.

S4.6. Module components shall not extend into another participant's module unless previously coordinated.

S4.7. Modules with a Mainline track center of 8 studs from the module edge shall use plexiglass barriers to keep derailed trains from falling to the floor.

S4.8. Plexiglass barriers shall be no more than 3 inches (7.62 cm) above rail height.

S4.9. Lower than nominal modules, such as those used for canyons or bridges, shall have their connecting ends raised such that adjacent benchwork remains hidden.

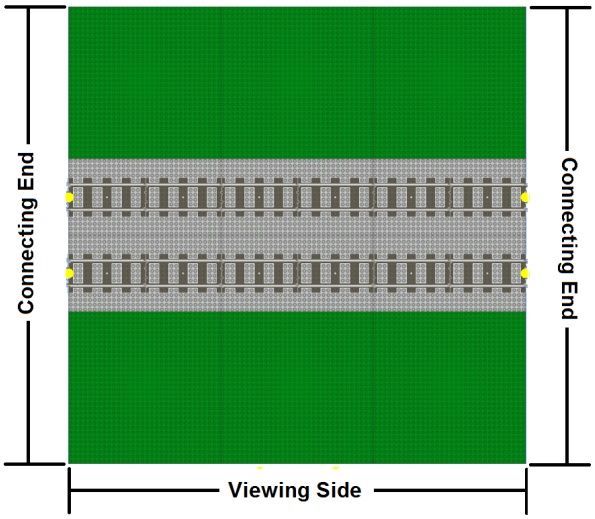

Figure 1: A typical 3 x 3 baseplate straight module consisting of two Module Connecting Ends and at least one viewing side.

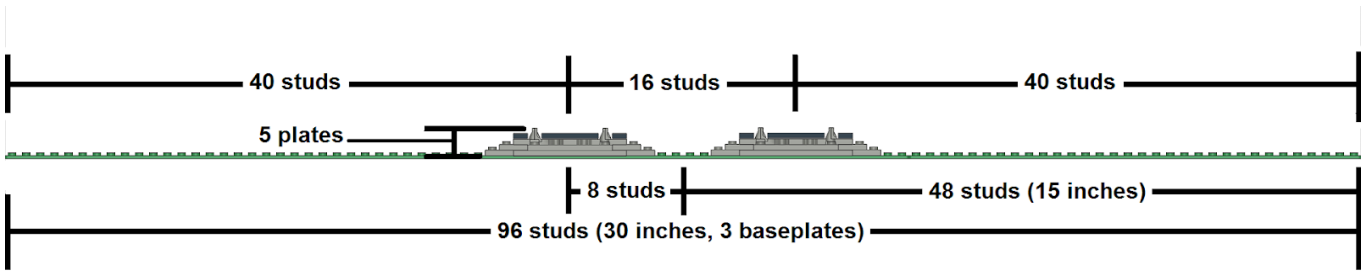

Figure 2: Diagram of a typical Module Connecting End

S5. Rail Specifications

S5.1. Rail height for all Mainline Tracks shall be 32 inches (81.3cm) above the floor.

S5.2. There shall be no gradient on any Mainline Track. All Mainline Tracks shall be level, smooth, and well-supported for safe operation of trains.

S5.3. Mainline Tracks shall have no fewer than 16 studs of separation between track centers, except at connecting crossovers, turnouts, or intersections.

S5.4. Mainline tracks shall have ballasting and ties that do not extend above rail height.

S5.5. Mainline tracks shall have a rail profile identical to current LEGO plastic track with the exception of 1 x 16 rail (3228c). No Flexible track, 4.5V or ME Models track.

S5.6. Mainline curves, crossovers, and turnouts that carry a Mainline on the divergent route of the turnout shall have a minimum radius of R104.

S5.7. Mainline Tracks shall be fully accessible within 30 inches (76.8 cm) of at least one module side.

S5.8. Mainline Track(s) spanning any gap shall be capable of supporting at least 2 pounds (.91kg) of weight per track per baseplate length.

S5.9. This Standard makes no provisions for electrified track. All trains are expected to provide their own on-board power.

S6. Clearances

S6.1. Scenery within 8 studs of track center on any Mainline shall be kept at or below rail height.

S6.2. Tunnels, overpasses and other overhead obstructions shall be a minimum of 16 bricks (6 inches / 15.4 cm) above rail height.

S7. Collaboration

S7.1. Layout(s) shall be coordinated by a Layout Coordinator.

S7.2. The Layout Coordinator is responsible for the oversight of overall setup, teardown, and all operations on the layout for the duration of the show or event.

S7.3. The Layout Coordinator is responsible to communicate all setup/teardown hours, public hours, train running schedules and any changes of such to all participants and guests.

S7.4. The Layout Coordinator is responsible for designing the layout size, shape and style to fit within the space allotted to the group by the show staff.

S7.5. LGMS is open to all compliant modules, however the Layout Coordinator may deny some modules from participating based on available space or layout design constraints.

S7.6. Non-conforming modules shall be modified during setup hours. Should modification be infeasible, the Layout Coordinator may remove the module at their discretion.

S7.7. A participant’s module is their responsibility for the duration of the event.

S7.8. Mainline Tracks shall be open for use by all Participants and Guests.

S7.9. Secondary Tracks are considered “privately owned” by the module owner. The module owner can give Secondary Track usage permission to other participants and guests.

S8. General Guidelines

S8.1. There shall be no defined scale for trains operated on an LGMS layout. It is the responsibility of the train owner to ensure it conforms to the clearances outlined in S6.

S8.2. Train Operators are responsible for total control and safe operation of their train at all times while the train is in motion.

S8.3. No trains shall be parked on the Mainline.

S9. Appendix A

Example Modules. This is a small sampling of acceptable module types and is not an exhaustive list of every available module configuration.

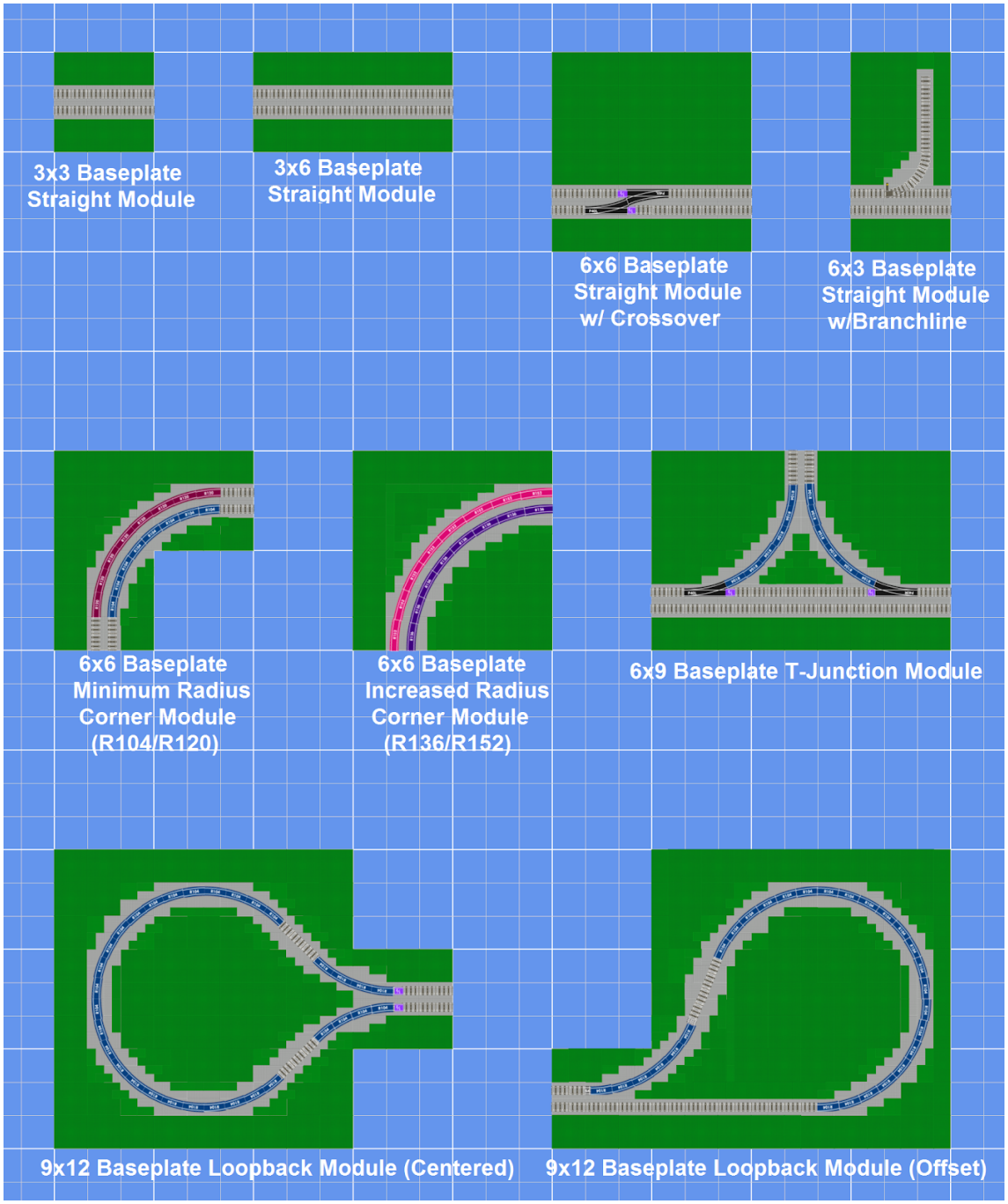

Figure 3: Example Modules on a baseplate grid, with the 3 x 3 sections in bold.

S10. Appendix B

Maximum Train Dimensions for unattended two track train running. The following diagrams indicate examples of maximum lengths and widths of locomotives and rolling stock when negotiating LGMS R104/R120 curves. Running larger/longer cars will be up to the discretion of the Layout Coordinator and will require single track running. Clearances in S6 will still apply.

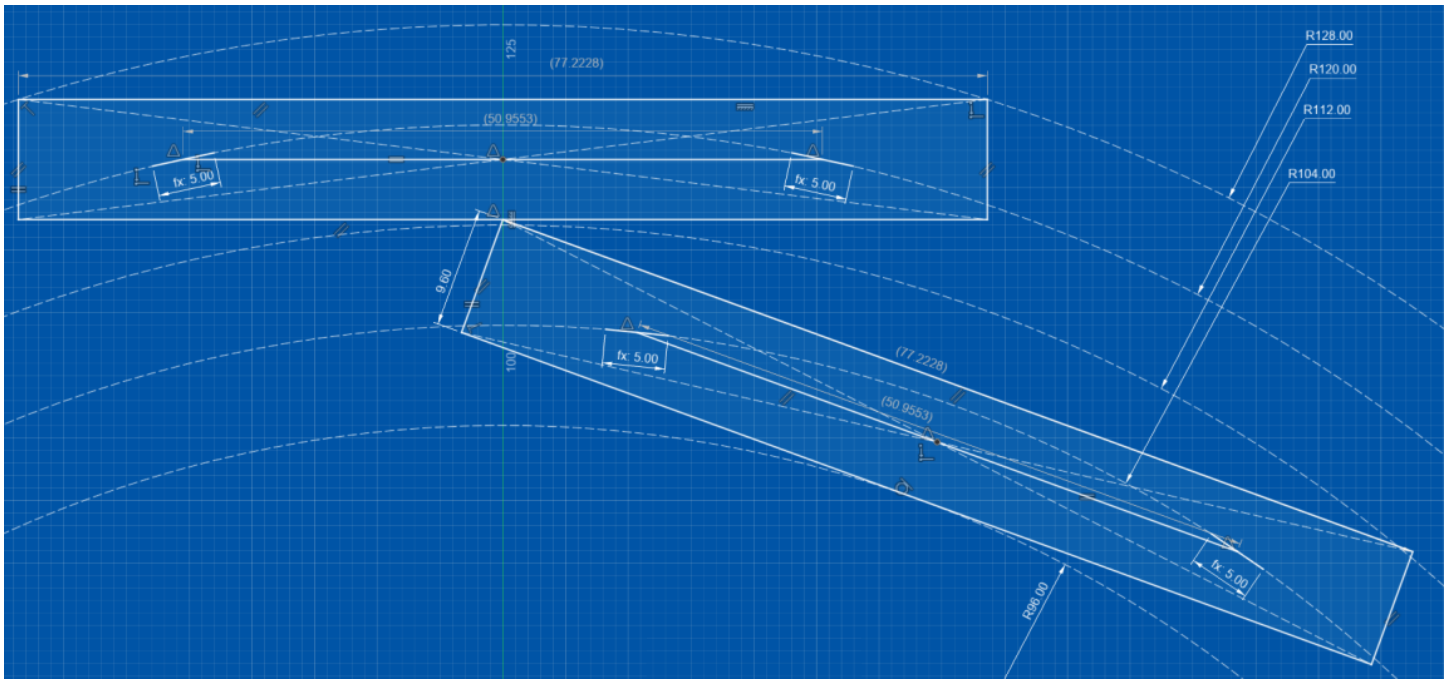

Figure 4: 1:48 scale “8-wide with greebles” (9.6 studs).
Maximum car length is 77 studs long on a 55 stud wheelbase.

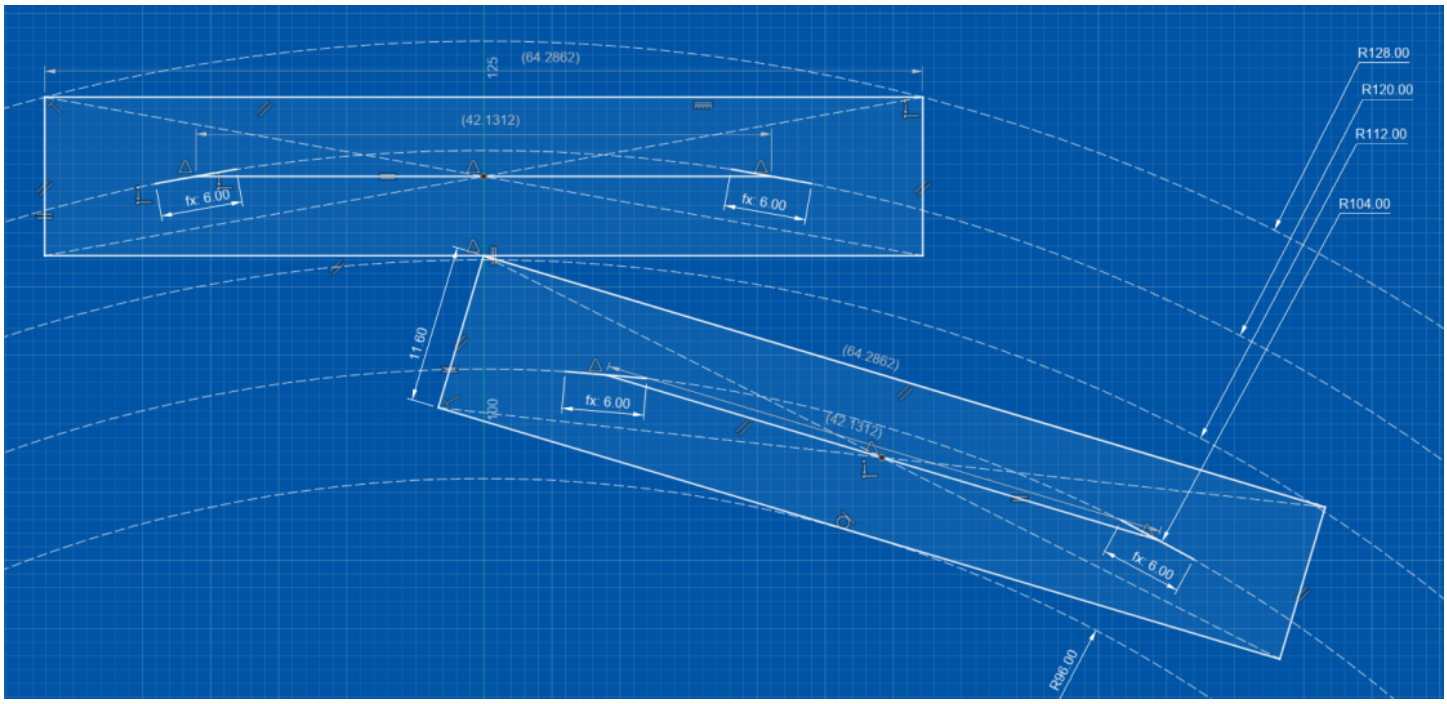

Figure 5: 1:38 scale “10-wide with greebles” (11.6 studs).
Maximum car length is 64 studs long on a 42 stud wheelbase.

Revision History

V1.0 : January 30, 2019 – Compiled and published
The Layout Chief is responsible for maintaining a low Bonahoom factor at appropriate shows. This includes arranging any branch modules in a neat and orderly fashion.
V1.1: February 12, 2019 - Changed wording in 1.1 (“Our” to “The”), added sections 4.5 (mainline gradients), 6.4 (branchline gradients), 7.2 (discussion of additional modules), 10.2 (Table + MILS + PennLUG ballast), 12.3 (Bonahoom factor), removed section 3.1 (table height), 13.4 (maximum grade). Changed wording in 11.1 (“mirrors” to “replicates”. Removed red asterisks from sections 4.3, 6.1, 6.2, 6.3, 8.1, 8.2, 8.3, 8.4, 9.1, 9.2, 9.3, 9.4, 10.1, 11.1, 12.1, 12.2, 13.2.
V1.1.1 : February 14, 2019 – Removed “convention” from 3.5. Convention tables are not allowed to be used for displaying modules, updated section 7.1 to disallow extra modules outside the given floor space reserved for the layout (subject to change following Brickworld Chicago 2019).
V1.2 : Added Definition of Terms, now section 2.0. Clarified section 3.1 (module dimensions), added section 3.2 (increasing a module size), removed “or three feet” from 4.1, removed section 4.4 (MILS Modules), removed “custom tables are not required” from 4.5, inserted “two mainlines” in 5.1, clarified 5.2 (mainlines), added 5.2.1, clarified section 5.3 (space between mainline tracks), added 5.3.1 and 5.3.2, removed 5.4 (crossovers on mainlines), added 5.5 (restriction on track), removed requirement for R104 and R120 placement from 6.1, added 6.2 (minimum radius for mainline corner), split section 8.1 (additional modules) into 8.1, 8.2, 8.3, 8.5, changed “should” to “shall” in 10.1 and 10.2. Name changed from “Stud-Mo” to “LGMS”.
V1.3 : Updated rail height from 37 3/16” to 32 2/16”, added 5.6, removed 8.4, 8.5, removed 9.1, added link to PennLUG ballast instructions, removed Bonahoom factor requirements and definition.
V1.4 : Added 11.3 defining minimum and recommended tunnel and overpass heights.
V1.4.1 : Removed 11.3, added 10.5.
V1.5 : Major overhaul of all sections with simplifications and easier to understand clarifications of standards: Changed rail height to 32 inches, added examples of modules with photos, added table of contents and appendix A. Added Appendix B for maximum train dimensions. Changed wording of S2.17 Secondary Track. Added S7.8-S7.9 track usage permissions. Removed Red/Blue text indicators above ToC.