# Stud-Mo

## Modular Standard for LEGO Trains

The following is a list of requirements for modules to be used in group layouts. Modules must meet the minimum requirements set forth in this standard.

There are still a few topics which will be play-tested at Brickworld Chicago 2019 and may affect the final decision, possibly changing the requirements listed in this standard. This document will be updated accordingly. Anything marked with an asterisk is still open to discussion (i.e. not already voted on).

**1.0 Introduction**

1.1 The objective is to provide a platform for realistic group layouts. Stud-Mo is not intended to replace LUG layouts or render them obsolete. Stud-Mo was created for the sole purpose of group layouts, particularly in a convention setting. The goal is for a number of people to arrive at a show with various modules and be able to put together a coherent, reliable, and plausible layout suitable for realistic operations and switching but also loop running.

**2.0 Module Dimensions**

2.1 Modules shall have a depth of 30” (3x 32x32 baseplates) and a minimum length of 30”. Therefore, the minimum size of a module is 30” x 30”. The length may be increased in increments of 30” with no maximum.

**3.0 Table and Rail Height**

3.1 The table height shall be 36” or 3 feet from the floor.

3.2 The rail height (measured from floor to top of the rail) shall be 37 3/16”. This is equivalent to a standard MILS module (one baseplate, one brick, one plate) with standard “PennLUG” ballasted track (2 plates, then track) sitting on a 36” high table.

3.3 Tables of lower height (example: tables for a river module or trestle) are allowed as long as the rail height is maintained.

3.4 MILS modules are not required. For scenery requirements, see Section 9.0.

3.5 Custom tables are not required. Convention or folding tables may be used as long as the rail height is correct. There will be more discussion on this requirement following Brickworld Chicago 2019.

**4.0 Mainline Modules**

4.1 Any modules added to the layout must include a mainline at a minimum.

4.2 The mainline shall run through the center of the module and for the entire length of the module. It shall consist of two separate tracks to allow independent operation. See Figure 1.

4.3 Each mainline track shall sit four studs in from the edge of that baseplate, allowing two tracks per baseplate with even spacing. See Figure 1. There will be more discussion on this requirement following Brickworld Chicago 2019.

4.4 Crossover switches on the mainline are allowed.

4.5 There shall be no gradient on any mainline track.

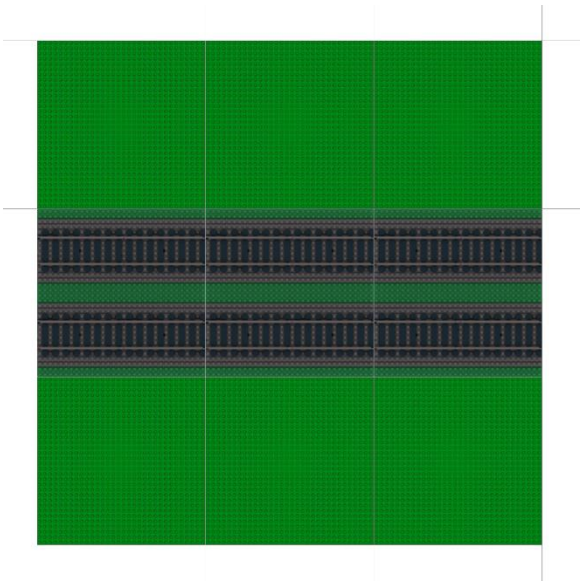

**Figure 1: An example of a minimal mainline module.**

## 5.0 Corner Modules

5.1 Corner modules shall be used to complete the mainline loop of the layout. The radii to be used on the inside and outside of the curve is R104 and R120, respectively. An example corner module is shown in Figure 2.

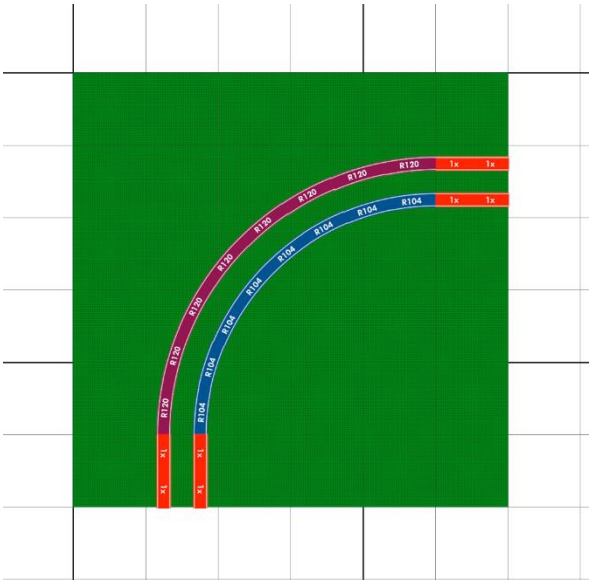


**Figure 2: An example of a minimal corner module.**

## 6.0 Branchline Modules

6.1 Branchline modules are allowed. They should connect to the builder's own mainline modules, except through coordination with another participant.

6.2 Branchline modules must meet the requirements listed in Sections 2.0 and 3.0 but do not need a mainline.

6.3 There is no minimum radius established for branchline modules.

6.4 The maximum gradient for branchline modules shall be one plate in height per 16 studs in length.

**7.0 Additional Modules**

7.1 Additional modules may be added to either side (viewing or operating) of the mainline module. Railyards parallel to the mainline, sidings for industries, and more fall into this category. These modules must meet the requirements listed in Sections 2.0 and 3.0 but do not need a mainline. They should connect to the builder's own mainline modules, except through coordination with another participant.

7.2 Modules including S-curves and turnaround loops will be discussed at a later date.

**8.0 Switches and Turnouts**

8.1 There is no regulation for switches, minimum radius or otherwise.

8.2 Switches and turnouts may be hand-thrown or controlled remotely.

8.3 Any motorized switches shall be self-contained within the module.

8.4 Any motorized switch mechanism shall be included in such a way that they do not foul any locomotive or car.

**9.0 Scenery**

9.1 All track should be ballasted.

9.2 Scenery should cover any benchwork at a minimum.

9.3 The ends of all modules shall be flat to prevent any unwanted "cliffs".

9.4 Scenery within four studs of any track must be kept below the height of the rail.

**10.0 Recommended Practice**

10.1 Mainline switches and crossovers should allow for large locomotives to be moved onto and off of the mainline without touching the locomotive, if possible.

10.2 Rail height is 37 3/16". The recommended method to achieve this height is by using a standard MILS module (one baseplate, one brick, one plate) with standard "PennLUG" ballasted track (2 plates, then track) sitting on a 36" high table.

**11.0 Operation**

11.1 Mainline trains shall be run in a manner that replicates driving in the United States. In essence, trains running on the outer mainline (closest to viewers) shall run counterclockwise, and trains running on the inner mainline (closest to the inside of the layout) shall run clockwise.

**12.0 Collaboration**

12.1 Layouts shall be designed by the participants in that event or show before arrival at the venue. Collaboration groups shall be open to outside and first-time participants who may bring their own Stud-Mo compliant modules.

12.2 Layouts shall be coordinated and designed by the Layout Chief. The Layout Chief is in charge of that layout for the duration of that show or event, including setup and teardown.

12.3 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.

**13.0 Miscellaneous**

13.1 There shall be no defined scale for the trains used on the modules.

13.2 Modules shall be intended for use with battery powered trains only.

13.3 Plexiglass is not a requirement but may be utilized. If used, it shall not exceed 3" above the height of the table. It shall be fastened to the fascia of the module.

**14.0 Revision History**

January 30, 2019 – Compiled and published

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.