On30 Module Standard
Introduction

The SLOMRA On30 module standard is a new and unique format based on several popular module standards. This standard evolved over time, trial-and-error, and the desires of the SLOMRA members to feature scenery over operation. The primary purpose of this standard is to provide guidelines that allow members to independently construct modules that can be joined together and operated as a layout. This standard allows for a continuous mainline loop for public display and also allows for maximum flexibility in track arrangement, module size and scenery. This standard does not specify the actual methods of module construction but makes helpful suggestions. Only the track placement, track connection, module height, and electrical requirements are specified for the module ends. The standard allows total flexibility between the standard interfaces.

There are three levels of Standards in this specification. The Basic Standard establishes the rules that shall apply to all modules. For interoperability, the Basic Standards are mandatory.

Recommended Practices can be employed for greater continuity, but are not mandatory. Under the Recommended Practices there are scenery and sky color recommendations.

Under the Advanced Standard, module dimensions and shape are left to the imagination and artistic license of the module builder. The Advance Standards include specifications for track elevation change.

On30 Module Concept

There have been endless discussions of the two conflicting approaches in modular railroads. On the one hand, a modular layout can be built for public display and continuous running. This approach is typified by classic NMRA Standard of fixed length modules used to make an oval (N-Trak), and more recently, the Bend Track Standard for double sided modules. These modules employ sky backdrops and emphasize scenery over operation.

The other approach is a standard that allows free-form modules with no attempt to close-the-loop. This approach connects modules of odd shapes and emphasizes operation and scenery. Since the trains can't be left to run on their own, hands-on operation is required. One popular free-form module standard is Free-Mo.

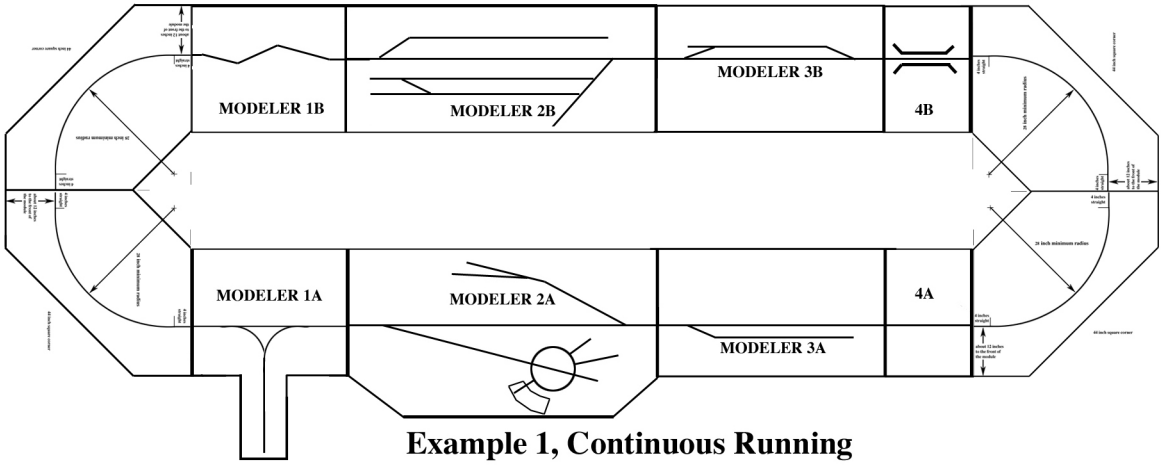
After the first meeting of the ad hock SLOMRA On30 Standards Committee it was clear that we would like to do it all. We want continuous running for public shows, space for expansive scenery, and realistic narrow gauge operations. We want the flexibility to allow each modeler to create his or her unique concept with the absolute minimum of requirements.

On30 Considerations

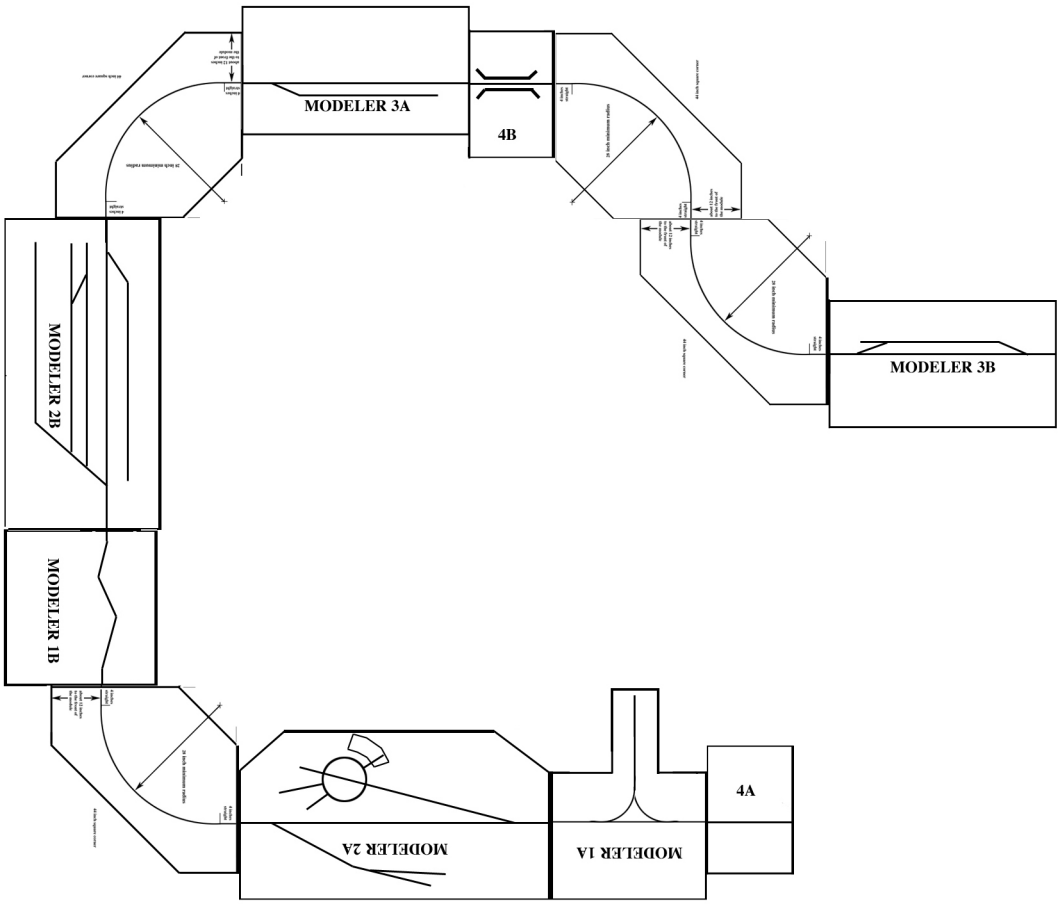
A double mainline would not be prototypical for a narrow gauge railroad so the SLOMRA On30 standard uses a single mainline. The standard N-Scale Bend Track module is 12 inches from fascia board to the backdrop. Scaled up to O-Scale this same module would be four feet deep. Four feet deep

is not practical for access (reach), transport, and getting through doorways so the SLOMRA On30 standard requires the module interface be 30 inches deep. The front of the module can extend further when more surface area is desired.

The 50-inch rail height comes from viewing comfort and convenient leg lumber length of 48 inches. A plus or minus 1 inch minimum adjustable foot is used to level the module. The position of the track at the interface is near the center to maximize scenery possibilities but not at the center so as to not visually bisect the module.



Example 1, Continuous Running



Example 2, Same Modules Arranged for Point-to-Point Operation

After looking at the popular module approaches, this new On30 module proposal combines the best

of the other standards. The new wrinkle in this specification is a trick that allows our modules to connect free form or in a continuous loop, depending on the venue. This standard also allows us to connect to most other On30 module groups with minor adjustments or simple adapter modules.

Of course, this flexibility comes with a price. First, for continuous running, at least two end loops (or four corners) will have to be constructed. This is no different than any other modular railroad. The second, and unique concept is, every module has a mate of matching length. They can have different track plans and different scenery but they must travel as a set. Modelers can build a matching pair or team up with another modeler to build matching modules. Be warned, if your partner doesn't attend the show, your module may not be used.

As shown in Example 1 and 2, the pair of modules are used on opposite sides of the loop when continuous running is desired and clamped end-to-end (or anywhere, really) for free-form operation. Construction of a matched pair of modules is only slightly more difficult than building one module, especially when cutting the lumber.

Consider having matched industries, a producer and a consumer, on the two modules. This makes a place for the cars to go. For example, one module has a lumber mill and the other, a lumber yard.

Adapting this standard to O-Scale is straightforward. The only limit on size is what the modeler can transport. The minimum width is 12 inches to meet the track setback requirement. There is no maximum width. The minimum depth is 30 inches from the face of the backdrop. There is no maximum depth.

For the enjoyment of all the members it is suggested that quick set-up be a prime consideration when designing your module. The goal should be to have your module up and running in 15 minutes. This is accomplished by having a minimum of loose parts and equipment. Having the module self contained with its wires, cords, power supply, and legs will make the set-up run efficiently.

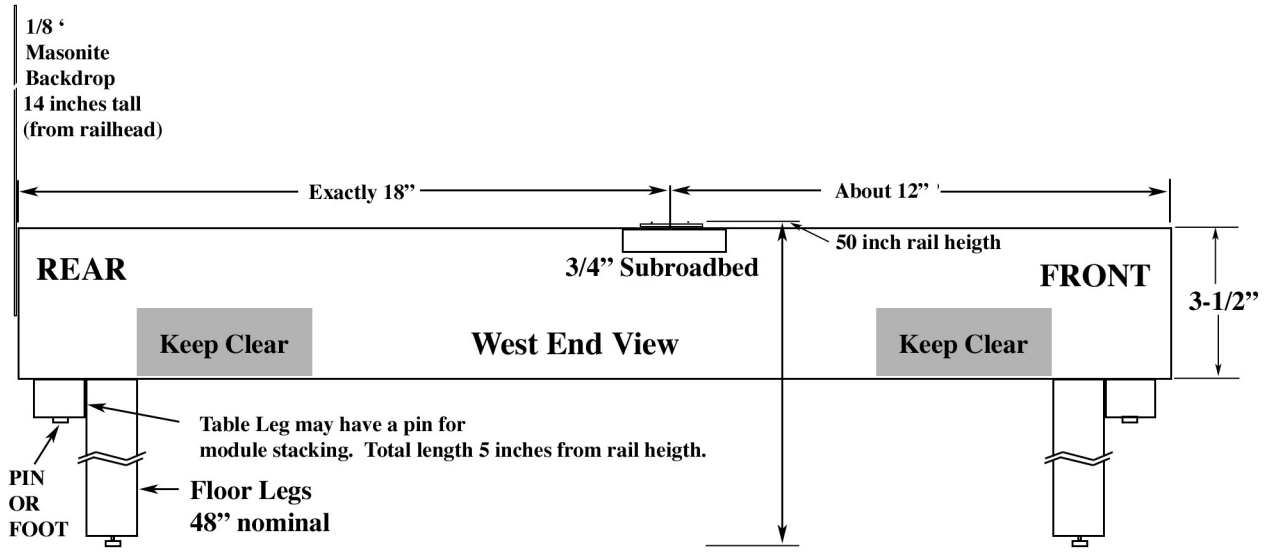


Figure 1, Module Endplate

1.0 Module Construction

1.1 Construction Mandatory Standards

Interface Plates shall be 3.5 inches high and 3/4 thick wood, plastic or metal (birch plywood works well). The depth at the end plate shall be 30 inches as shown in Figure 1. Clearance for two C-clamps is required. Recommended clearance area is 2 inches high by 4 inches wide, near the front and back of

endplate inner surface. Module length is left to the discretion of the builder.

Module frame and surface should be constructed of dimensionally stable materials to ensure proper alignment with other modules under all possible environmental conditions. Avoid dimensional pine lumber. It has a tendency to warp and cup, throwing off track alignment. In its place, consider using materials such as plywood ripped into strips the equivalent size of dimensional lumber, other types of laminates, metal studs, etc.

Default height to the railhead from the floor shall be 50 inches. Each leg must include vertical adjustment of +/- 1 inch minimum to compensate for uneven floors.

Sub roadbed shall be at least 1/2 inch thick plywood or equivalent (foam tops and plywood/ Homasote™ combinations are acceptable), braced to prevent sag or flexing. No shaped roadbed is required or recommended, in keeping with narrow gauge practice. The centerline of the mainline track shall be located 18 inches from the front surface of the backdrop. The track centerline shall be clearly marked on the roadbed at each end for alignment with the next module.

Each module shall be equipped with sufficient legs to be freestanding and a module must stand secure and level, independent of other modules, through the use of proper cross and angle bracing. The backdrop shall be removable as modules may be used with spectators viewing from either side. Note: the 30 inch depth does not include the backdrop (if used) and does include the front fascia board. Track shall be O-scale, 30 inch gauge, code 83 (0.083 high) rail. Micro-Engineering Code 83 flex or hand laid track is recommended.

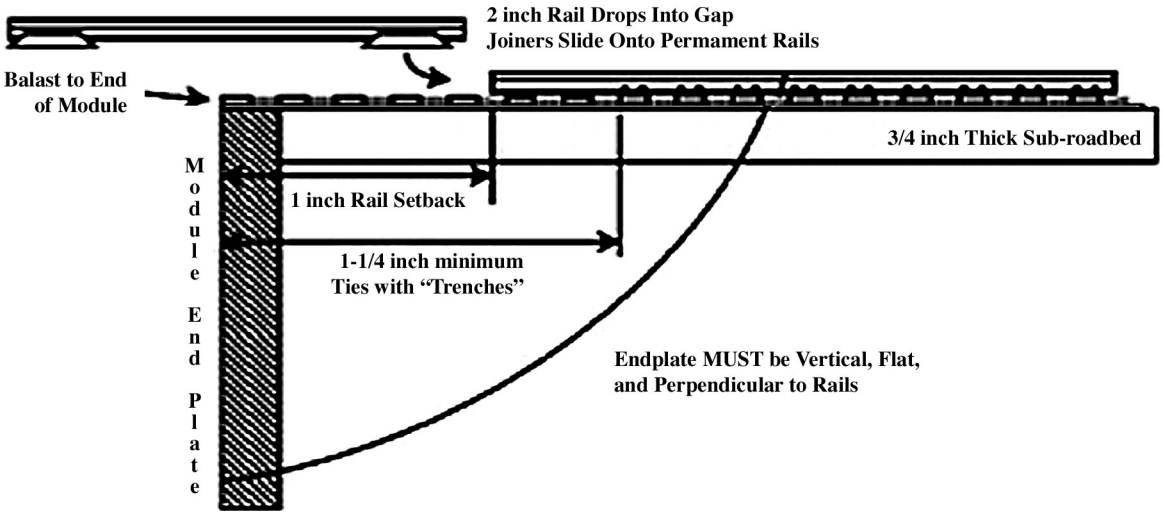


Figure 2, Two Inch Long, Code 83 Fitter Rail

1.2 Construction Advanced Standards

Module end plates between permanently mated modules (module sets or sections) can be any depth. Only the end plates designed to be interchangeable with other modules must meet the 30-inch standard. Offset and curved modules are allowed as long as a pair of modules maintain the required interfaces to the adjoining modules. Example, If a module makes a jog, the mating module must make the same dimensional jog.

1.2.1 Mainline Grades

Mainline grades are allowed on modules. Module grades must not exceed 4% (1 inch in every 25 inches) on mainline track. Track must be level for the 6 inches prior to each interface. Suitable Easements are required between grade and level track. A recommended minimum would be an 8-inch

transition from level ground to a 4% grade. This imposes a practical limit of less than 2 inch rise over a 4 foot module, and less than 3 inch rise over a six foot module (6 inches level on each end, 8 inch transition to grade (2.25 ft) +1 inch rise per each additional foot of module length. Opposing interfaces may be of different heights.

1.3 Construction Recommended Practices

The front and back of both modules can be skirted. The ends of the skirts will extend two inches past the module end plate to allow overlap from the skirting on an adjacent module. The bottom edge of the skirt shall be 1 inch off the floor when the leg adjustments are set to the modules minimum height. Recommended color of the skirt is chocolate brown.

2.0 Track

2.1 Track Mandatory Standards

Mainline minimum radius is 22 inches (32 inches is preferred) with at least 12 inches of straight track between reverse curves on mainline track. The track center line shall be 18 inches from the front of the backdrop (see Fig 1) at the interface. Track must be perpendicular to the end, straight and level for 6 inches from each end of the module (see Fig 2). By ensuring 6 inches of straight track from each module, the 12 inches between reverse curves can be maintained. Rail shall be cut off 1 inch away from module end; ties and ballast shall be continued to the module end for good appearance and matching with the adjacent module. Ties shall be commercially available low profile ties or home made equivalent.

Mainline turnouts shall be #5 or greater (Micro-Engineering turnouts recommended). Frogs shall be powered. Mainline track shall be placed no closer than 6 inches from the track centerline to the front or rear edge of a module. Yard or industrial spur tracks shall be placed no closer than 4 inches from the track centerline to the front or rear edge of a module. NMRA On3 Clearances (Figure 3) shall be used for all tracks, tunnels, and platforms.

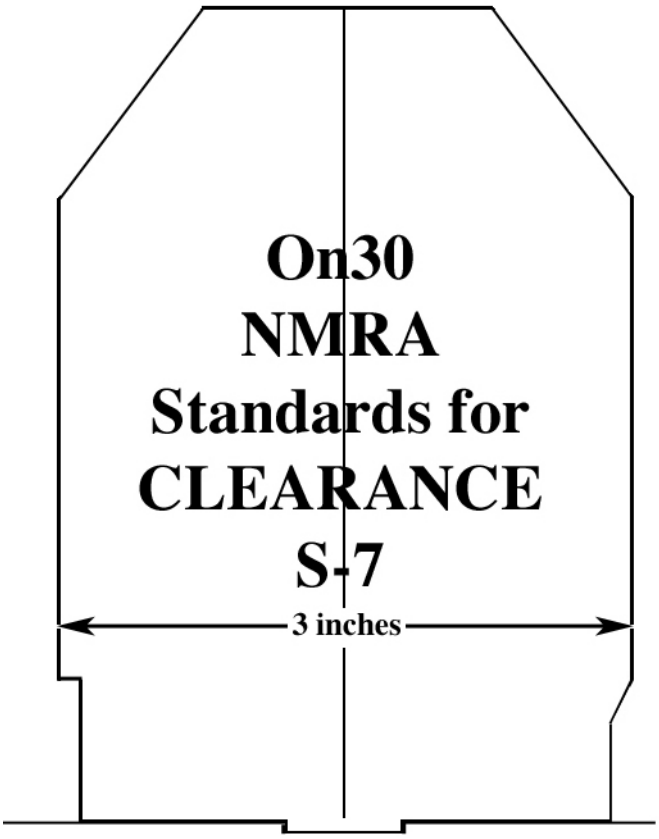


Figure 3, NMRA Clearance Gauge (Full Size)

2.2 Track Advanced Standards

Mainline track can be code 70 within the module, but must transition to code 83 at the interface. Code 55 may be used on sidings if desired.

3.0 Control and Wiring

DC Cab control has been chosen as the standard throttle for all SLOMRA On30 modules. The single main line, short runs, and the high start-up cost of command control suggests conventional DC cab control is adequate for our needs. However, each module will accommodate DCC as an alternative.

3.1 Wiring Mandatory Standards

Ten Amp barrier style terminal blocks shall be installed at each interface and shall accept 12 AWG wire with spade tongue lugs. A 14 AWG stranded two conductor wire bus shall extend full module length under mainline. Eighteen AWG feeders shall connect individual rail lengths to the wire bus. Inter-module connector wires (pigtails) shall be 10" long with spade lugs attached to the terminal block. Color coded 30 Amp Anderson Powerpole connectors shall be used for track connection between modules.

There may be modelers who use DCC therefore, as a minimum, each module shall carry a single RJ12 pass-thru cable (Figure 4) equal to the length of the module plus 18 inches (to allow for interconnection) and one F-F coupler. The cable is used to construct a Cab, XpressNet or Loconet

throttle network for Digital Command Control (DCC).

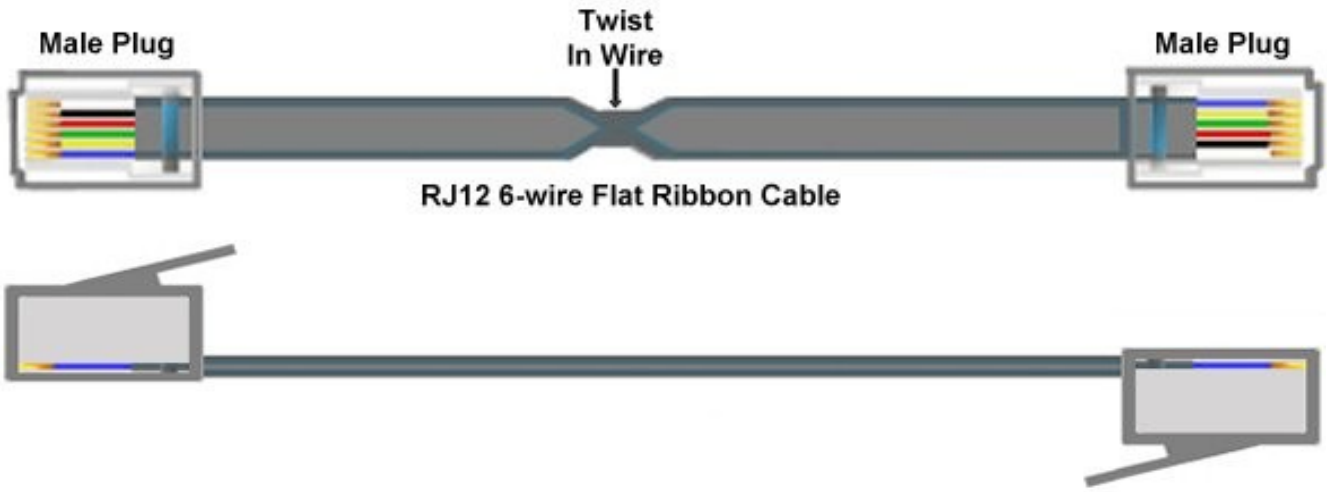


Figure 4, Required DCC Cable

Spur tracks shall have a double pole "kill" switch to allow both rails to be completely isolated from mainline. Lights and accessories shall not derive power from track power.

The module owner shall provide AC power (socket) to the module on the left (west). As a minimum, an extension cord, longer than the module shall be provided. The male connector (plug) is always on the right (east) end.

3.2 Wiring Advanced Standards

Whenever possible, red wire/connector will be used for the north rail and black will be used for the south rail. Any module may provide conventional DC cab control to the mainline through a switch that can isolate the throttle from the track bus wire. Any track beyond the mainline (sidings, spurs, yards) may be operated from a second throttle. A Double Pole (DP) switch is required to connect spur track to the mainline bus when necessary.

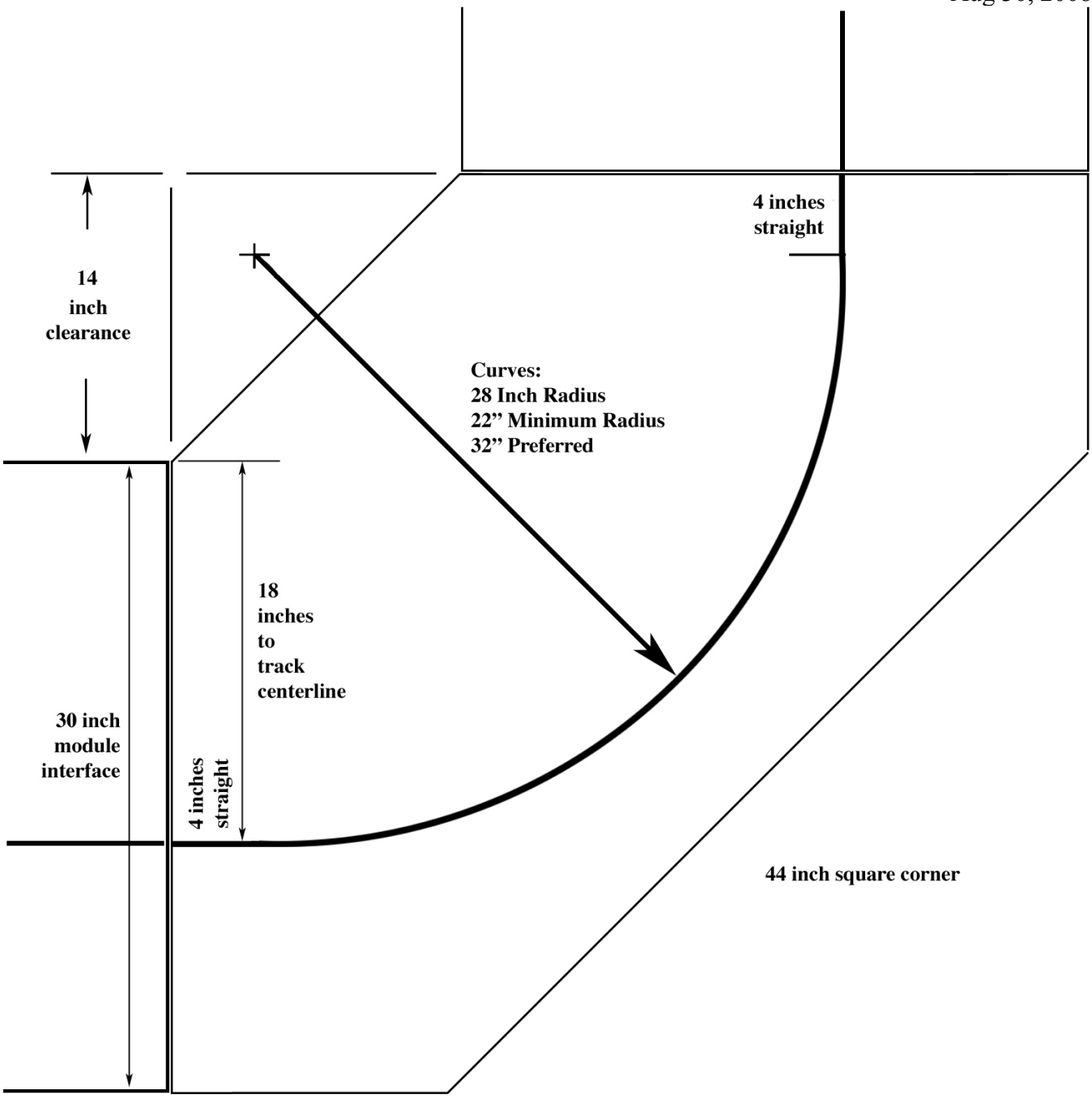


Figure 5, Typical Corner Module

4.0 Scenery

4.1 Scenery Mandatory Standards

A flat scenic profile should be used at the module standard end(s). A module should not only have universal ends in a physical and electrical sense, but also in a scenic sense as well. Having a scenic element that abruptly ends at one module end, like a mountain, river, or road, detract from the overall layout scene. Remember, this applies to the universal module end. On an internal interface between two sections of one module pair, these requirements do not apply. The flat scenery profile should continue for 4 inches into the module.

4.2 Scenery Recommended Practices

The front and back module fascia color should be chocolate brown. A semi gloss latex over a primer/sealer is recommended. Module legs may be painted to match.

The basic sky color should be a light sky blue flat latex paint and transition to a darker blue at the top of the backdrop.

All turnouts should be accessible from both sides of each module and hand throws are recommended.

Standard ballast techniques are encouraged. Woodland Scenics Cinders number 76 is preferred. The fine grade should be used. Ground foam grass and soil in the ballast is recommended as an occasional scenic event - especially on less used track. Rails should be painted rail brown with occasional rust streaks.

5.0 Definitions

These definitions are provided to establish a common basis of understanding of the standards.

Accessory Power Bus: The continuous two wire bus powering electrical accessories such as turnout motors, structure lighting, animation, etc.

DC Cab: Direct Current cab or throttle of 0 to 12 volts supplied by a convention throttle/power pack.

DCC: Digital Command Control

East: The direction to the right when facing any module. Trains traveling left to right are eastbound.

Endplate: The specified end surface of a module that joins with an adjacent module.

Fitter rails: The two 2 inch long removable rails and joiners used to bridge the joints between adjacent modules or sections.

LocoNet Bus: The continuous six-wire bus carrying DCC information among the DigiTrax brand DCC system components such as throttles, boosters, radio receivers, etc.

Mainline Track: On every module there is at least one route that connects the middle of the first interface with the middle of the second interface. One of these routes should be designated as the mainline route and must obey mainline track restrictions- all other tracks do not.

Module: A section of a portable layout that has a common endplate, track connections and electrical connections to mate to other units and features a single track mainline. Portable layout is constructed to provide a point-to-point, point to loop or loop-to-loop meandering main line. A module may consist of multiple subsections.

Module (Basic): Unit of a portable layout that is level and of a fixed dimension

Module (Advanced): Unit of a portable layout that may feature grades. Dimensions are not fixed and allow for a unit of any interior width, length or geometric shape.

North: The direction the viewer/operator is looking when facing the module.

Pigtail: Connector/wire assemblies used to connect any of the electrical busses together between modules.

Passing Siding: Parallel track that allows one train to overtake and pass a second train. Length is sufficient to hold entire train. Located along single-track main lines to facilitate passing.

Run-around Siding: Parallel track that allows motive power to run-around a cut of cars to switch a facing point spur. Length is not sufficient to hold an entire train. Located in industrial areas to facilitate switching operations.

Single Track: Single track that allows continuous operation of trains in one direction. Combined with multiple passing sidings, intermittent operation of trains in opposing directions is possible.

Section: A part of a larger Module. Used in conjunction with other sections and assembled in the same configuration to create that module. Conforms to end profile, track and electrical connections only on the ends that mate with other independent modules. Typical examples include a long yard, passing siding or turn back loop constructed of multiple sections that only mate together in one configuration.

Standard end: A location where a module will connect to other modules; also contains an external interface that must meet all mandatory standards.

South: Is always behind the viewer/operator.

Track (Power) Bus: two wire bus for feeding power to the track.

West: The direction to the left when facing any module.