

Northern Virginia NTRAK "How-To" Article

NTRAK MODULE STANDARDS JUNE 2015 BY JIM DAVIS

We seem to all agree that an **NTRAK** module built to go in **NVNTRAK** club shows must conform to some set of standards. However, in discussion there seems to be some disagreement as to what those standards are and how they apply.

At the 2014 Convention there were several spots in the main layout that created problems with smooth running. In most cases the cause, at least in part, could be attributed to a failure to follow standards. Violation of track radius limits, clearance, and power through turnouts were the most common problems.

There are two organizations that provide standards that we use. The **National Model Railroad Association (NMRA)** has a very detailed standard development process. The main benefit we get from the **NMRA** standards process is in the equipment we buy. Without standards, *Kato*, *Atlas* and *Bachman* couplers would probably not work together. In the more recent development of DCC, standards are essential for any compatibility.

In a much less formal process, **NTRAK** has provided most of the standards we need in the *Module Manual*. *The NTRAK Module "How To" Book* also provides useful information. It is sometimes hard to figure out which items are the requirements.

Here is a summary of the more important requirements for a NTRAK show module, taken from NTRAK's Module Manual, NMRA MS 1.0, NMRA MRP 1.0 and Power Pole RP. A little discussion has been added where needed.

Module Dimensions:

- Modules will be 24 inches wide, but up to 6 inches may be added front and back.
- Modules are multiples of 2 feet in length.
- Corners of modules must be square. (Easy to do with the right tools. The ends also need to be perpendicular to the top, without the top or foam hanging over the edge.)
- Clamp area shall be no more than 4.5 inches below the rails and 3 inches wide. (You must notch the base if you add more than 1 inch of foam on top.)
- Height of track is to be 40 inches, adjustable plus and minus 1 inch, from the floor.
- Skyboard is to be 8 to 18 inches with 14 inches preferred. (It does not say skyboards are optional).

Track (Track standards only apply to the main lines or "common track".)

- Center line of the Red line is 20 inches from the back of the module. (4 inches from the front should be the same position, so either works.)
- Distance between centers of the red, yellow and blue line is 1.5 inches. (The yellow at 18.5 and blue at 17 inches criteria is less important than the 1.5 inch track separation.)
- Minimum radius is 24 inches red and yellow and 18 inches blue. (This is very often violated and a source of problems. For reference, radii on a three foot corner are: red line 28 inches, yellow line 26.5 inches, and blue line 25 inches.)
- Zero grade is allowed on red and yellow lines. A 1.5 % grade is allowed on blue.
- Track ends cut back 2.470 inches from the edge. (Half an Atlas straight track, which is 4.910 inches.)

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- Connecting track is undercut to accept rail joiners. (Easier to replace than fixing the module track.)
- First four inches of track straight. (Frequently violated on corners.)
- Solder all metal rail joiners on the main line.
- In general, use code 80 track. (Some exceptions allowed to use Code 55 track, but it must be brought to the Code 80 atlas standard at the end of a group of modules. In general, use code 80 atlas track for a first module.)

Electrical

- Power wire is to be 12 gauge stranded with 12 inches extending beyond end of module. Polarity is red positive in front and black negative in back.
- Power Poles will be used for all new modules. Older modules with Cinch Jones connectors need to be brought up to the new standard
- Connecting wires are to be provided to the track every two feet. (One foot from each end on a 4 foot module.)
- The main lines must be electrically isolated from each other. (Two insulated joiners on crossover tracks.)
- Branch lines must be able to be isolated from the main line. (Requires an insulated joiner in each side of the line. If power is provided from the main line there must be an isolation switch.) This is frequently violated and hard to fix once the module is completed.
- If the branch line has a separate power supply it cannot be cross-connected to the main line. (We have had problems with this in the past.)

Turnouts on the main line.

- Turnouts shall be #6 or greater. (Consider #8 turnouts for crossovers between main lines. Some steam and larger SD diesels have trouble with #6 turnouts.)
- Power should be provided to each set of points. Power routing through the points should be avoided. (Often violated, this is a challenge with solutions that are manufacturer specific.)
- Are insulated joiners used where needed for turnouts? (Again, it depends on the type of turnout.)

Discussion:

This list provides a good starting point as you think about what to put on a new module. Deviation from these standards is sometimes necessary for special circumstances, but there should be a good reason.

Some examples of exceptions may help:

The club modules do not have sky boards so they can fit in the racks in the trailers. Two club module have a sky board added, but it is only 4 inches above the background. It was added to keep the scenery from getting knocked off during loading into the POFF rack.

On the four club junction modules, the red line that branches off from the normal corner track has a 19 inch radius. In a five foot module you cannot simultaneously have a 24 inch radius, a 4 inch setback, and use #8 turnouts. The 24 inch radius lost but track laying needed to be done very carefully.

The club has taken exception to the need for DC power line on each module. This line is never used and the requirement is out of date.

Module Certification Check List

	Item	Reference	Meets?
1	Module Dimensions		
1.1	Module 24 inches wide (6 inches allowed front and back)	Module Manual	
1.2	Module length 48 or 72 inches.	Module Manual	
1.3	Height at track 40 inches adjustable plus and minus 1 inch	Module Manual	
1.4	Clamp area no more than 4.5 inches from rails and 3 inches wide.	Module Manual	
1.5	Both ends square.	Module Manual	
1.6	Backboard 8 to 18 inches. (14 inches preferred)	NMRA MRP 1.0 note 7	
2	Track		
2.1	Blue line 7 inches from front (Center line)	NMRA MS 1.0	
2.2	Yellow line 5.5 inches from front (Center line)	NMRA MS 1.0	
2.3	Red line 4 inches from front (Center line)	NMRA MS 1.0	
2.4	Track ends 2 15/32 from ends (2.470 inches)	NMRA MS 1.0	
2.5	First four inches from edge are straight	Module Manual	
2.6	All track joiners are soldered		
2.7	Turnouts #6 or greater	NMRA MRP 1.0	
2.8	Points on turnouts set properly in closed and thrown position.		
2.9	Minimum Radius met-- Red and yellow 24 inches, Blue 18 inches	NMRA MRP 1.0	
2.10	All code 80 track	NMRA MS 1.0 note 5	
3	Electrical		
3.1	Power wire is 12 gauge, with 12 inches beyond module.	Powerpole RP	
3.2	Power poles connected correctly and color coded. From front--Right is red over black and left is Black over red.	Powerpole RP	
3.3	Track connected to connectors every 2 feet	Powerpole RP	
3.4	Polarity is proper, red, positive on front. Black negative at back.	Powerpole RP	
3.5	Check for grounds between lines.		
3.6	Are there insulated connections?		
3.6.1	Is there proper power on both sides of insulator		
3.7	Are there turnouts?		
3.7.1	Is power properly routed through around the points? Note: Using points to route power is not recommended.		
3.7.2	Are there insulated connectors on both rails between the main lines.		
3.7.3	Are there insulated connectors between main lines and any local track?		
Comments			