



Better modeling through peer
pressure...

NMRA

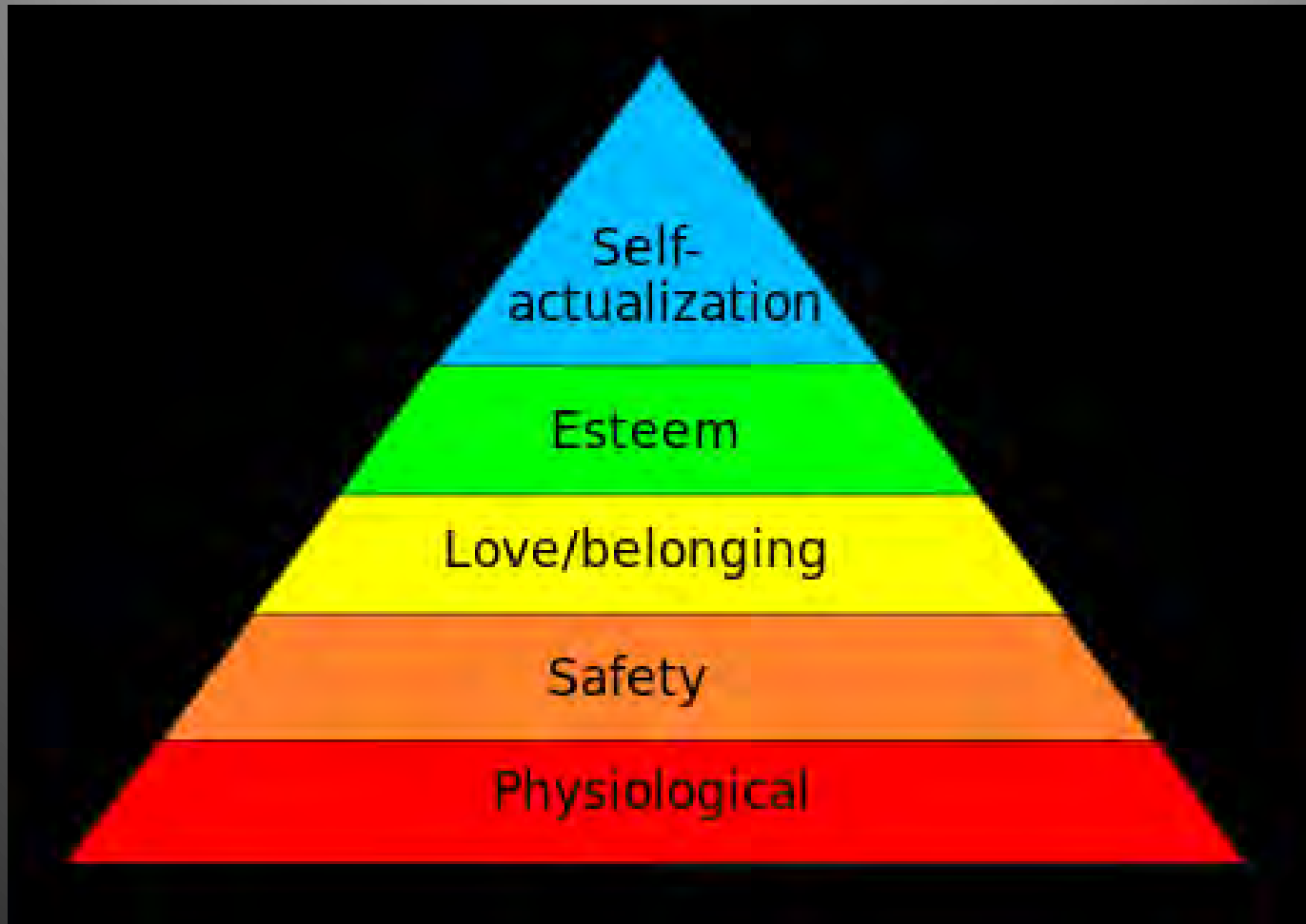
December 18, 2016

Mike Skibbe

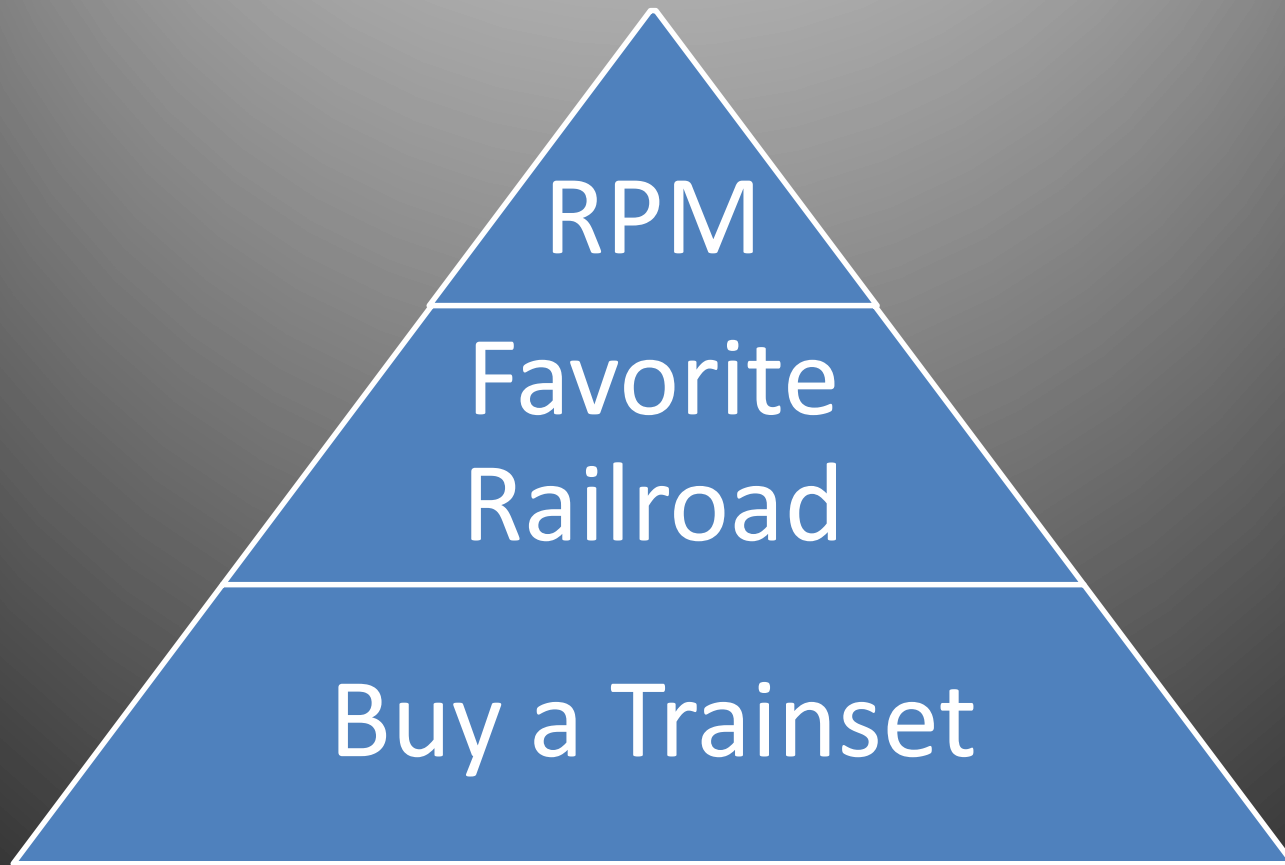
What is Modutrak?

- No club, no dues, no president
- Friends first, like-minded modelers
- Widespread hometowns
- Keep in touch via Internet
- Attend 3-4 shows a year
- Better Modeling Through Peer Pressure!

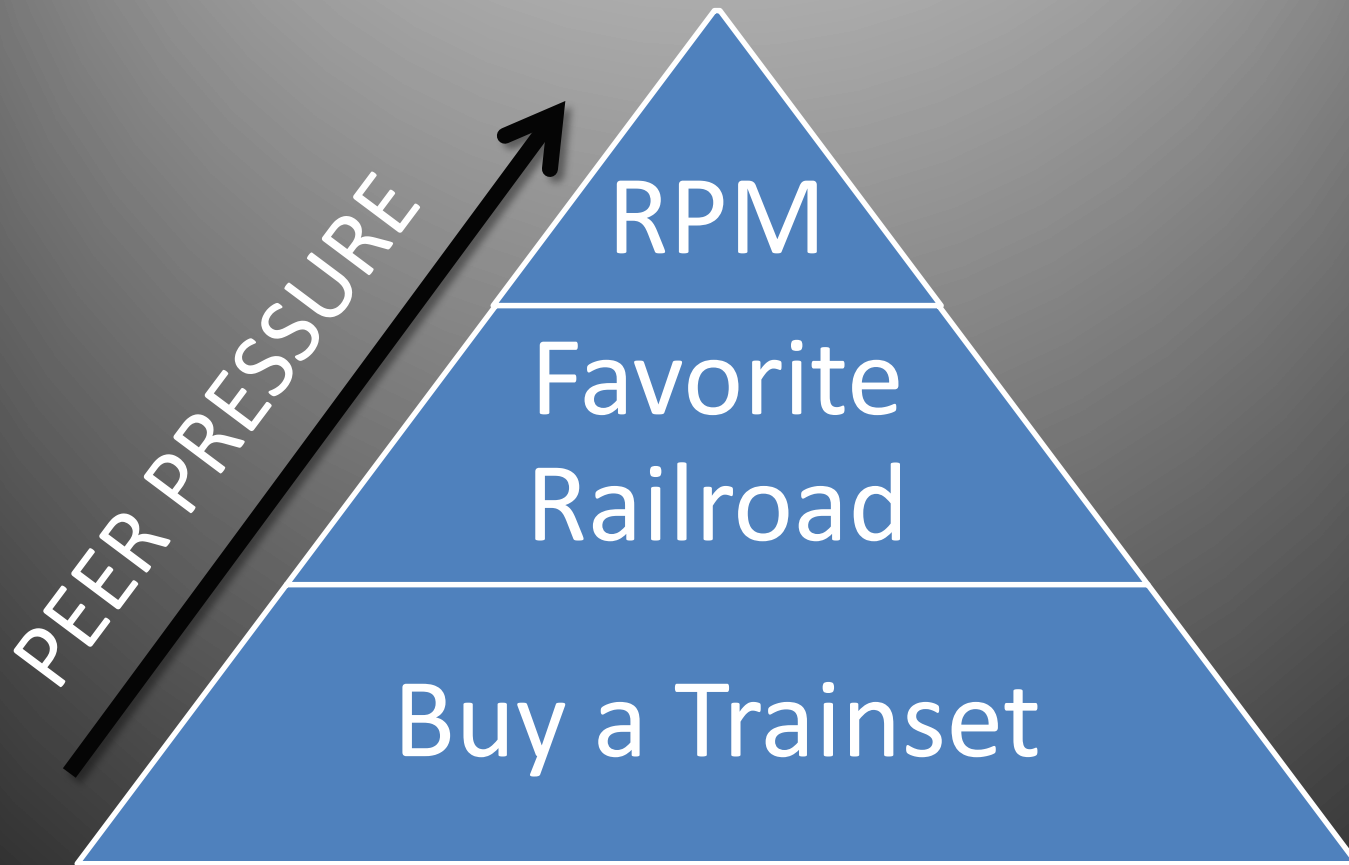
 MODUTRAK



Maslow's Hierarchy of Needs



Skibbe's Hierarchy of MRR'ing



Skibbe's Hierarchy of MRR'ing



Mike at 18 months.



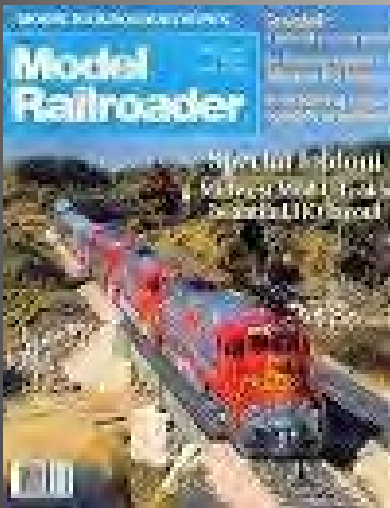
John at 8 months.

- History of the Modutrak Layout
- Module Construction and Design
- Modular Layout Wiring (Signals!)





N-Trak Module



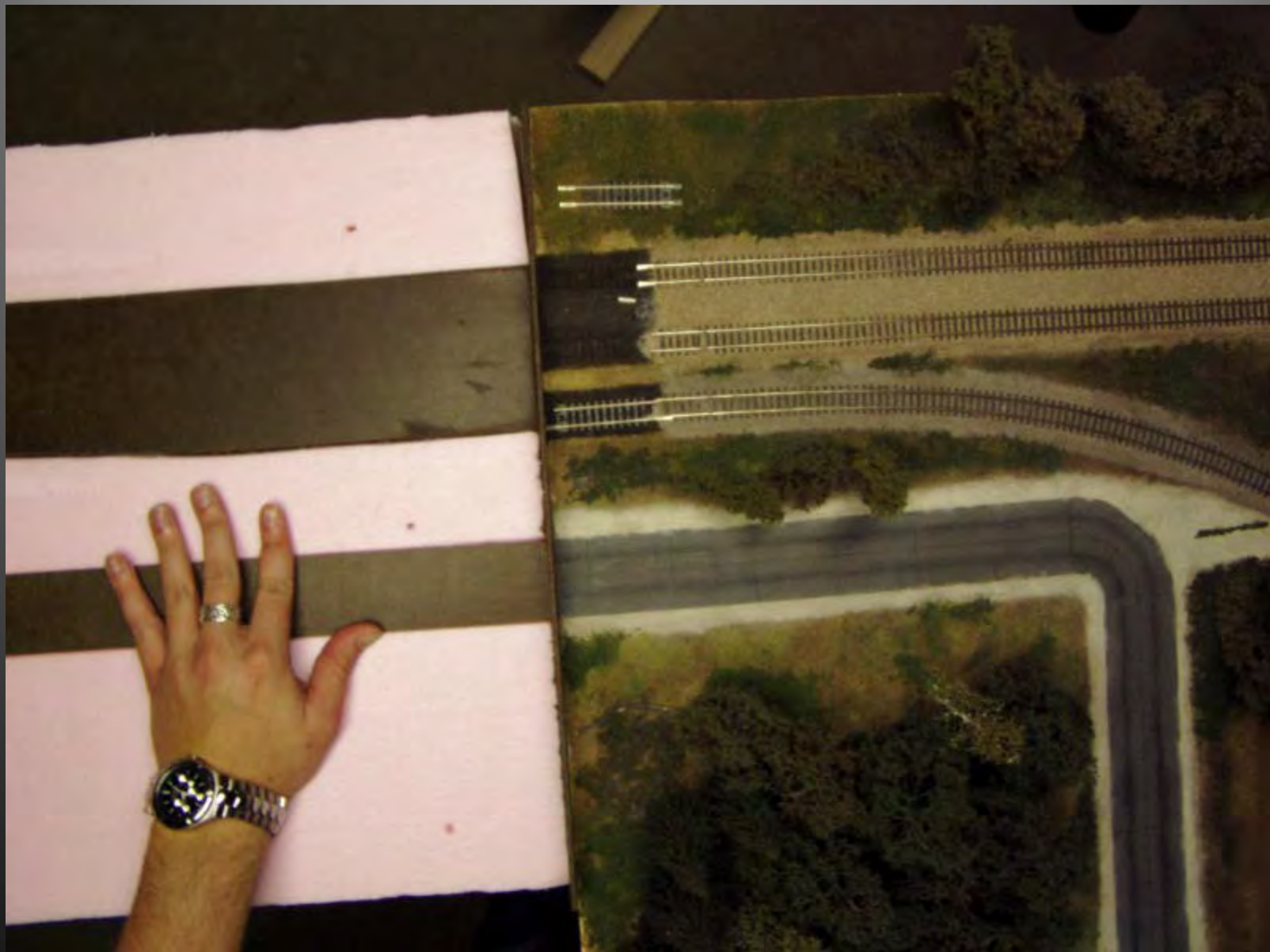
Midwest Mod-U-Trak

What does our ideal layout look like?

- 53" Nominal Rail Height
- Two Track Mainline
- Lightweight & Sturdy
- Easy Transport & Set Up
- Typical Midwestern Scenes

















MiNi Mod-U-Trak's First Set Up
Naperville 2004



And so we began collecting like-minded modelers
and building midwestern prototype scenes...
mostly Milwaukee Road.



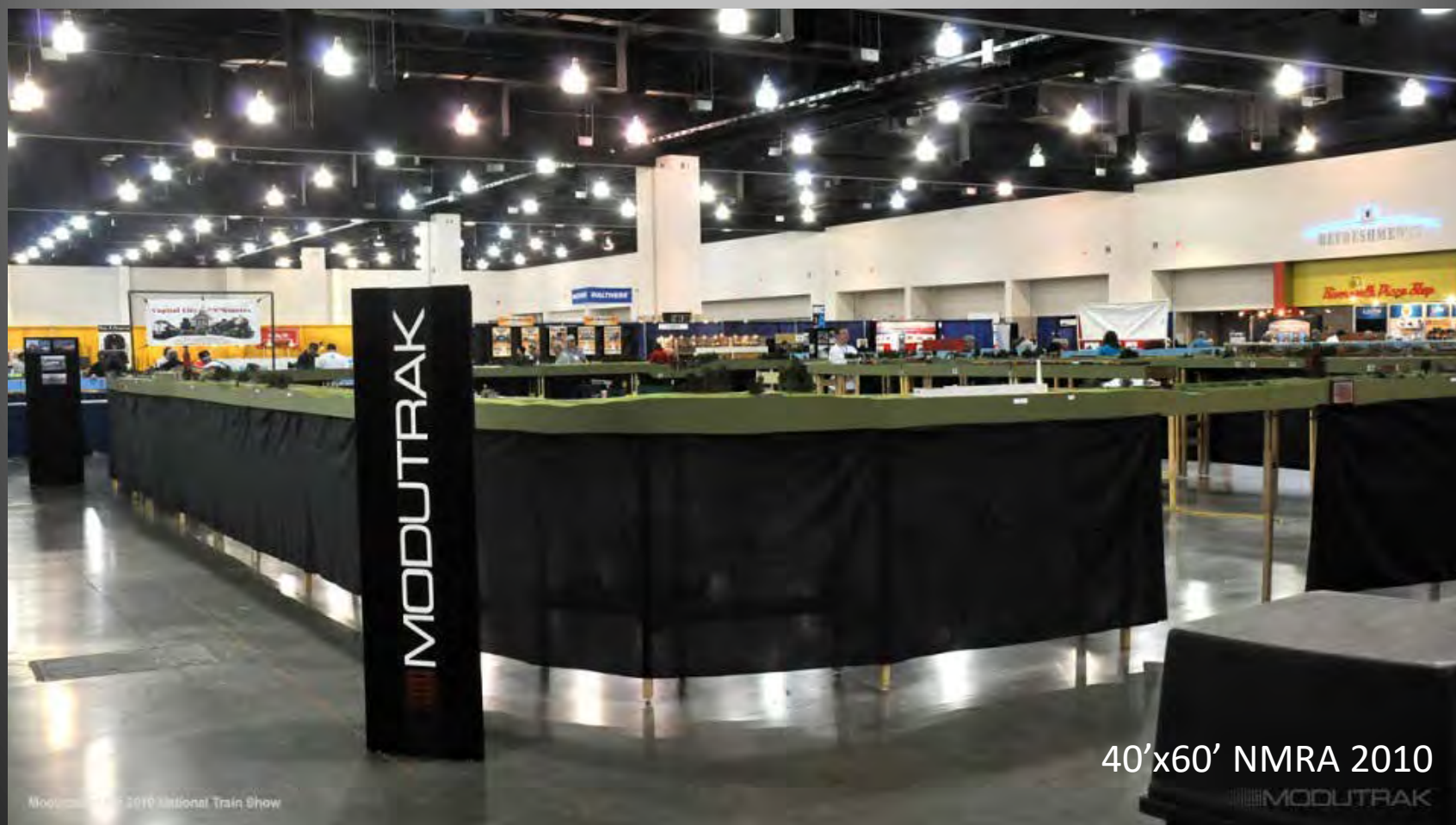
Keith Kohlmann came next with Berryville, WI on the C&NW, then Oklahoma Ave on the Milwaukee, Sturetevant and Hwy 20 in Wisconsin, and now the C&NW Lakefront Depot



Jamie VonDruska introduced us to static grass (peer pressure...)
and built Franksville, Tower A68, and Caledonia.



Nate Pierce built two modules featuring the Wisconsin Dells



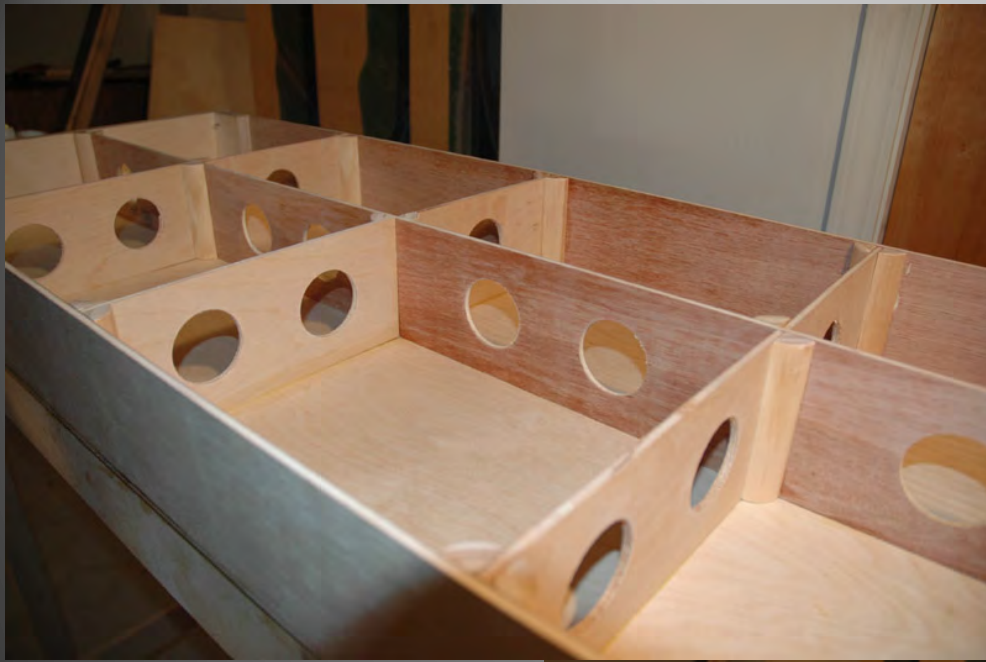
And after Matt Gaudynski (Springdale Rd), Rick Hall (Techny), Matt Jacobs (Oakwood), and some sweet display boards by our Iowa division, pretty soon we have too much stuff...

Modular Layout Video

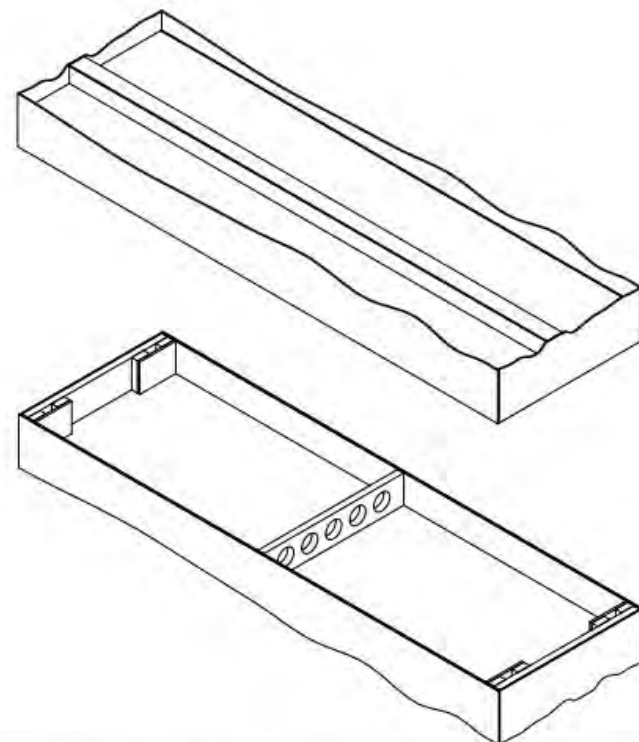
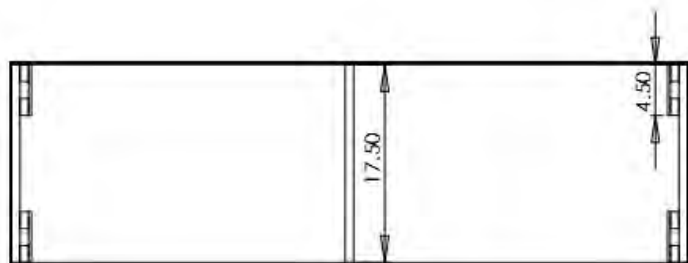
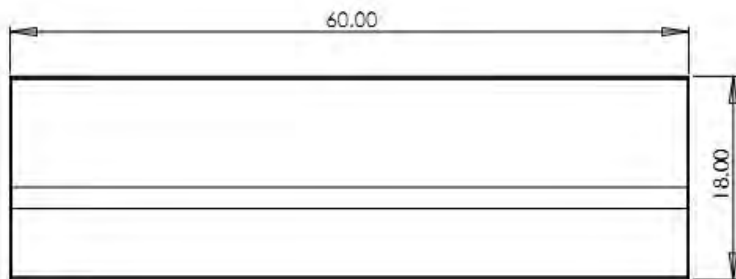


Modular Layout Construction Practices





Sippin' and Switchin' Style Test Module



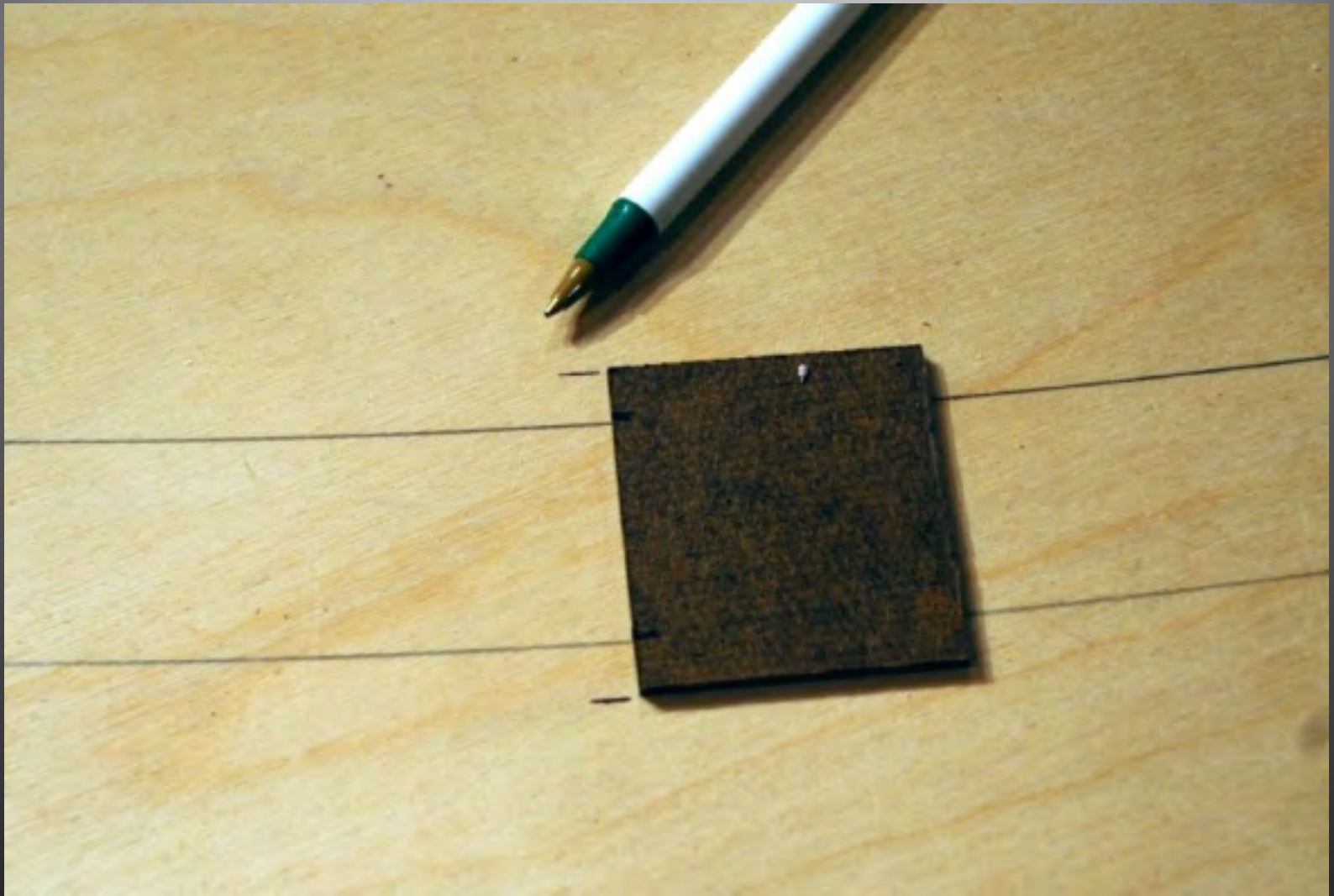
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	Straight-Module-Plywood-Top	(59.75" x 17.5") 1/4" Baltic Birch Plywood Top for Straight Module	1
2	End-Plate	(17.5" x 3.5") 3/4" thick Baltic Birch End Plate	2
3	Mid-Plate	(17.5" x 3.5") 3/4" thick Baltic Birch Middle Plate with Holes	1
4	Straight-Module-Stringer	(59.75" x 3.75") 1/8" Baltic Birch Stringer for Straight Module	2
5	Straight-Module-Spline	(59.75" x 1.875") 1/8" Masonite Spline	3
6	End-Profile	Standard End Profile 1/8" Masonite	2
7	Straight-Module-Side-Profile-Board	1/8" Masonite side profile board	2
8	Leg-Pocket-Assembly	Assembled Leg Pocket	4

Modutrak	5' Straight Module	Mike Skibbe
N scale	Rev 1.0	11/28/10

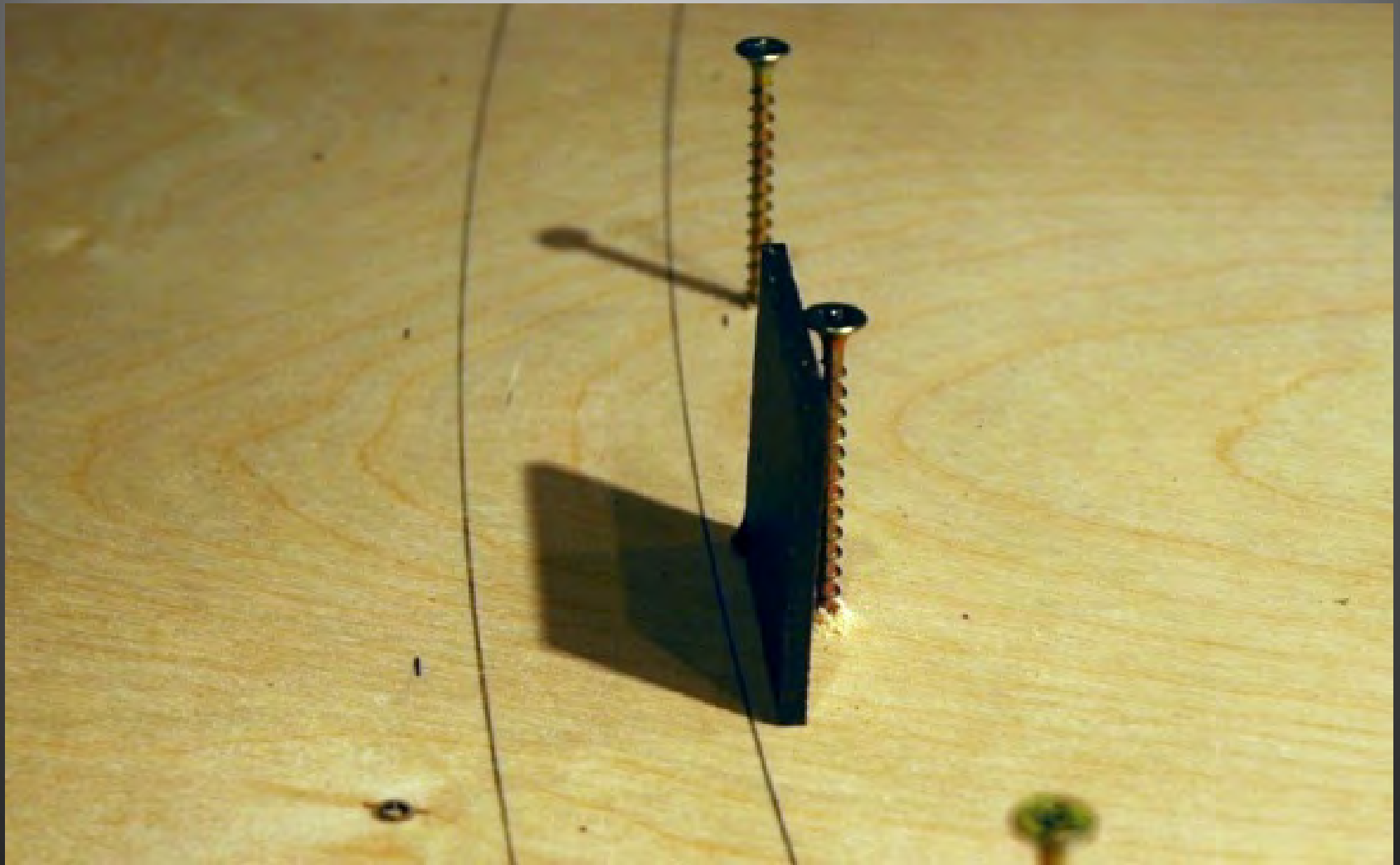
Standard Straight Module (18" x 60")



Module Build Sequence Video



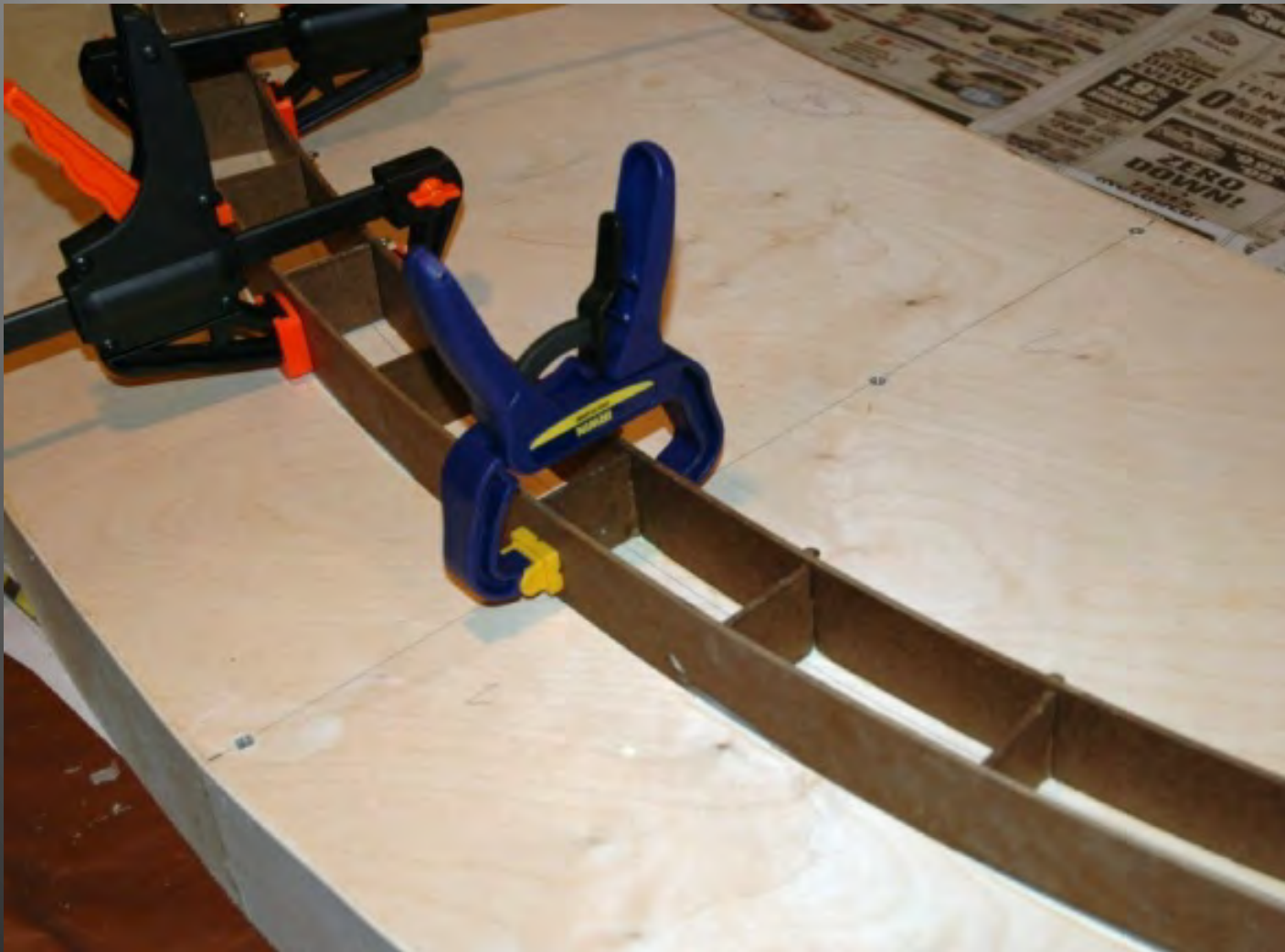
Spline Roadbed Construction



Spline Roadbed Construction



Spline Roadbed Construction



Spline Roadbed Construction



Spline Roadbed Construction



Spline Roadbed Construction



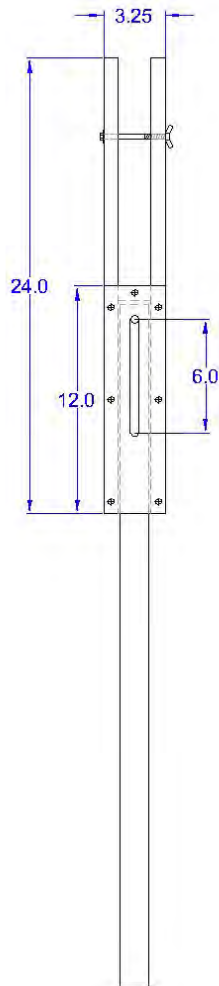
Spline Roadbed Construction



The legs are designed to save space during transport and allow height adjustment without crawling on the floor. They use readily available materials and do not require fancy cuts or tools for construction.

~40 leg assemblies can be transported in a rolling garbage can. With the legs spanning a module joint, that's 20 modules worth of legs!

Leg Construction



This drawing shows the overall dimensions.

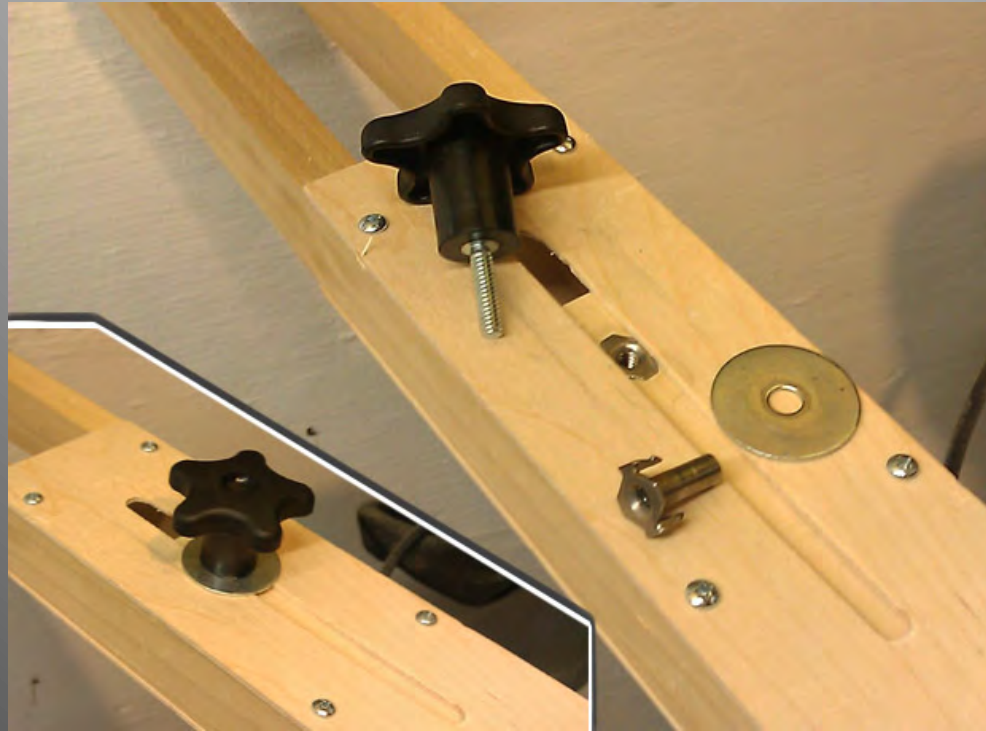
The two uprights are 1"x2" (nominal) Poplar cut to 24" long.

The plates, one plain and one with a 6" slot, are cut from 1/8" Baltic Birch Plywood.

The main leg is 2"x2" (nominal) Poplar cut to 34" long.

Poplar is available in most big box home improvement stores and lumber yards. It is straight and high quality.

Leg Construction



A t-nut is sunk into the 2x2. This nut then accepts a plastic knob with threaded insert and fender washer. Loosening the knob allows the 2x2 to slide up and down, ready to be locked in at the proper height when the layout is leveled. All this can be done without crawling on the floor, as is necessary with leveling “glide” feet.

Leg Construction

Modular Layout Wiring Concepts

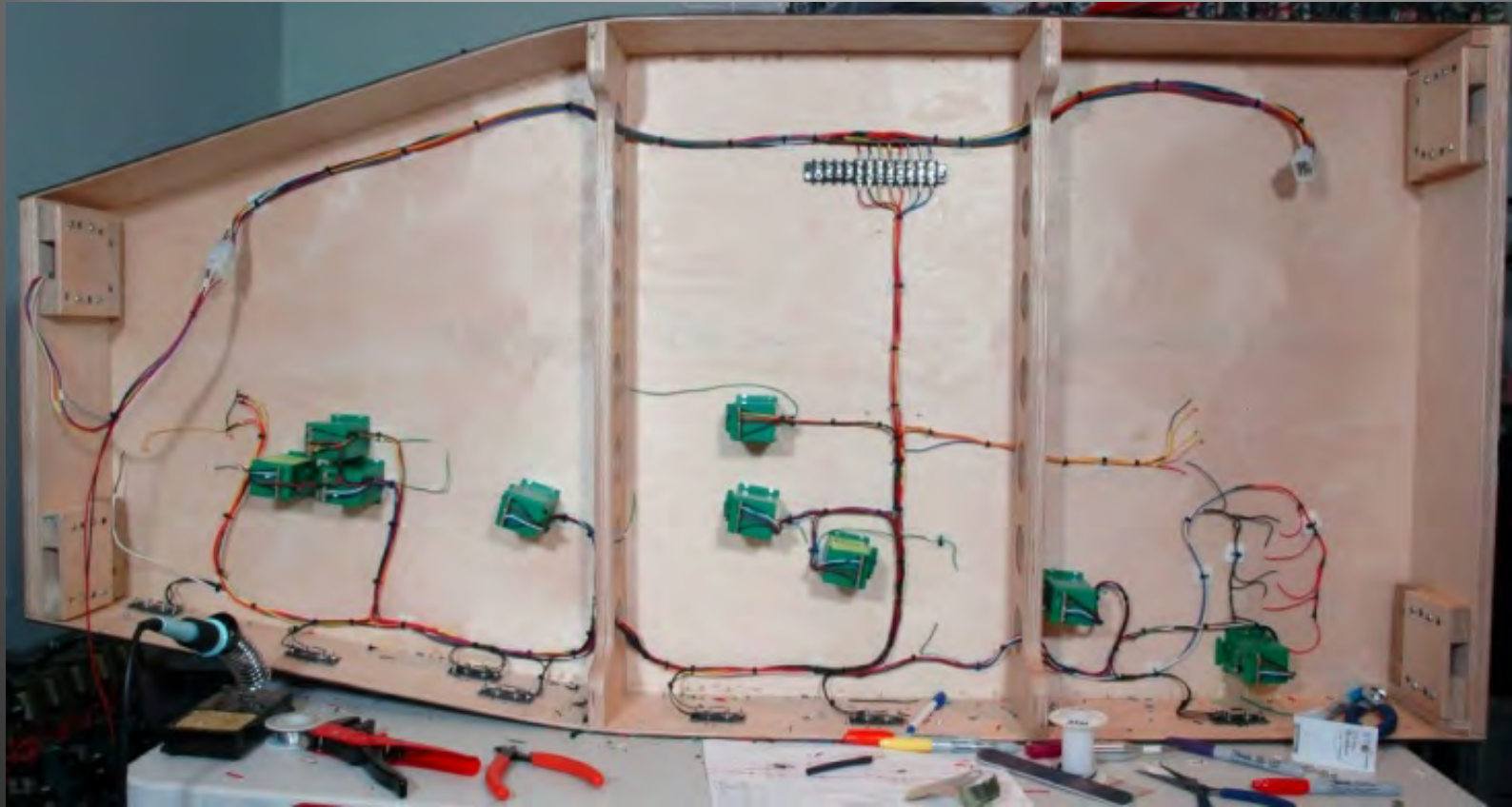


What does our ideal layout look like?

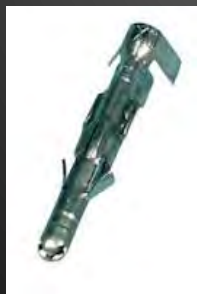
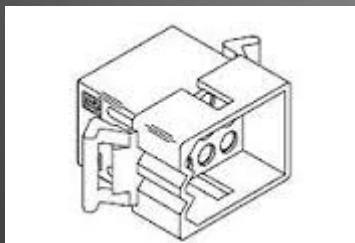
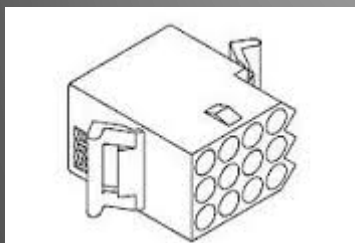
- DCC
- Modular Wiring
- Easy Set-up
- No dangling wires
- Signals! (ABS)


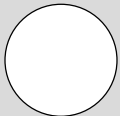

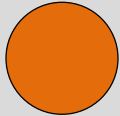
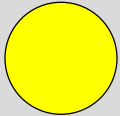


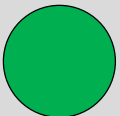
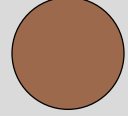
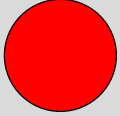
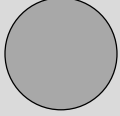



Simple Corner Module Wiring



More Complex Depot Module



<p>1 14 AWG</p>  <p>Main 1 Non-Detected</p>	<p>2 14 AWG</p>  <p>Main 1 Common</p>	<p>3 18 AWG</p>  <p>Main 1 Detected</p>
<p>4 14 AWG</p>  <p>Main 2 Non-Detected</p>	<p>5 14 AWG</p>  <p>Main 2 Common</p>	<p>6 18 AWG</p>  <p>Main 2 Detected</p>
<p>7 18 AWG</p>  <p>Future</p>	<p>8 18 AWG</p>  <p>Future</p>	<p>9 18 AWG</p>  <p>Future</p>
<p>10 18 AWG</p>  <p>+12 Volt</p>	<p>11 18 AWG</p>  <p>+5 Volt</p>	<p>12 18 AWG</p>  <p>Ground</p>

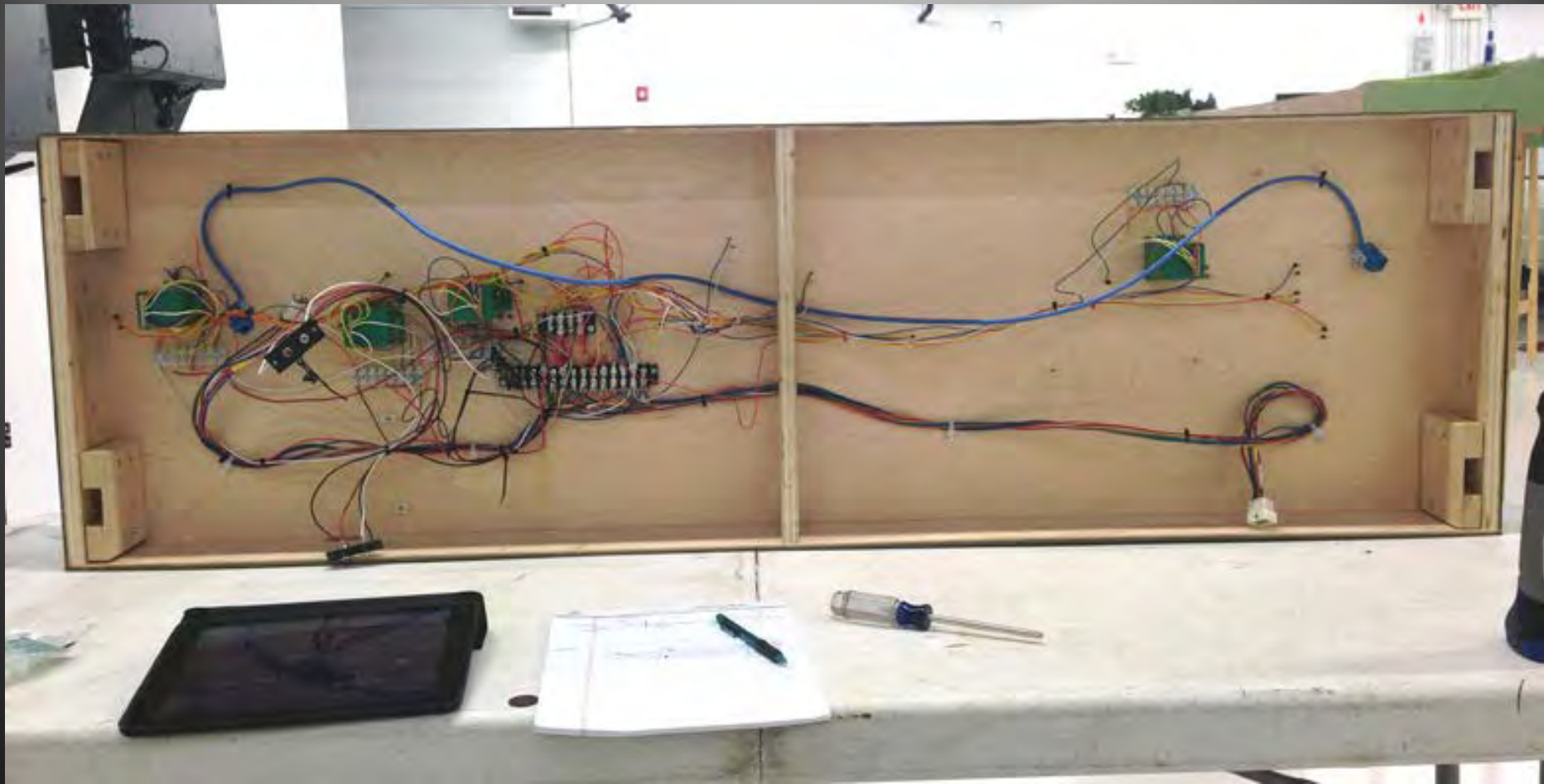
Molex .093" 12-Pin Connector



Keep the wiring tight under the modules so there is nothing to snag during transport. For connections between modules, don't leave the wires long at the ends. Simply put a female Molex connector at the modules ends and build jumpers with two male ends to plug in during set-up.

These jumpers should be 12 inches long.

Wiring Jumpers



How not to do it...



Panduit Cable Tie Mounts (#6 Screw)

- (<http://www.digikey.com/product-search/en?mpart=TM2S6-C&vendor=298>)

4" Nylon Cable Ties

Cinch Terminal Blocks

Crimp on Ring Terminals

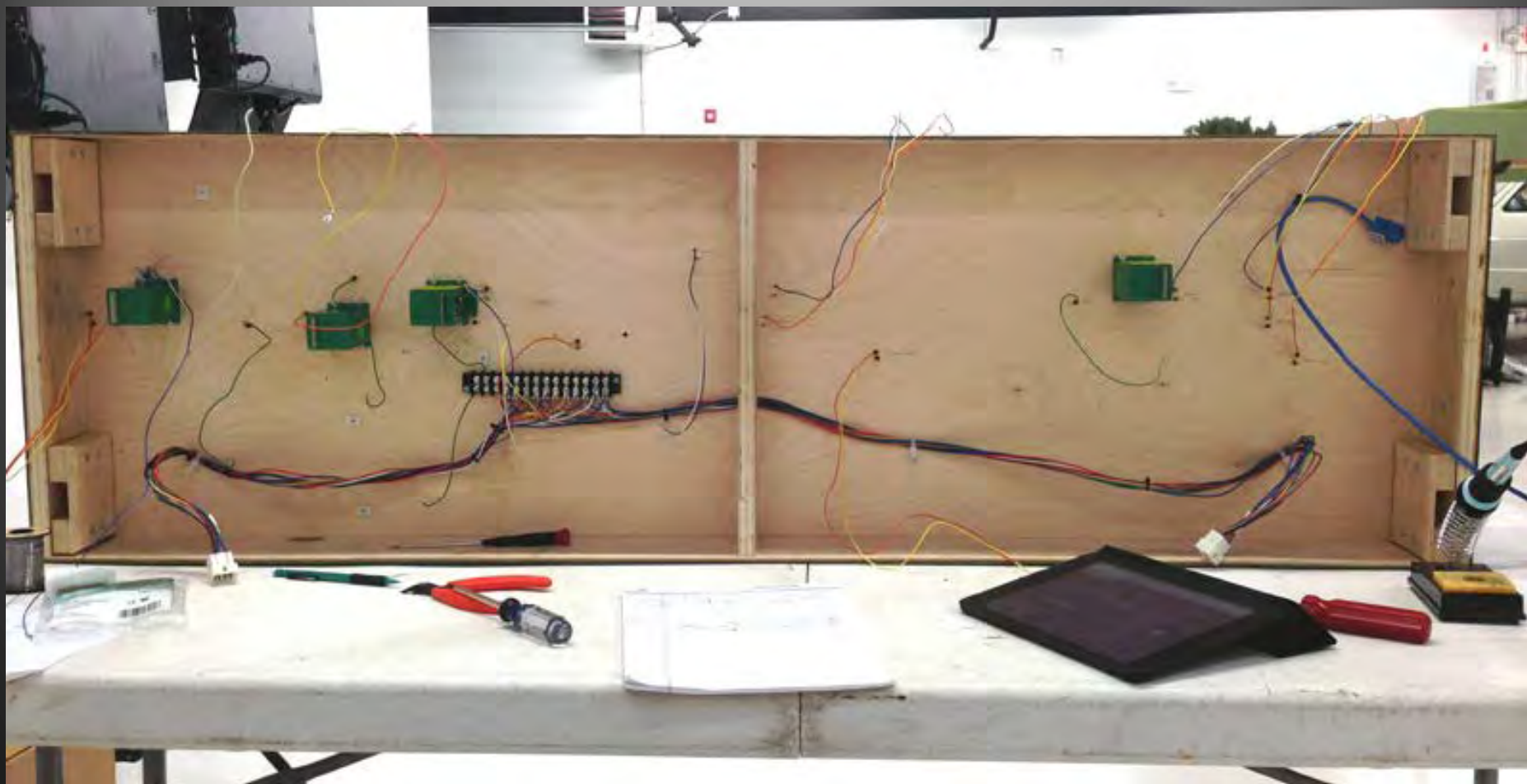
16 AWG Stranded Wire

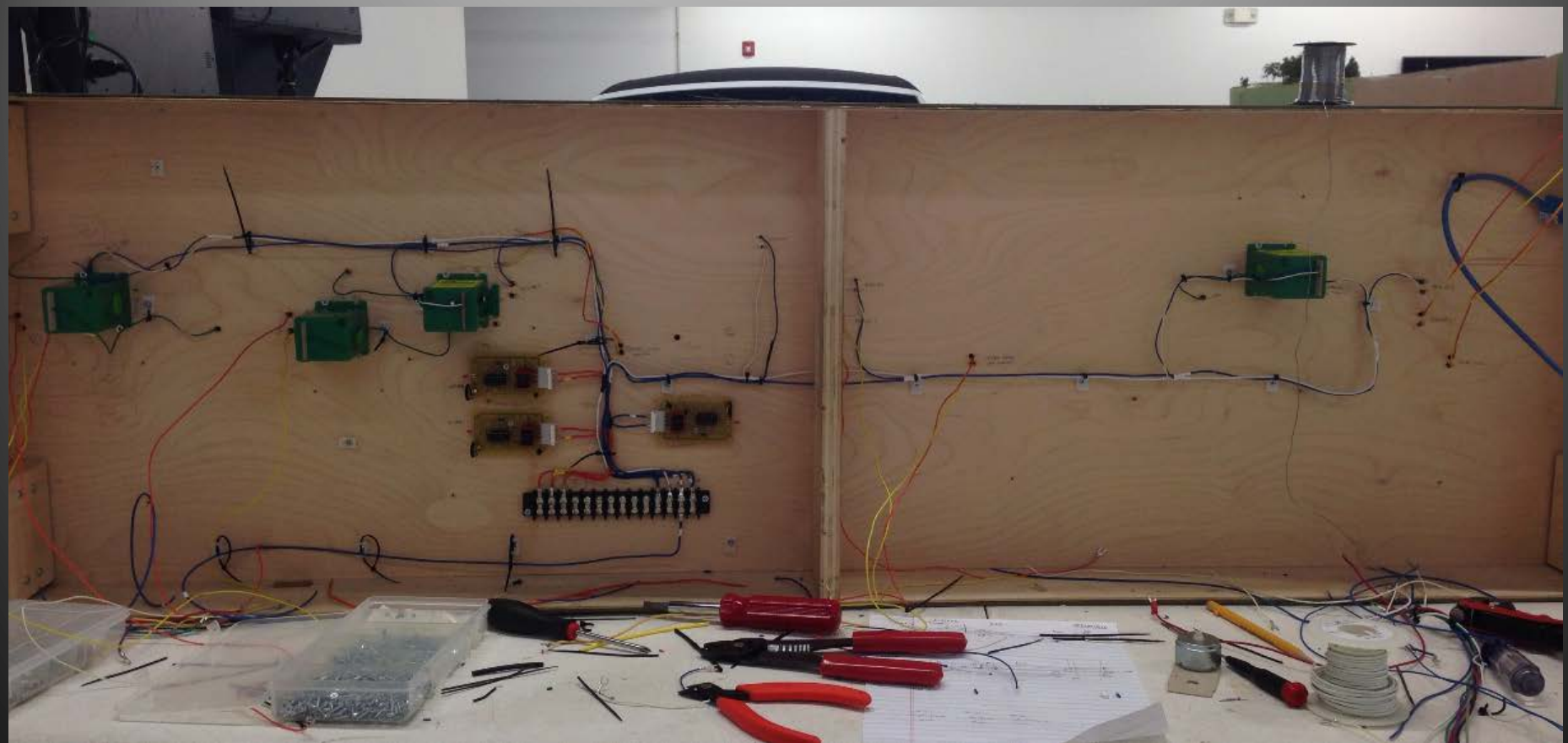
18 AWG Stranded Wire

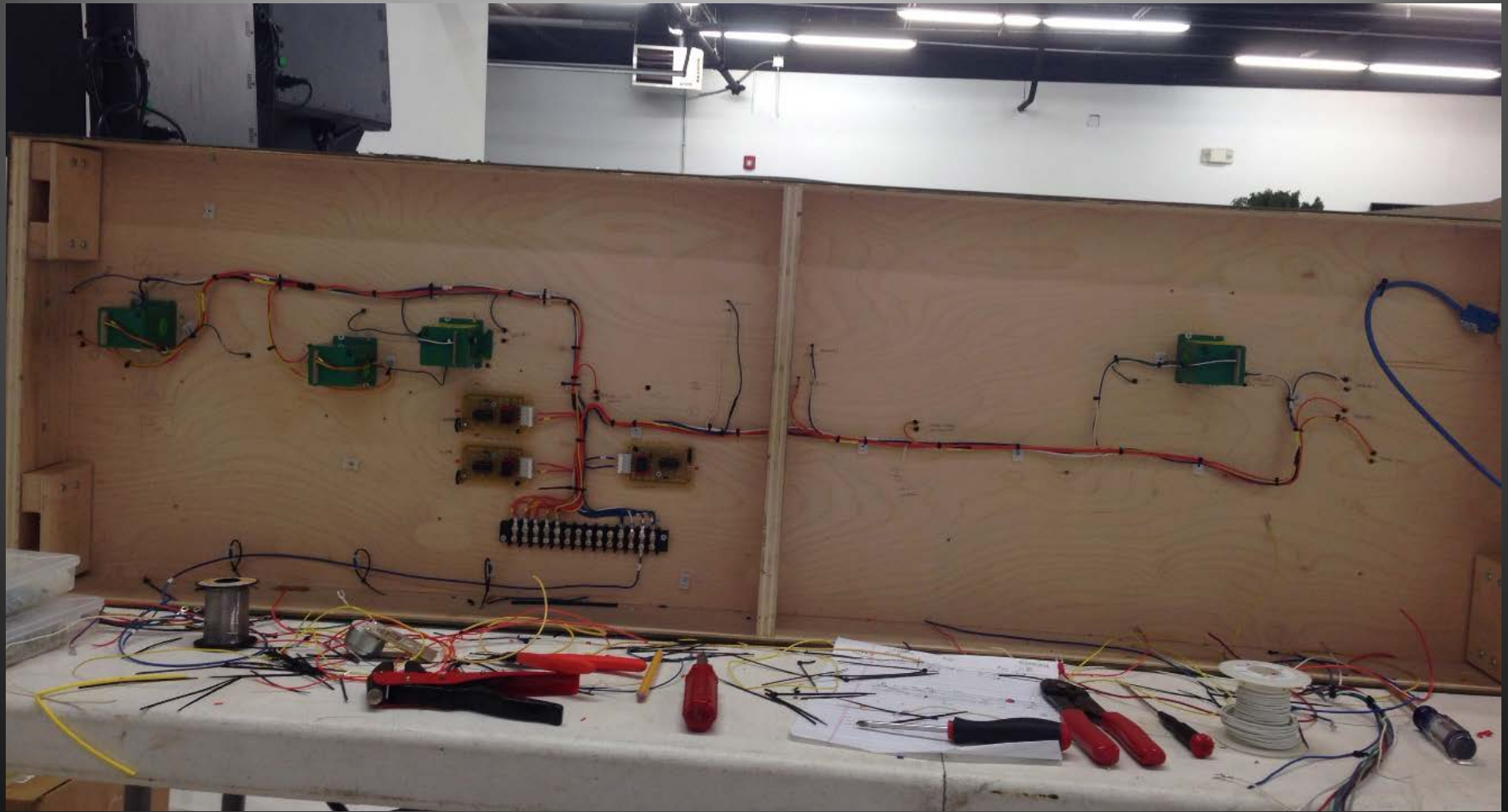
24 AWG Stranded Wire

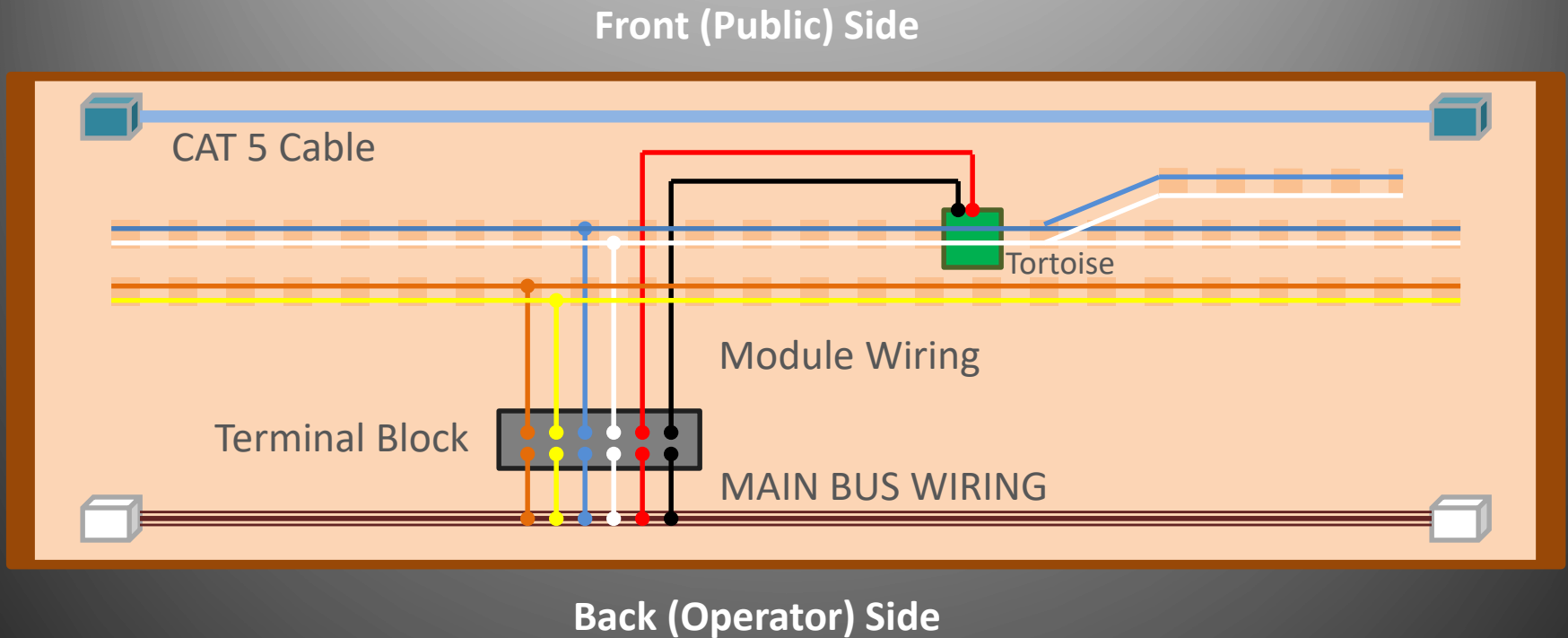


Wiring Supplies



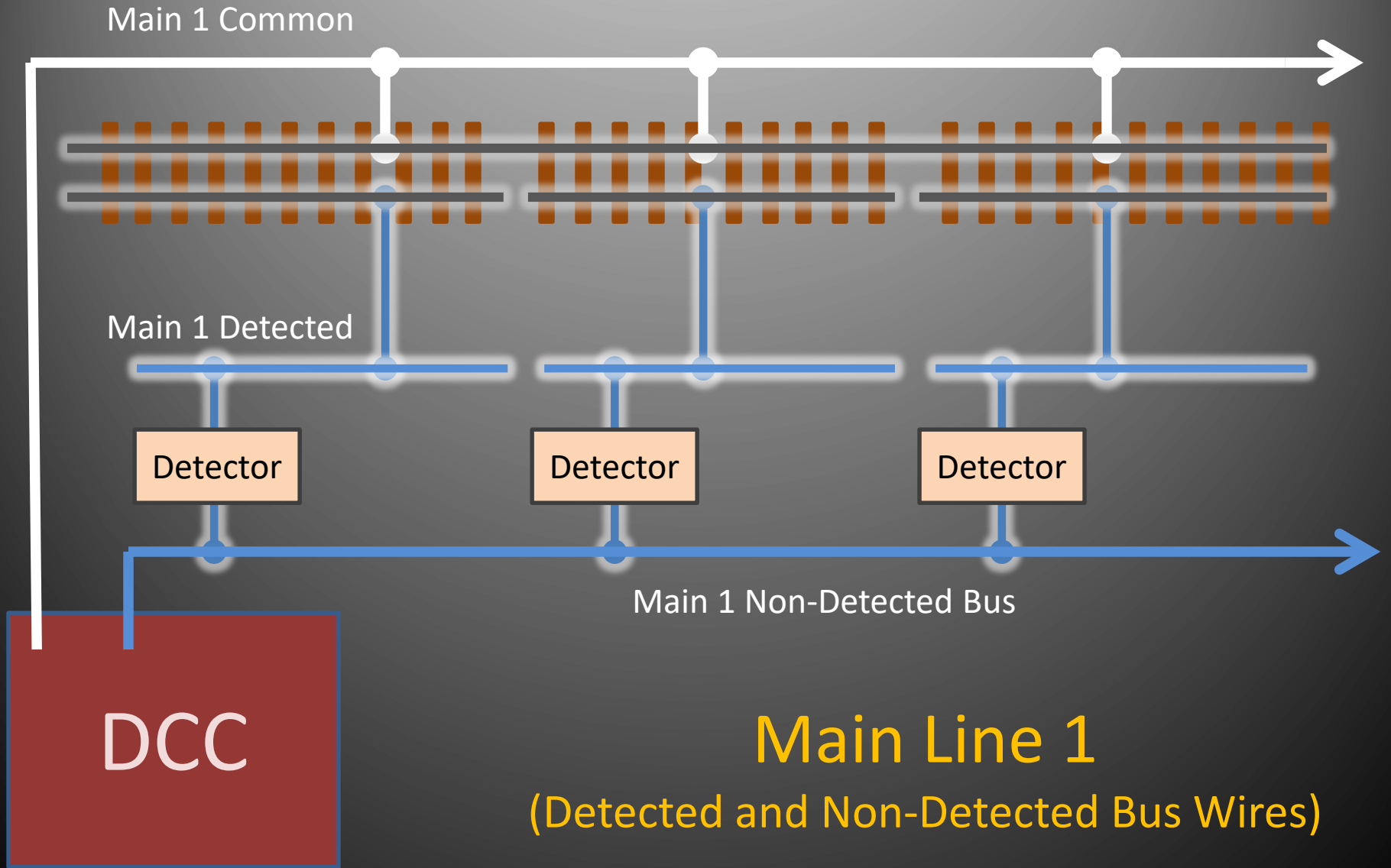


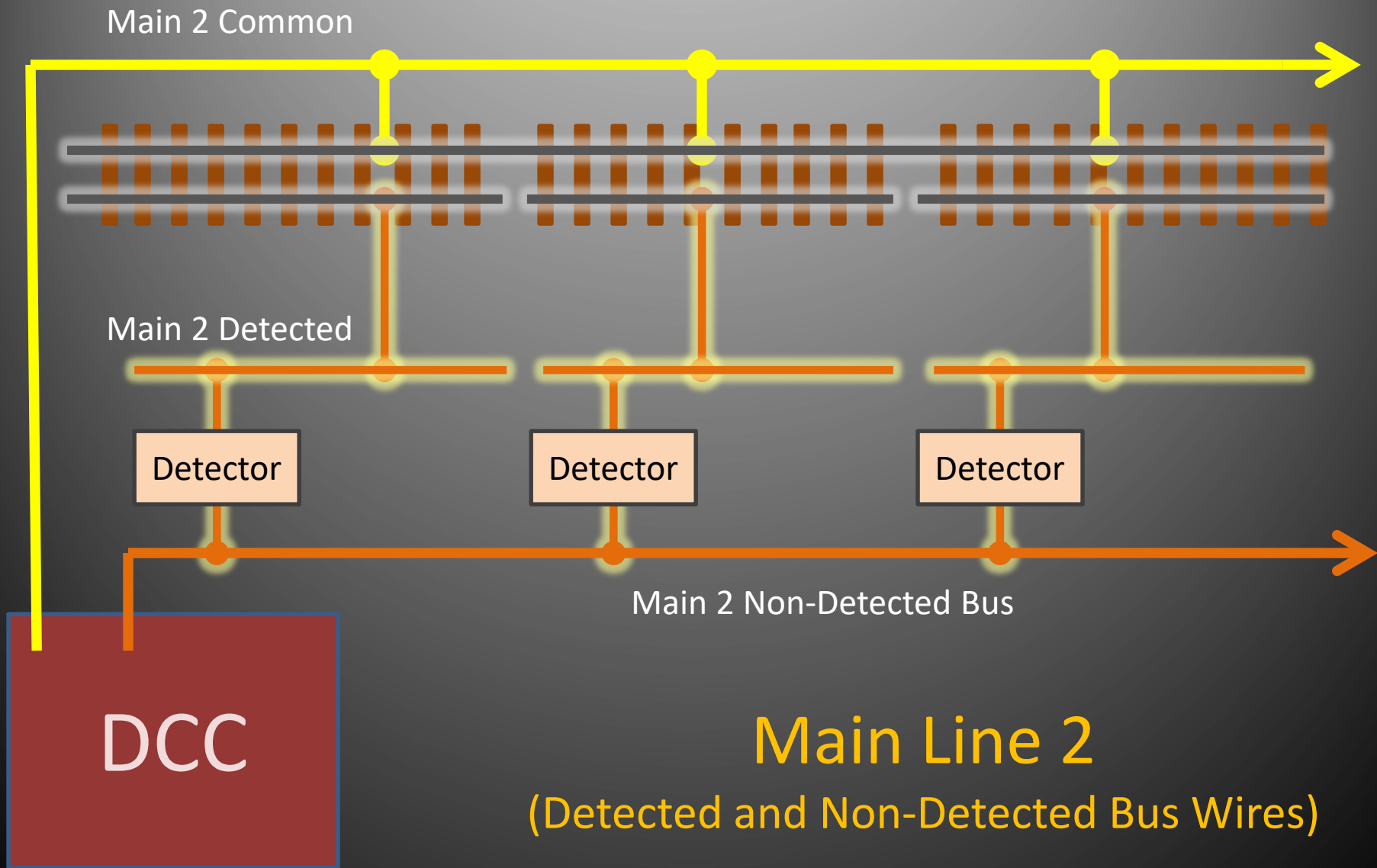


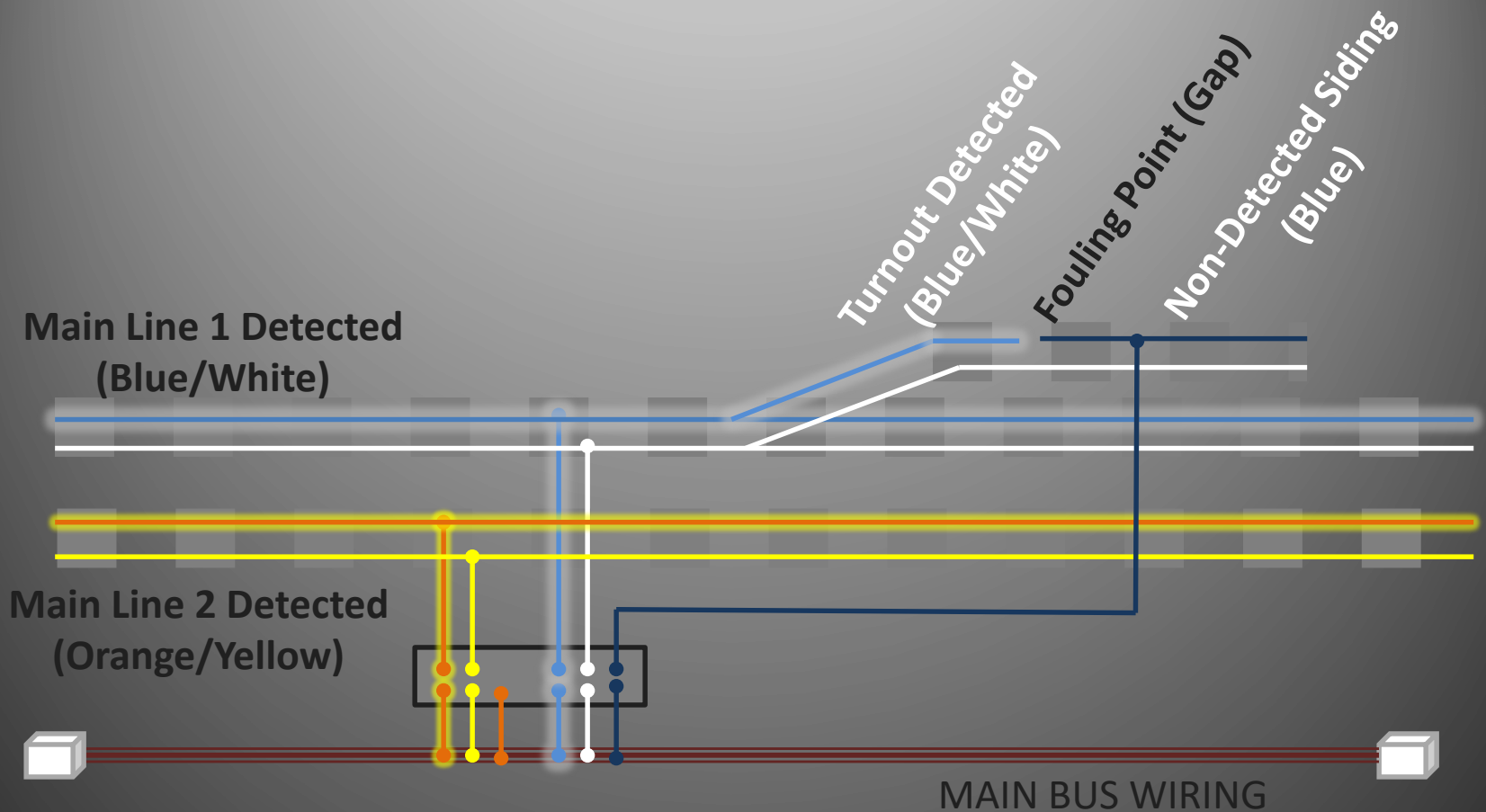


Standard Straight Module Wiring

(from below)

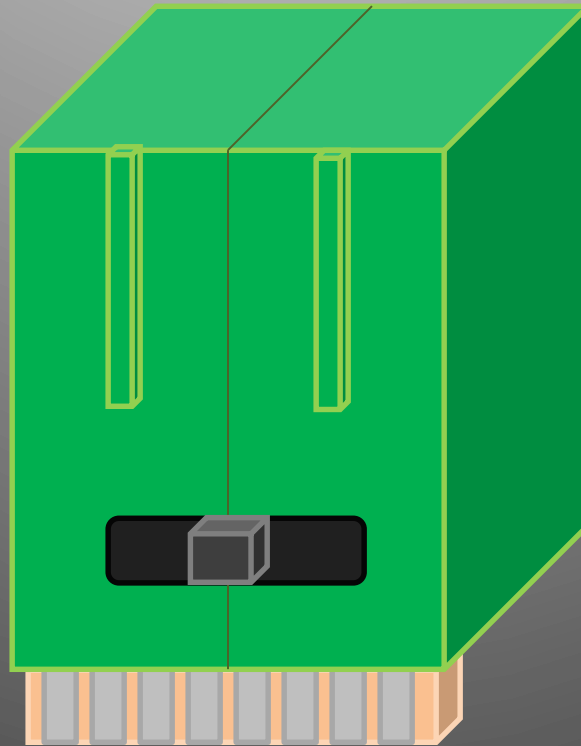




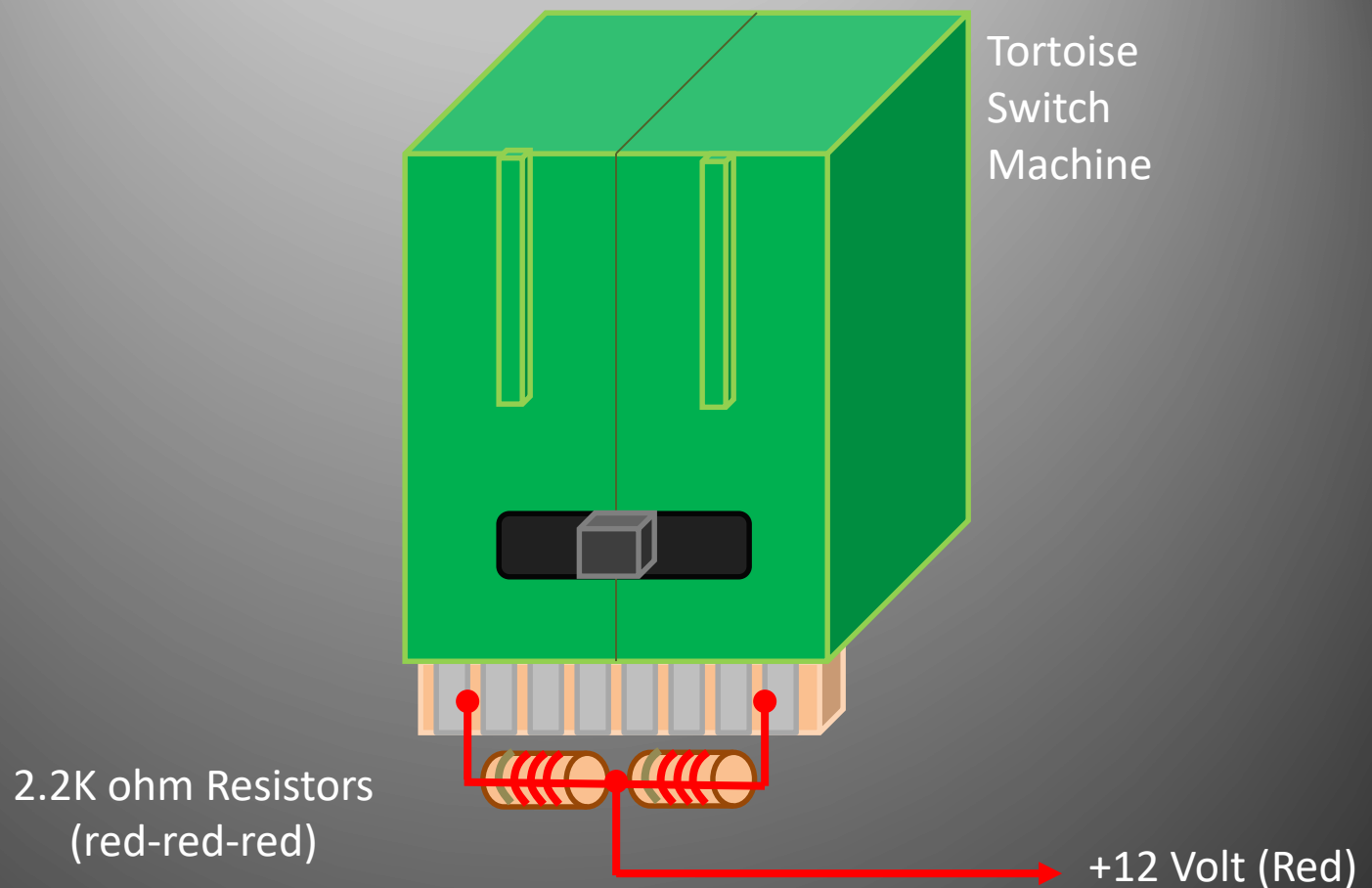


Siding Wiring (Non-Detected)

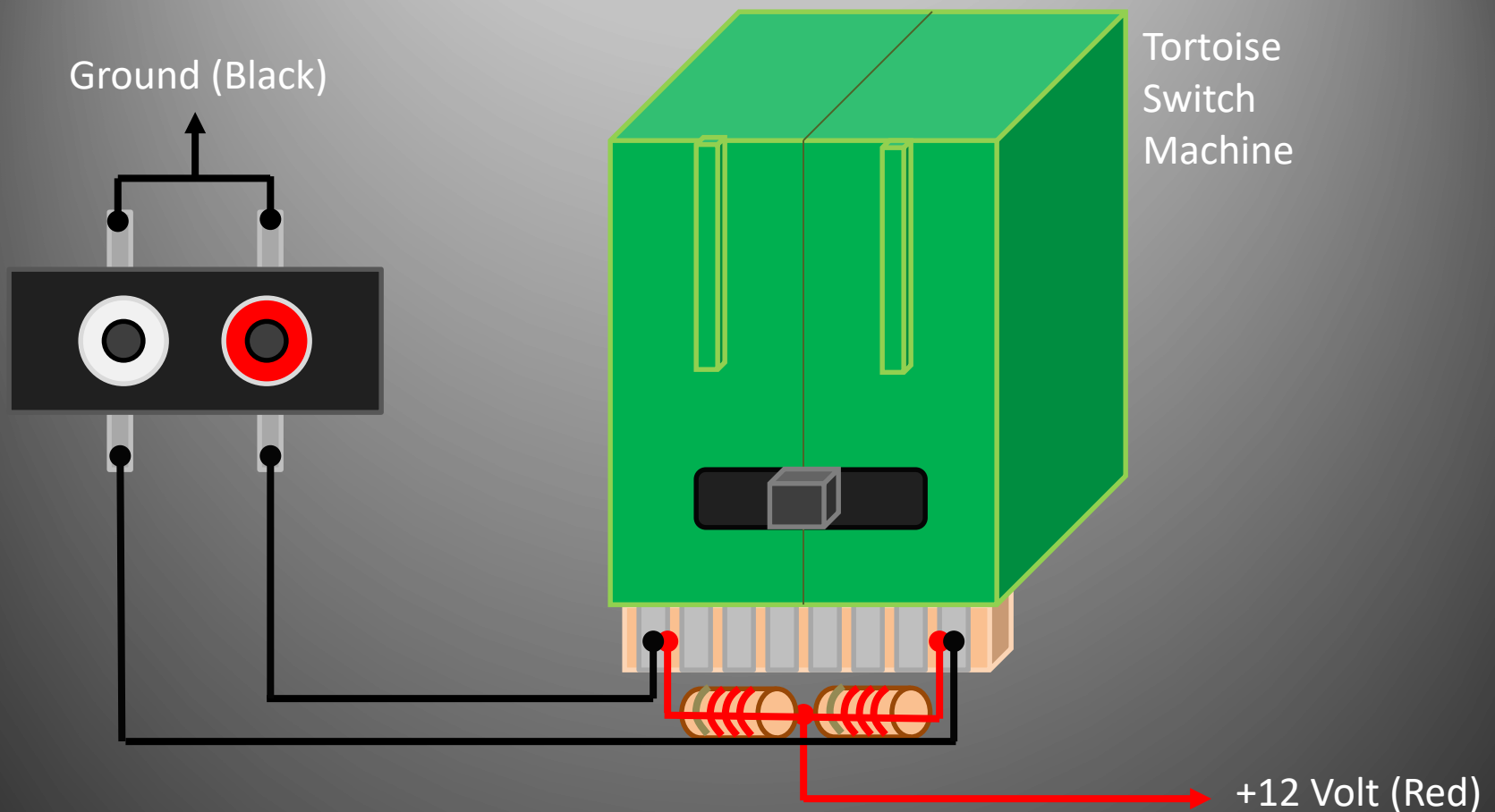
Tortoise Switch Machine



Turnout Control

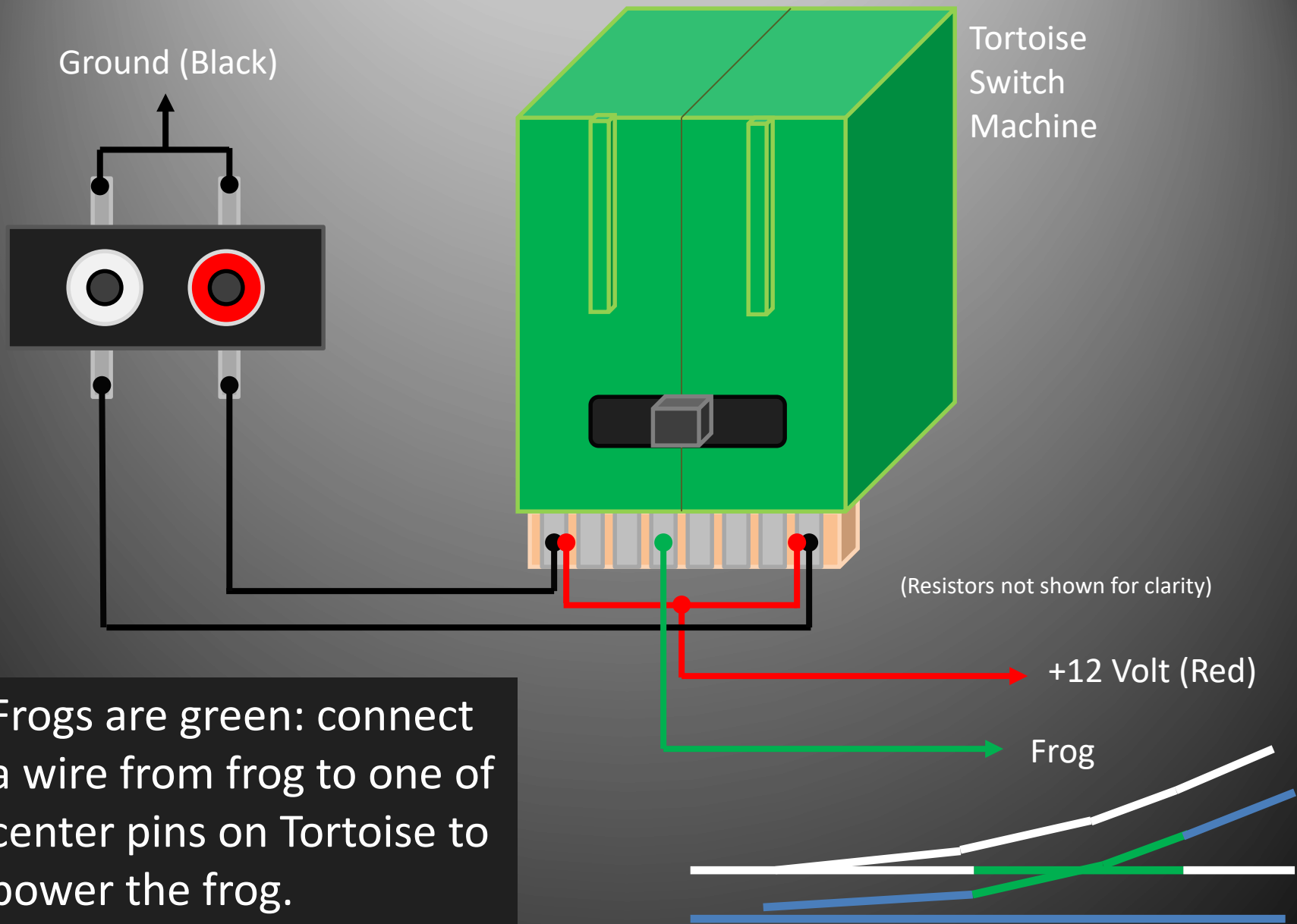


Add a 2.2k Ohm (red-red-red) Resistor to pins 1 and 8 and feed each with +12 Volt from the Red Bus.



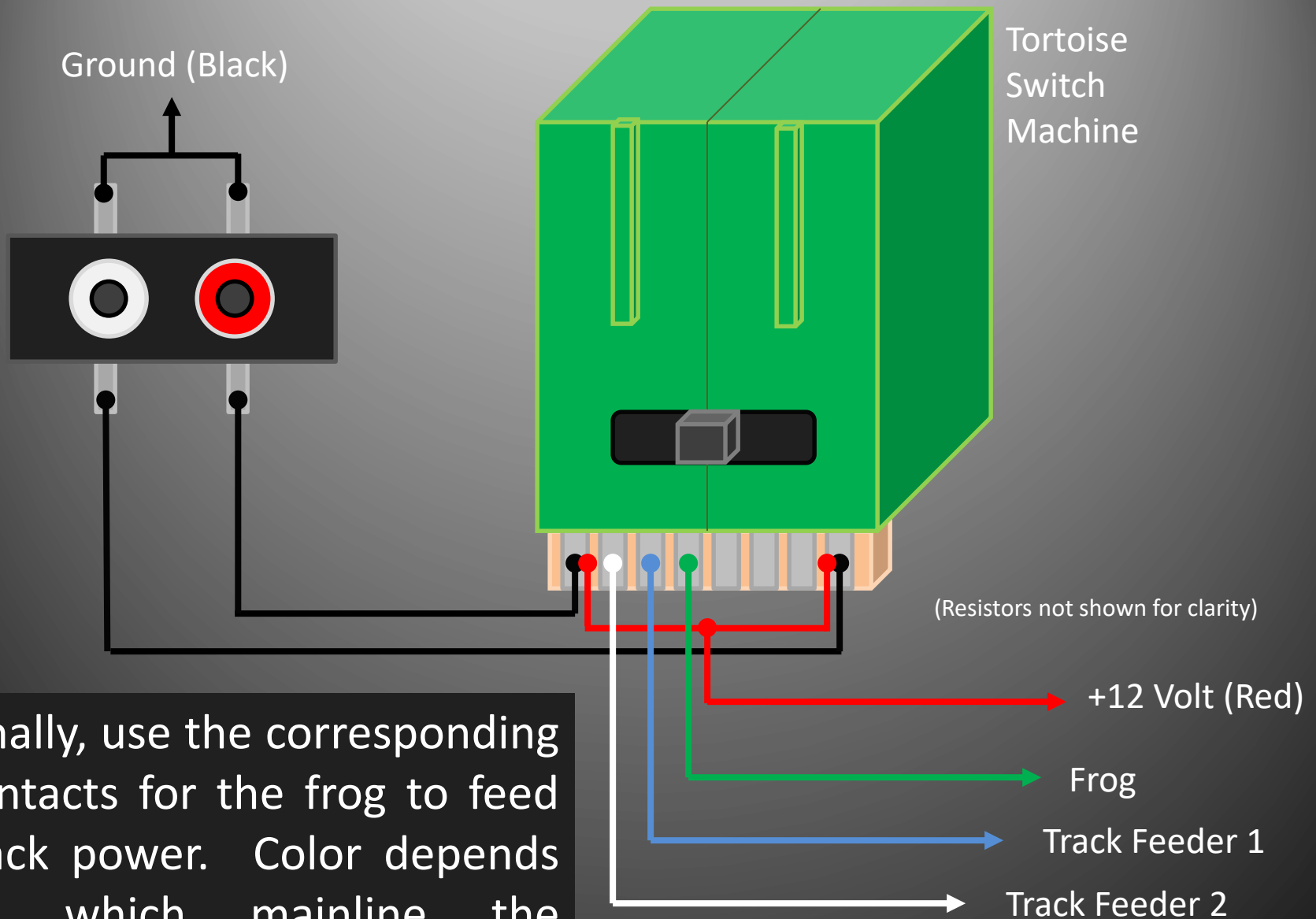
Connect a wire from each phono jack to pin 1 or 8. The Tortoise throwbar will move in the direction of the grounded pin. Standard convention uses red jack for "reverse" on the turnout, white for "normal".

Turnout Control



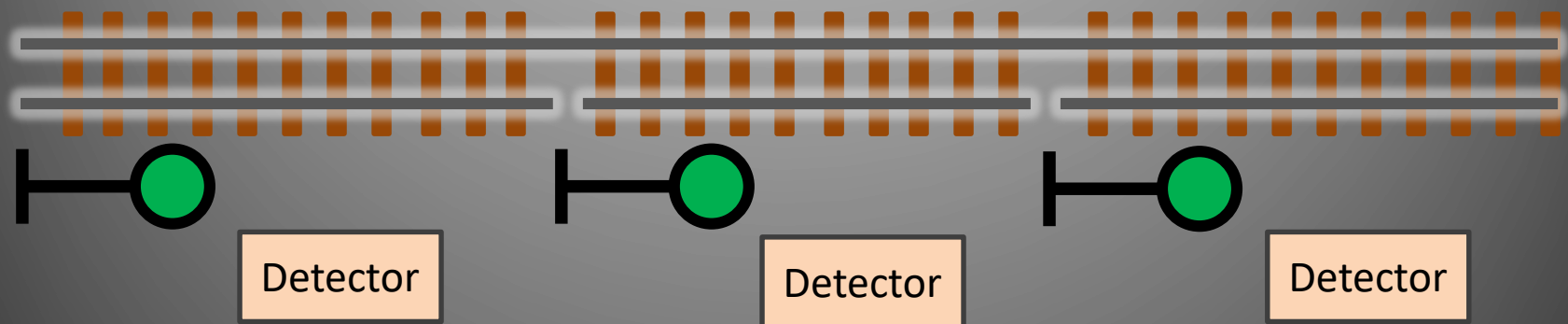
Frogs are green: connect a wire from frog to one of center pins on Tortoise to power the frog.

Turnout Control

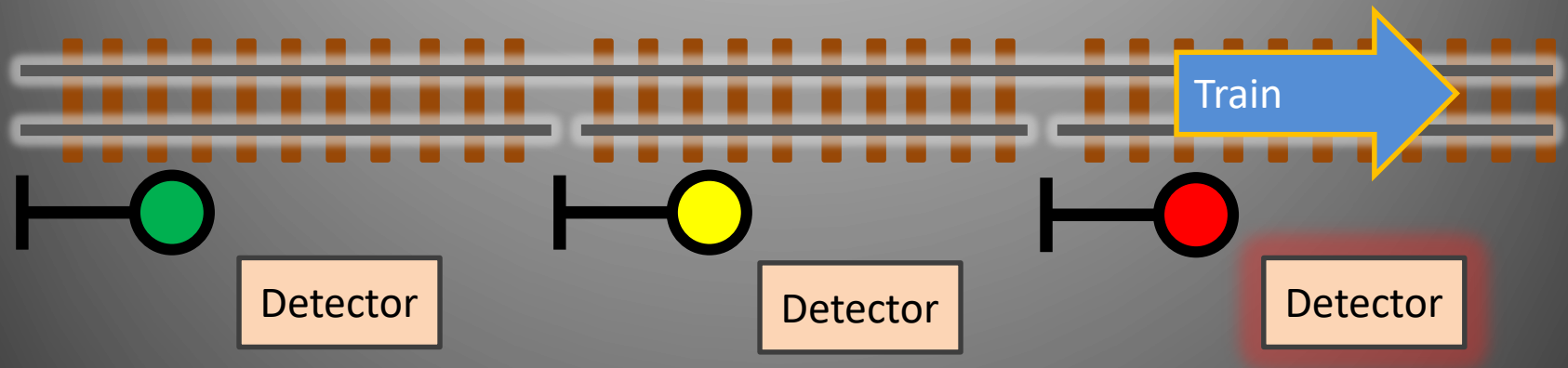


Finally, use the corresponding contacts for the frog to feed track power. Color depends on which mainline the turnout is on.

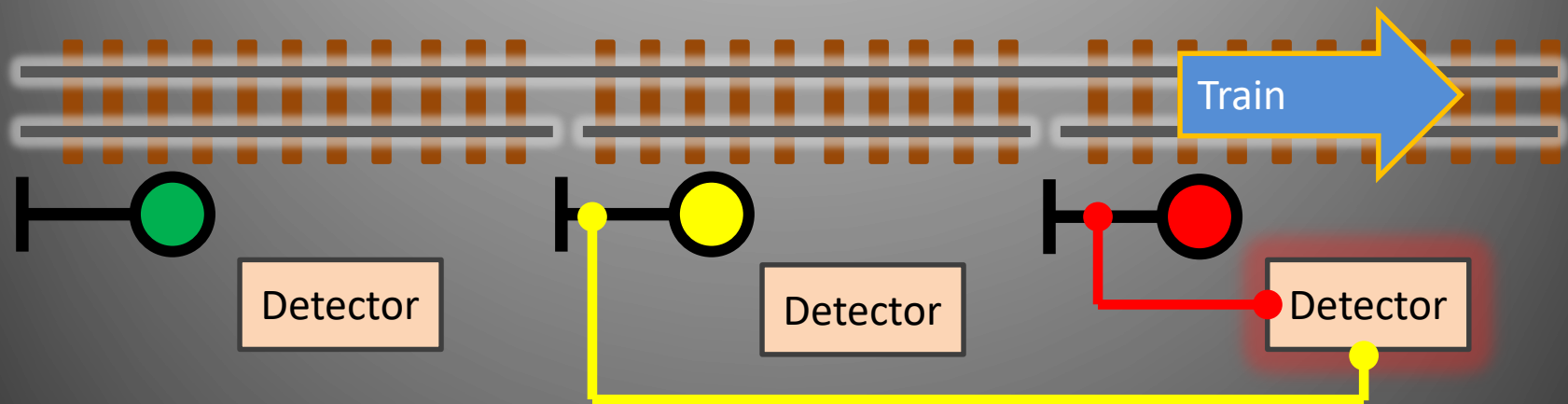
Turnout Control



Each block uses a Chubb DCC Optimized Detector (DCCOD). Occupancy is read through a current sensing transformer (no voltage drop) with as little as a 10k resistor across the track.

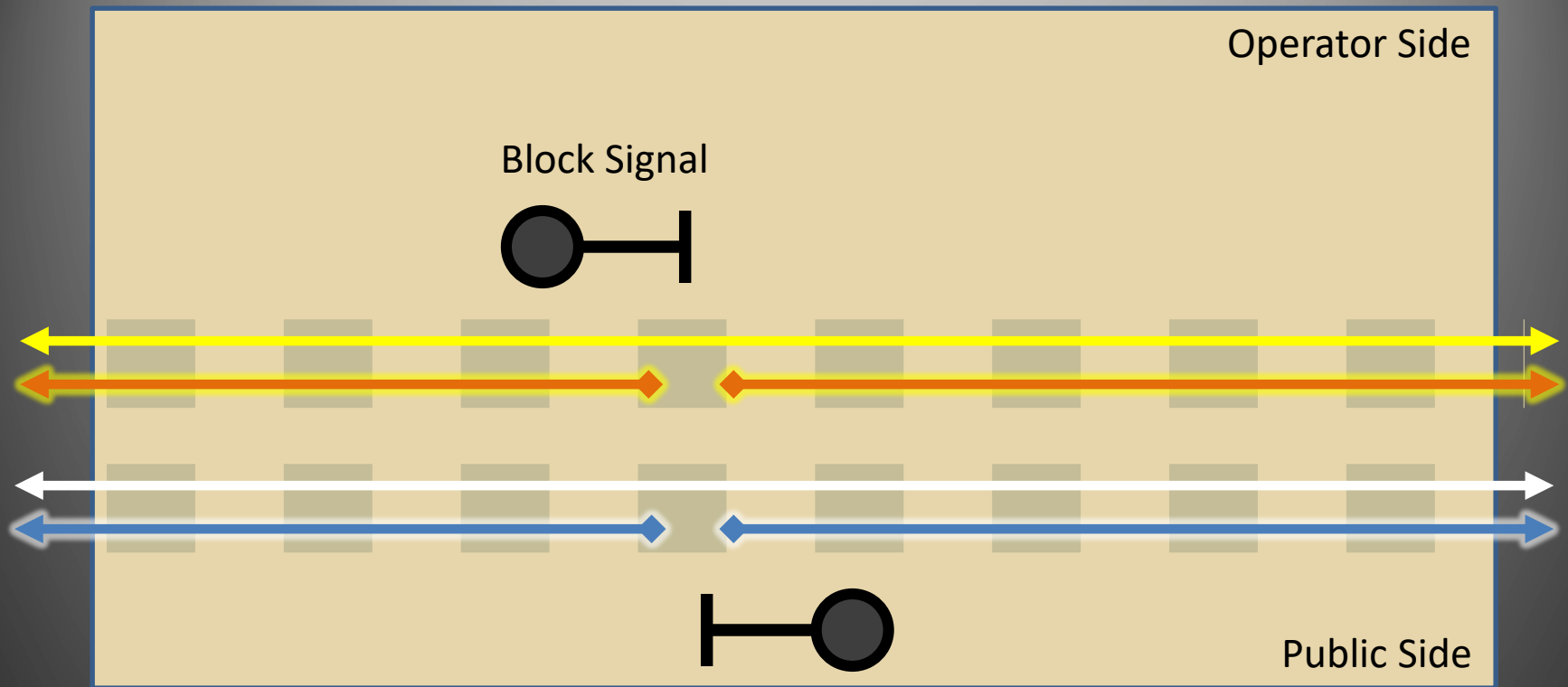


When a train enters a block, the DCCOD will detect and ground the indication in the appropriate signals.

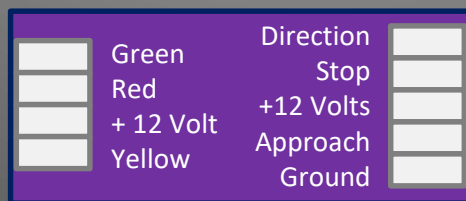
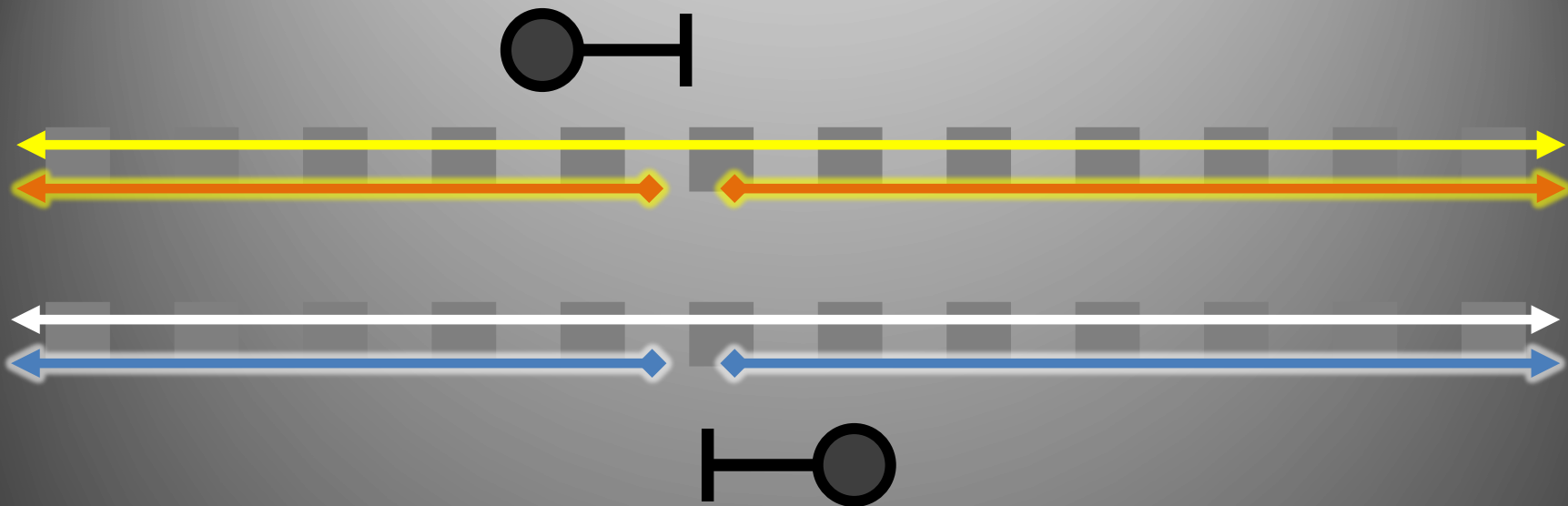


In general terms, the detector will drive its block signal to red (stop) and then back feed to the previous block to drive the preceding signal to approach (yellow). A signal with no grounded pins will display clear (green).

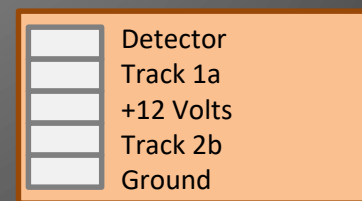
Occupancy Detectors



Standard convention is to gap the front (or public side) rail for signal blocks. The gaps allow the mainline feeders for signal blocks to be fed through an occupancy detector to drive the ABS signal logic.



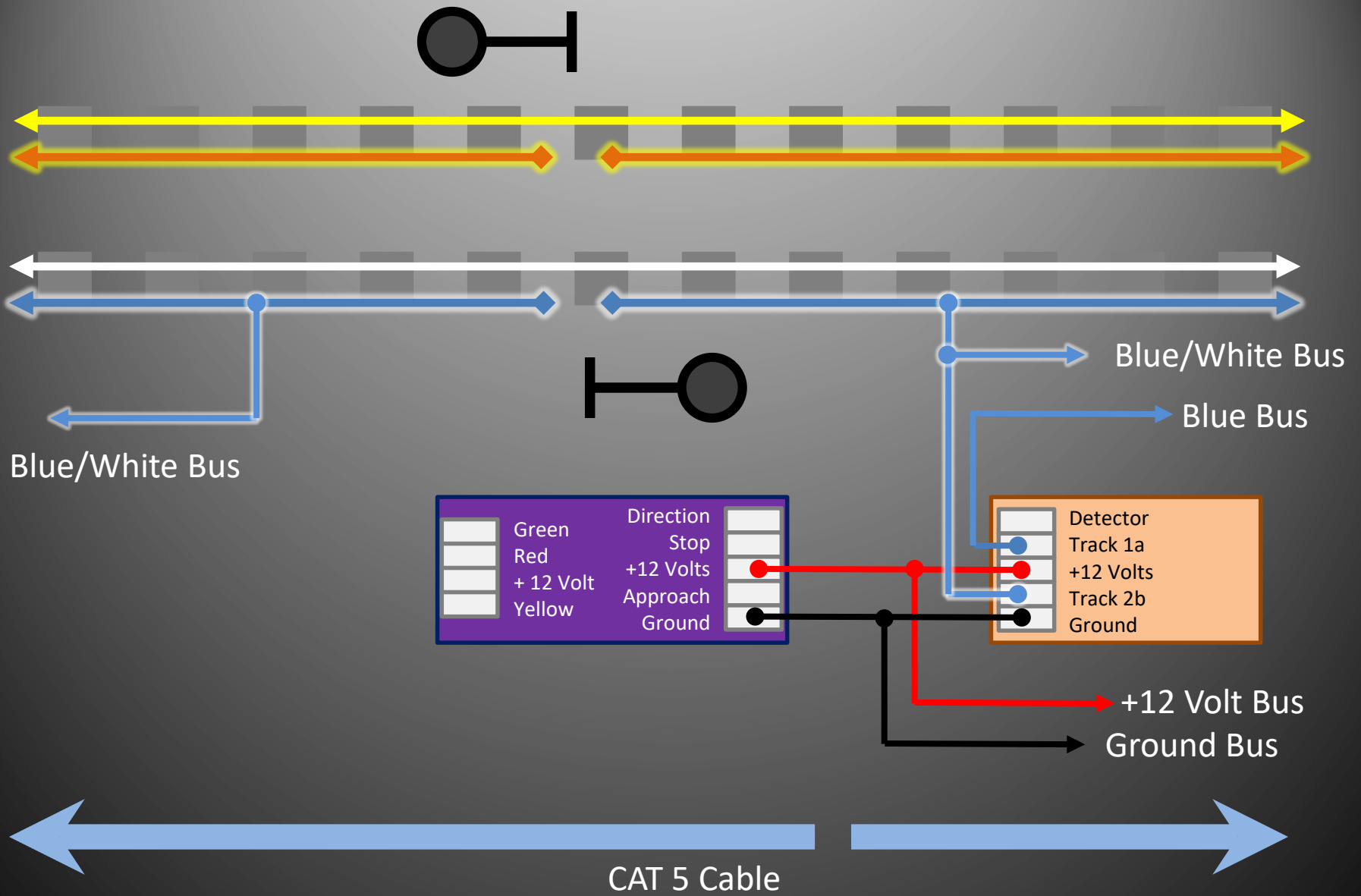
Modutrak Signal Driver



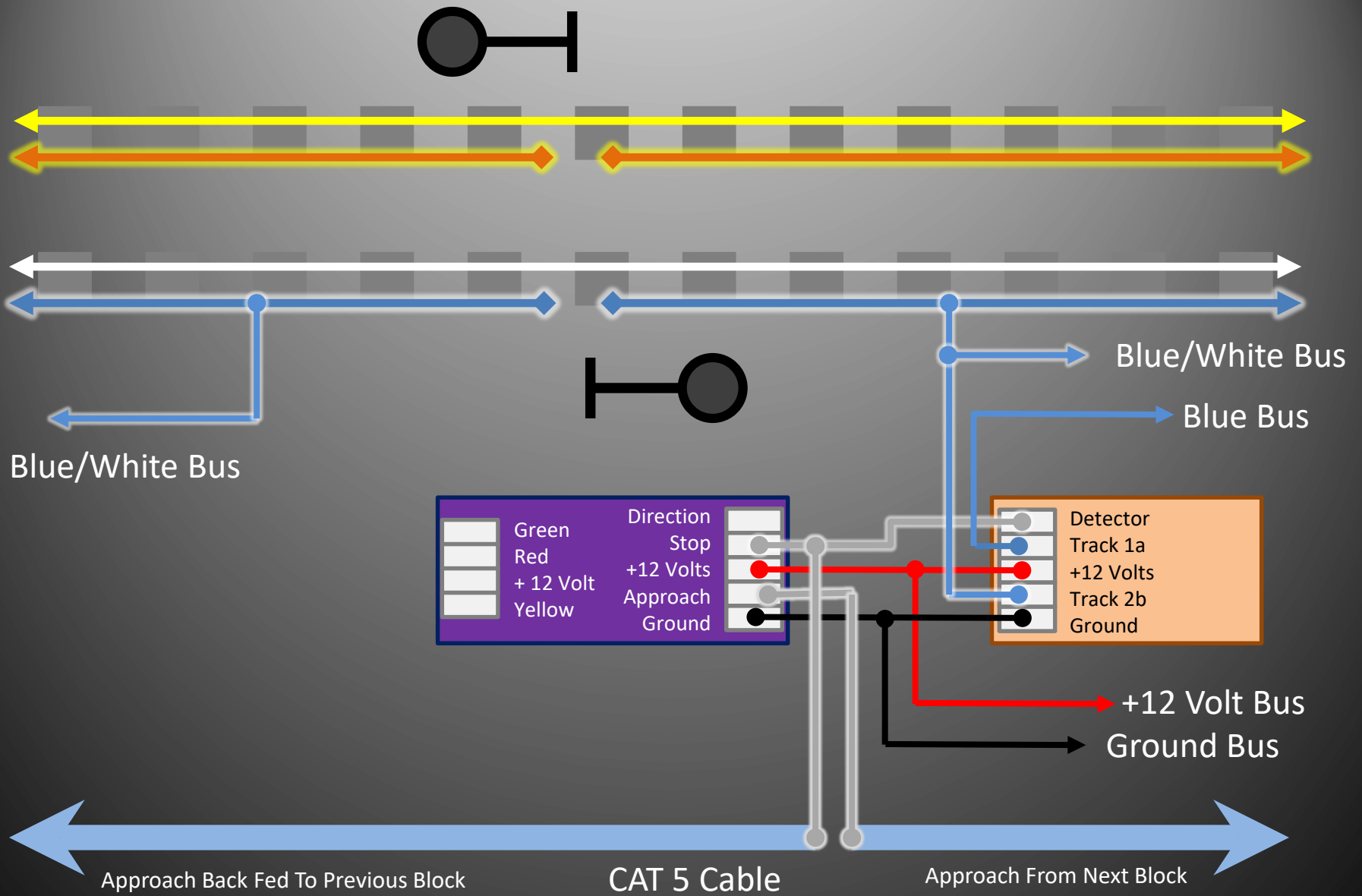
DCCOD Detector

CAT 5 Cable

Signal Control

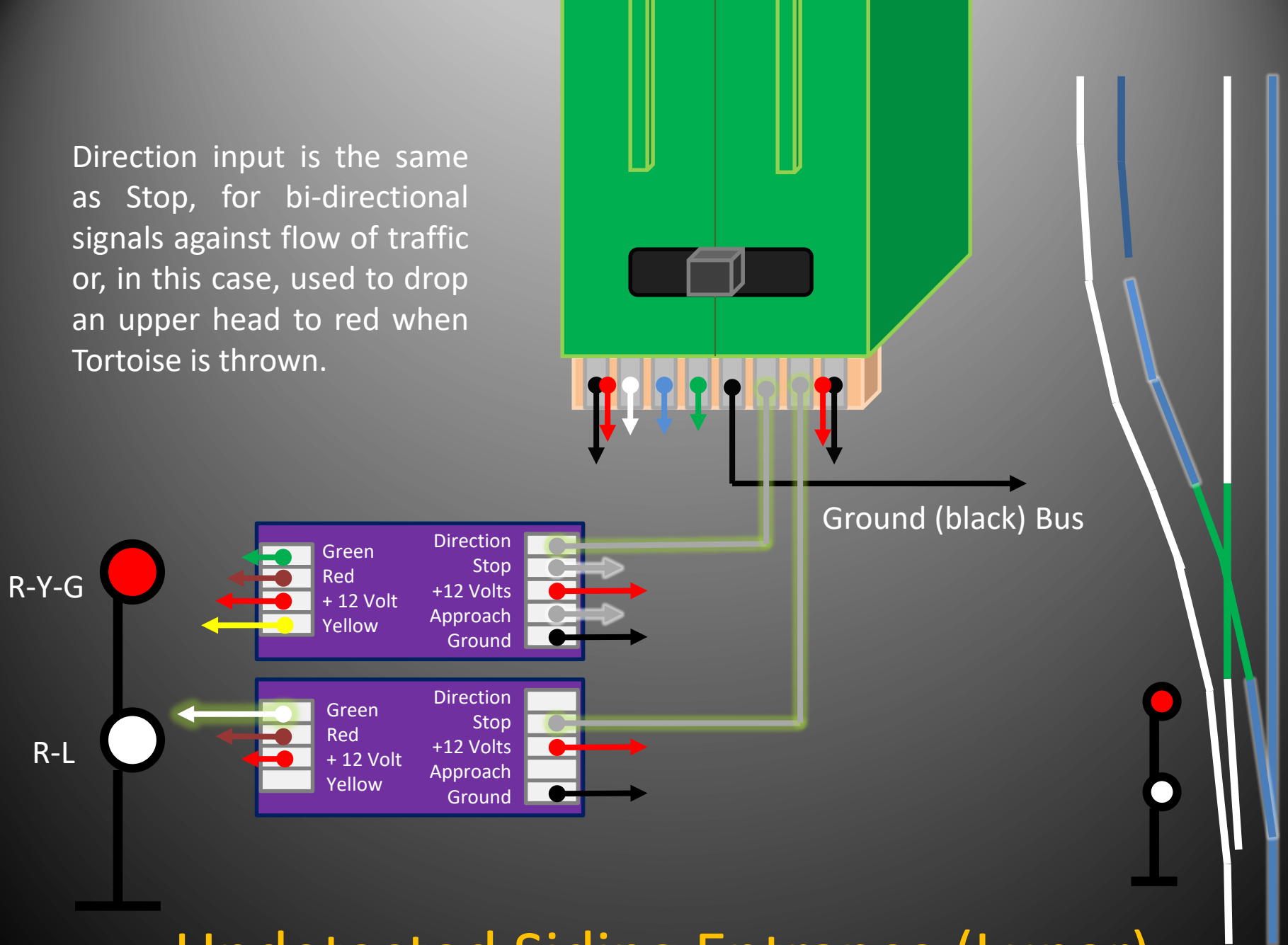


Signal Control

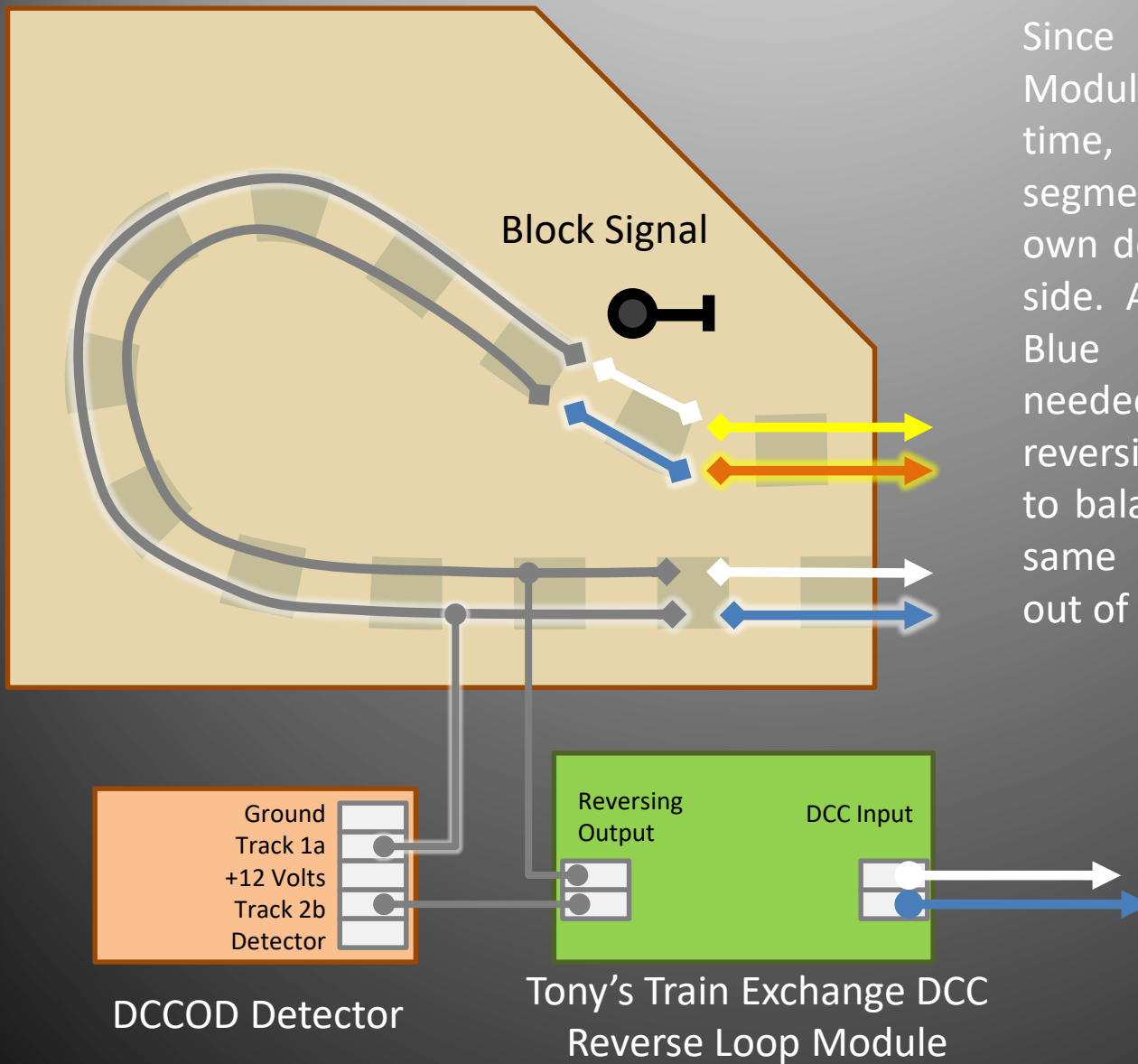


Signal Control

Direction input is the same as Stop, for bi-directional signals against flow of traffic or, in this case, used to drop an upper head to red when Tortoise is thrown.

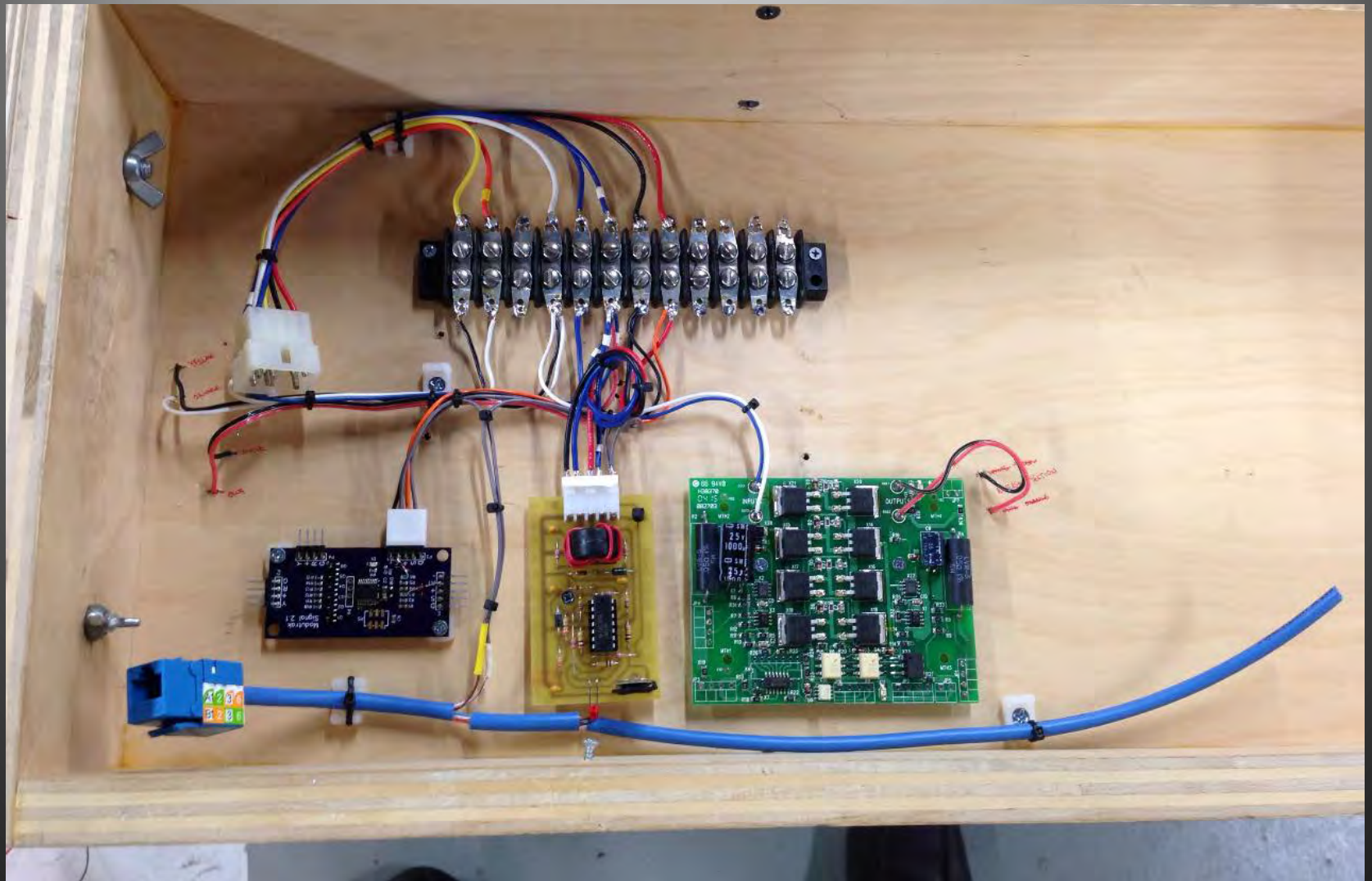


Undetected Siding Entrance (Lunar)



Since the Reverse Loop Module draws power all the time, the reverse loop segment will require it's own detector on the output side. Also, a small section of Blue mainline will be needed on both sides of the reversing segment in order to balance voltage from the same DCC supply into and out of the reverse loop.

End Loop Wiring Convention



End Loop Wiring (Actual)

Better Signals through
peer pressure...

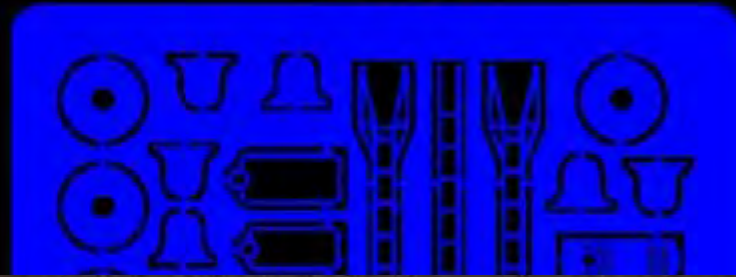
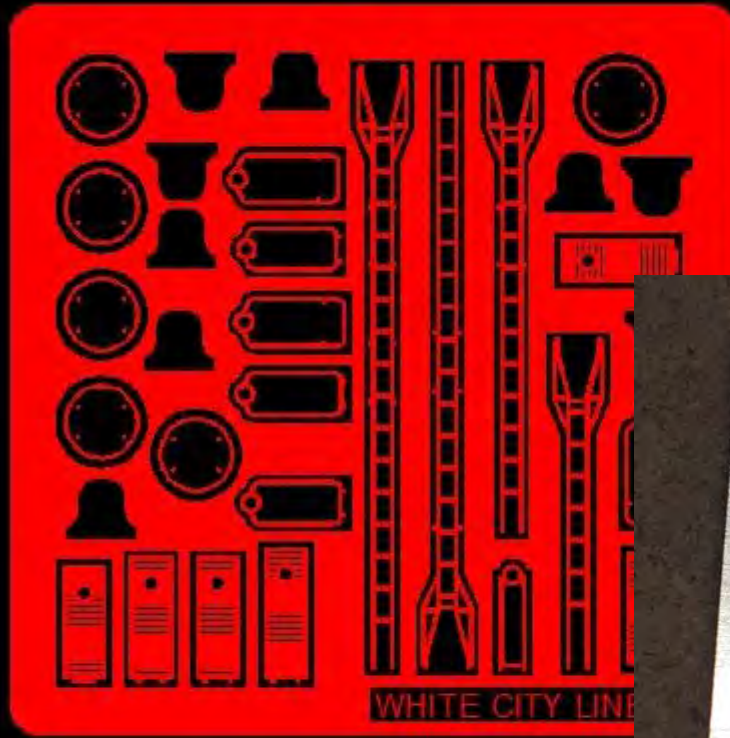
 MODUTRAK



BeNscale vs Modutrak

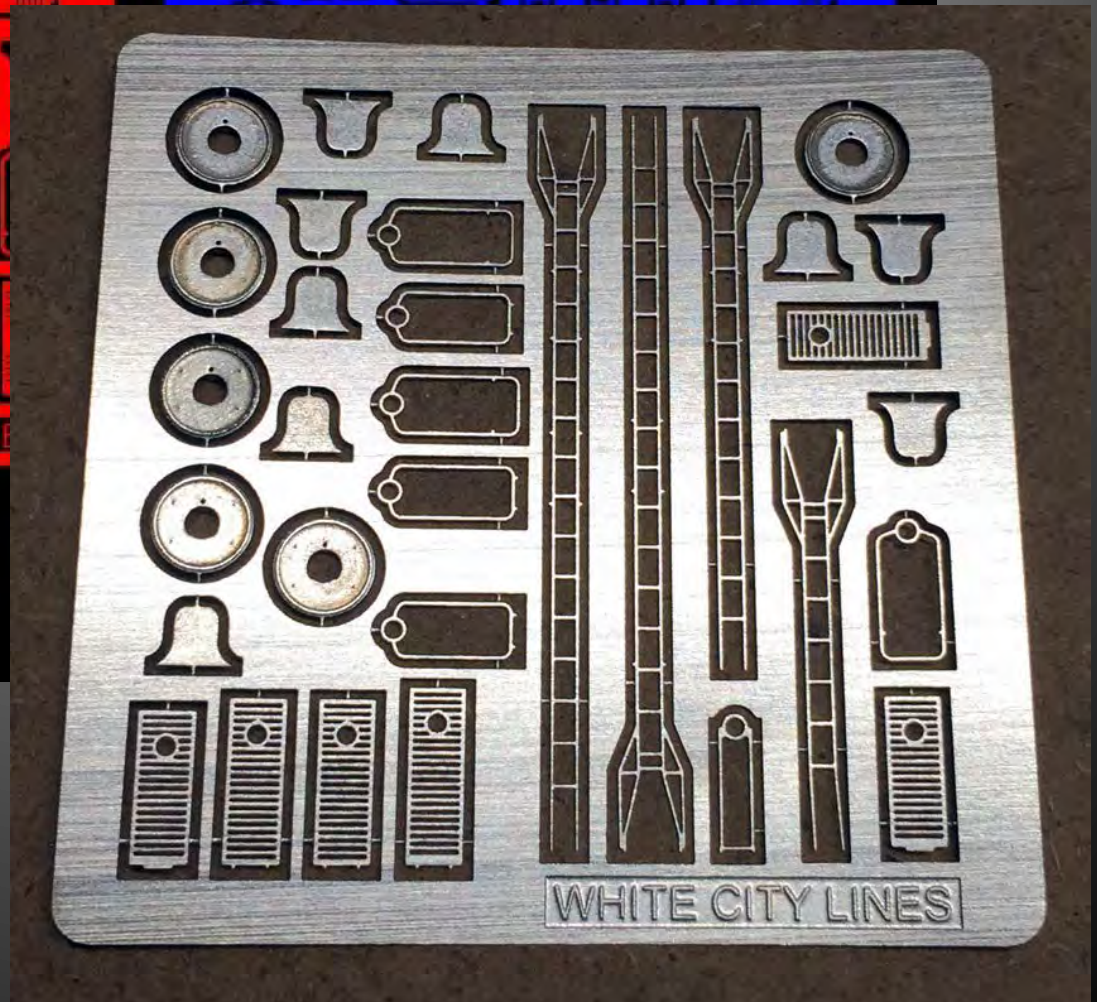
TOP

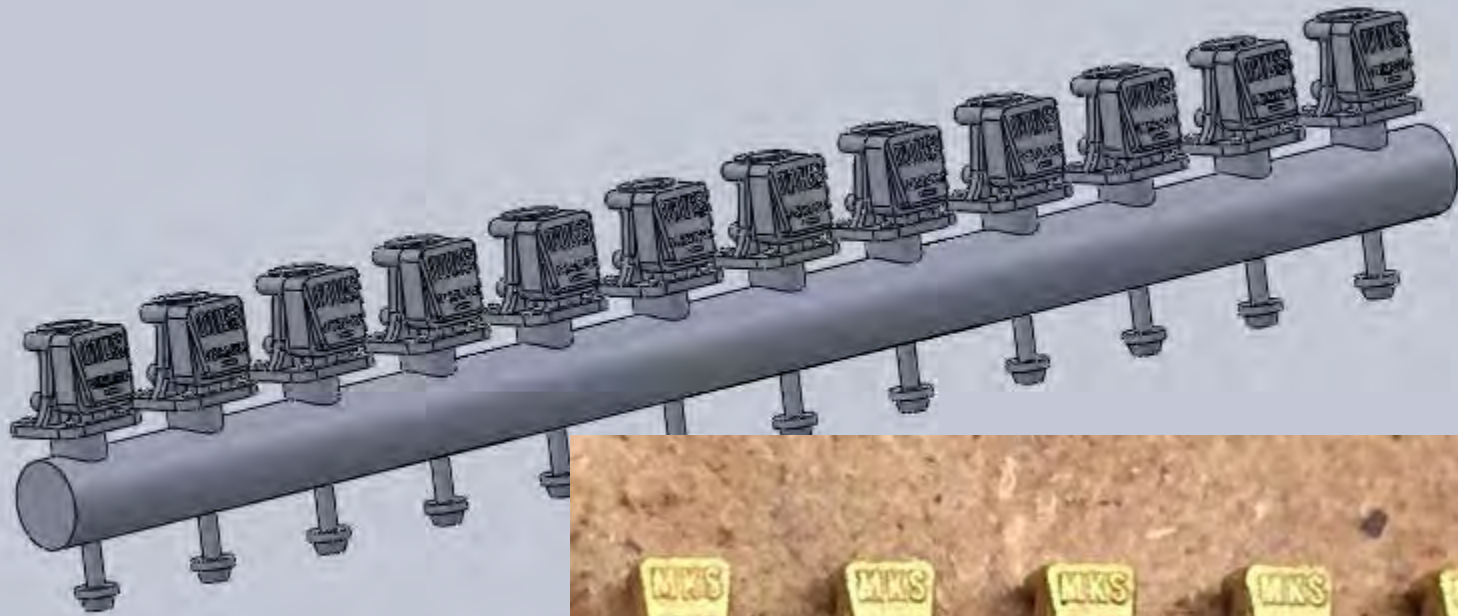
BOTTOM



1 inch (25.4mm)

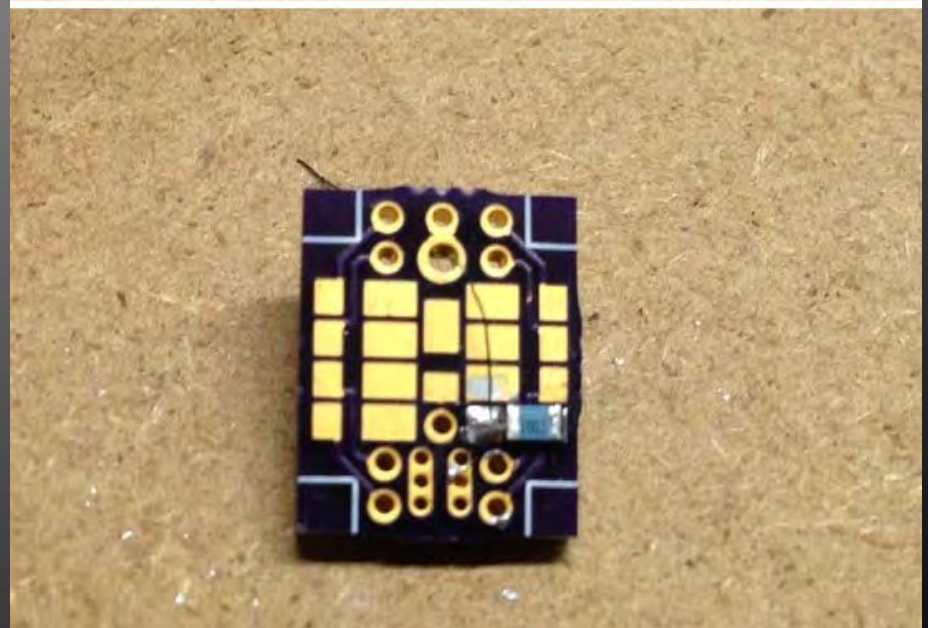
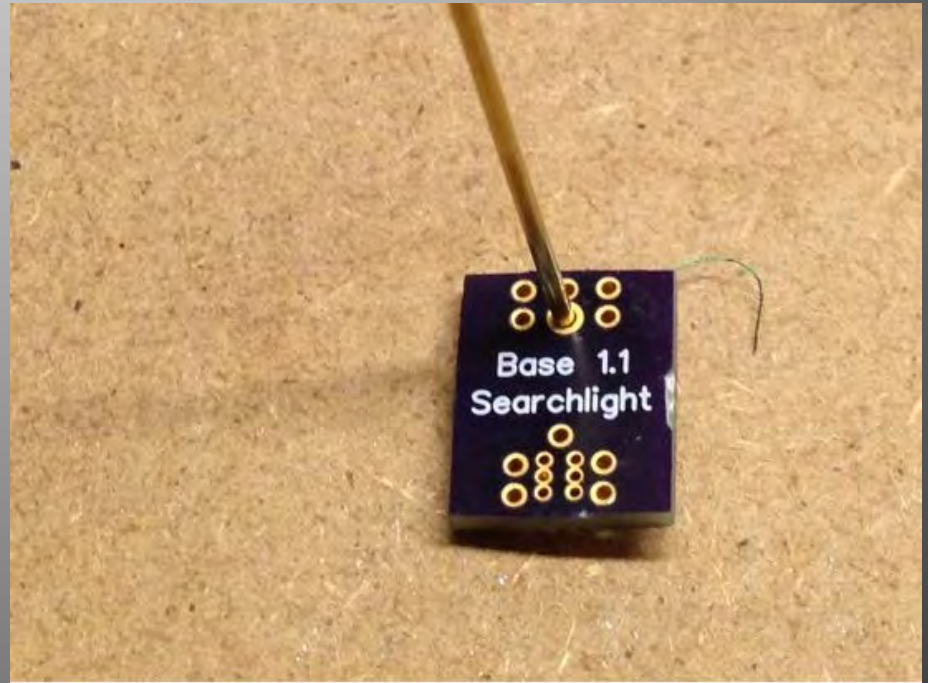
Etchings
(PPD Ltd.)

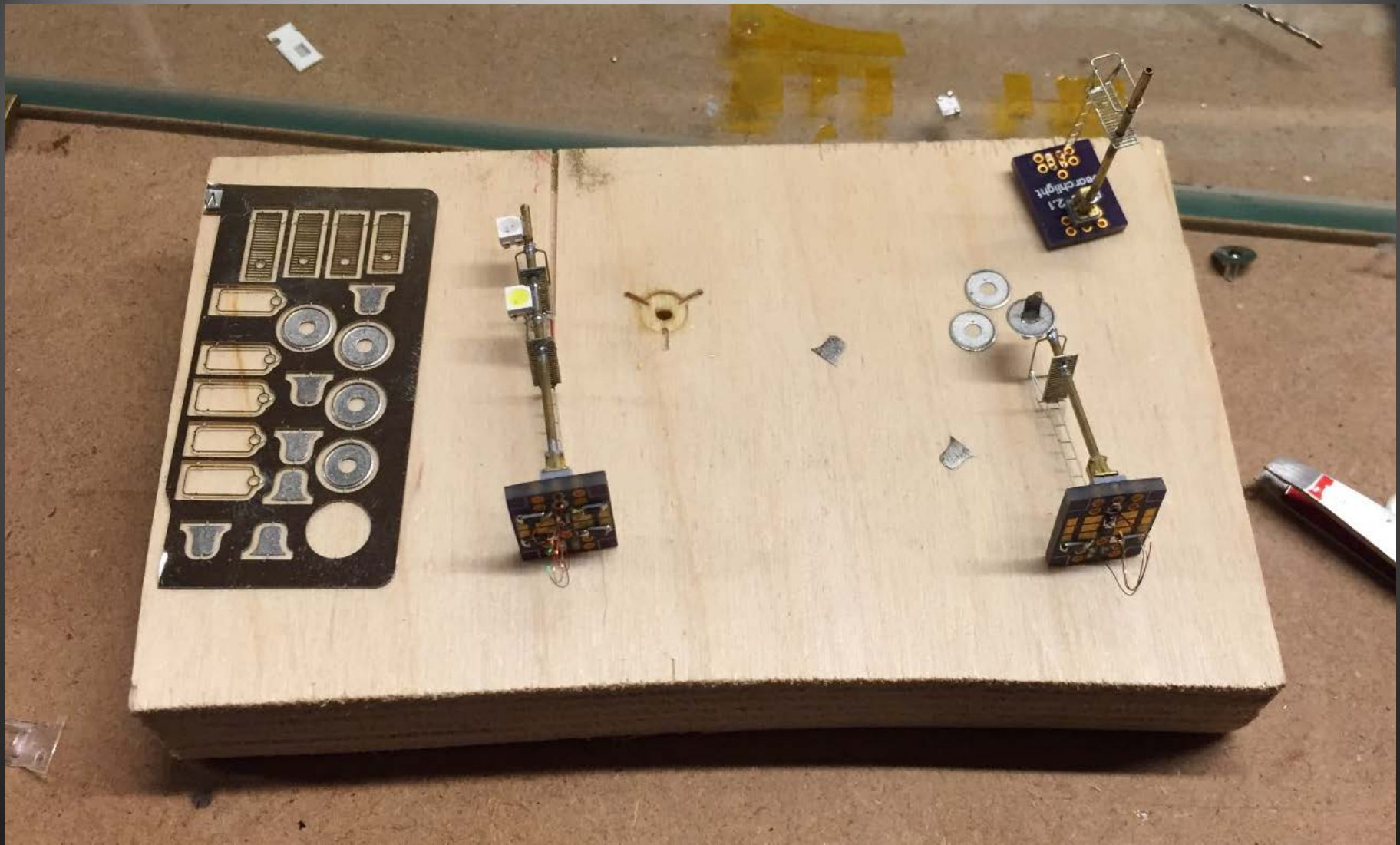




Lost Wax
Brass
(BestCast)

PCB Bases (OSH Park)





Signal Assembly



Signals in resin bases





Final Installation



And then we pack it all up and travel the world...

Thank You

Bill Denton

Marshall Skibbe

Keith Kohlmann

Jamie Vondruska

Matt Gaudynski

Harz Sondericker

Vince Kotnik

Nate Pierce

John McCarthy

Matt Jacobs

Rick Hall

Jim Starman

The logo for MODUTRAK features a series of vertical red bars of varying heights on the left, followed by the word "MODUTRAK" in a bold, white, sans-serif font.

MODUTRAK