



Rollout Staging Drawer

The **MEGA-DRAWER**

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Why ?

- Common theory:

*There is no such thing as
too much staging.*



Why? But really...

- Hidden
- Out of the way
- Make good use of otherwise unused space
- Sounded like fun



Goals

- Large capacity for staging
- Avoid run away cars
- Ease of access
- Smooth traversing of drawer
- Reliable entry track alignment
- Maintainable design
- Safe for humans and trains
- Maximize use of space



Inspiration

- Member discussion of a staging drawer seen in a popular model rail road magazine.
- Membership desire for additional staging in the layout design.
- File cabinets?



Basic Design

- Twenty-Two Feet long
- Twenty-Six Inches wide
- Twenty-Four Inches top to floor
- Thirteen tracks fanning out from track lead
- Four tracks fanning out in wrong direction (just to use space)



Basic Design Continued

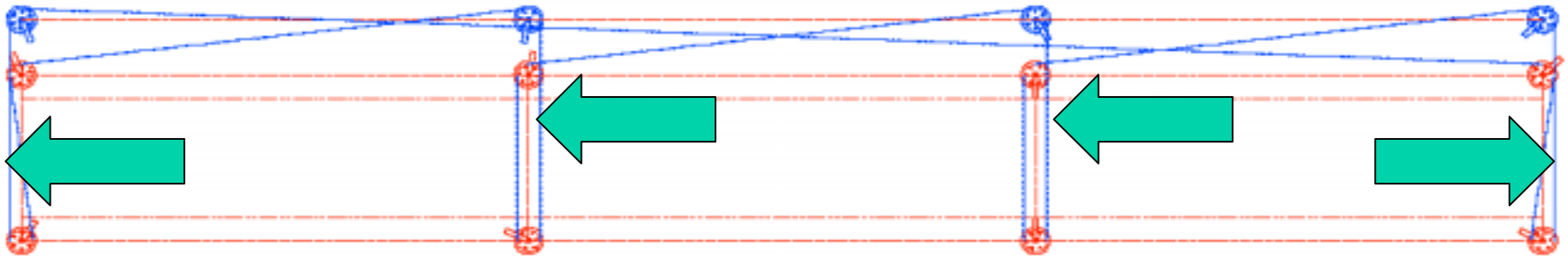
- Motorized control from single toggle switch
- Box top same basic construction as layout, plywood covered by homosote
- NCE SwitchIt DCC Stall Motor Controllers
- Motorized turnouts (Hanks Craft Stall Motors)
- Diode Matrix control of ladder (pending)
- Code 100 Track
- Block detection (pending)



Keeping Things Straight

The key to it all lies in keeping the drawer straight when moving.

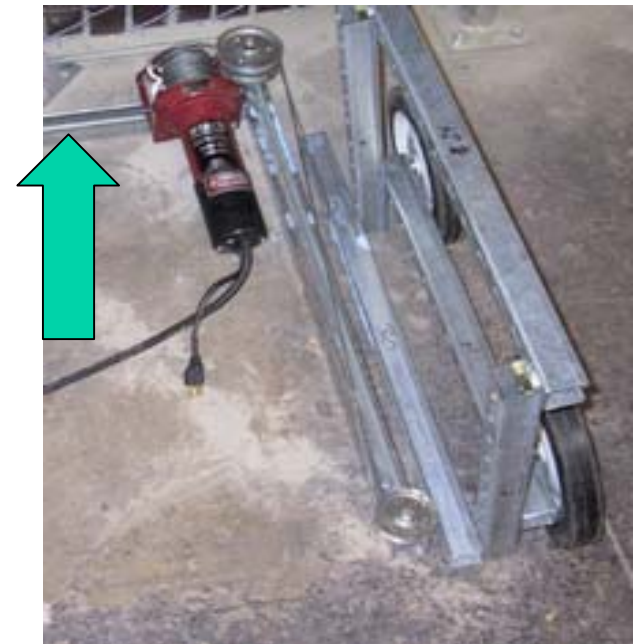
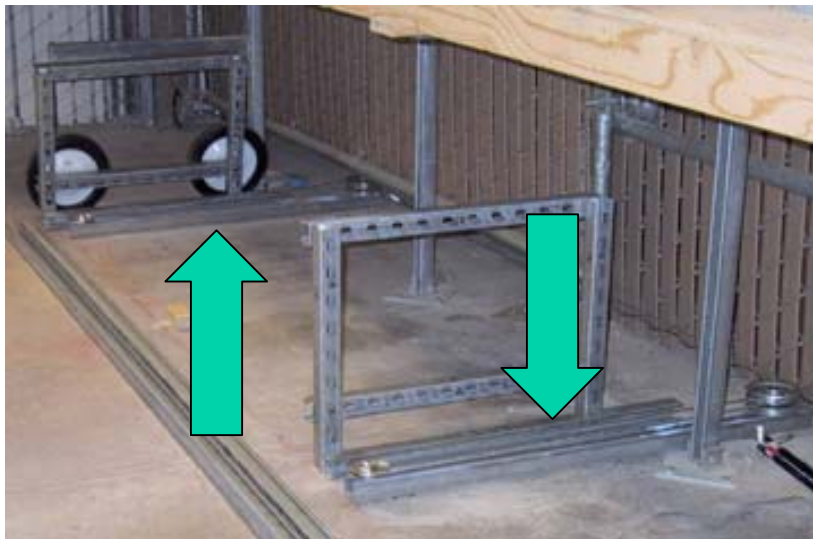
This is achieved by a cable that is strategically routed to create a “loop”. The cart attaches at four points to the cable. Those four points move together.





The Floor

Bolted to the floor are four pieces of B-Line strut that provide the mounting for the pulleys and an additional one as a motor mount.





Cart Design

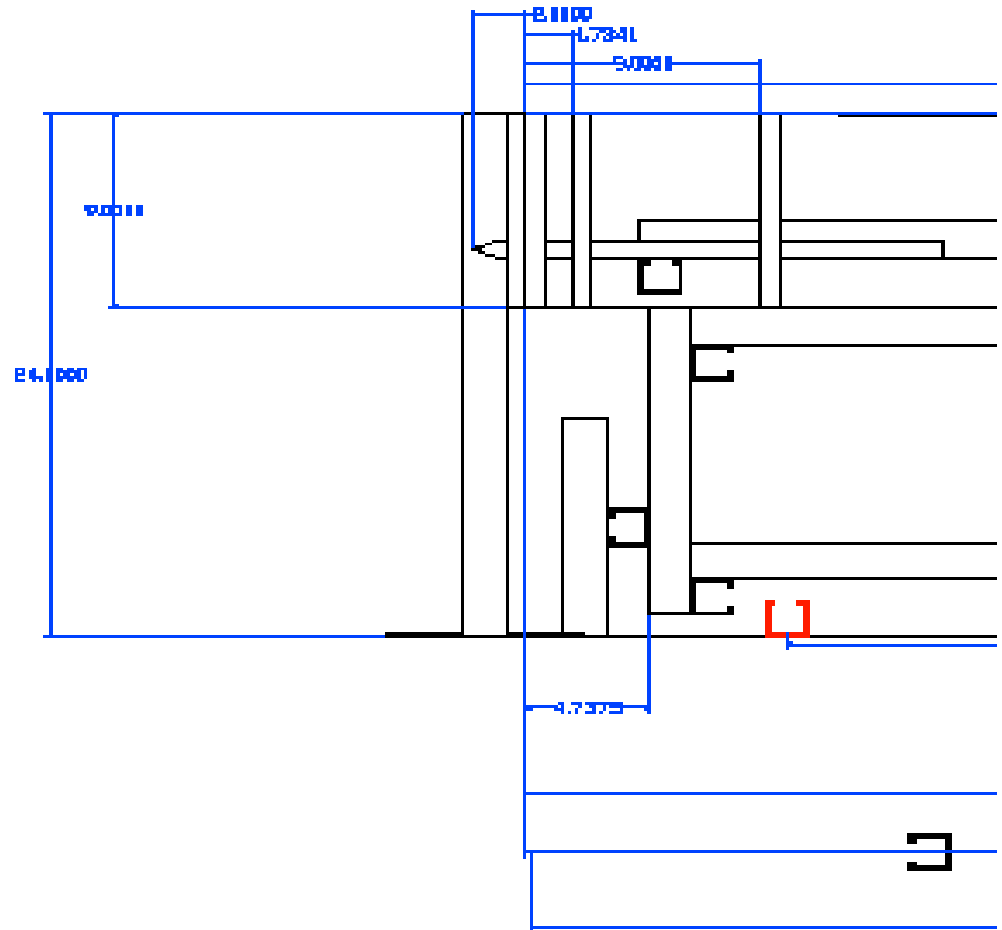
- B-Line Strut (2 sizes)
- Spring Nuts
- Nuts, Bolts and Washers
- B-Line 90° brackets
- B-Line flat brackets
- Chop Saw!





Cart Design Continued

The height of the trucks was determined by subtracting the thickness of the box top from the height of the entrance ramp of the track.





Cart Design Continued

Four trucks provide elevation, support and transport of box top. Large rubber wheels for smooth ride. Front wheels are flush with the front of the truck.





Cart Design Continued

Three horizontal bars

1. Top for strength and fastening area for lengthwise strut to come later
2. Middle for fastening wheels, intended to be adjustable.
3. Bottom for strength and rear extension for attaching clamp for guide wire.





Cart Design Continued

The four trucks are connected by full length pieces of B-Line strut. The full length pieces also provide fastening points for the box top and other mechanized components.





Lock Design

- The cable can move the cart in and out
- The cable can keep the cart straight traversing in and out
- The cable cannot keep the cart in place
- The cable cannot align the cart so that the track is lined up well enough so that trains will not derail



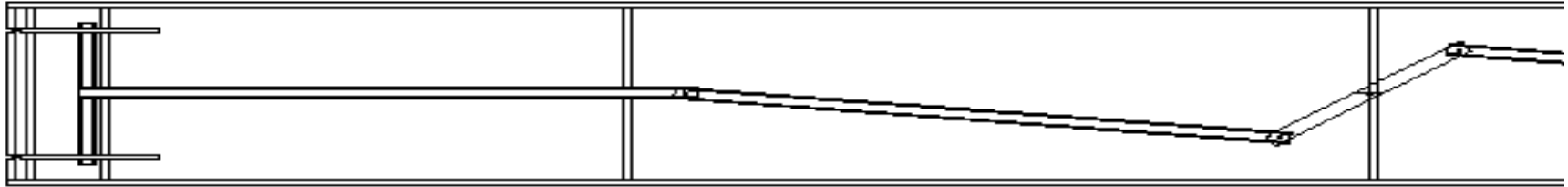
Lock Design Continued

The locking pins were installed to provide secure alignment of the cart. Four pins, Two at each end extend to lock the cart in place. The pins are guided by half inch galvanized pipe. The pins are set at diverging angles to remove slack when extended.





Lock Design Continued



To move the locking pins, additional B-Line strut is connected to the center of the cart where both ends can be moved together. But how to move the pins?



Lock Design Continued



1ea. 3X938 Sheave-12" CONGRESS CA120012AX12
1ea. 4L520 V-Belt,41,1/2X52 DAYTON 4L520G
1ea. 3X895 Sheave-2" Od-Single CONGRESS CA2002AX12
2ea. 4X815 Mounted-Bronze-Bearing DAYTON 4X8152818
1ea. 2X568 Shaft-Collar-1/2id-Pk3 DAYTON
2X56820034
1ea. 5JW35 Shafting-1/2-X-12 THOMSON QS12LX12

- To move the pins a large pulley (Sheave) is attached to the center B-line strut.
- A belt attaches the large pulley to a smaller pulley at a gear reduced AC motor
- Additional parts are used to support the pulleys and motor.
- Belt tension is adjustable, and belt can easily be removed or replaced.



How to Move the Drawer

- Have someone pull/push it?
 - Not smooth, could knock cars off track
- Garage Door Opener?
 - \$100+
 - Limited physical characteristics
- Use the winch that one of the members donated?
 - Free
 - Powerful
 - Reversible Motor
 - Compact size



How to Move the Drawer Cont.

- **The Winch Brash Movement**
 - Resolved with Block and Tackle Assembly 4:1 reduction
- **Wire tension (cannot push wire off of spool)**
 - Resolved with Garage door spring to pull cart while winch lets out cable
- **Loud**
 - Well, we tried





Electrical Design Requirements

- Control Winch motor
- Control Lock motor
- Synchronize Winch and Lock motors
- Provide track and accessory power to drawer top
- Disable drawer track power when open
- Disable approach track power when open
- Connect 120V and DCC wiring to cart separately and safely

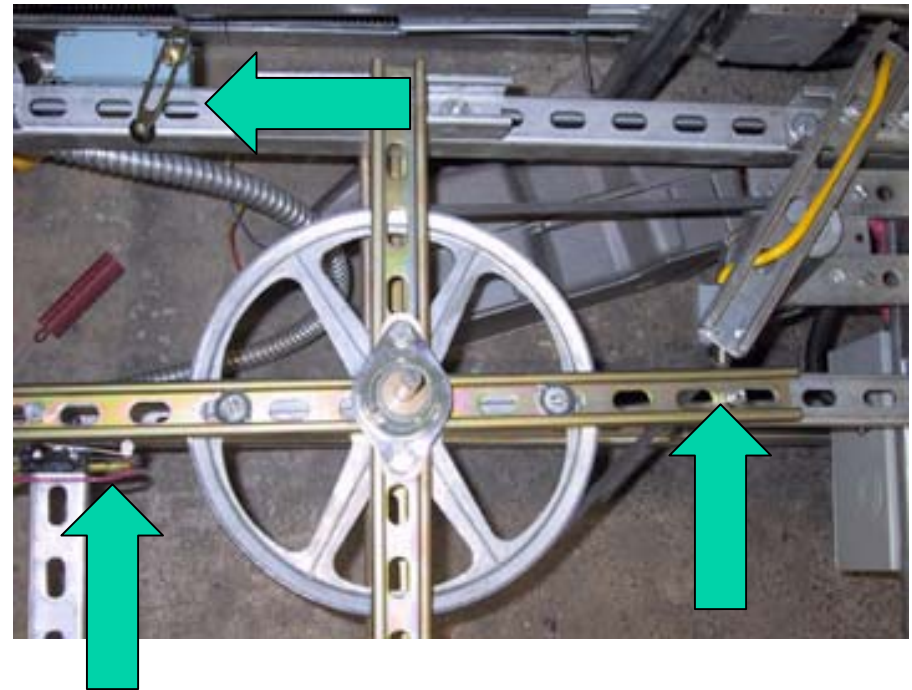


Electrical Design Limit Switches

The use of limit switches allows the synchronization of the two motors.

Two One Inch flex conduits attach to the cart. One for 120V the other for DCC

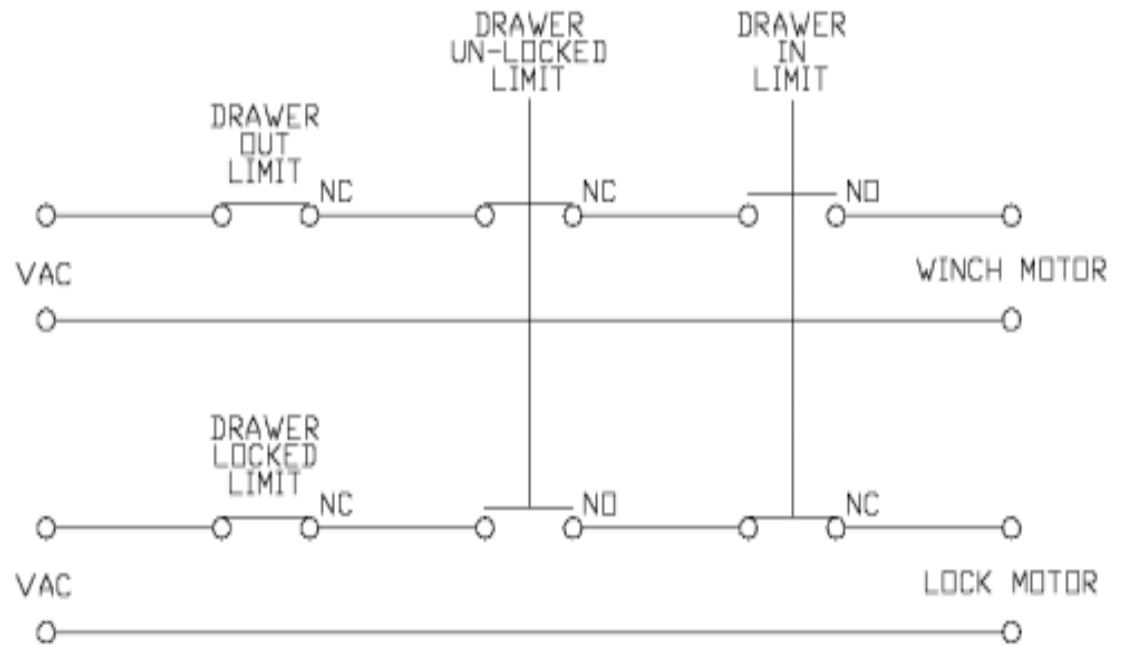
A limit switch is also used to determine the drawer is locked and enable track power to the drawer top and track lead





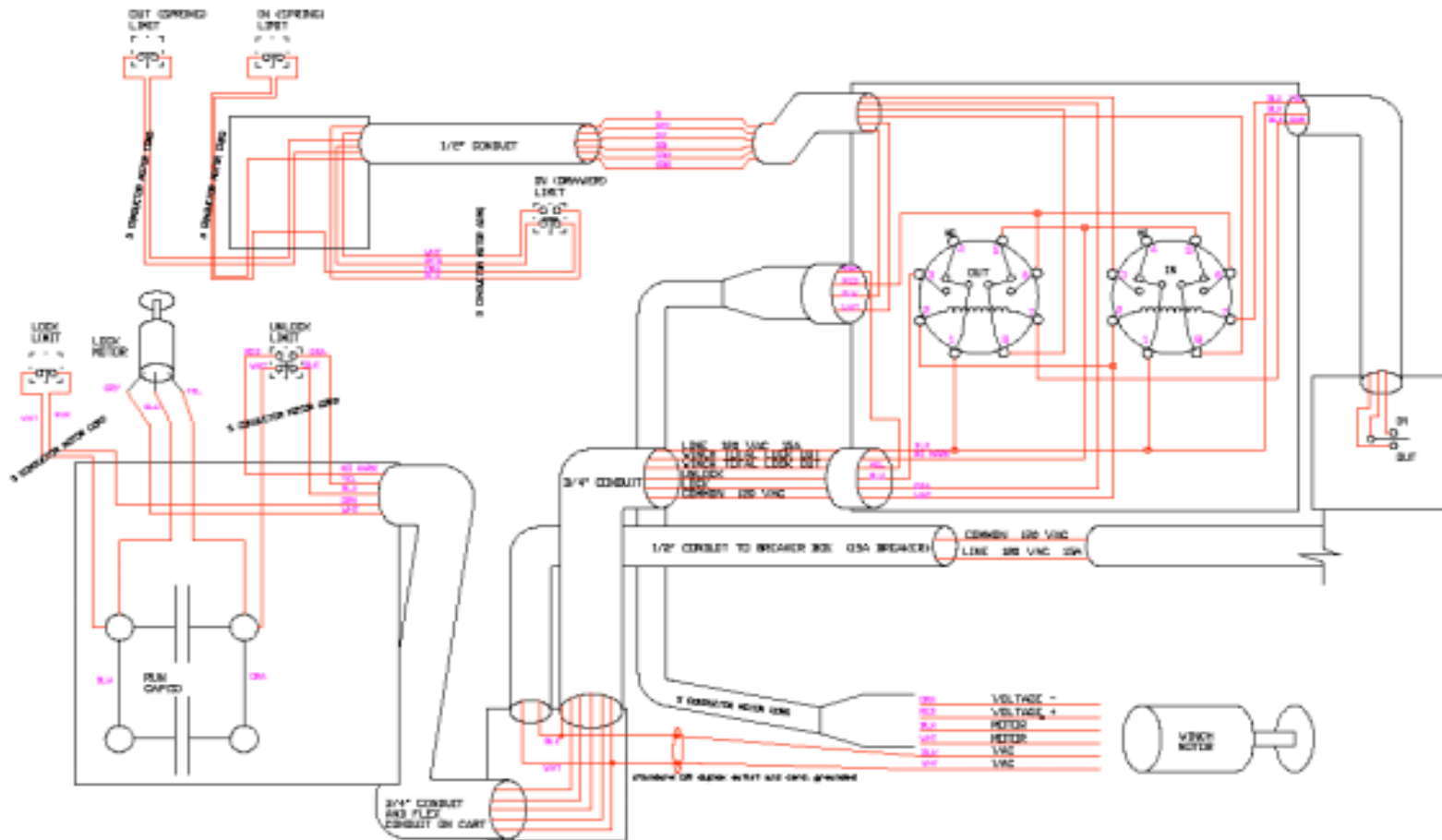
Electrical Design Control

Limit switches serve to enable each motor in the appropriate direction at the proper time.





Electrical Design Overall





Top (Box) Design

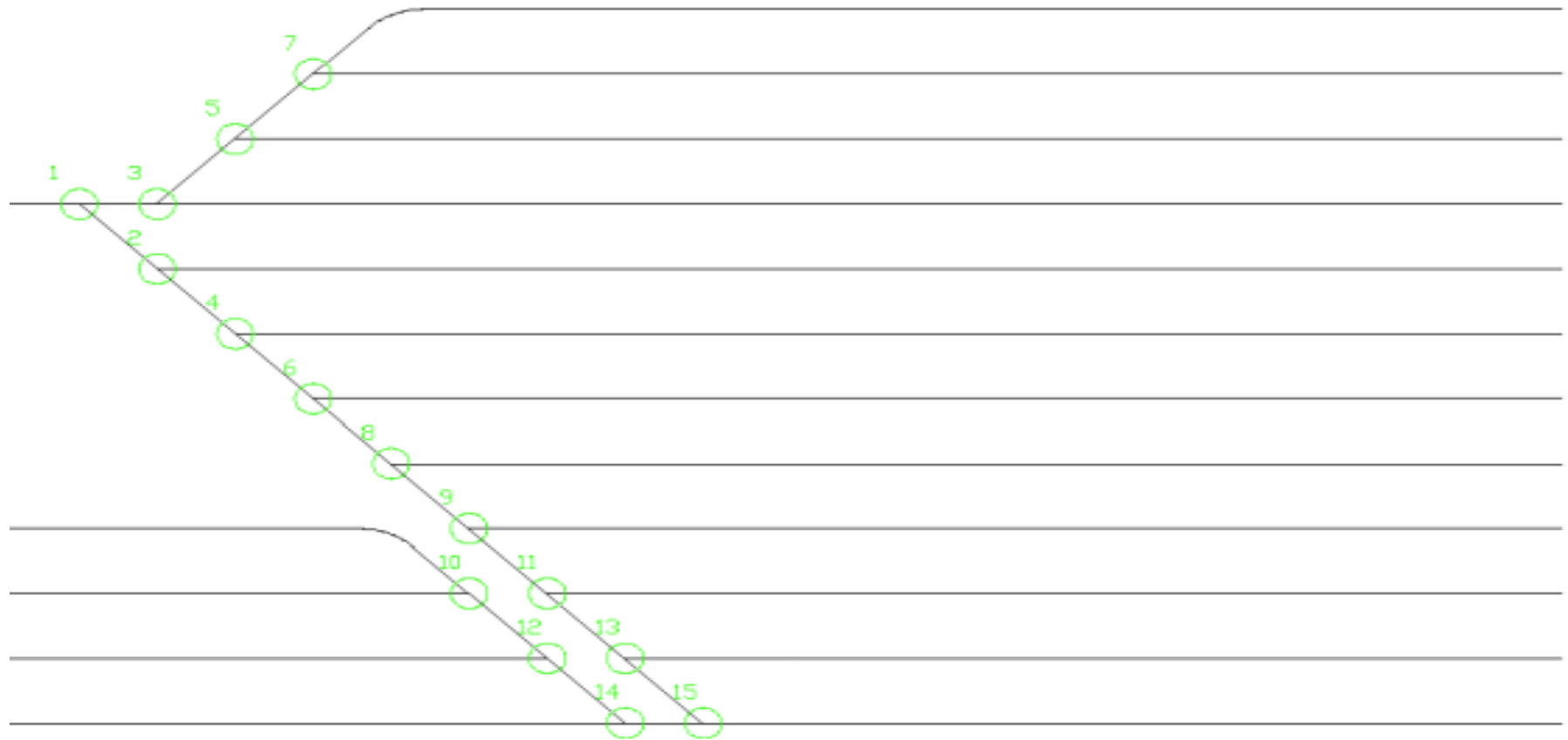


- Simple box with a few cross braces.
- Top covered with homasote.
- Center of box is one inch lower than ends to prevent runaway cars.
- Height of box allows ample room for wiring and switch machines.

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Track Plan





Thank You

Now witness the
MEGA-DRAWER
for your self!!

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Links

- <http://www.b-line.com/product/Strut/index.asp>
- <http://www.allelectronics.com/>
- www.grainger.com/
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