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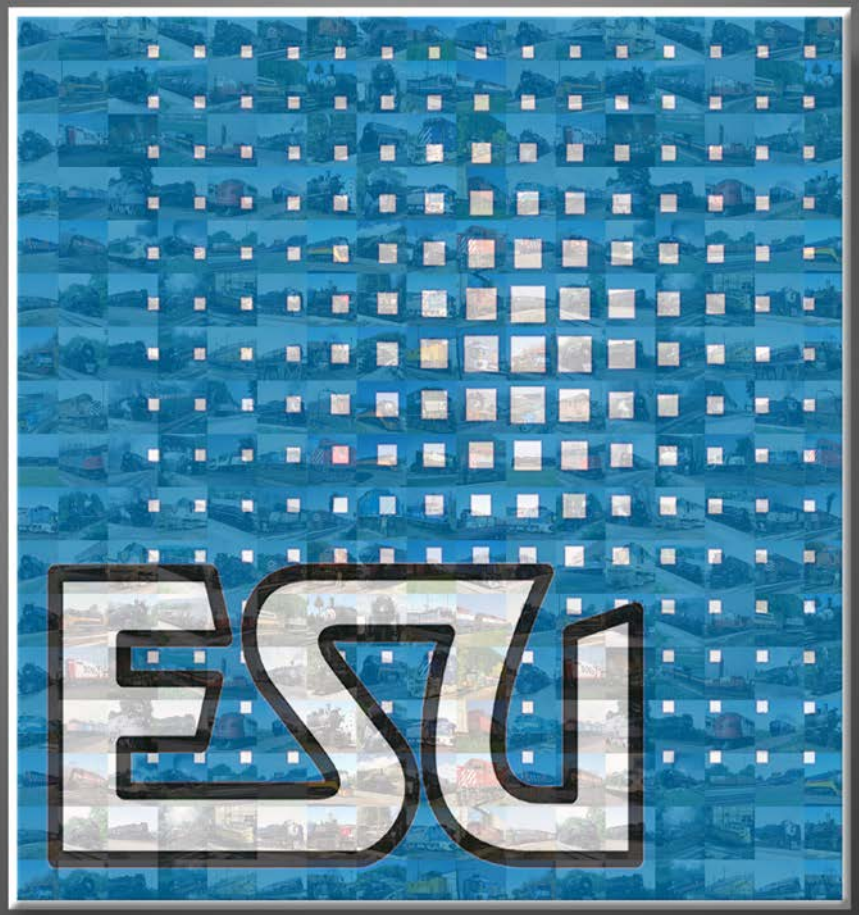

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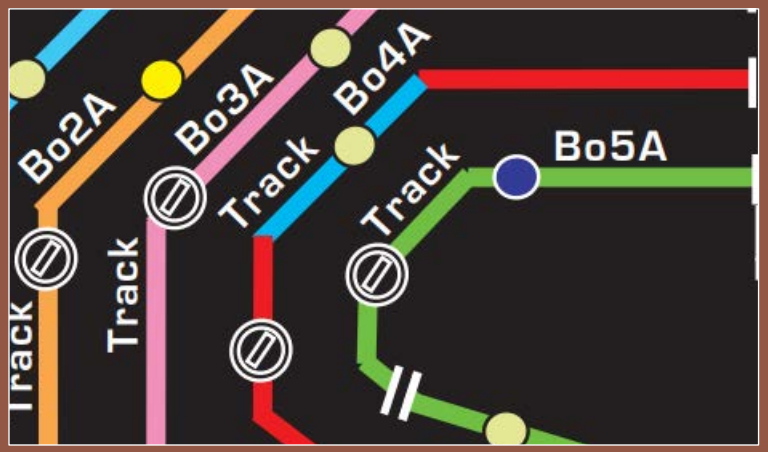
Automatic staging stopping blocks



Model Railroad Hobbyist | November 2021

GREG CIURPITA SHOWS A SOLUTION FOR STOPPING TRAINS RELIABLY IN HIDDEN STAGING AREAS...

VIEW READER COMMENTS

MANY MODELERS RELY ON BLOCK DETECTION TO DETERMINE THAT A train has completely entered a staging block. This can be challenging with hidden staging, momentum, and excessive speed.

One approach is an automatic stopping block at the end of the staging block that can be unpowered and automatically stop a train.

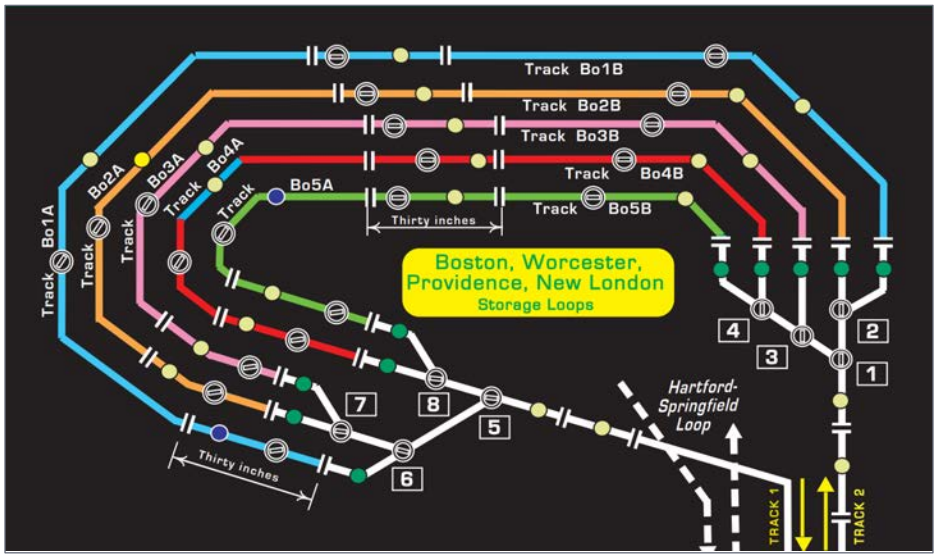
Automatic stopping blocks | 2

A 30-inch stop block should suffice for most HO-scale trains, even if the locomotives have stay-alive capacitors.

Of course this isn't very sophisticated, and does require additional block detectors. It makes sense to use a little bit of circuitry to make operation a little more reliable, especially for a distracted operator. As a bonus, cutting off power will reduce idle power requirements and sound levels.

A separate panel switch routes power to each staging track block, allowing you to cut off power. I've been working on several staging loops with three to five tracks, each long enough for two trains.

If a staging block is ~18 ft, six sections of flex track, the last section of flex track can be left isolated (gapped). You can isolate



1. As you follow the train from Track 2 into Staging 1(blue) from the bottom right, the train goes through two entrance blocks and an interlocking block with turnouts. It then enters Bo1B (Boston) block and a 30” stop block, and on to the Bo1A block and stop block before exiting through the interlocking and back to Track 1.

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the last segment as a stop block. The panel diagram shows a five-track staging loop. In the diagram, each staging loop stores two trains. Each loop is divided in half, and each half divided into 2 blocks – two main blocks and two stopping blocks [1].

Each of the staging blocks, including the main and stopping blocks, have block detectors, panel LEDs and switches to cut off power. All the switches have a 1K resistor wired across them to limit power but low enough to allow sufficient current for the detectors to indicate occupancy even when the switch is off.

Consider a train intended to stop in staging track block Bo1B with a train occupying block Bo1A. Operation is as follows:

- Turn on the Bo1B main block and verify the Bo1B stopping block is off.
- Train enters the staging area at a reasonably slow speed and proceeds through the entrance blocks.
- The main Bo1B block detector should indicate when the train has entered the main block
- The stop block detector will indicate when the train enters the stop block and the train should come to a stop.
- Turn off the switch for the main staging block, especially if there is an engine consist.
- Set the throttle to zero. With the stopping block unpowered, there's no hurry.

Exiting staging from Bo1A is as you would expect:

- Turn on the switches for both the main and stopping blocks.
- Throttle the train up to take it out of staging.
- Turn off the stopping block, leaving the main block on for the next train entering staging.

If there is a train in the second staging block (Bo1B), it needs to be moved up:

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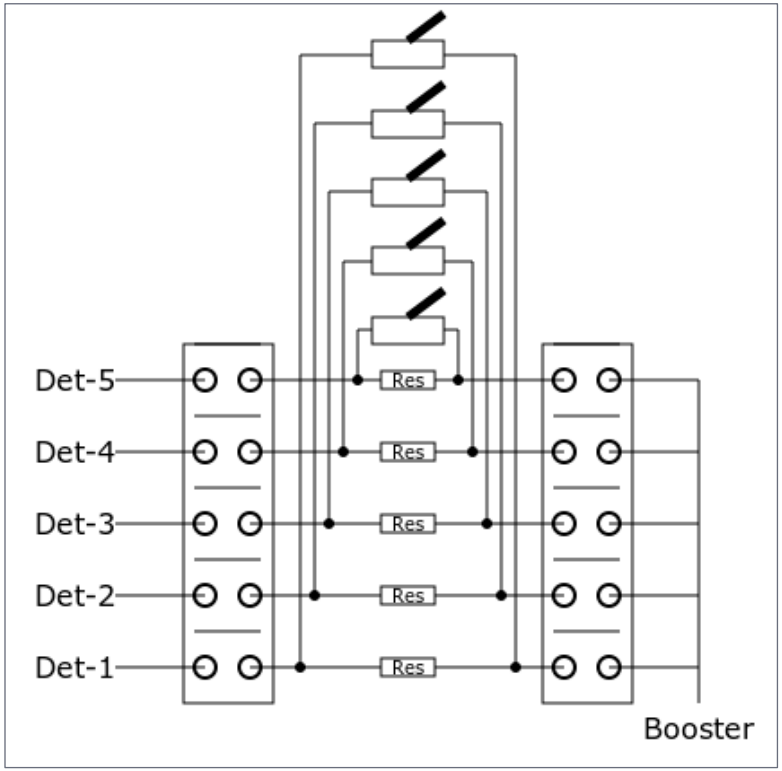
- Turn on the Bo1A main and both Bo1B blocks and verify the Bo1A stop block is off.
- Throttle up to move the train
- The train should stop as it reaches the Bo1A stop block.
- Turn off both Bo1A blocks and the Bo1B stopping block.
- Set the throttle to zero.

With alert operators, this is unnecessary. A short block at the end of staging makes it easier to know when a train is near the end of the staging block, even without the power switch.



2. Panel switch wiring.

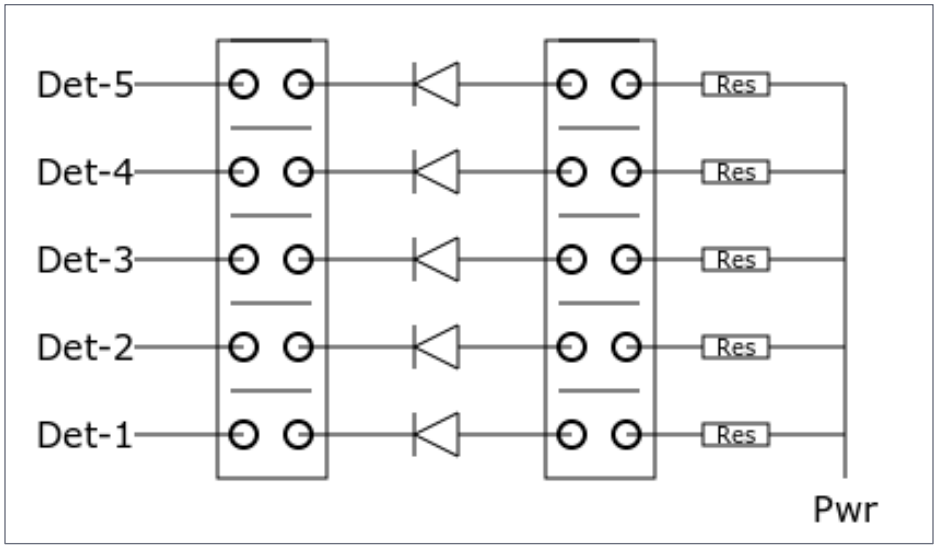
PANEL WIRING

There are several approaches for wiring the panel to minimize confusion. The diagram illustrates the wiring for five tracks, conceivably main blocks Bo1A-Bo5A. You can use larger barrier strips as needed [2].

This panel has a pair of barrier strips for each panel switch. All the terminals along one edge of one barrier strip are wired to the booster.

Each terminal of the second barrier strip is wired to a block detector. A resistor is wired between the pair of barrier strips and each panel switch is wired in parallel with the resistor to the same barrier strip terminals [2].

This approach with resistors wired between barrier strips avoids soldering a resistor across each switch. Bringing the



3. Panel LED wiring.

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booster connection into the panel also minimizes wiring by requiring only one wire from the panel to each detector.

Additional wires are needed from the detector to drive the panel LEDs [3].

These can also be similarly wired to a pair of barrier strips with either ground or power (e.g. 5V) replacing the "Booster" connection.

An LED replaces the resistor between the barrier strips. A resistor could be between the common ground/power and each barrier strip terminal instead, avoiding the need to solder resistors in series with each LED. ☑

GREG CIURPITA

Model railroading motivated Greg to become an electrical engineer, and is a retired embedded firmware developer using those soldering skills helping others build and maintain their layouts. ■

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