City Streets Modifying Control Tricks

.A Simple, DEPENDABLE Method of Block Control on 'Streets that permits more than one vehicle to be run on the same loop even if they run at different speeds

April 23, 2015 4:22 PM

This long post outlines a simple, super-dependable way of controlling power to isolated blocks on a 'Streets loop so that two or more vehicles can run on the loop at the same time, spaced out around the loop, without one vehicle ever catching up to another, even if they run at different speeds. Total cost is a bit less than a single 'Streets vehicle costs.

THE PROBLEM I AM SOLVING: Any two 'Streets vehicles will run at slightly different speeds. If put on the same loop, the faster will eventually catch the other and they will run front bumper to rear bumper from then on. Even identical models, such as two WBB sedans, will run at slightly different speeds, so this will happen eventually It can get tedious, picking up one car and putting it down in front of the other to separate them. Really tedious.

THE PROBLEM THAT GETS IN THE WAY: Traditionally, with toy trains, isolated-rail block control has been used to do this for decades (at least five decades by me, anyway), but that does not work effectively or dependably with 'Streets. In that traditional approach, if you wanted to run two trains on a single loop, with them never meeting even if they ran at different speeds, you would isolate one outer rail of a section of track. When a train passed over this section (drawing its power from the one still-powered outer rail) its wheels would connect the powered-outer rail to the isolated outer rail to complete a circuit. That circuit would then route power to activate a normally closed relay that opened the flow of power to a section of track behind this isolated rail section. Any locomotive on that section, catching up with the first train, would be "automatically" halted until the end of the first train has passed that isolated-rail section. Set up with the right spacing, this guarantees the faster locomotive never catches the slower.

While this method of "tailgating control" works with trains, it does not work well on 'Streets, as anyone who has tried knows. Trains have a lot of wheels to make electrical contact with the rails. 'Streets vehicles have just four (three, if you discount the traction tire). 'Streets wheels are smaller, too, which seems to make some different in and of itself. Finally, locomotives weigh a lot, which pushes the wheels down firmly on the rails for good contact. 'Streets vehicles weigh much less, between just six to thirteen ounces, less than most rolling stock, and far less than any loco. As a result, 'Streets vehicles run into two problems when you try to set them up with this type of block control:

- The vehicles often do not run smoothly over the road section with one outer rail isolated (i.e., not providing them power). This is particularly the case if the traction tire happens to be on the side with the power rail. They stall or stutter.

- The vehicles often do not cleanly close the circuit - they just do not provide sufficient connectivity from that powered to that isolated rail to complete the circuit.

At best, it "sort of works."

There will be a video showing it working further below, but first, some slides on details and showing you what you will be looking at in the video.

The equipment - the single thing you have to buy, which you do not have to modify but merely hook up, is a particular IR sensor beam device. I got mine for less than $48 from Amazon.

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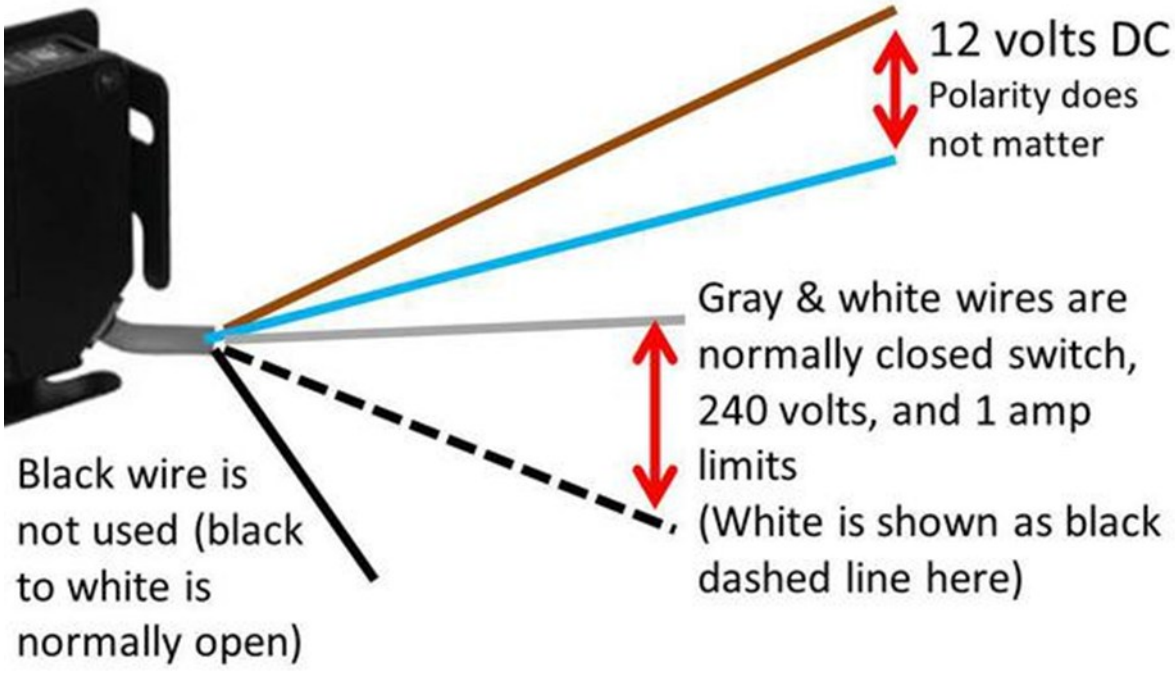
All of its guts are in one unit. It sends and receives abeam that is invisible to me - I assume it is IR. It bounces it off a small mirror made of rectangular facets so that it reflects the beam back to its source even if not aimed exactly at it.



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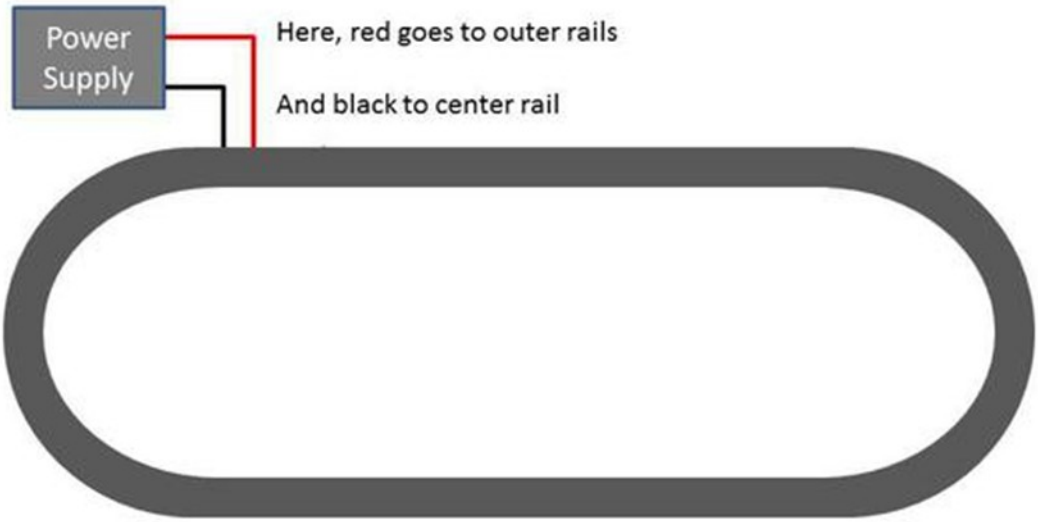
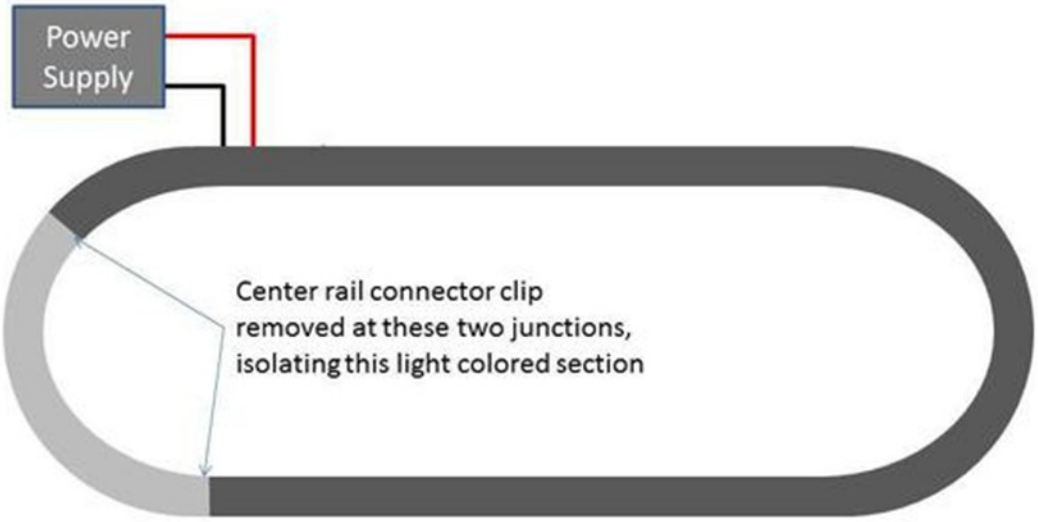


I pulled the center connectors at two junctions to isolate the block of road shown in lighter gray.



I set up the Seco-Larm unit so that it sends its beam down one straight side of the loop. The beam is narrow and it takes some adjustment but it has small LED's on it that indicate when it is seeing the beam, so it takes only a minute to get it fine-tuned. I have the beam running right above the road surface. I was worried that the beam might spread out over the more than five feet of distance in travels, so wide that a sedan or van would not fully block it, but this does not happen: in fact it works out to eight feet and maybe more (I haven't tried more). I then run a wire from the center rail of the powered portion of the road loop to the center rail of the unpowered loop, through that normally closed relay. When a vehicle is on the straight section and interrupts the beam, the result is power to the isolated section (light gray curve on the left) is shut off. Any vehicle follow close behind is halted until the vehicle gets to the end of the straight.

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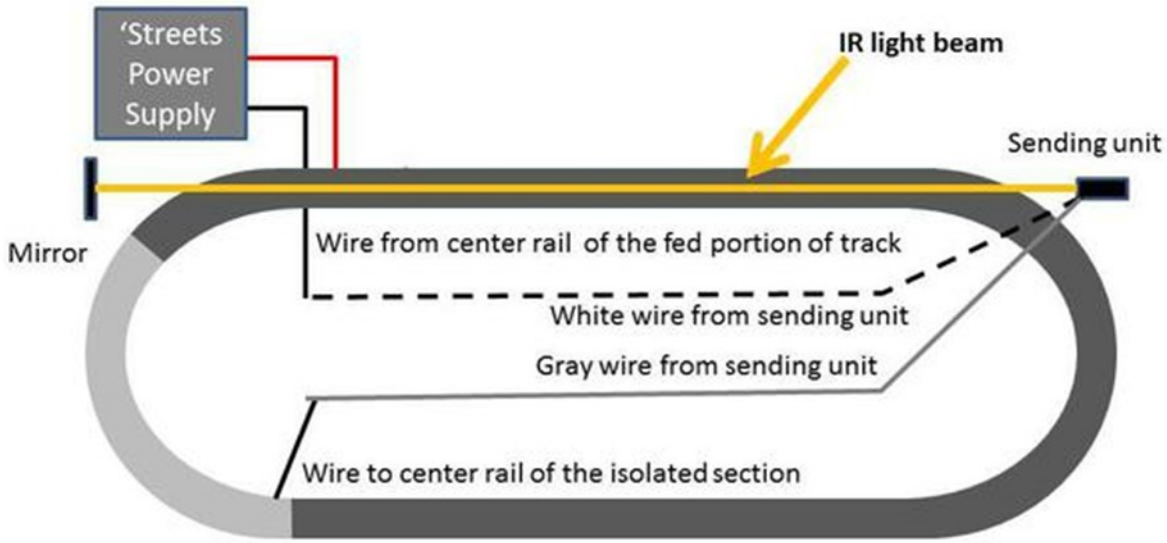

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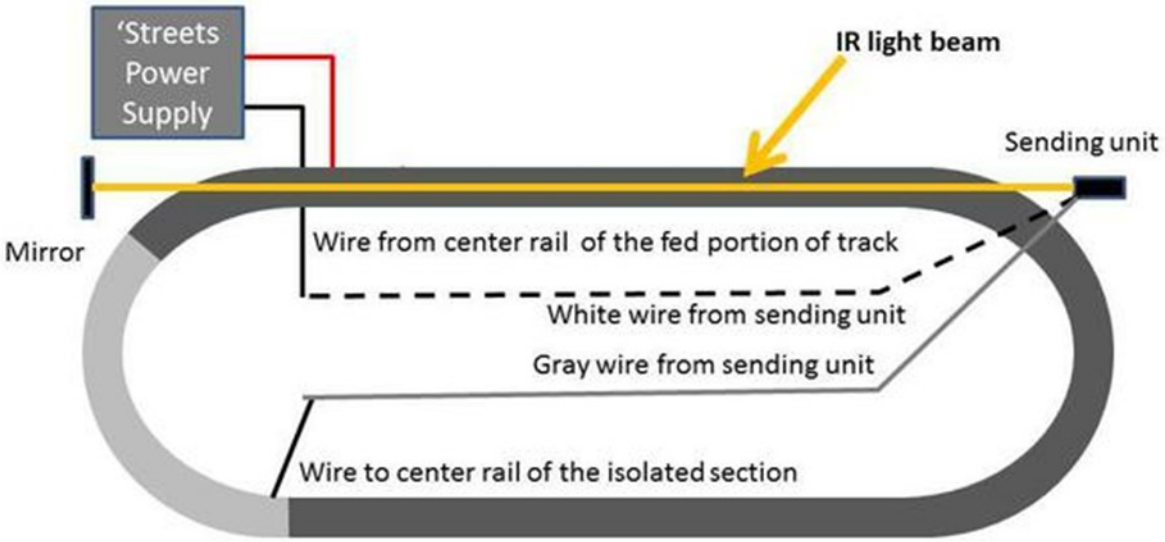

Here is a still photo of the test setup

I'm using this big C-clamp just to hold the sensor unit steady.

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The mirror is screwed to a block of wood. The wood-framed battery pack is my workbench pure-DC power supply and I am using it to power the road, providing 10.5 volts to it. The small black power supply is feeding 12.5 volts to the sensor. The mess of alligator clips implement the wiring shown in the diagrams above.

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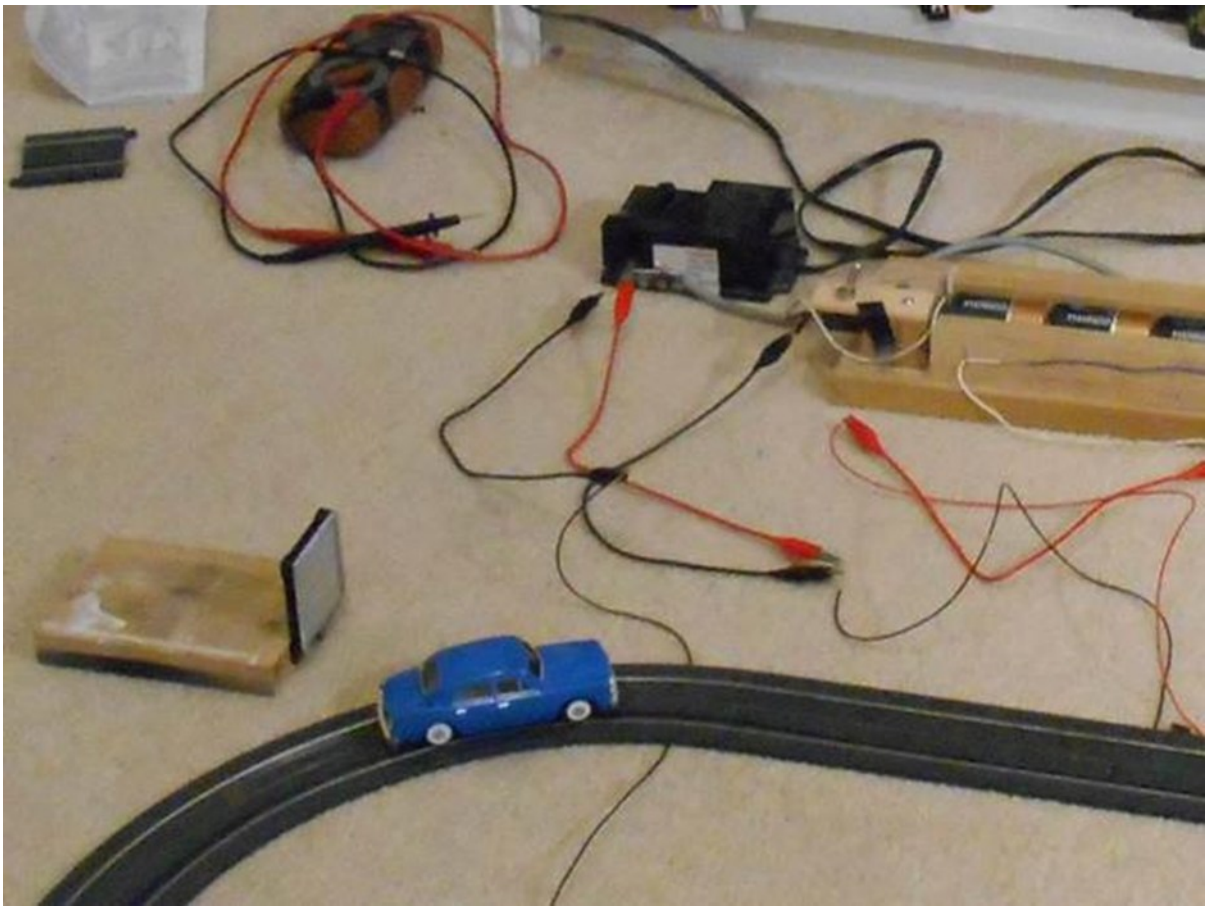

In the video below, the Seco-Larm is at first turned off, and its relay closed all the time. The white van is slightly faster than the blue sedan, and catches it and then stays on its read bumper. Then you see me reach over and turn on the power to the IR Seco-Larm. The rest is self-explanatory.
"If no one has ever done it that way, it might be fun to try."
Book: 'Streets for O-Gauge Model Railroads now available from Amazon.com or download free from my website: www.hleewillis.com
April 23, 2015 4:31 PM

That great Lee. Can you wire a traffic light for stop and go into the configuration?
April 23, 2015 4:52 PM

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Yes, you could connect the red of a stop light to the normally open output to power it went the isolated section is "stop' and the green to the one powering the track.

By the way, the method will run more than two vehicles on a loop. As set up above it spaced out two of them nearly equally around the loop, because it spaced them a full straightaway apart. In the video below, I moved the sensor and mirror a bit sideways, so the beam does not go right down the middle of the track, but crosses it at a slight angle, positioned so that a vehicle interrupts it only for the first half of the straightaway length. Now it spaces three cars out around the loop. The maroon sedan is much the slower vehicle, by the way.
"If no one as ever done it that way, it might be fun to try."
April 23, 2015 5:21 PM

Terrific. I see where this can be useful for replacing relays in a conventional controlled layout quite easily.
As I was scrolling down, I was sure I would get to the video where you have bled some DC over into the control section to slow down the faster car instead of stopping it completely, for smoother operation.
I will assume this is what you are doing right now if we don't get a quick response!
April 23, 2015 5:55 PM

Yes, I want to do that eventually - I'm thinking of never slowing the cars entirely, but I'm still thinking about some details there. Also, for this thread, a demonstration of how well it works when it shuts down cars entirely is easier to show here, to make the point of how effective it is. I am very pleased with it.
This sensor can be used to do more than just this. I am also playing with having it operate switches and perhaps some other road accessories.
"If no one as ever done it that way, it might be fun to try."
April 23, 2015 7:40 PM

Cool! Lot's of potential there for sure. Collision avoidance at a 4 way intersection with all the associated signal lighting. One thought...have you ever integrated Streets with the 313 bascule bridge, Lee?
April 24, 2015 1:17 PM

Originally Posted by frizzinbee:
Dustin - I am updating the first 'Streets book now with a new chapter on the turnouts, and wiring tricks and such like this and similar block control, along with differential voltage feeds (sending different voltages to different parts of a loop on purpose) and some other wiring things. It should be out hopefully by August or September, but who knows.