TROLLEY CAR CROSSING of MAIN RAILROAD LINE

PROBLEM: Trolley line crosses railroad line, using a diamond crossing, and it is desired that the trolley line be protected so that when a train is approaching the crossing, the trolley cannot enter, but can continue on.

DISCUSSION: If insulated 'stop' sections are provided on the trolley line on either side of the crossing, a DALLEE ELECTRONICS TRAK-DT (Item 365) can be used to provide the protection. If the DC track power in the 'stop' sections is made directional when the relay on the TRAK-DT activates, then the trolley can run away from the crossing, but must stop going toward the crossing.

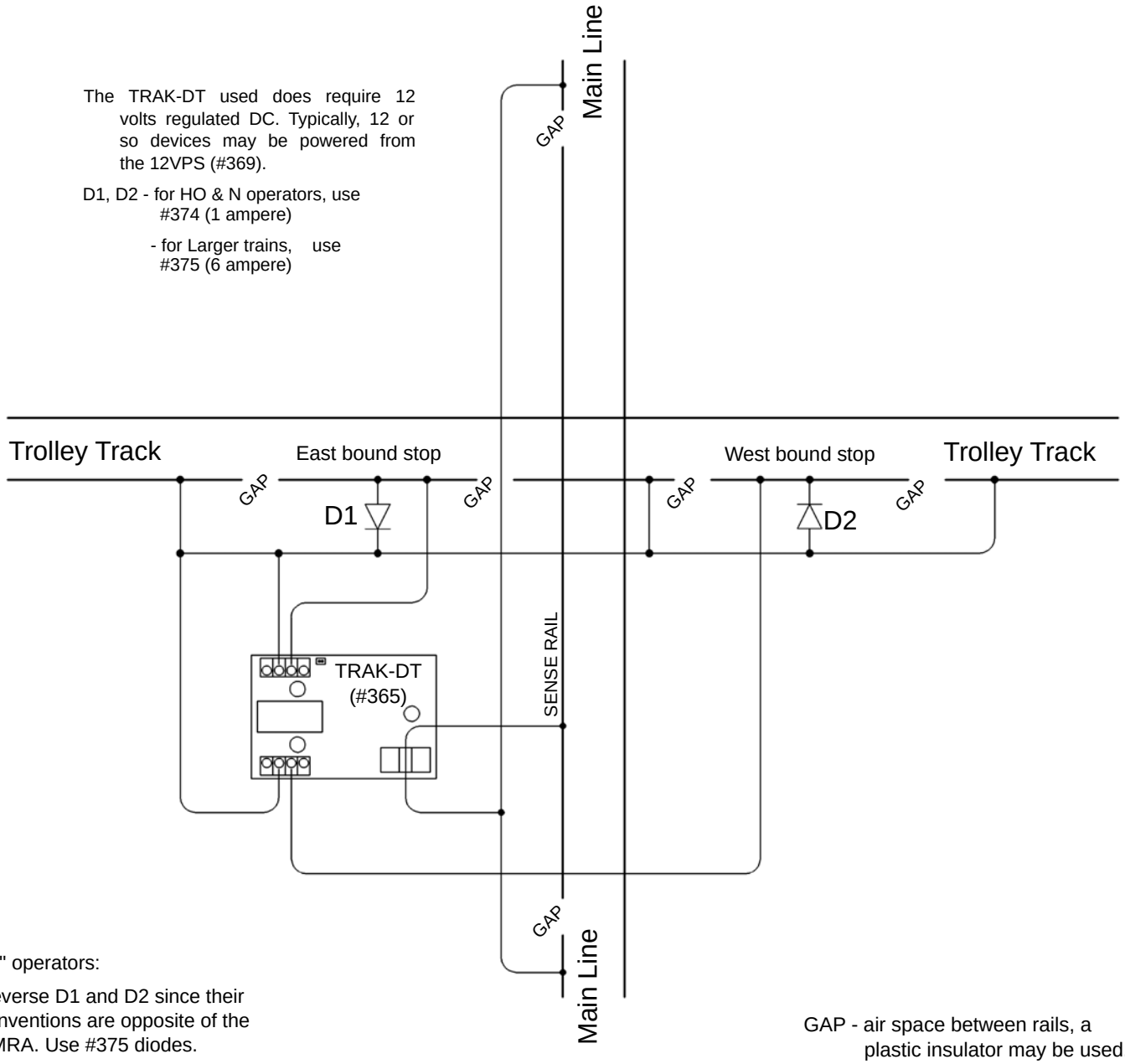
SOLUTION: One rail of the railroad line must be insulated, for a reasonable distance, on either side of the crossing and the wire to this insulated rail must be routed through the detection coil of the TRAK-DT. The length of this rail determines how long the crossing is to be protected. When a locomotive or lighted car on the train is in this insulated rail section, the TRAK-DT will activate its relay. The insulated rail should be longer than a normal train length so that the crossing is fully protected for the total passing of the train. If you desire protection without lighted cars / current sense, the OPTO-DT can be substituted for the TRAK-DT. The optics, of coarse, cannot be aligned through the crossing point or you will detect the trolley car when it passes.

The two 'stop' sections of the trolley line are wired directly to the normally closed terminal of the TRAK-DT relay. DC track power to this same rail is connected to the running sections and to the common terminal of the TRAK-DT relay. DC track power for this rail is also connected to the two 'stop' sections through diodes. When the TRAK-DT relay is relaxed, track power goes directly from the common terminal to the normally closed terminal, thence to the 'stop' section, bypassing the diodes. When a train activates the TRAK-DT, the relay breaks the direct connection to the 'stop' sections putting the diodes in the circuit, therefore the 'stop' sections become directional, allowing the trolley to only run away from the crossing.

The TRAK-DT used does require 12 volts regulated DC. Typically, 12 or so devices may be powered from the 12VPS (#369).

D1, D2 - for HO & N operators, use #374 (1 ampere)

- for Larger trains, use #375 (6 ampere)



"G" operators:

Reverse D1 and D2 since their conventions are opposite of the NMRA. Use #375 diodes.

GAP - air space between rails, a plastic insulator may be used.

DIAMOND CROSSING

PROBLEM: A track loop, done as a figure eight, requires a diamond crossing in the track. If several trains are in operation, it is possible that collisions could occur at the diamond crossing and it is desirable to protect against such events.

DISCUSSION: If 'stop' sections in the approach rails to the crossing are provided, it is possible to have the first train, entering the crossing area, interrupt power to the 'stop' sections of the other track. As a further safety precaution, it is suggested that the crossing be wired so that it is only powered for the route in use. With no train in the crossing area, the diamond would be electrically dead. The stop sections should extend beyond the sense sections (as shown below) so that the train comes to rest before the sense sections. This way if one train is in the crossing the other cannot trip a stalemate condition. The sense section should be long enough to detect one train. You can also use the OPTO-DT in place of the TRAK-DT to sense all of the unlighted cars.

SOLUTION #1: A DALLEE ELECTRONICS TRAK-DT (ITEM 365) can be used to detect the presence of a train entering the track, approaching the crossing. A length of rail, on each track, must be insulated, for the full distance through the crossing and the wire feeding power to this insulated rail is passed through the detection coil of the TRAK-DT. As a minimum, this insulated rail should extend one locomotive length on either side of the crossing. It would be best, if the insulated rail exceeded the length of a normal train, which would then provide detection for the full train. When the TRAK-DT activates, the relay interrupts power to the 'stop' sections of the other track. An additional RELAY BOARD (Item 555) connects the diamond itself to the same power as connected to the approach track. A duplicate set of equipment consisting of a TRAK-DT and a RELAY BOARD is then used for the other track.

SOLUTION 2: With several trains operational, the figure eight should be done as a fully automated track loop. Since the automation requires signal blocks anyway, it is simple to establish the block boundaries such that signals would be located just prior to the crossing. A train entering the block containing the crossing would not only set the signal behind the train to RED, but would also force the signal on the other approach to the crossing to RED. The first train to enter the crossing area would effectively stop an additional train from entering until the crossing was clear. As a further safety feature, the diamond crossing should be wired so that it is only powered for the crossing train. For specific information as to the wiring of the full automation refer to instructions covering either two or three aspect signals and automation.