AUTOMATIC STAGING TRACKS continued

Additional runs can be added by adding an expansion relay to the TRAK-DTL to illuminate a ballast lamp activating a second TRAK-DTL when the relay is relaxed. Each additional expansion relay, ballast lamp and TRAK-DTL will add two runs around the loop.

As an example, if it is desired to have one train make four circuits of the loop for each circuit by the other train, two TRAK-DTL's are needed. If either TRAK-DTL relay is "on" the stop on track "B" is disconnected AND the stop on track "A" is "on" so Train "A" will continue running.

Train "B" makes its run, trips "A" and stops.

Train "A" starts, trips TRAK-DTL #1; therefore "B" can not go and Train "A" continues for its second run.

Train "A" now relaxes TRAK-DTL #1, illuminating ballast lamp to activate TRAK-DTL #2; therefore "B" can not go and Train "A" continues for its third run.

Train "A" again trips TRAK-DTL #1 turning "off" ballast lamp. Both TRAK-DTL relays are activated so "B" again cn not go and Train "A" continues for its fourth run.

Train "A" now relaxes TRAK-DTL #1, illuminating ballast lamp which now relaxes TRAK-DTL #2. With both TRAK-DTL's relaxed staging is ready so Train "A" will trip "B" and stop.
On initialization (power up) of this automation Train "A" will run as TRAK-DTL #2 will begin "on".

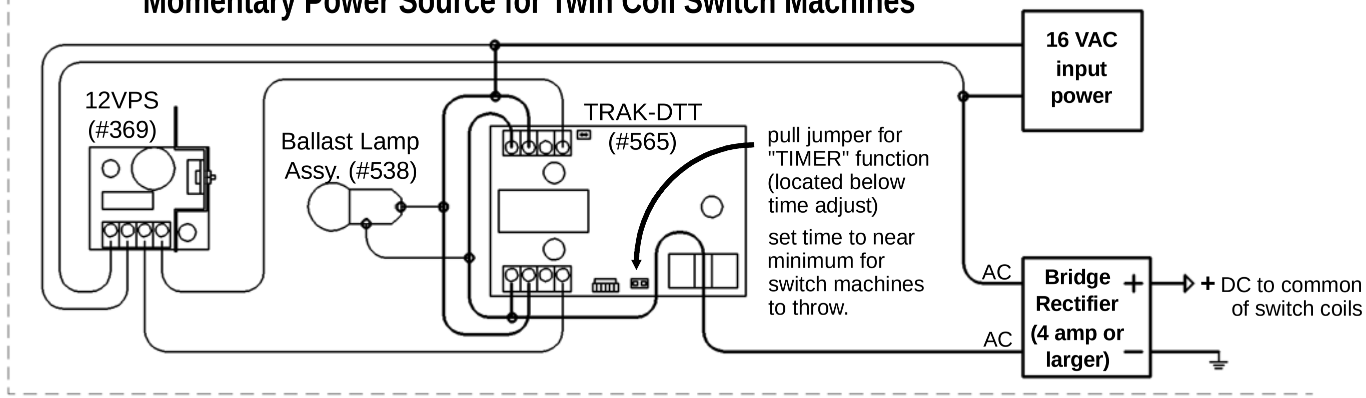
ADDITIONAL ALTERNATIVES:
To avoid having the second or later units in a multi-unit set spinning wheels trying to push a 'dead' engine, rather than use a stop section, we should cut power to the entire siding track once the train is beyond the clearance points. If the turnouts are of the power routing type, where only the aligned track gets power, it is possible to use a TRAK-DTT to do a timed stop when the train reaches a clearance point and to realign the turnouts during the stop. When power returns, only the train on the now aligned track will run. Each siding will need a trip section at the departure end so that the train will stop prior to the clearance point of the siding. This trip section will activate the TRAK-DTT for the timed stop and must also activate what ever is used to realign the turnouts.

SWITCH MACHINE POWER SUPPLY

Twin coil switch machines require a fairly heavy current flow to move the actuator rod and this flow must be momentary to prevent coil burnout. Switching devices such as toggles, push buttons or even relays, once the contacts are tightly closed, will carry considerably more current than they are able to switch. The current sensing characteristic and the momentary setting of the TRAK-DTT allow compensation for these conditions.
If push buttons or momentary toggles are used to control switch machines we can insert a light bulb and a TRAK-DTT between the power supply and the switch machines. The result is a true momentary action and elimination of contact arcing which sometimes occurs with capacitive discharge systems. At the instant of contact the light bulb illuminates causing a current flow which activates the relay of the TRAK-DTT. Current now flows through the closed contacts to the coils of the switch machine but only as long as the relay is activated. With the TRAK-DTT set at minimum time frame we are sure of a momentary activation regardless of the duration of the switch contact.
A single insertion of a TRAK-DTT with ballast lamp between the switch motors and power supply could handle an entire layout. Since there is a short delay needed between activations to allow the time function of the TRAK-DTT to reset it is suggested that the layout be divided into areas with a separate power supply and TRAK-DTT for each area.
An example of a TRAK-DTT being used to activate twin coil switch machines is shown in the drawing on page 25. Another drawing is shown on page 26. This also shows using how to use a diode matrix so that a single push button switch can throw many switch machines. If you choose to use the diode matrix system, automation can be accomplished by utilizing a TRAK-DT to automate each push button location. This is especially useful when approaching a switch thrown the wrong way. A block needs to be made for the sense section of each TRAK-DT used. Please remember that you must clear (remove/open) the switch a few seconds before another switch sequence can begin. On larger layouts the possibility of multiple switches throwing at the same time exists. Therefore, you would need to make zones where each momentary power sources for twin coil switch machines would exist. This way multiple demands could be met.

using diodes to control twin coil track switches

Momentary Power Source for Twin Coil Switch Machines

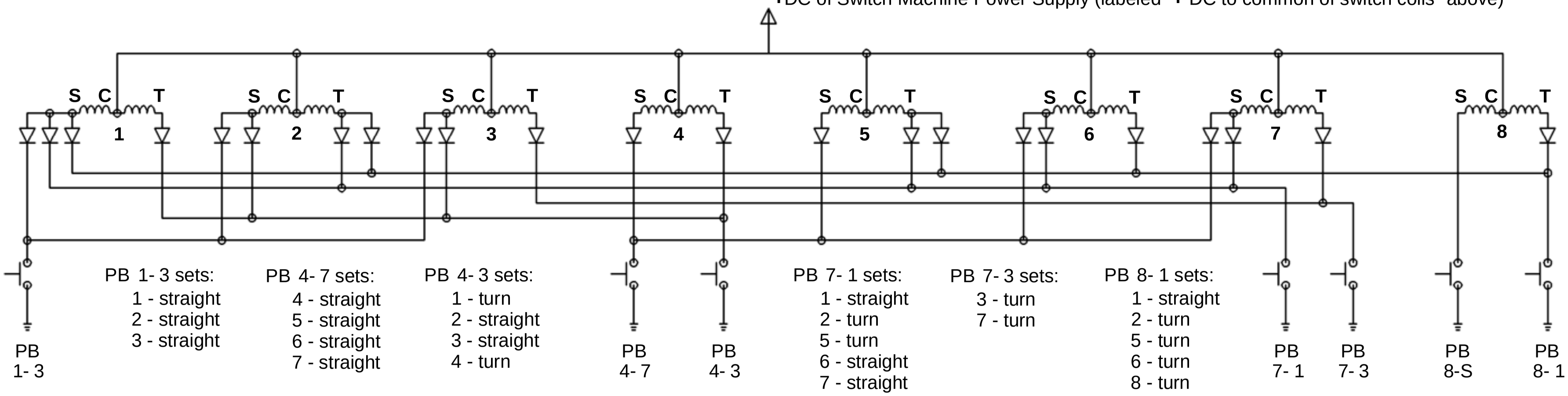


Push Button (PB) momentary (#618)

use 1 ampere for small coils, 6 ampere for larger coils (tinplate type sw mach)

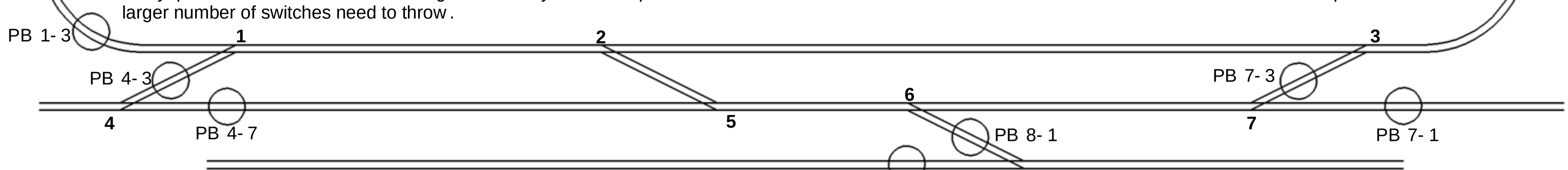
Switch Machine

S - straight coil
C - common
T - turn Coil



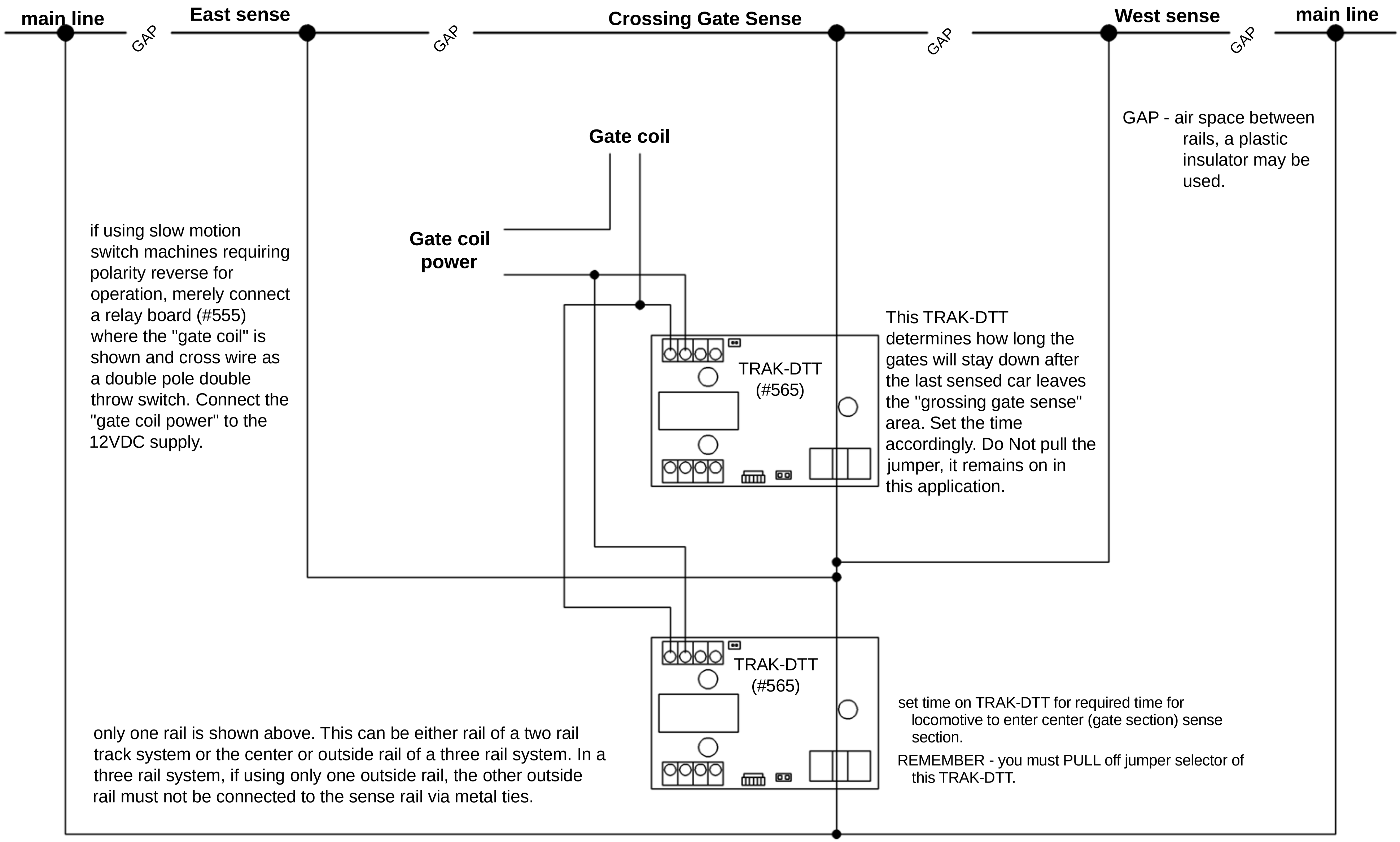
Typical Layout Line Diagram

Only some push buttons have been shown for possible routings on this layout. Many more routings can be done. As seen, when more than one switch machine coil has to be thrown at a time, a diode is necessary for proper power routing. This drawing has the push buttons labeled to represent the route set. You can either operate this diode ladder with a fixed DC voltage or use the momentary power source shown above. By using the momentary power source, switch arcing is brought to a minimum. This is due to the fact that when the PB switch is closed you are merely illuminating a light bulb. During the period that the switch contacts are closed, the TRAK-DTT closes it's relay contacts, sending the bulk of the current. Switch contacts can carry a much higher current than they can switch. We do not reccomend capacitor discharge units since they typically charge to a high voltage. This high voltage leaves many push button switches arced together. They also overpower the switch machines when a small number of switches throw and under power when a larger number of switches need to throw.

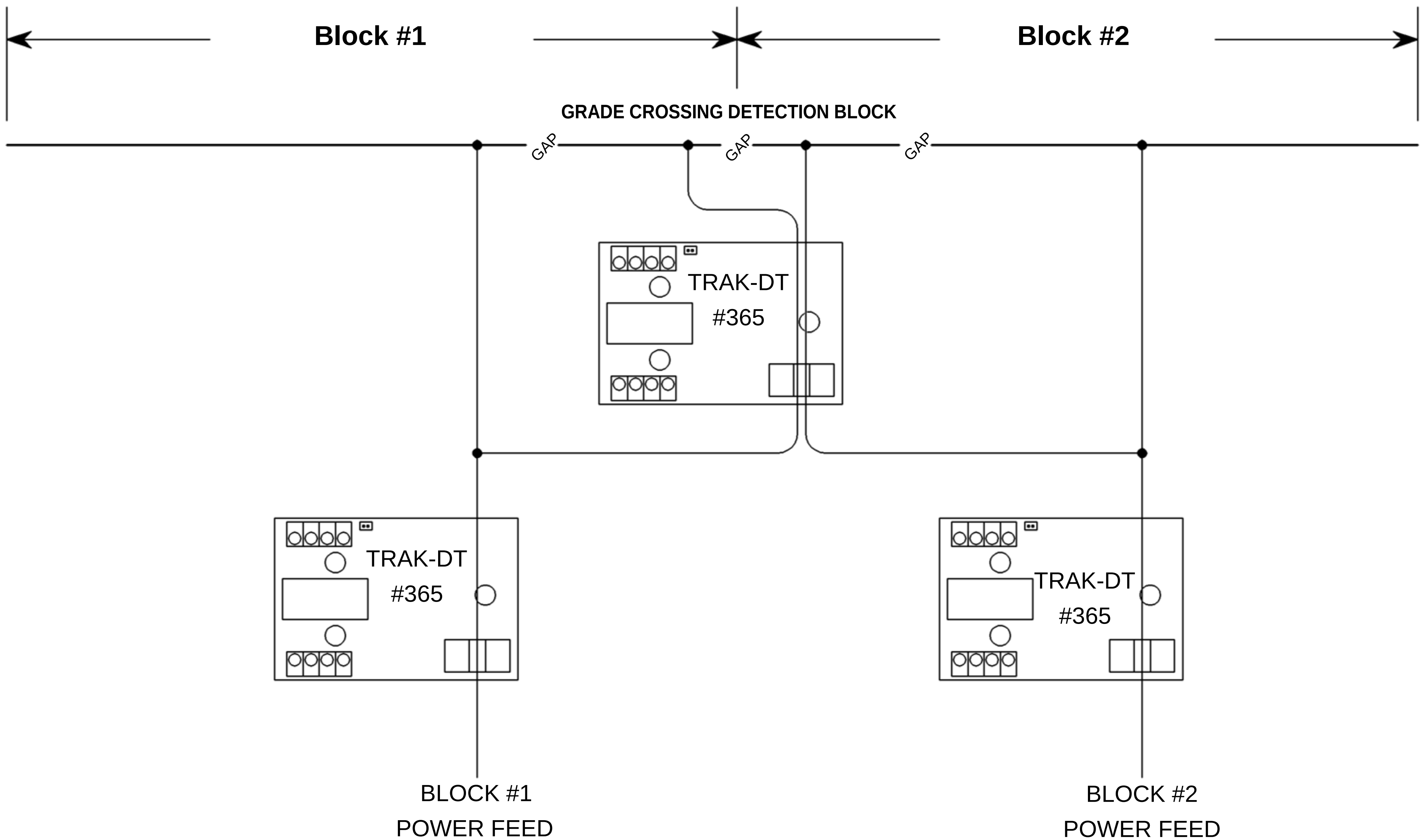


suggested locations for push buttons

Prototypical gate operation using two TRAK-DTT's



Grade Crossing Detection between two blocks using the TRAK-DT, Grade Crossing Controller, or a different TRAK-DT from the family of DT's.



By wiring this way, the signaling blocks are not affected when a grade crossing occurs between them.

AUTOMATIC TIMED STATION STOPS

STOP sections have power removed during timed stops. This section must contain the locomotive when coasting to a stop.

If using with sequence reverse units, the E-Unit must be locked in forward.

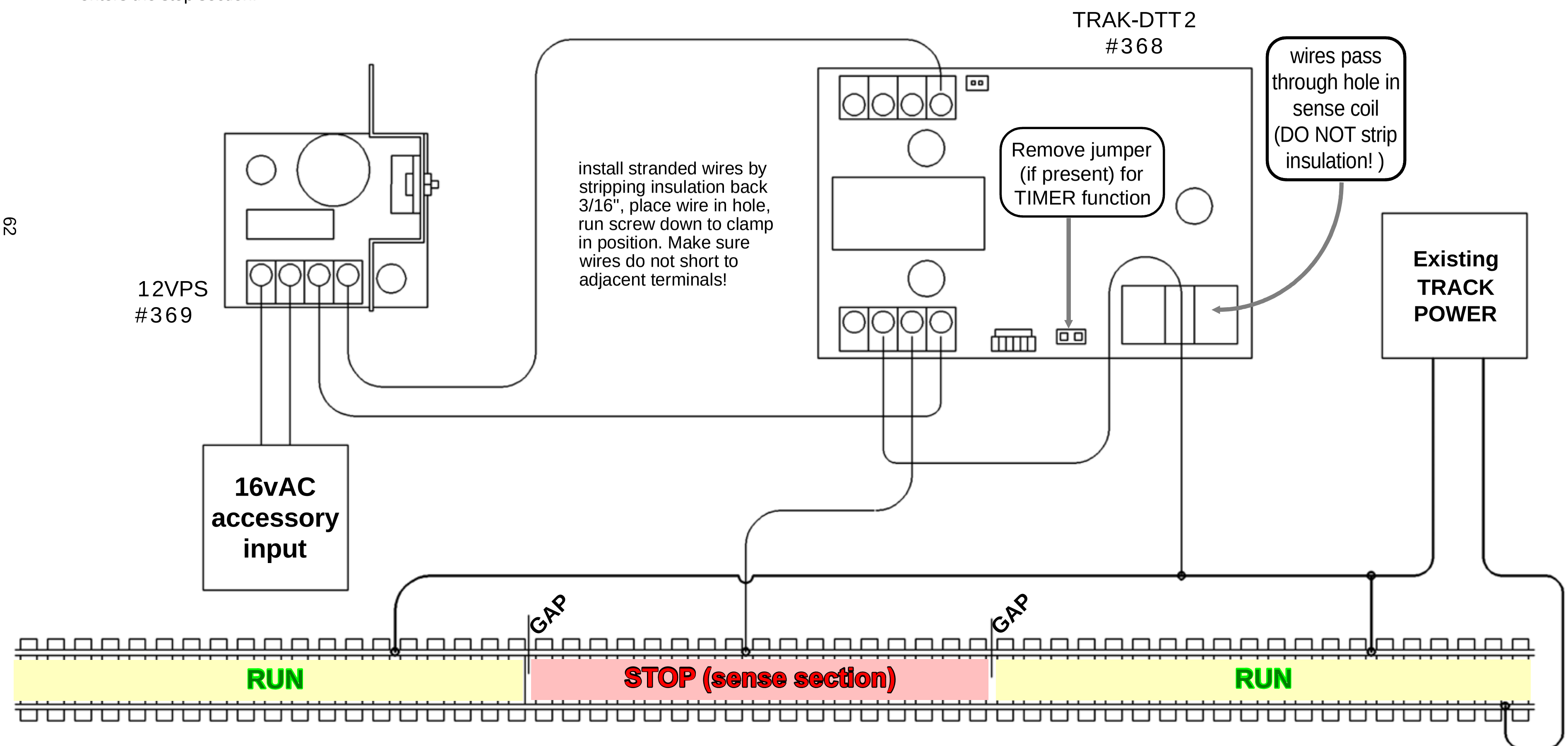
For MU operation (more than one locomotive), either jumper power between all units or use an expansion relay (#555) and wire it to make the stop section grow to encompass all of the locomotives when the first locomotive enters the STOP section of track. If operating the stop from either direction, this must be done to cover the MU for either direction.

3-Rail operators, use the center rail as the upper sense rail or both outer rails.

All operators: If using an illuminated caboose (3-rail operators if using the center rail), a re-trip of the Trak-DTT2 will occur making for improper operation since the Trak-DTT2 will most likely re-trip when the caboose enters the stop section and not remain there for the sequence to complete. This will result in the train stopping at the station every other pass. If this is not desired and you are running in the same direction, make the stop section long enough to encompass the locomotive and the caboose. The stop will occur when the locomotive enters the stop section.

More stops can be generated using the same TRAK-DTT2. Simply isolate another section as a "STOP" section and connect the two stop track power feeds together. The time at each stop will be the same. For differnt timing, you will have to utilize another TRAK-DTT2 connected to the same 12VPS.

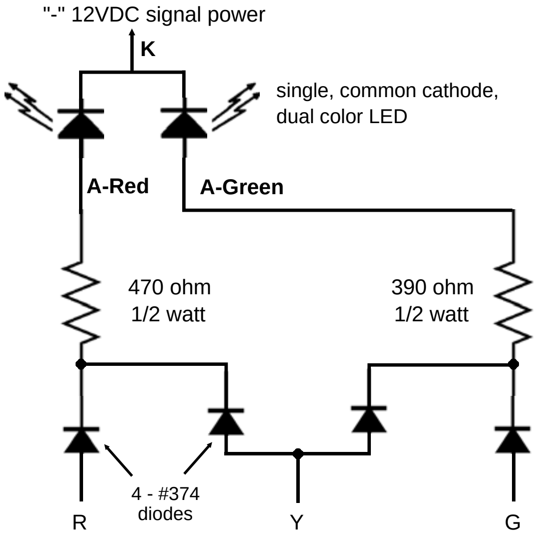
Another method of operation is to connect the "STOP / SENSE SECTION" through the SENSE COIL and not to the relay contacts as shown. Then connect the "C" and "N/C" terminals to disconnect the track power in the opposite rail. This will remove the power from the entire layout or area sectioned off with the opposite rail.



GAP - cut rail leaving an air gap or use plastic insulators

Dual Color LED applications

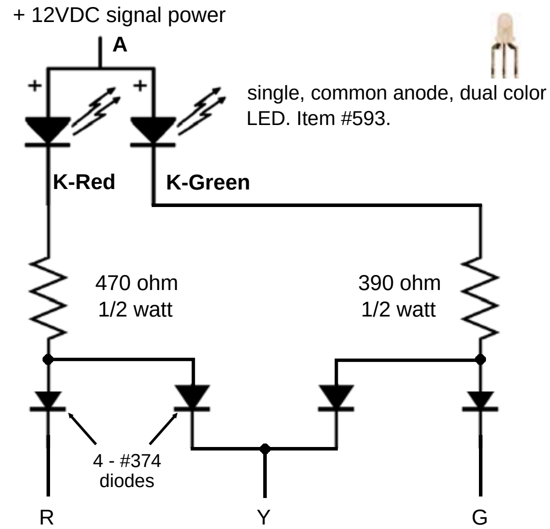
using common Cathode, three leaded dual color LED.



for wiring into three aspect signal diagrams use the upper line of "Signal Lamp Power" for the "-" 12VDC signal power and the lower line of "Signal Lamp Power" for the "+" of the 12VDC signal power. Although a single resistor could be used in the Anode lead, separate resistors were used to help balance the Yellow color when both the Red and Green LED's are activated. Since Red is the predominant color, it is necessary to lower the current in the Red LED and raise the current in the Green LED to balance the Yellow color. The resistor values shown are typical values.

A-Red = Anode of RED LED, A-Green = Anode of GREEN LED,
K = common cathode of the dual color LED.

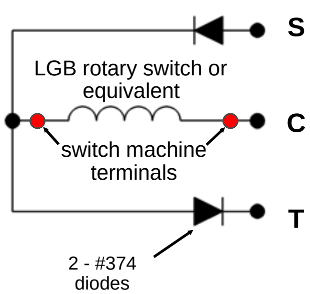
using common Anode, three leaded dual color LED.



for wiring into three aspect signal diagrams use the upper line of "Signal Lamp Power" for the +12VDC signal power and the lower line of "Signal Lamp Power" for the "-" of the 12VDC signal power. Although a single resistor could be used in the Anode lead, separate resistors were used to help balance the Yellow color when both the Red and Green LED's are activated. Since Red is the predominant color, it is necessary to lower the current in the Red LED and raise the current in the Green LED to balance the Yellow color. The resistor values shown are typical values.

K-Red = Cathode of RED LED, K-Green = Cathode of GREEN LED,
A = common Anode of the dual color LED, item #593.

Wiring Rotary Coil switches instead of twin coil.



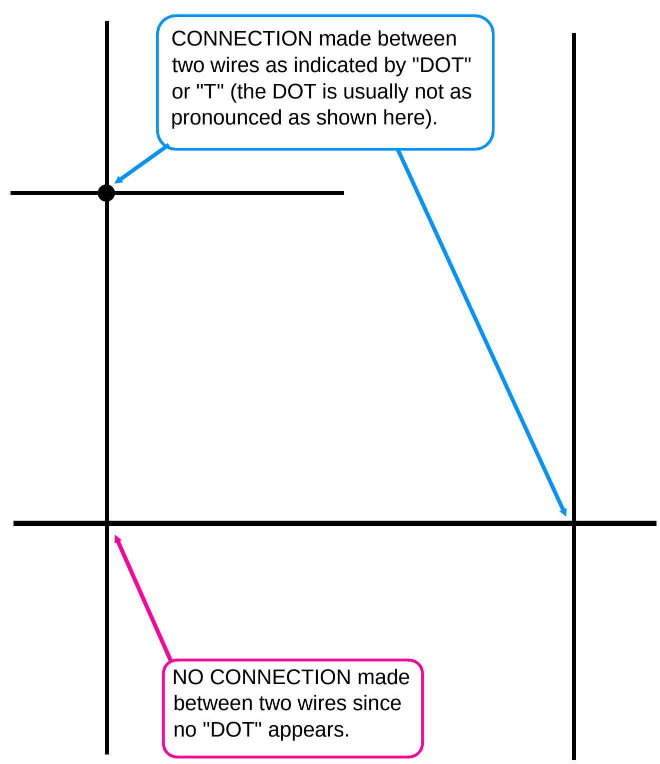
DALLEE Electronics standard wiring diagram connections.

In our drawings, switch power should be from a 16 vAC transformer (item 690). The TRAK-DTT (jumper removed) provides for momentary power to switches.

Wiring symbols are as follows:

- S - STRAIGHT
- T - TURN
- C - COMMON

Wiring Diagram conventions



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