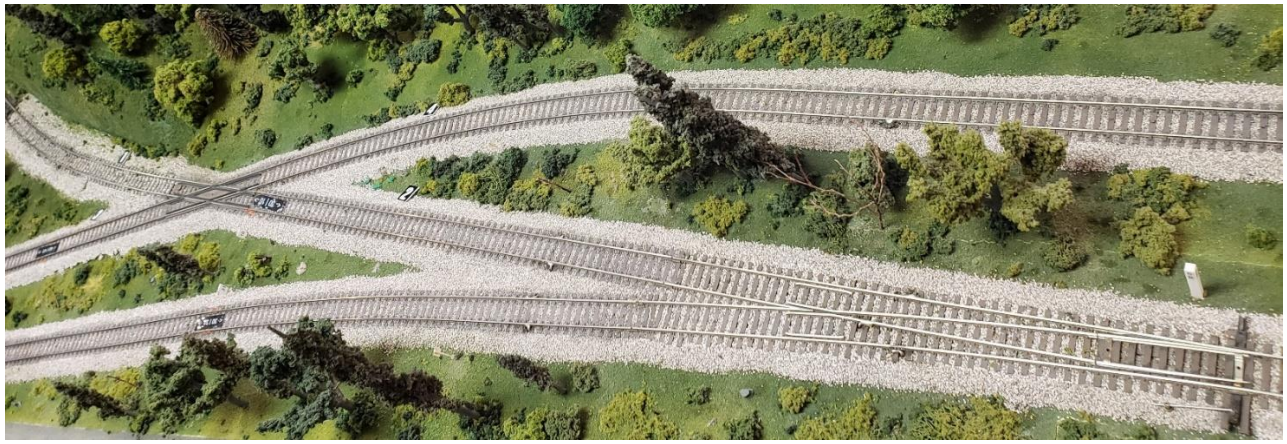
Controlling the Interlock and Switch 59 Approaches

Purpose: to prevent trains from running into each other at the interlock, and to prevent trains from running into Switch #59 when it is thrown against them.



#1. Photo showing Switch #59 (lower right) and the Interlock (upper left).

#2. Photo of the Interlock (center), the part of the 'Middle Loop' ('3' & '4') passing through it, and the part of the 'Outer Loop' ('5') approaching switch #59 (to the right, off the picture).

NOTE: Looking at photo #1, you can see that Switch #59 routes trains *coming from the right (off the picture)* to either:

- continue along the 'Outer Loop' (bottom track in the photo);
- **or** turn off the 'Outer Loop', pass through the Interlock, and on to the tunnel under 'Old Glen Carbon'.

It also allows traffic *coming from the left* to either:

- continue on the 'Outer Loop' (bottom track in the photo) through the switch;
- **or** pass through the interlock, and through the switch onto the 'Outer Loop'.

ALSO NOTE: When switch #59 shows 'Clear' on your throttle, traffic flows unimpeded through the switch, along the 'Outer Loop'. But if you look at the switch itself, you will see that it is physically in the 'Thrown' position. This is due to the way track was originally laid, and because that is the normal traffic route, along the 'Outer Loop'.

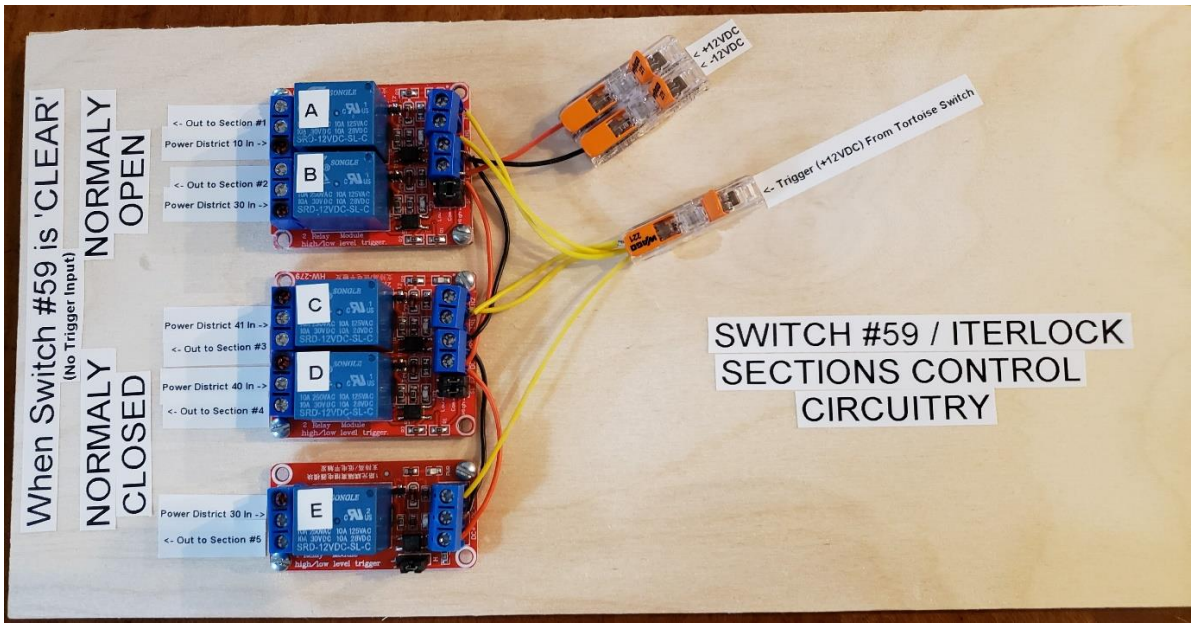
SO: When switch #59 is in its 'Clear' position:

- **we want** trains to be allowed to travel through the interlock, along the 'Middle Loop', indicated by '3' and '4' in photo #2, as well as along the 'Outer Loop' (bottom track in photo #2).
- AND **we don't want** trains to be able to enter into the interlock from the route marked by '1' in photo #2.
- Therefore, we want to cut the power to sections '1' and '2'; and connect power to sections '3', '4' and '5'.

BUT: **When switch #59 is in its 'Thrown' position**:

- **We want** trains to be able to pass through the interlock along the route marked by '1' and '2' in photo #2 (to or from switch #59), **and not** along the routes marked by '3', '4' or '5' in photo #2.
- Therefore, we want to connect power to sections '1' and '2'; and cut the power to sections '3', '4' and '5'.

To Do This: We use electronic relays, triggered by a +12VDC input (from the same white power module under the layout, behind the big rolling red tool box; that powers the Glen Carbon Street Lights, the automated RR warning lights in "West Point Corner", and the Thresher) through one of Switch #59's tortoise switches. These relays are indicated by **'A' through 'E'** in photo #3 (next page).



3. Photo of the control circuitry panel (under the layout).

NOTE: The relays ('A', 'B', 'C', 'D' & 'E', in photo #3) all receive their individual power from the same 12V DC source under the layout that powers the Glen Carbon Street Lights, the automated RR warning lights in 'West Point Corner', the Thresher, and the (future) automatic crossing gates (on *'Route 157'*, near to its intersection with *'Route 162'*). The double orange connectors in photo #3 (above) are the connections to this independent power supply.

ALSO NOTE: One of the switches <u>within the tortoise that drives Switch #59</u> is wired so that:

- a +12VDC (red wire) is connected to its 'common' terminal.
- a (yellow) wire is connected from one of its output connections, to the 'trigger' connection on the circuit board.
- this single trigger (+12V DC output from switch #59's tortoise switch) is fed to the 'trigger input' of all five electronic relays.
- **SO:** <u>When switch #59 is in its '**Clear**' state</u>: its tortoise switch is open, and no trigger voltage is sent to the relays. This is the 'normal' state of the switches; with track power being supplied to sections '3', '4' and '5'; and no track power supplied to track sections '1' and '2'.
- **BUT:** <u>When switch #59 is in its '**Thrown**' state</u>: its tortoise switch is closed and a 12VDC 'trigger' voltage is sent to the relays. This causes all five relays to 'flip', and track power to be supplied to sections '1' and '2'; and track power to be removed from track sections '3', '4' and '5'.

In photo #3:

- relays 'A' and 'B' are both 'normally open' (i.e. track power is cut from their respective track sections), and:
    - relay 'A' controls track power from Power District '10' to track section #1.
    - relay 'B' controls track power from Power District '30' to track section #2.
- relays 'C', 'D' and 'E' are all 'normally closed' (i.e. power is supplied to their respective track sections), and:
    - relay 'C' controls track power from Power District '41' to track section #3.
    - relay 'D' controls track power from Power District '40' to track section #4.
    - relay 'E' controls track power from Power District '30' to track section #5.

Results:

- When Switch #59 is in its '**CLEAR**' position:
    - Trains are <u>allowed</u> to run (in either direction) through this portion of the 'Outer Loop'.
    - Trains are <u>allowed</u> to run (in either direction) through the 'Interlock' portion of the 'Middle Loop'.
    - Trains are <u>prevented</u> from entering (from either direction) the 'interlock', toward or from the tunnel under 'Old Glen Carbon'.
- When Switch #59 is in its '**THROWN**' position:
    - Trains are <u>allowed</u> to use the interlock to cross (in either direction) the 'Middle Loop'.
    - Trains are <u>prevented</u> from running through the interlock portion of the 'Middle Loop'.
    - Trains are <u>prevented</u> from approaching (via the 'Outer Loop') the open end of Switch #59.
- **Therefore:**
    - **Trains are prevented from colliding with each other at the interlock.**
    - **Trains are prevented from entering switch #59 when it is thrown against them.**