

DCC Basics for MRR layouts

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Part 4 Special Trackwork Wiring

Reversing Sections

Reversing sections can be classified as special trackwork that has different wiring needs than most of the track on our layouts. There are three types of reversing sections that almost always required some sort of special wiring in order for them to work correctly. They are: 1- The Reversing Loop; 2- The Wye; and 3- The Turntable. In all cases, the section of track that is set aside to be the reversing section must be completely isolated at both ends from all other layout tracks or wiring. This is usually done by track and electrical gaps at both ends of the reversing section.

Reversing sections can be controlled or switched in one of three ways: 1- A Double Pole, Double Throw toggle switch; 2- An automatic reversing module; and 3- An automatic reversing DCC booster.

Turntable

Lets start with the simplest, the Turntable. Put aside for the moment that some turntables do not need to have their tracks reversed because of the manufacturers design of the electrical system in connecting to the track on the Bridge of the Turntable. (The moveable part.)

If the wires are connected to the bridge track correctly and will allow a locomotive to move onto the bridge from the approach track, all is well for the moment. Now suppose that we want to turn the locomotive around so it will be running in the opposite direction on the layout. So we turn the bridge and line up the opposite end of the track with the approach track. At this time, if we move the loco off the bridge to the approach track, we will cause a short. Because we have rotated the Turntable Bridge 180 degrees, we have also rotated the wires or rails, which reversed the polarity, or Phase, of the DCC power with respect to the approach track. To correct this problem, we must change the polarity of one of the tracks.

We can do this in two ways.

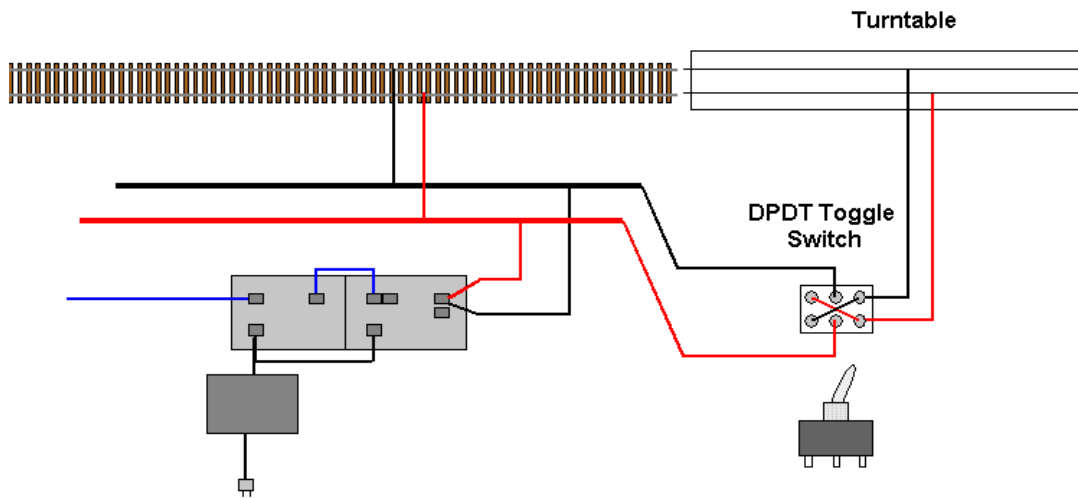
- First, we can wire in a manual reversing switch in the track. Now all we have to do is flip the switch to change the polarity.
- Second, because we are using DCC, and the track power is "ON" all the time, we can install an Auto-Reverser Module. An Auto-Reverser is an electronic circuit that senses when the polarity is not right between two tracks as the locomotive hits the gap, and changes it automatically and instantly. It changes so fast that our locomotives crossing to the other track won't even hesitate, but keep going.

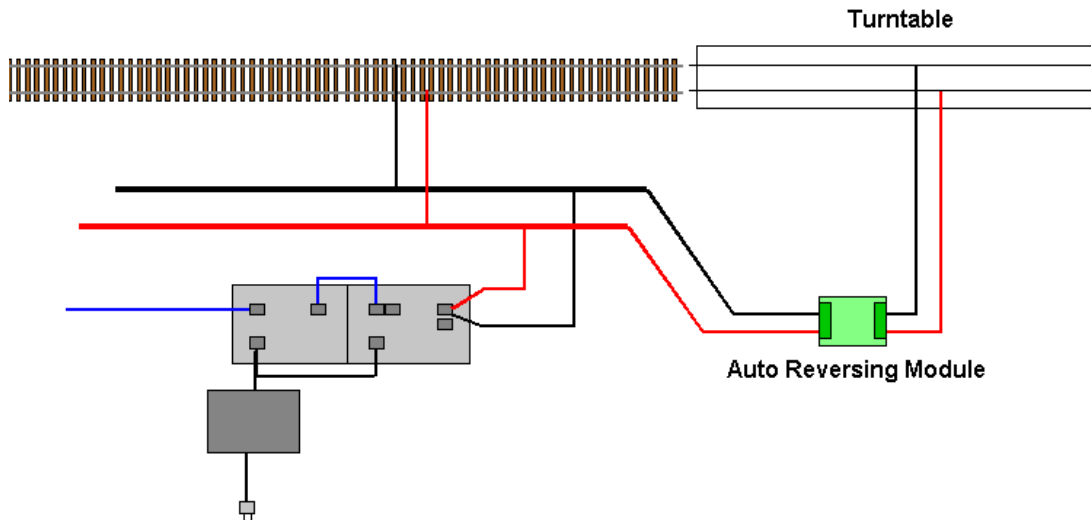
But wait, which track do we reverse? On DC layouts, we reversed the track that the locomotive was going TO. However, because DCC is AC, and our locomotives pick up AC power, the track that we reverse the Phase on doesn't matter.

Lets see how that works. If we were to connect a test track to our DCC power through

a standard reversing switch and place a loco on the track, it would run forward and backward by our control of the throttle. Now, if while the loco was running forward, we flipped the reversing switch and changed the Phase or polarity of the track, what would happen? Nothing!! The loco would continue in the same direction. Why? Because the way DCC is designed, the decoder in the locomotive determines the direction that our loco will go, and NOT the track polarity or Phase.

OK, back to our Turntable reversing problem. Which track do we connect the Reversing Switch or Auto-Reverser to? The shortest one. Pretty simple huh? Well, OK, not quite that simple, but pretty close. Here is what we actually do. The Reversing Switch and the Auto-Reverser have a couple of things in common. Both have two input wires and two output wires. The input wires go to the Main Power Bus for the area that we are working in. The output wires go to the track on the Turntable Bridge. (You may have to swap the connection of the output wires of the Auto-Reverser on the bridge until things are working correctly. Just follow the instructions with the unit. If our manual reversing switch was backwards, we would just throw the switch.) OK, were done. Easy wasn't it?

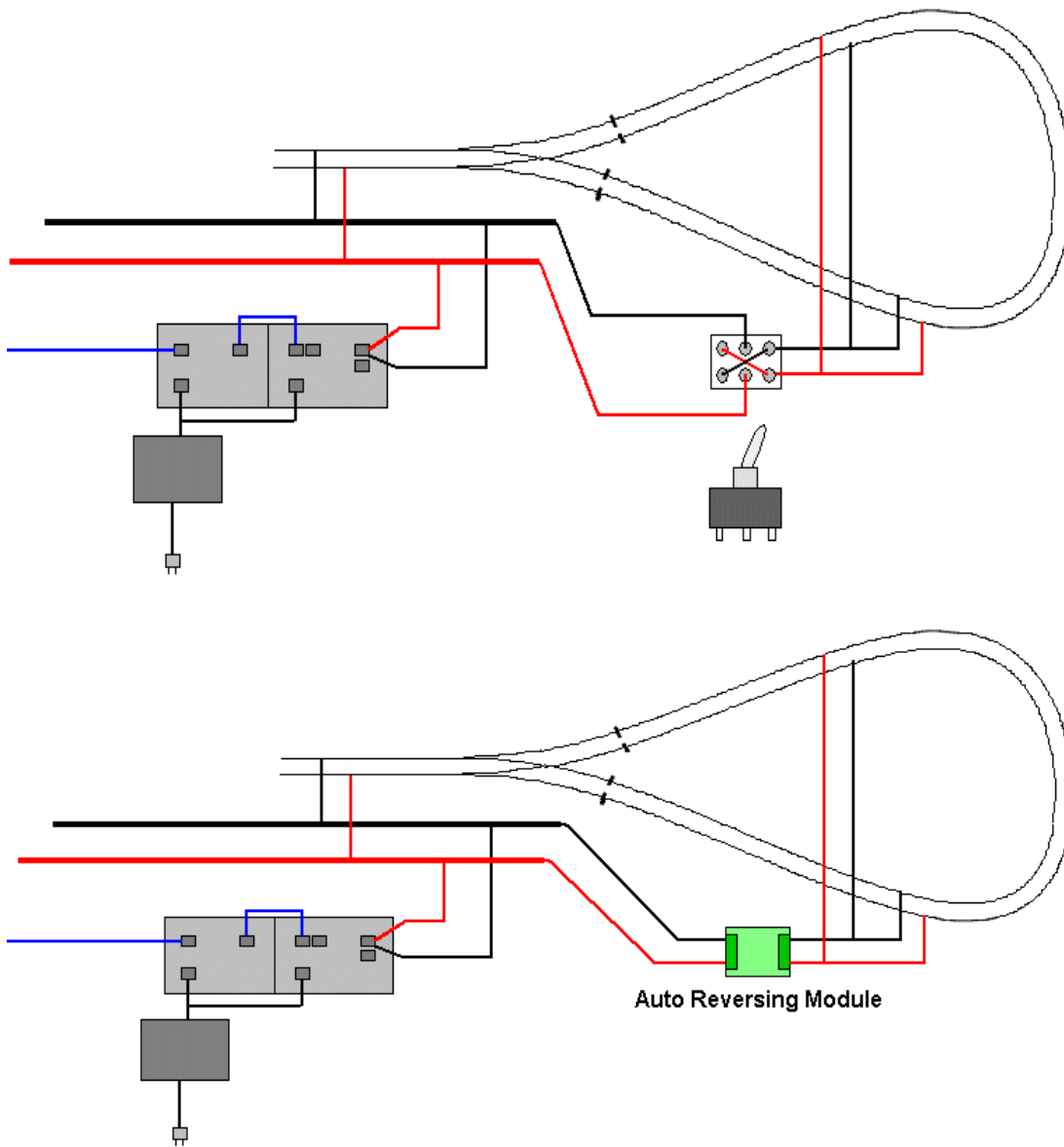




Reversing Loop

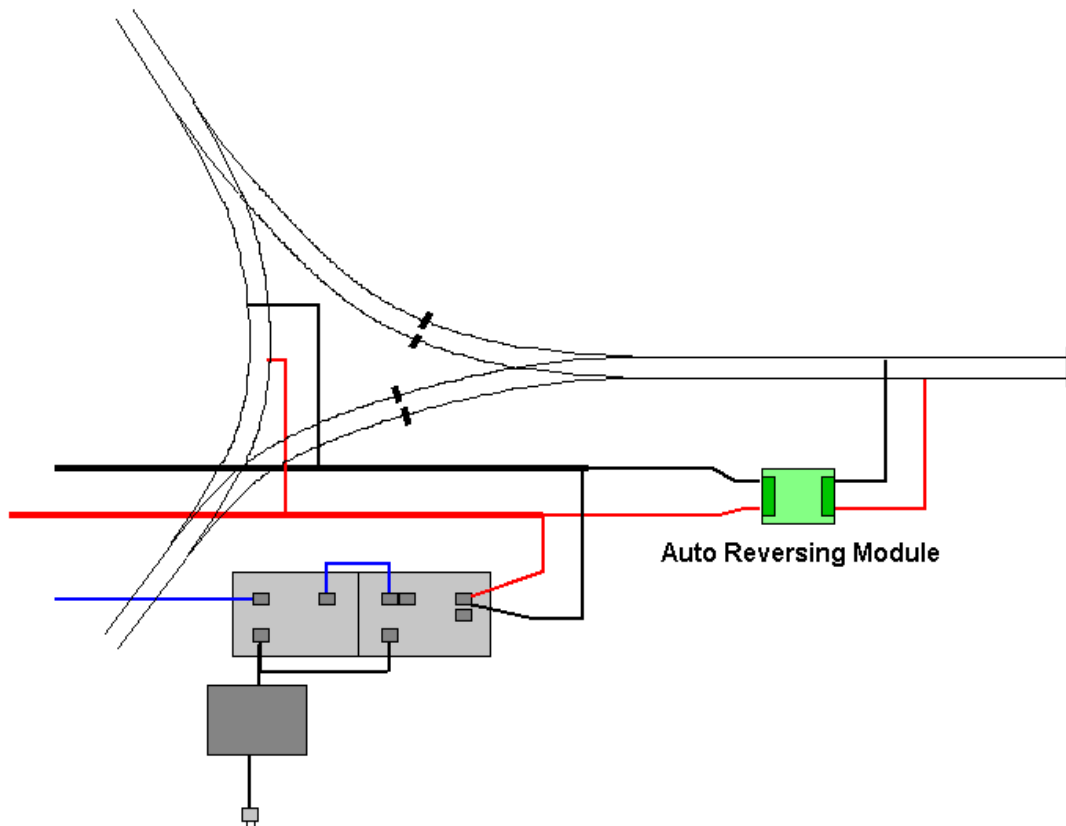
The reversing loop is next. OK, same situation as the turntable. Our locomotive enters the loop through the turnout, goes around the loop and approaches the other leg of the turnout. (To prevent a track short, the track coming back into the turnout must be gaped electrically.) But to change the polarity of the loop, the loop itself must be isolated, so both tracks from the frog end of the turnout must have gaps. Our Auto-Reverser or reversing switch output will be connected to the track that makes up the loop. The electrical connections are as follows; input wires or terminals connected to the main Bus, output wires or terminals connected to the Loop. If the Loop is large, we may need a Power Bus for it. However, the Power Bus for the loop will be isolated from all other Power Busses similar to the Sub-Power District. The Loop Bus will be powered from the reversing switch or Auto-Reverser Module.

If you use a toggle switch, you must know which direction the switch has to be in for the train to cross the end gaps.



Wye

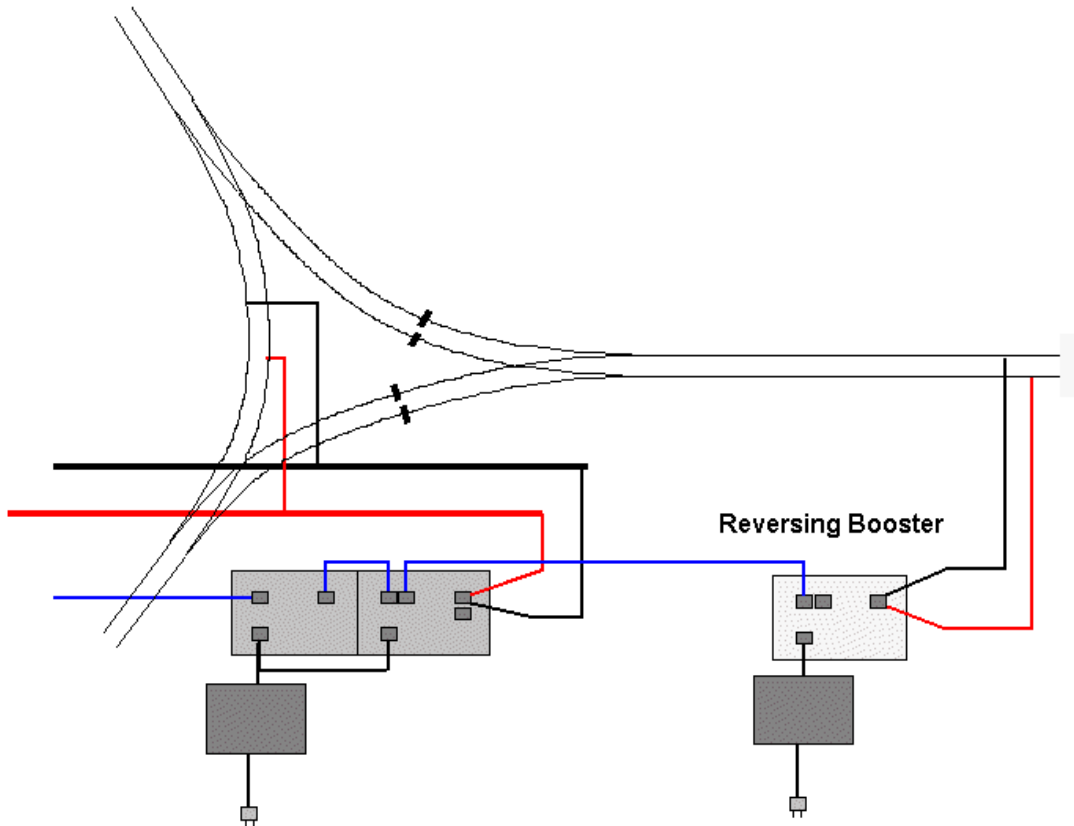
The Wye is also a type of reversing track. Again, part of the wye needs to be isolated from the normal Power Bus. Usually the "Tail Track" is the section that is gaped and isolated. Again, the gaps are at the frog end of the turnout that goes to the Tail Track. And once again, the output of the reversing switch or Auto-Reverser is connected to the Tail Track. If the Tail Track is part of a branch line and has quite a bit of track associated with it, a separate Power Bus is needed. The output of the reversing switch or Auto-Reverser Module feeds the Tail Track Power Bus.



More Power to the Reversing Sections

If your reversing sections are large, there are two choices. Lets look at the example of the Wye that has made a junction to a longer branch. We could make the Tail Track Branch a separate Power District by using an "Auto-Reversing Booster". The Auto-Reversing Booster will be connected similar to the Auto-Reversing Module. And because it is a Booster, it will provide the power needed for the whole branch.

Loops can be the same way. They can be large and also require an Auto-Reversing Booster.



Different Reversing Section Tracks

- Train Length.

There is an alternative to having very large reversing sections that require an Auto-Reversing Booster. A reversing section only has to be as long as your longest train. So when we look at it that way, we can place the reversing section so that it only reverses a particular section of track.

- Locomotive consist length.

If you have a reversing section that for one reason or another needs to be shorter than your longest train, we may be able to do that with another special section. However, that section does need to be long enough to hold all the locomotives that are consisted together at the same end of the train. What we can not have is two locomotives spanning both gaps at both ends of the reversing section at the same time, otherwise a short circuit will occur. To make this type of reversing section, we need to have double gaps at each end of the reversing section. The double gaps provide a short, un-powered section of track. The length of isolated track should be one-half inch to one inch long. An isolated section this short will not affect locomotive pick up of electrical power. The reason for these isolated sections at each end is so that any metal car wheels can not bridge the gap between any live rail or track at both ends at the same time, also causing a short circuit.

LIMITATIONS This type of special reversing section does have a few limitations. First, you can not run a passenger train through it that has lighted cars. The lighted cars will cause the section to reverse as the cars enter and depart, and there is a chance of two cars bridging the gaps at both ends at the same time causing a short circuit. Second, this type

of reversing section must use an Electronic Reversing Module, and can not use a toggle switch. Thirdly, if a lighted caboose is on the end of the train, the train must be long enough so the caboose and any locomotives are not crossing both gaps at both ends at the same time, which will also cause a short circuit.

