**LOGIC RAIL™ TECHNOLOGIES**

**"Sophisticated Model Railroad Electronics"**

# *BlockMaster* Application Note #4

## Wiring detection diodes with command control systems

Command Control (e.g. DCC) generally simplifies layout wiring because it is not necessary to electrically divide the layout into multiple control blocks in order to run more than one train at a time. The simplest wiring for command control is to have two wires going to the track at a single location. This is shown for a loop of track in Figure 1 below. However, with command control it is important, and strictly speaking, necessary, to have multiple track *feeders*. These help minimize voltage drops that occur the farther away the track connections are from the booster/command station. These voltage drops result from the resistance of the wire and rail. As virtually every command control system installation manual will (or at least SHOULD) tell you, you should use heavy (e.g. 14 AWG) wire for the track power bus with medium (e.g. 20 AWG) wire acceptable for the track feeders. The use of track feeders for a long section of track is illustrated in Figure 2.

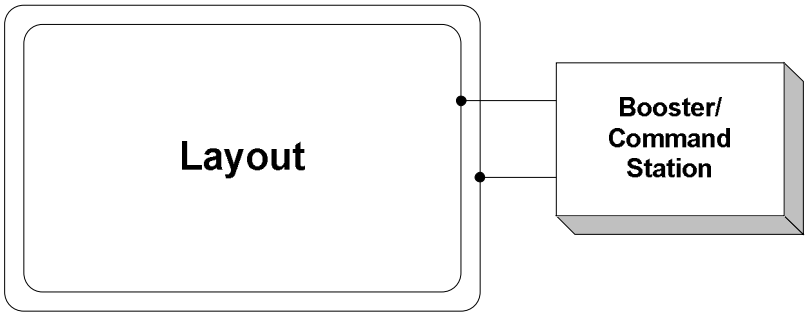


**Figure 1 – Simplest Command Control wiring**

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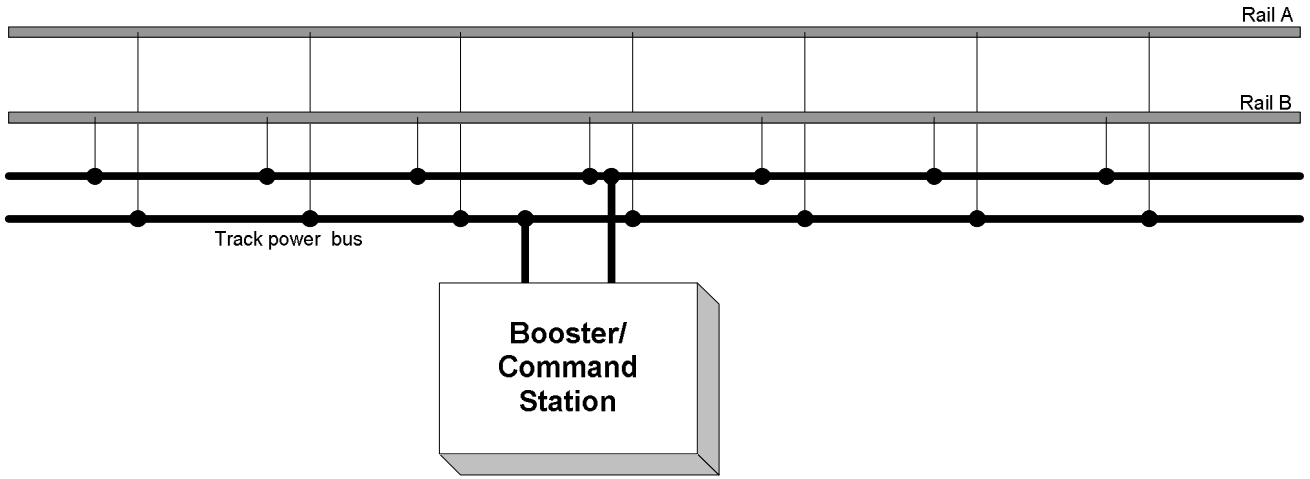


**Figure 2 – Typical Command Control wiring – Track bus and feeders**

However, in order to have train detection and signaling it IS necessary to gap the track; the track gaps define your detection blocks. For each detection block you will use one pair of detection diodes. These diodes will be "inserted" into the path between one rail and the track power bus wire that now becomes a common ground. It is very important to note that for a given detection block there must no longer be any direct connections between the gapped rail and the common ground. There are two ways to accomplish this wiring. Figure 3 illustrates the first way – all track feeders are ganged together and connected to a single pair of diodes. Figure 4 illustrates the second way – each track feeder is connected to its own pair of detection diodes. Each of these options has its benefits. The benefit of the first option is retaining the use of a single pair of diodes but requires additional rewiring. The benefit of the second method is minimal rewiring but incurs the cost, although not huge, of additional detection diodes. Your choice!

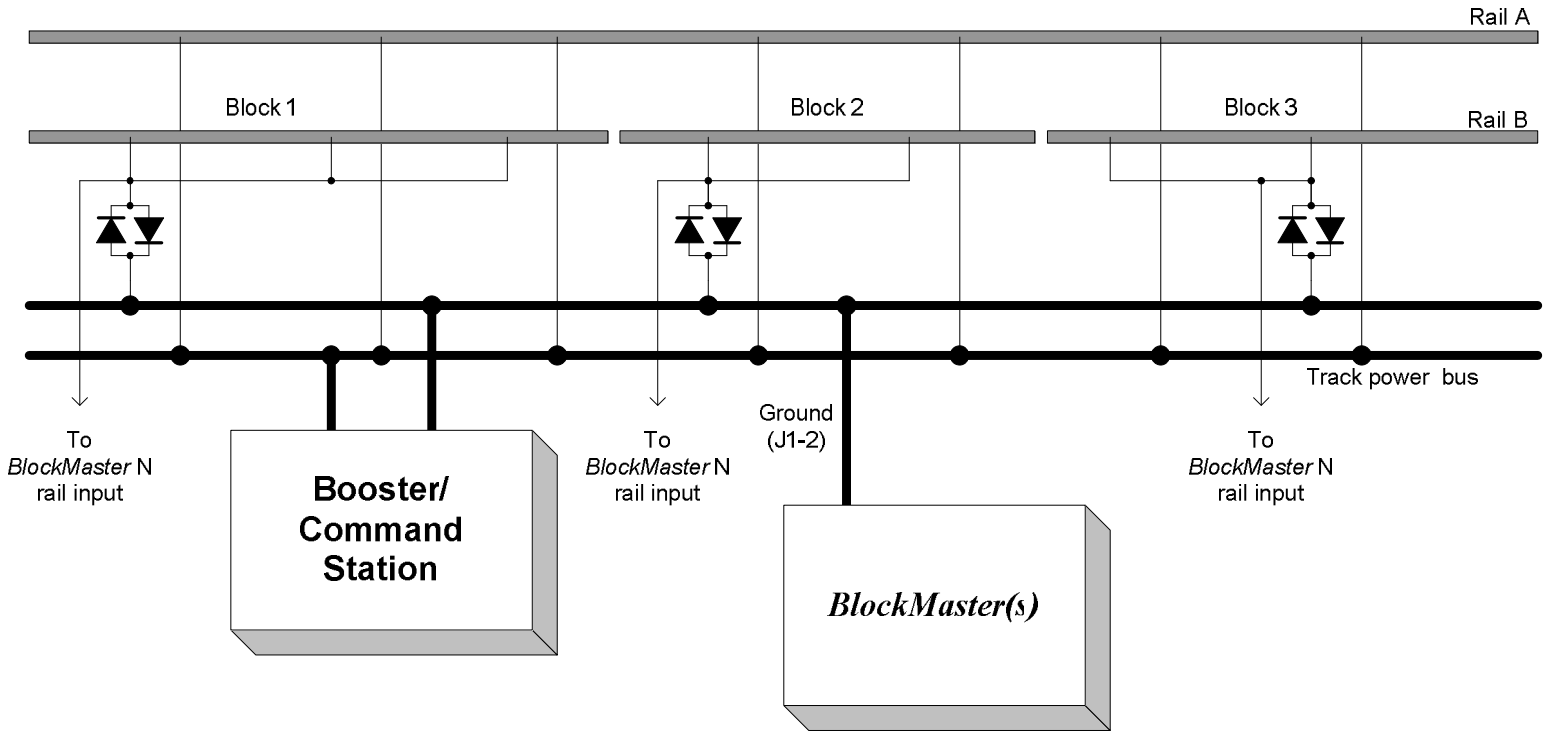


**Figure 3 – Block Wiring with Detection Diodes – Option 1**

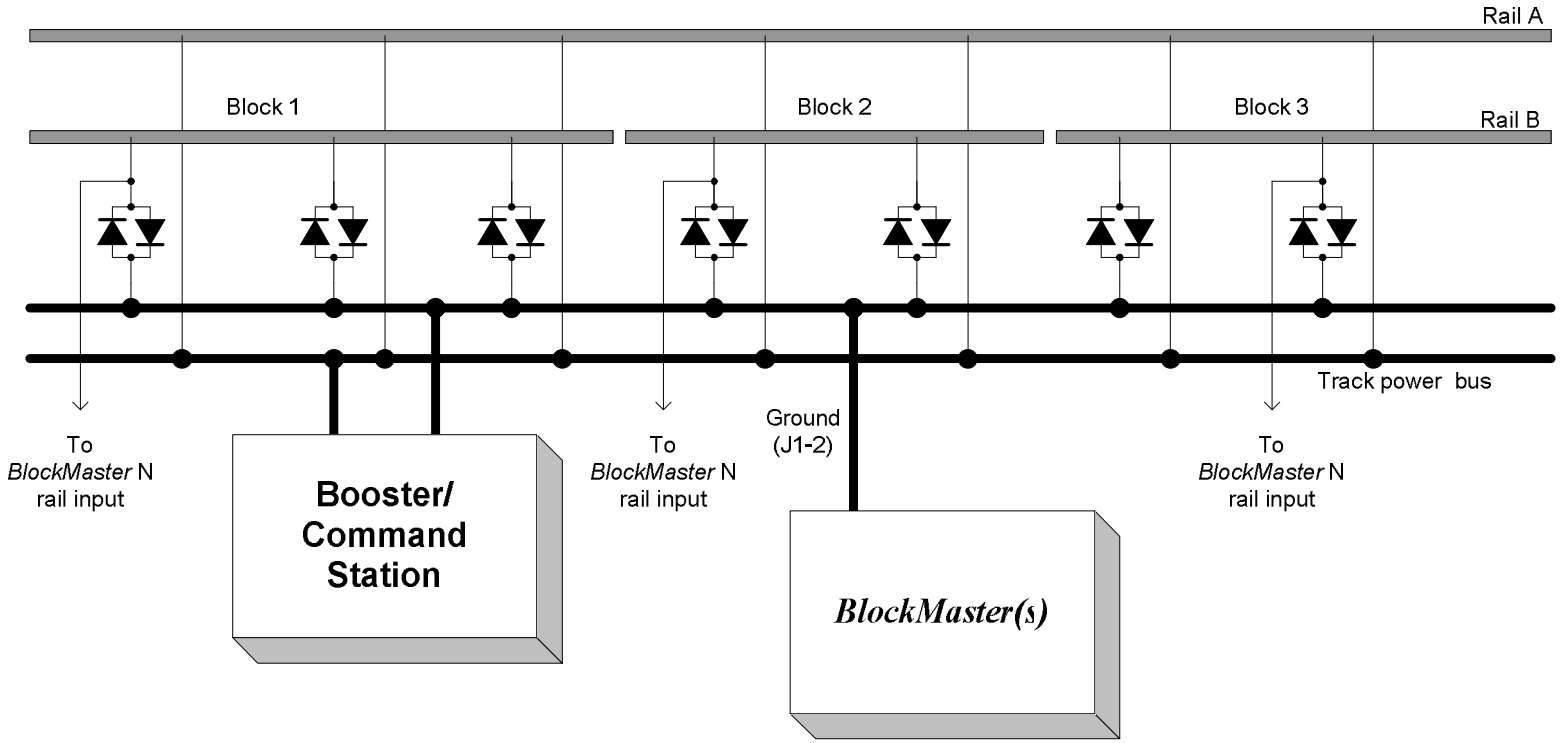


**Figure 4 – Block Wiring with Detection Diodes – Option 2**