

DM TMCC Buffer

Product Description

A common problem with TMCC/Legacy layouts is inadequate command signals that cause poor locomotive operation. Many efforts to enhance the transmission of the command signal through earth-ground enhancement wires and other techniques are available, but problem areas remain on some large layouts.

The DM TMCC Buffer is designed to provide stronger command signals everywhere on the layout through two improvements. First, the signal source is made stiffer, resulting in less signal loss due to the very heavy loads placed upon the base by layouts with extensive track mileage. As an example, the output of a Legacy base will drop about 45% with major waveform distortion when driving a 50 ohm load. In comparison, the Buffer/Booster drops less than 5% with no distortion.

The second improvement is a three times increase in the signal level thanks to a power amplifier in the Buffer/Booster. The normal (unloaded) Base signal of five volts peak-to-peak is amplified to 15 volts peak-to-peak. This triples the signal throughout the layout, even with the heavy loading of a large layout.

The net effect can be more than triple the original loaded-down track signal actually fed to the track when we combine these improvements.

What's In The Kit?

The DM TMCC Buffer is supplied with three components.

1. The TMCC Buffer Power Amplifier box that provides the signal processing.
2. The 24VDC "wallwart" power supply to provide buffer power.
3. The "earth ground" tether that taps the earth ground from the TMCC/Legacy command base.



Figure 2 TMCC Buffer Power Amp



Figure 1 24VDC Power Supply & "earth ground Tether

Connecting The Components



Figure 3 TMCC Buffer Connections

The “earth ground” tether is connected to the command base power jack, and the command base power is connected to the other end of the “earth ground” tether. The single wire from the “earth ground” tether is connected to the DM TMCC Buffer **Earth GND** connection (black wire).

The command base track signal is connected to the DM TMCC Buffer **Base INP** connection (yellow wire).

The DM TMCC Buffer **Boost Out** connection is the new track signal to be connected to the outside rail of the layout.



Figure 4 TMCC Buffer Connection Block

Using the DM TMCC Buffer

There are two LED indicators on the top of the DM TMCC Buffer. A blue LED is lit any time the DM TMCC Buffer is receiving power from the included 24V power supply.

The bi-color LED is a quality indication of the base input track signal. It's not designed to be a definitive test; however it does give you the signal status at a glance.

If the indicator is red, this you have a very low or unconnected track signal. You will likely experience operational problems if you're seeing this indication with any command base.

If the indicator is off, this indicates you have a marginal but usable track signal. The older TMCC BASE1 will frequently give this indication as its output voltage isn't typically as high as the Legacy base.

If the indicator is green, this indicates you have a good track signal. A Lionel Legacy base in good operating condition should give you a green signal indication.

In addition to the LED indicators, there are three connections for DC measurement of relative signal strength of the input and output signal. These are only intended to be relative measurements to be able to track long term trends. For instance, with a Legacy command base signal output of 5.4V P-P, the DC measurement port indicates 1.88 volts. The boosted signal of 16.00V P-P yields a 6.44 volt output on the DC measurement port. By recording these and periodically checking them, you can keep track of long term trends on your command base signal and the layout loading of the buffer signal with nothing more than a common multimeter.

The connections for the DC measurement are, **GND DC**, **Boost DC**, and **Base DC**. These are measurement outputs and do not have any effect on the actual functionality of the DM TMCC Buffer operation or track output signal.

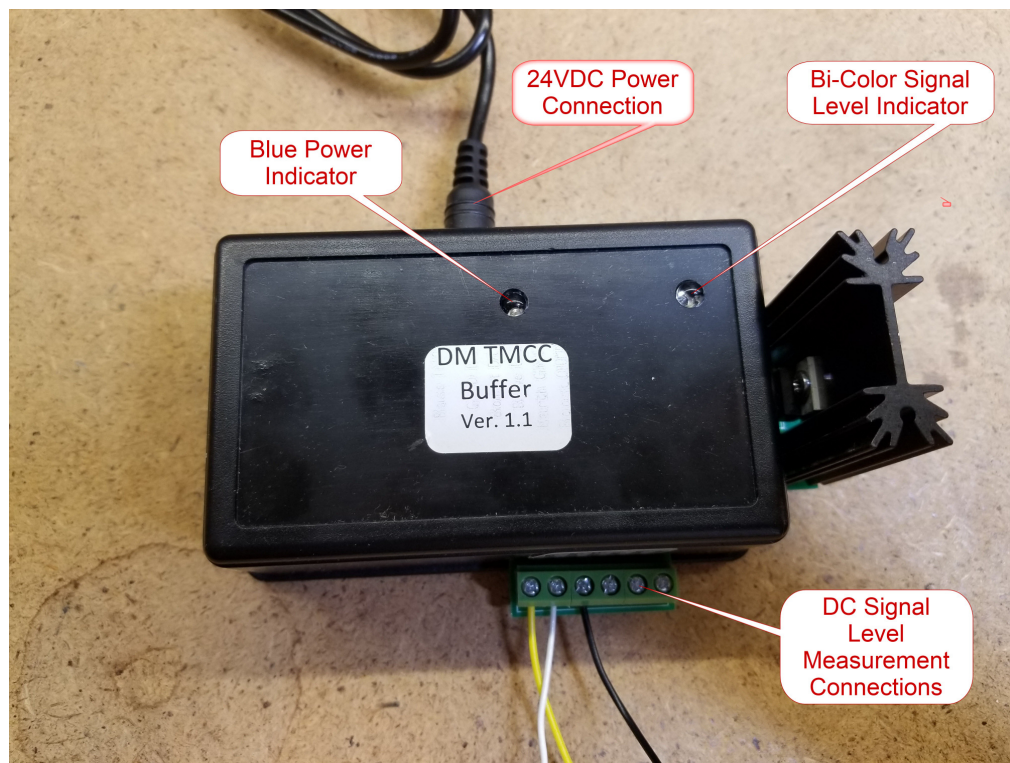


Figure 5 TMCC Buffer Connections & Indicators

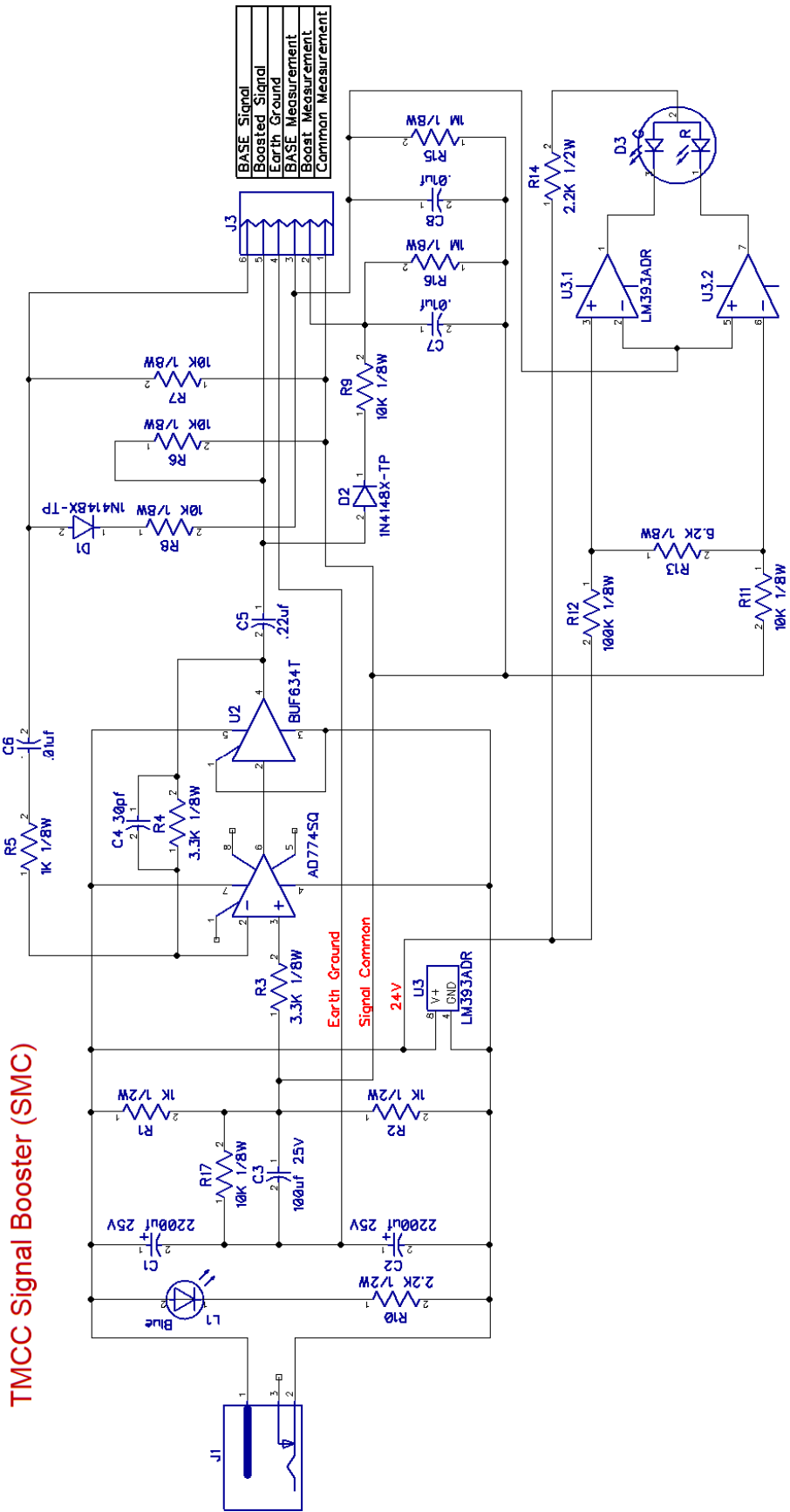


Figure 6 DM TMCC Buffer Schematic Diagram