

TMCC/Legacy (TrackLink) Info, Hints and Tips

Any power or signal supply must have two connections, a source and a return. **For the Command Base the source is the earth ground and the return is the U terminal on the Base that is connected to the outside rail.** This means that the earth ground is acting as the transmitting antenna for the Base. This also explains why putting earth ground wires on the layout helps. The idea that the earth ground is the signal source is what normally confuses most people. For most radios the earth ground is the return.

What causes problems is when the wires from the Base U terminal are run close to the earth ground or track power wires. When two wires are close together there is a property called capacitance between the wires. This capacitance acts as a path for radio frequency signals. The closer the distance between the wires and the longer the wires run together the more the capacitance. This capacitance can effectively short out the signal from the Base.

To prevent this, **do not run the Base U terminal wires in the same wire bundle as the ground or run them over a ground plane. Do not run the ground wires directly under the track.** The outside rail is connected to the Base U terminal so a ground wire under the track is the same as running the wires together in a bundle. A separation of a couple of inches should be adequate but more is better. **To be really careful treat track power wires just like you would ground wires with respect to the Base U terminal wires.** The track power terminal on the power supply is capacitively coupled back to earth ground through the power lines.

Steam engines use the handrails for the antenna which run close to the die cast shell. The shell is connected to the outside rail which is the return for the TMCC signal. **This creates a capacitor between the antenna and the shell that loads down the signal and reduces reception.** The effect is similar to that caused by running the BASE U wire next to the earth ground I described earlier. Diesel engines with plastic shells do not have this problem so they will always perform better than steam engines.

The gauge of the wire used for the TMCC signal should not be critical. There is no significant current in the wire so anything from 22 AWG to 14 AWG should be fine.

Summary

- Do not run ground (TMCC source) near the outside rail (TMCC return) or track power
- Keep ground (TMCC source) 2-4 inches from outside rail (TMCC return)
- Multiple connections (TMCC return) to the command base are OK
- Steamers may be more problematic due to antenna proximity to the shell
- Gauge for the TMCC signal wire is not important as very little current runs through it

This information is provided without warranty (both express or implied) and no results are guaranteed. As always....your mileage may vary! Good luck and Happy Railroading.