

Build a Battery Power Trailing Car

by Del Tapparo

In battery power, a trailing car, is a piece of rolling stock dedicated to housing some or all of the components required for battery power and/or sound. It must always be coupled directly behind the motive power it is controlling. Some consider this a negative, because any switching maneuvers must be done with both loco and trail car. But trail cars have several advantages; 1) They provide more than enough room to house all of your radio control, sound, and battery components, which may not fit in the loco. 2) They provide easy access to all components for troubleshooting, programming, and operation. 3) One trail car, full of all those pricey components, can be used for more than one loco.

The trail car for this project will contain all of the radio control and sound components, as well as the battery pack. The only connection between loco and trail car is a 2-wire motor connection. Battery charging can be done in the car at the end of the run, or the battery pack can be swapped out for a fresh one for continuous running.

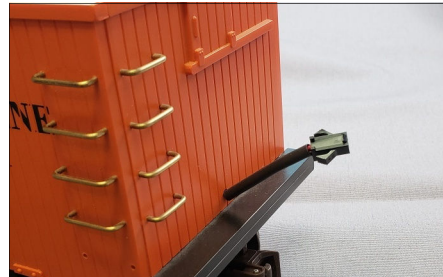
Overview

An AristoCraft box car obtained at a swap meet will be used for the trail car, and the first loco to use it will be an LGB Diesel Switcher.

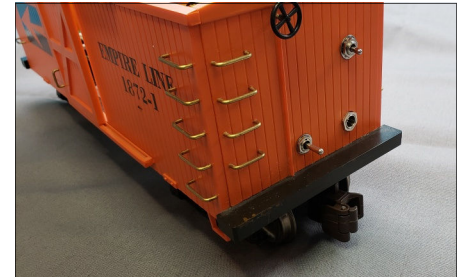
Radio control will be done using a G-Scale Graphics RailBoss 4 Plus control. Sound is provided via a Phoenix Sound P8 board and 3" speaker, and there is room for any size Li-Ion battery pack. A G-Scale Graphics Battery Conversion Module will be used to



switch power on/off, provide fuse protection, a charging port, and power outputs to both the RailBoss and Phoenix boards. This greatly simplifies wiring.



Front: Motor Out to Loco



Rear Controls: Top Right-Power, Bottom Right-Charging, Bottom Left-Sound Volume

Box cars with a removable roof are the best choice for trailing cars. You could also use a gondola with a removable load. This gives you easy access to everything for trouble shooting, setup, programming, and operation.

Planning

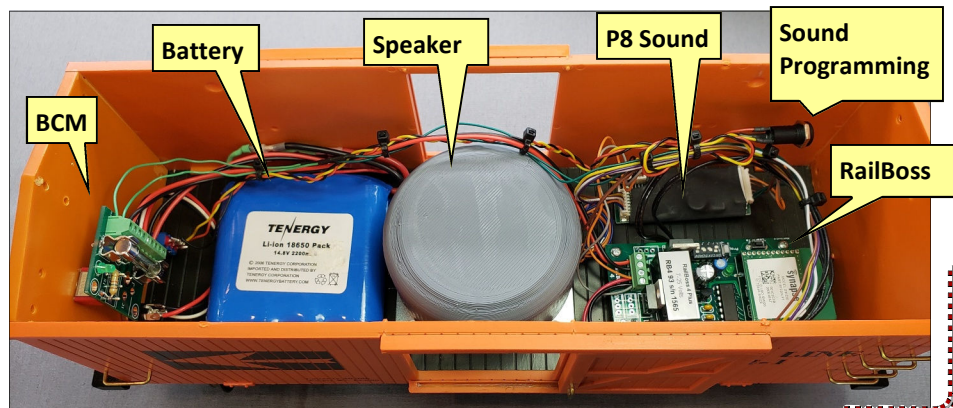
Where to put all of the components and how to we access the controls?

Well, the speaker needs to be in the center of the boxcar to avoid the trucks on either end, so that will be installed first. The Phoenix P8 Sound card is very small and can go about anywhere, but it has a volume switch and programming jack. The volume switch could be floor mounted for un-

car. The programming jack gets the most use during initial setup, so it will stay inside the car secured with a tie wrap.

Battery power requires an On/Off switch. The speaker kind of hogs all the space in the center of box car, but we could mount a Door Mount Battery Conversion Module on top of it. This makes access difficult through the door, but easy via roof removal. Since I already have the external volume switch, I will also mount the power on/off switch and charging jack in the rear bulkhead using the Floor Mount Battery Conversion Module (BCM).

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The 2-wire cable for the motor output will protrude from the front of the car.

Assembly

Drill holes in the floor for the speaker "grill". Secure the speaker to the floor using screws or silicone adhesive around the perimeter. Speakers always sound better with a speaker baffle behind them to force all the sound out the front of the speaker. The box car enclosure does this to some extent, but a G-Scale Graphics speaker baffle should be an improvement. It is secured in place with silicone adhesive.

Next we drill holes in the rear bulkhead for the volume switch, power on/off switch, and charging jack. Also, holes for the motor cable, and reed switch wires.

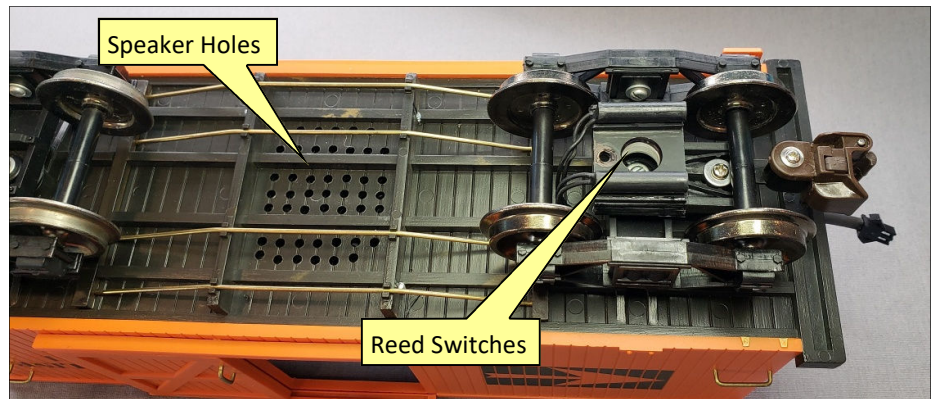
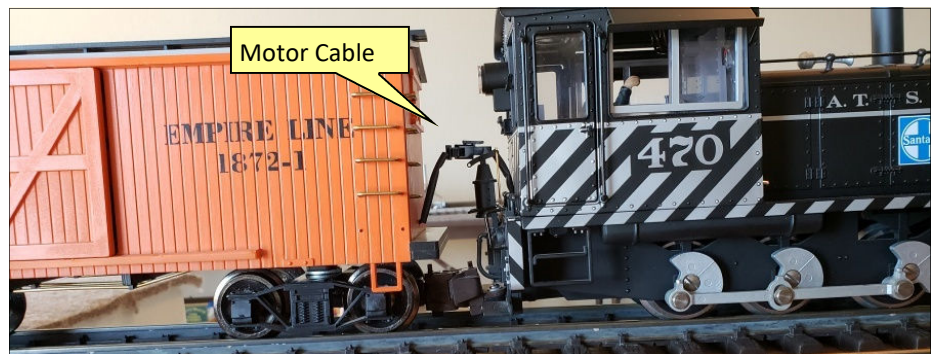
The RailBoss 4 Plus fits on the loco end of the floor, mounted using double sided foam tape and the RailBoss 4 mounting plate option. Use tape sparingly (less than 1/2" square) so things can be easily removed or moved if needed.

I like to encase the Phoenix Sound board in heat shrink tubing to avoid possible shorts if it comes in contact with other components. This also makes it easier to use double sided foam tape to mount it right next to the RailBoss on the floor.

The battery pack is secured to the other end of the floor with double sided foam tape, or can be left loose if you plan on swapping batteries.

The AristoCraft trucks were modified to taste. I replace the plastic wheels with metal wheels, and installed Bachmann couplers.

Reed switches for track magnet operation of the bell, whistle, and automated station stops are mounted on the bottom of a truck using a custom made bracket/shim from a previous project. More info can be found in my article on "Track Magnets and Reed Switches", available at www.GScaleGraphics.net. Basically, you just need to mount the reed switches 1" apart, whistle on the right,



bell on the left, so they just clear the top of the rails.

Wiring

Detailed wiring diagrams are available at www.GScaleGraphics.net.

The battery has a quick disconnect connector for safe and easy battery swaps. It connects to the BCM. BCM power outputs go to the RailBoss and Phoenix boards.

The RailBoss motor output goes to the motor cable. A short section of heat shrink tubing (not shrunk) is used to cover the exposed red/black external wires. A knot in the cable is used inside to car to provide a strain relief. Cable should extend just past the end of the coupler.

Standardize your connectors so all of your battery packs will be the same and all your locos will be the same. My scheme is: Battery (M) to BCM (F). Trail Car (M) to Loco (F). M = Male, F = Female.

Wiring for four sound triggers goes from the RailBoss to the Phoenix. All wiring is tidied up using tie wraps.

The Loco

Track power pickups must be removed or isolated to prevent power conflicts between locos on the same

track and/or track power. Locate direct connections to the loco's motor and connect the 2-wire cable extending out the rear of loco just past the coupler. In this case, I didn't have a nice route down low by the coupler, so the cable is up higher than desired.

Setup and Test

Track rollers are nice for testing. Run the loco and make sure it starts up in the forward direction and that the sound card makes two toots, not three. Reverse the wiring at the RailBoss motor output and Phoenix motor input as needed to correct.

Summary

At the end of your run always charge your battery pack so it will be ready to go for the next time. For long days, like an open house, you can swap battery packs as needed for continuous running.

This trailing car can be used with any loco that has your standard 2-wire connector on it. Using a Phoenix programming cable and your computer, you can change the sound file, if desired, to fit a different loco in about 10 minutes.