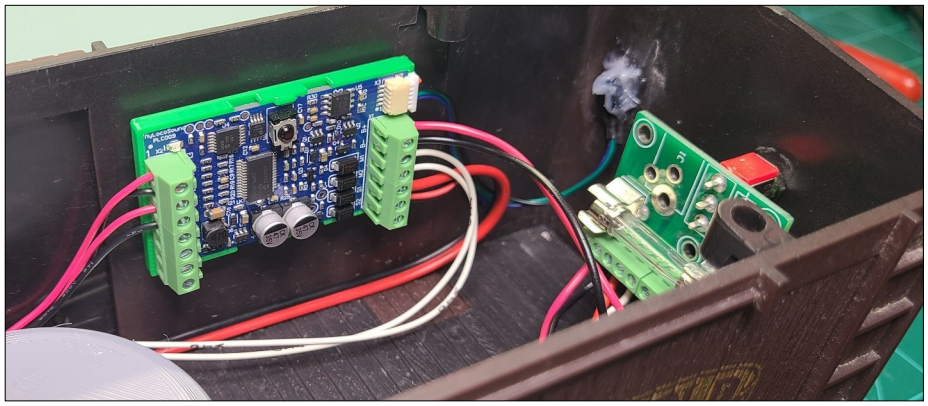
Building a Battery R/C Car: Step by Step

Del Tapparo



Project:

Build a trailing car containing all of the components for battery power radio control operation with sound to interface to multiple locomotives via a 2-wire locking connector.

Components:

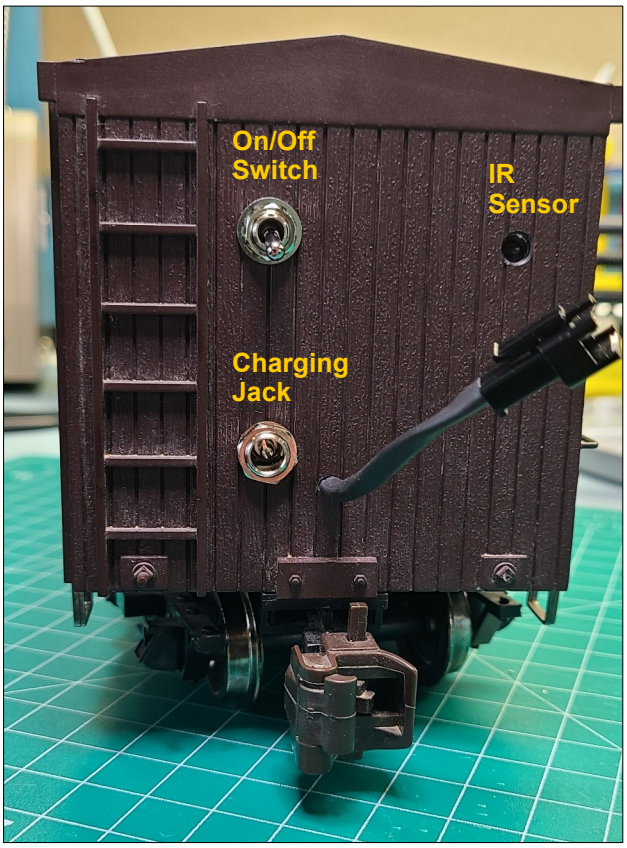
Bachmann 40' box car, RailBoss 4 Basic, Battery Conversion Module (BCM), MyLocoSound, 2 1/2" Speaker with baffle, 14.8V, 4200mah Li-Ion Battery Pack, 2-wire locking connectors for battery to BCM, and motor output to loco.

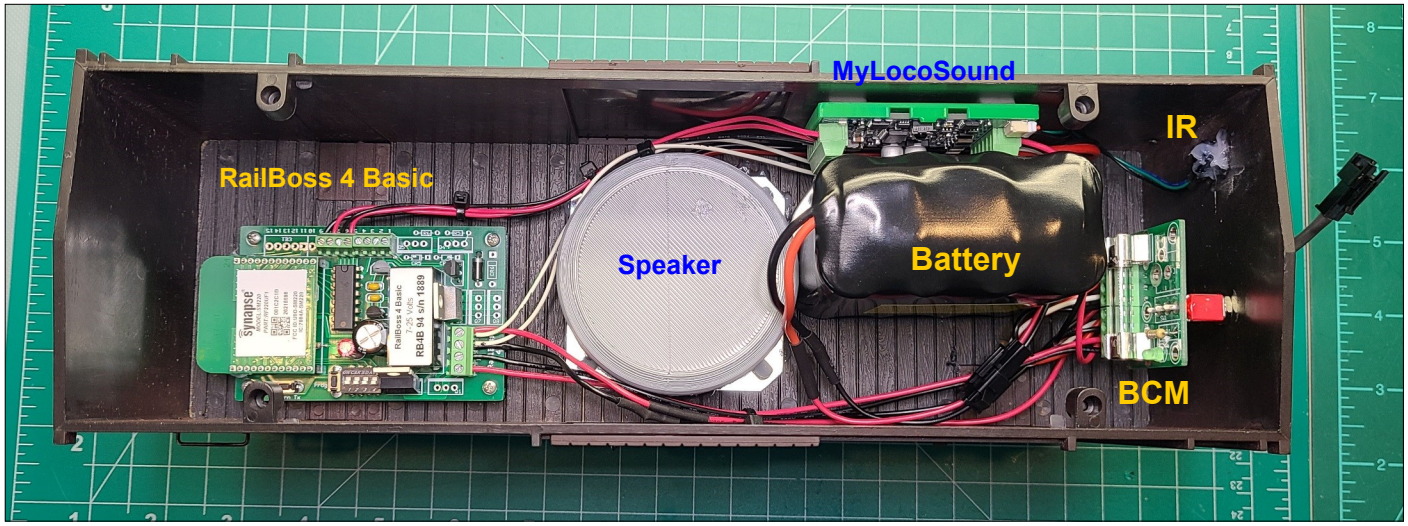
Where to start?
Planning before cutting!

Physical location of components that accounts for wiring connection requirements and access to components that may be needed during wiring installation, programming, or servicing.

Since we will need to drill holes in the floor to create a speaker grill, the best place in right in the middle to keep away from the trucks. So with the speaker in the middle, where does everything else go? The other two large components are the battery and the RailBoss. The RailBoss can go on the floor on one side of the speaker and the battery on the other.

The Battery Conversion Modules come in two models; Door Mount and Floor Mount. In this case we could use either. The Door Mount would go on top of the speaker baffle, making the power on/off switch and charging jack accessible by either opening the door or removing the roof. This is the easiest installation with no modification to the car required. The Floor Mount, in this case, is not actually floor mounted, but rather on the front bulkhead of the car, with a hole for the power on/off switch and a hole for the





charging jack. This allows easy external access. I chose the Floor Mount for this one. And, checking to make sure the battery will still fit in the space next to the speaker along with the BCM? it will.

So where to put the MyLocoSound which requires an external IR Sensor for configuration and volume control? The IR Sensor needs to be on the same bulkhead as the other controls. But there isn't any more room on the floor. It will be mounted on the side wall, next to the battery. It could be simple mounted with double sided foam tape, but then it is stuck down permanently, making any wire changes or servicing difficult. So I designed a 3D printed clip to hold the MyLocoSound board. The clip gets mounted via tape, but the sound card can be easily removed (which was actually done many times during the course of this project).

This job does not use a RailBoss 4 Plus. If using a plus, you may also want to install reed switches for the bell/ station stop and whistle functions.

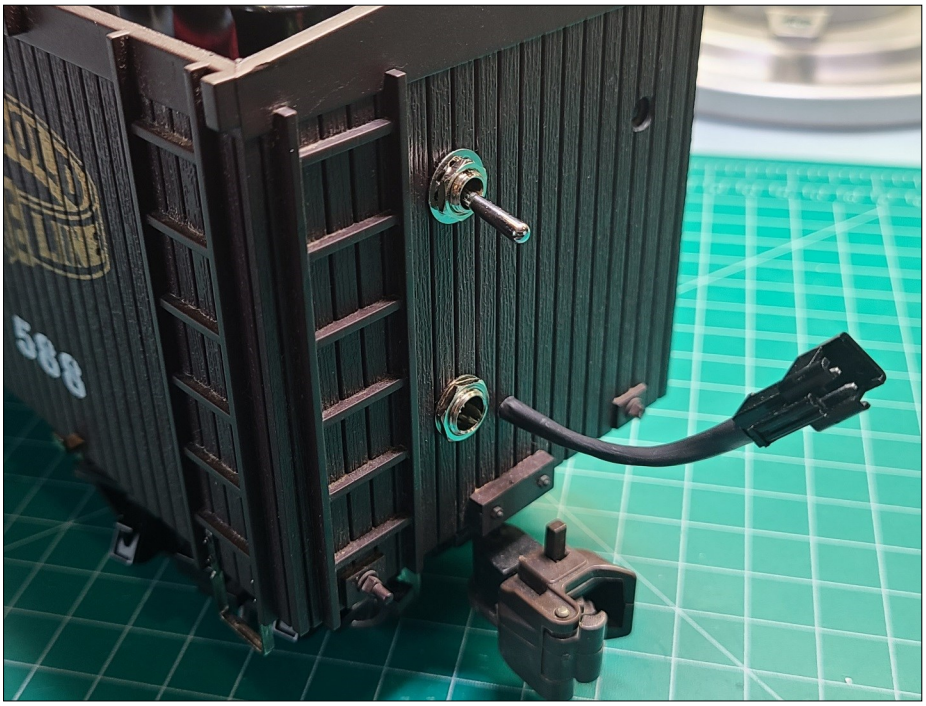
Construction begins!

Start with the speaker, cutting multiple holes in the floor, within the diameter of the speaker, and between the girders. Silicone glue the speaker to the floor.

Drill a hole for the motor connector to exit the car. Use heat shrink tubing to hide the black/red wires. Tie a knot in the cable or use multiple tie wraps on the inside of the car as a stress relief, so the cable won't pull out. The wire isn't long enough to reach the RailBoss on the other end of the car, so extension wire will have to be added wither now or later.

Drill holes for the BCM power on/off switch and charging jack. Test fit, but leave it out to make wiring easier.

Drill a hole for the MyLocoSound IR sensor. Carefully glue in place using CA to tac, and then silicone adhesive to



insure it stays, being careful not to get any glue on the lens. Connect the IR cable to the sound card and then locate the precise location for the mounting clip. Install it using double sided foam tape.

The RailBoss mounting plate is used for it. The plate is taped to the floor and the RailBoss is screwed in place with 4 screws. Again, allowing removal as needed for easier wiring and servicing.

The Li-Ion Battery Packs come with no connector installed. A quick disconnect cable between the battery and the BCM is used for safe and easy battery swap without shorting the battery (sparks, melting, and bad things can happen). Be very careful when soldering on the new connector wires. Do only one wire at a time to avoid any shorts. The battery pack will not be taped down so it can be easily removed if needed. The battery is normally charged via the charging jack on the car, but you can also do a battery swap if needed in the middle of an extended operating session.

Wiring:

Connections are simply a matter of following the wiring diagrams, but there a few things worth mentioning. Point to point wiring between the MyLocoSound and the RailBoss can be 22 ga. or smaller wire. Battery and motor connections can also be 22 ga., but I prefer 20 ga. One 20 ga. and one 22 ga. wire will just barely fit in the screw terminals of the RailBoss. One wire (20 ga.) goes out to the motor, the other (22 ga.) to the MyLocoSound. Use heat shrink on the extended wire connections for the motor cable. Always use stranded wire, not solid, and tin the ends of the wire with solder.

Testing:

Program MyLocoSound for battery power, desired whistle, manual bell, less sensitive to load, and US Rules whistle toots. After power up, move loco off. If it goes in reverse, swap the motor wires at the RailBoss M terminals. Then, move loco forward, and you should get two toots. If not, swap wires at MyLocoSound M terminals.

Summary:

I think the most difficult part of these battery conversion projects is deciding where all the components are going to go. It is a packaging project. The rest is just follow the instructions.