Converting a USA Trains F3 A-B-A consist to Battery Power R/C

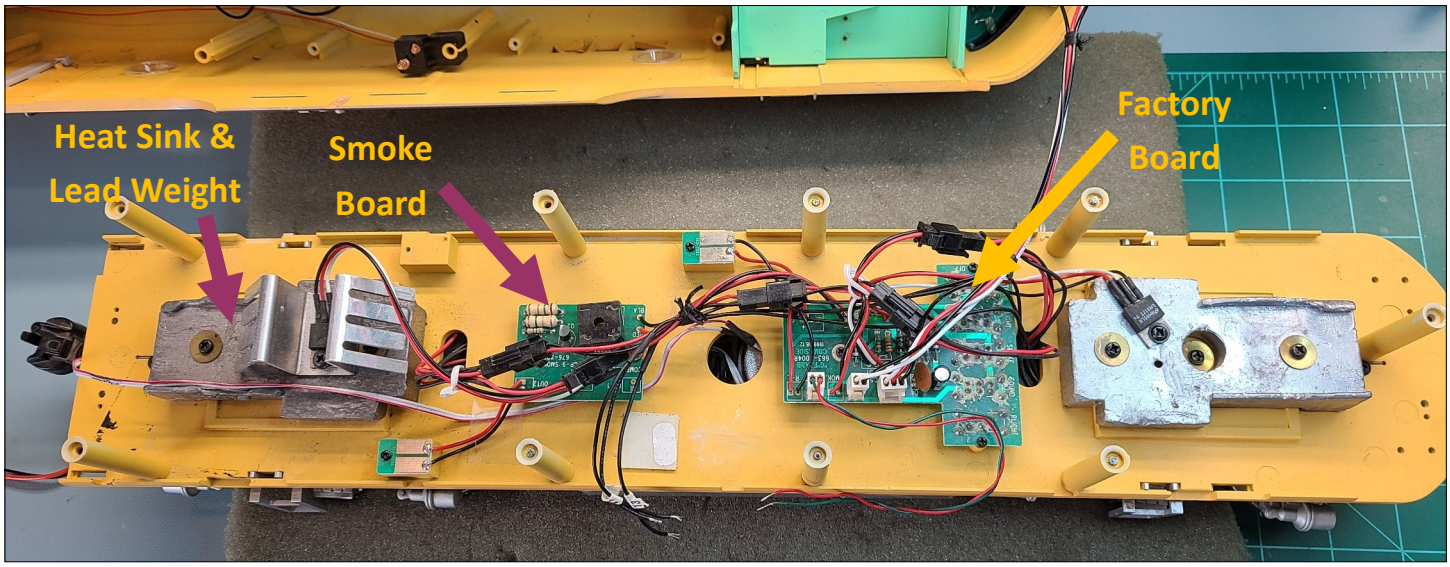
By Del Tapparo

F3 A-B-A USA Trains: Lead A 5521, B unit 5522, Trailing A unit 5694

As received: All locos are powered, missing Phoenix Sound card in lead A unit, second speaker in B unit.

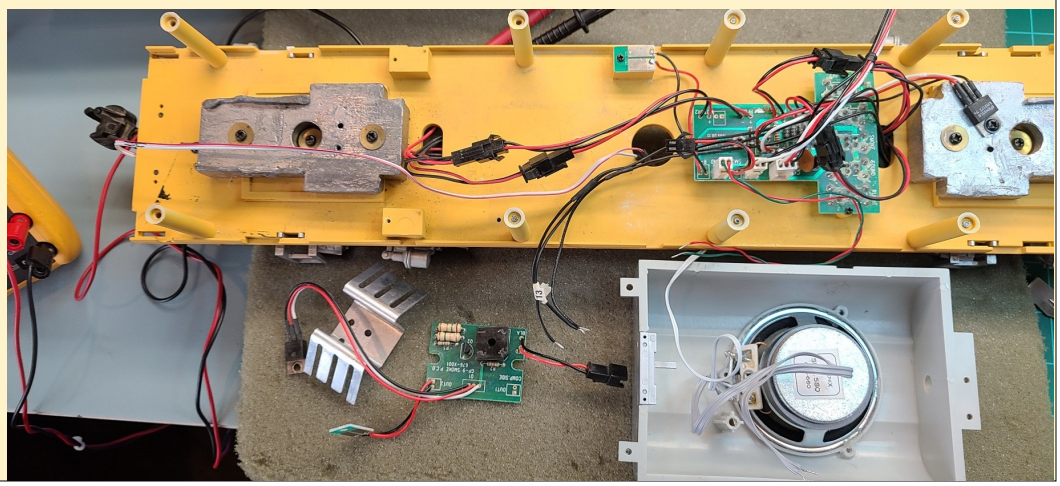
Plan: Install G-Scale Graphics RailBoss 4 Plus 10 Amp in lead A unit, along with battery and MyLocoSound. 4-Wire connectors between all threelocos for motor/speaker. Move existing speaker in B unit to the trailing A unit. Remove motors from B unit to make it free rolling and use less current.

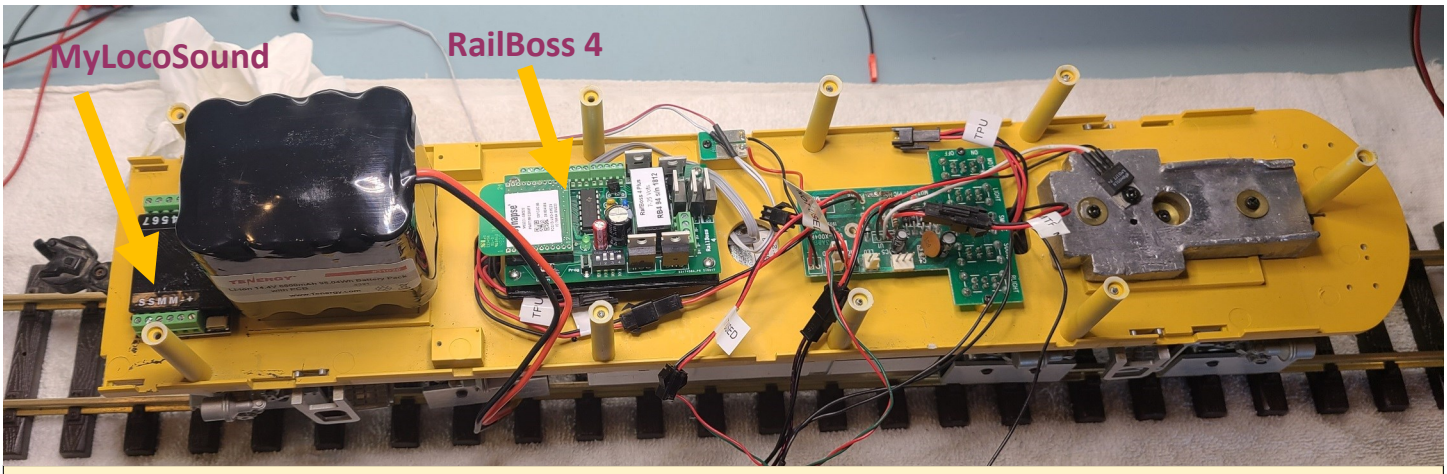
Access: 9 screws to remove the body shell. 4 of them are under the tank/speaker. Remove front pilot to access the one in front/center.



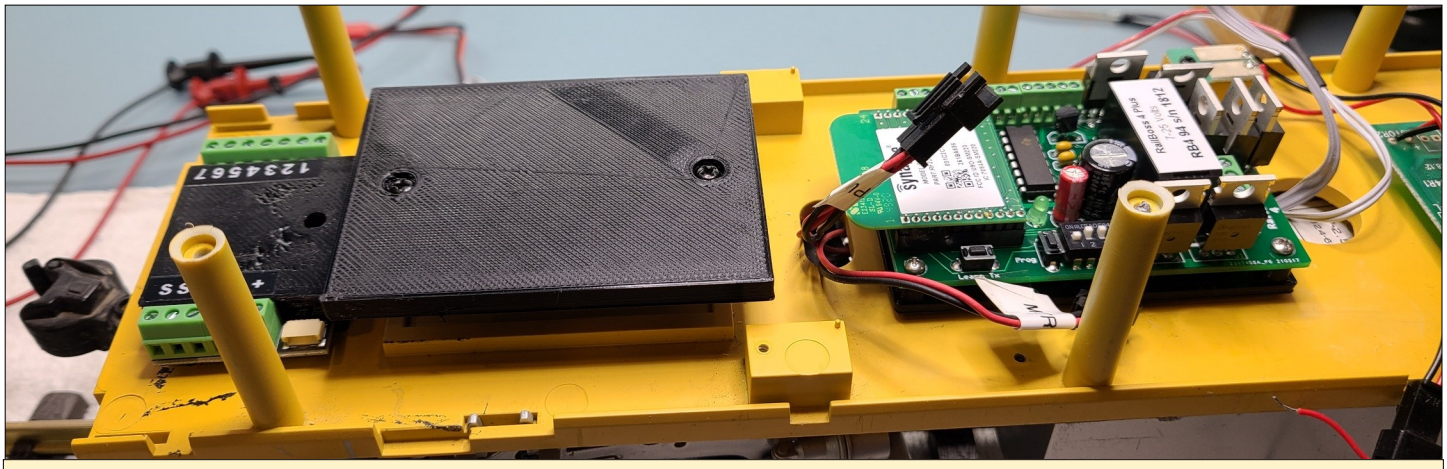
Lead A Unit 5521.

- Remove smoke board, heatsink, and lead weight. Weight of battery will replace the lead.
- Disconnect track pickup wires (front and back) and label. Removing track skates from motor blocks to reduce drag is optional.
- Connect motor output of RailBoss 4 to male track pickup No. 1 plug connected to the factory board. Track Pickup No. 2 on this loco has a blown trace on the factory PCB. Not needed anyway. Connecting to just one is easier and runs both motors. Factory board will then route power to motors and front lights. Note: Polarity of TPU1 when connected +red, -blk runs motors backwards.
- Test motors: Apply power to the TPU1 connector and verify that both motors run, and in the same direction. Reverse polarity of power and verify all works in reverse.

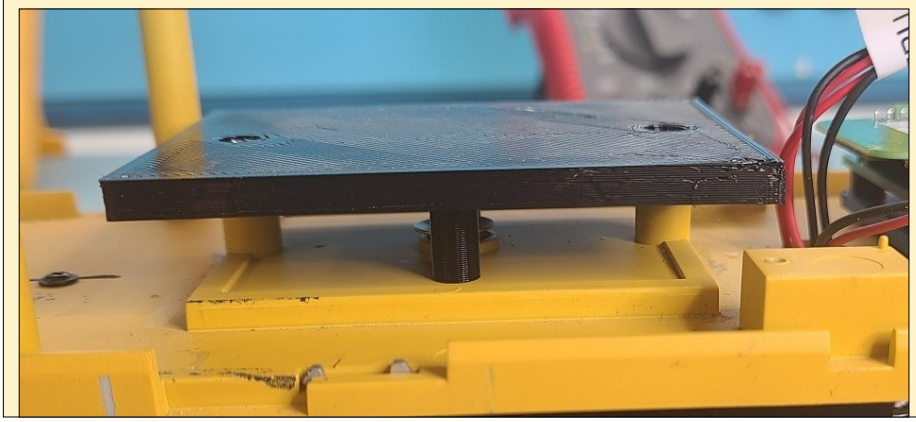




Lead A Unit 5521. Mock layout of components to see where it will all go and fit. Battery Conversion Module will go in shell.



Lead A Unit 5521. MyLocoSound with PCB cover. 3D printed a battery floor to use mounting posts for lead weight. Could have just cut off the mounting posts to get a flat surface instead.

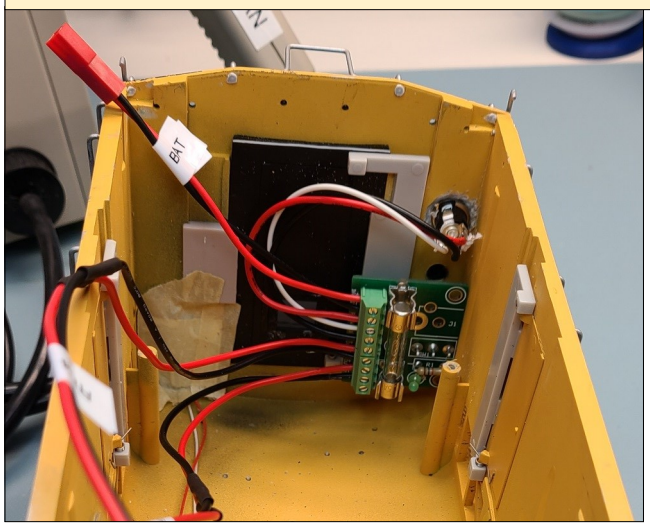


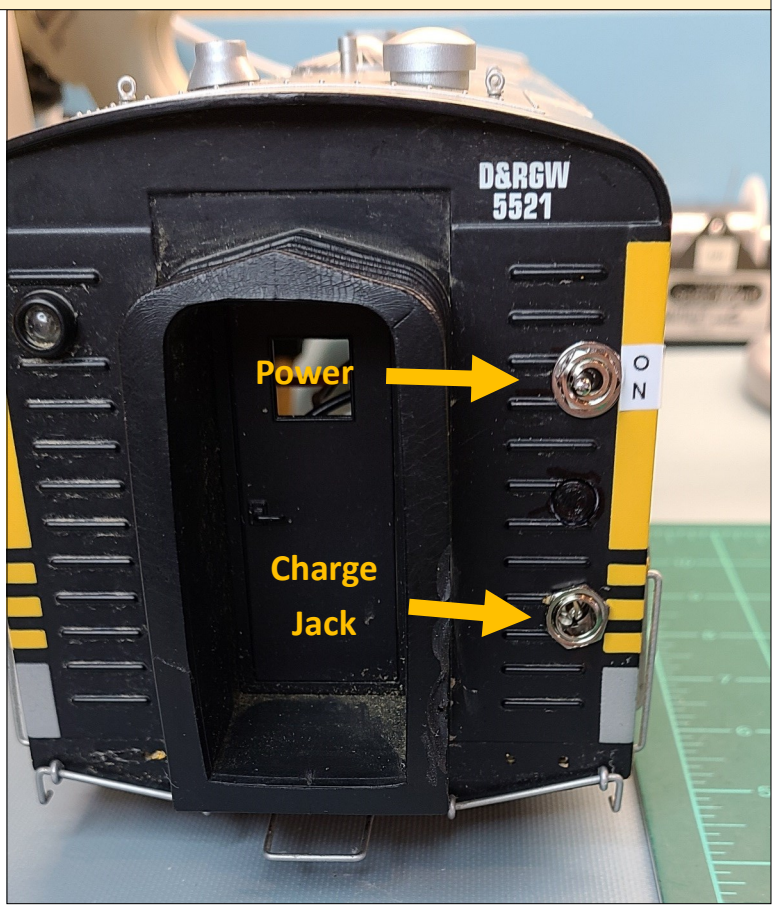
Remove mounting posts for smoke board so we can mount the RailBoss 4 flat in that spot with RailBoss 4 mounting plate. All components mounted with double sided foam tape. 14.8V, 6600mah Li-Ion battery pack.

Lead A Unit 5521.
Battery Conversion Module (BCM)

Locate where holes for power on/off switch, charging jack, and MLS IR sensor will go, and if wiring between components mounted in the body shell and chassis will be long enough to allow for easy removal of the body. Wires need to be long enough to remove body shell and lay it down next to loco without disconnecting anything.

BCM sits above MyLocoSound in back of battery pack, mounted in rear of body shell. Drill 5/16" hole for charging jack and ¼" hole for Power switch. Dremel out the backside of 5/16" hold to allow charging jack to protrude out enough to capture retaining nut.





Lead A Unit 5521.
Mounted **MLS IR receiver** on battery pack. It will be accessible when the rear door is open. Short leads on MLS board don't allow it to be mounted on the shell and visible from the outside. No good spot on the chassis to mount it for visibility. This is a compromise. (Turns out it works fine through the grill on side of loco).

Trailing A Unit 5694

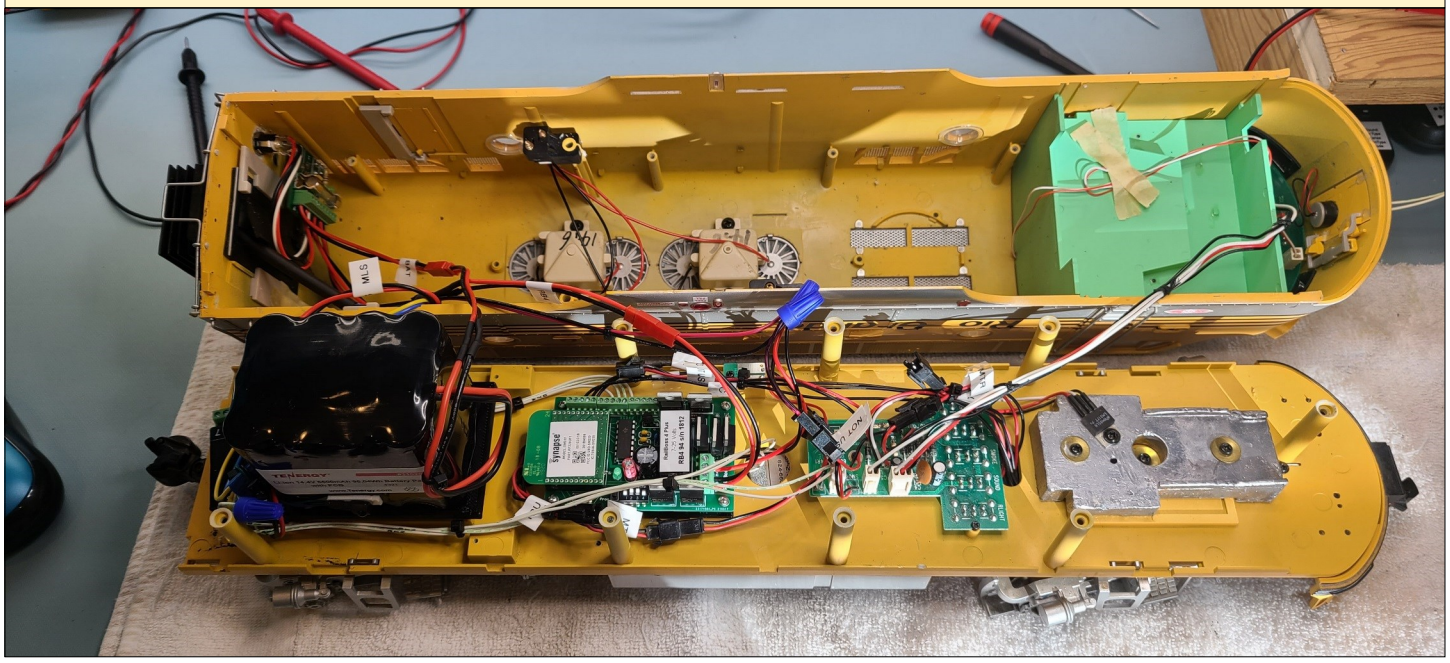
Install new 2.5" **speaker** with silicone adhesive. Drill new wiring hole for speaker wire as not enough clearance between speaker and floor for the wire.
Pick1 and Pick2 connectors get wired in parallel, but pick2 is reversed so both motors run in the same direction. Red/Blk wires in 4-connector; + results in forward motion (all units).

Lead A Unit 5521 - Wiring

Power (BCM to RB4 and MLS). RB4 Motor to Track Pickup 1 on Factory board. MLS motor terminals to "Sound" connector on Factory board.

Loco to Loco 4-wire cable routed throuigh the open doors of each loco. Red/Blk motor, Yel/Blu speaker. 2" of black heat shrink tubing to conceal wire colors. Male plug out of rear, female plug into front of next loco.

Use existing reed switches mounted on front loco. Horn on the right, Bell/Station Stops on the left. Use existing speaker infuel tank.



B Unit 5523

Remove motors to make the car free rolling and reduce current load on motor driver. Remove motor block by taking off the side frames. Turn motor block over and remove cover. Motor will just lift out. Remove existing speaker which was damaged. Pass thru 4-wire connector for motor/speaker to lead and trailing A units via doors.