

Install SoundTraxx TSU-1100 Decoder in P2K EMDGP38-2

In a previous article entitled “NCE P2KSR decoder installation in P2K Life-Like EMDGP38-2” I commented that I should repeat this installation in another P2K EMDGP38-2 using a sound decoder. Here is the quote from that article:

“Before attempting this installation it would be worth waiting for more suitable accessory parts than what I used. For example don't use 5 mm LEDs. Obtain 3 mm LEDs. Use narrower gauge wire for connections..i.e. 30AWG. This will also allow for use of smaller diameter heat shrink tubing. I found that due to the excellent design of the PROTO 2K Life-Like EMDGP38-2 model's Track Pickup system, I did not require a keep alive. If a keep alive is necessary I think you would have to cut out space for it in the lead weights. Much more space could be gained by not using the original 8 pin plug, and wiring directly to appropriate connection points on the decoder board. In other words using a prewired Decoder with an 8 wire harness would avoid having to use the 8 pin plug which takes up a lot of critical vertical space. To add sound you could use a Soundtraxx Tsunami TSU1100 (which includes an optional capacitor) or TSU 2200 with an 8 wire harness and place mini cube speakers in the cabin space on either side of the front truck Drive gears?”

So here is documentation of my repeat installation of a Sound Decoder into a P2K EMDGP38-2. The accessories and parts I used that were different from my previous install of a NCE mobile Decoder into a P2K EMDGP38-2 locomotive:

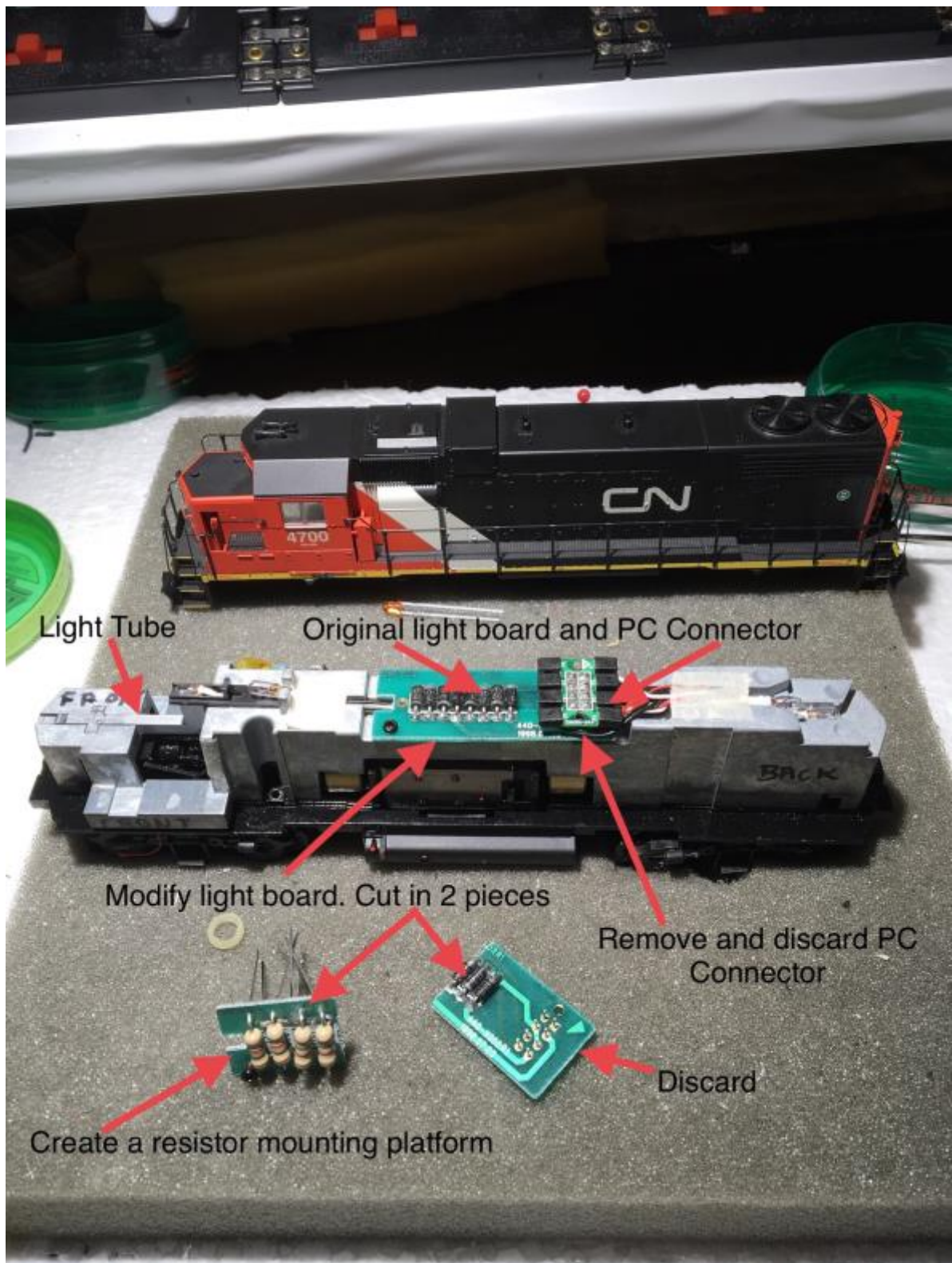
SoundTraxx Tsunami2 TSU-1100 Decoder with optional small can capacitor
30 AWG flexible wire
2 SoundTraxx Mini Cube2 speakers.
2 3mm Golden White and 2 3mm Sunny White LEDs

I fastened the 3 mm Golden white (or Sunny white) LED to the modified cut end of the front light tube as before. I also used the light tube as a secure surface to glue the two Mini Cube2 speakers to, on either side just above the front drive gear. Cyano-acrylate glue worked well. If also using Kapton tape or black tape to shield light from the cab, be sure there are no loose ends as this will transfer vibrations from the speakers causing a raspy sound. Also insure the light tube is firmly secure in its channel between the lead weights so as to eliminate vibration. See photo next page for further clarification.

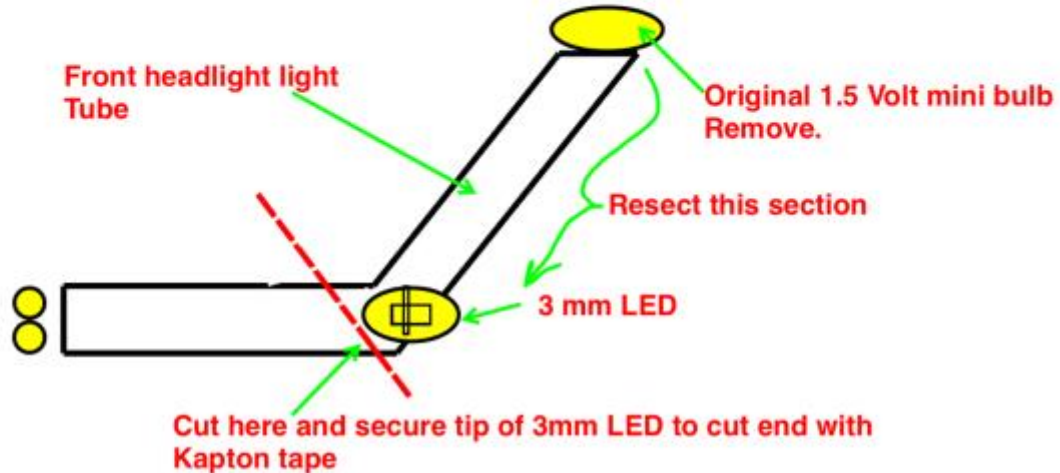
One other major change I made to reduce space taken up by resistors was to mount all 4 resistors together on PCB board. Use the pre-existing light board, by cutting it in two pieces, and using one piece for a platform to mount resistors, one each (1.5 K) for each LED. Cut any traces to eliminate possibility of short circuits. The resistor platform is mounted next to the decoder above the center of the lead weights. See below.

Removing the shell only requires taking off the coupler gear boxes, and removing two screws, one each behind the front and rear trucks. I clearly document this in my previous article.

This is what you see after removing the shell.



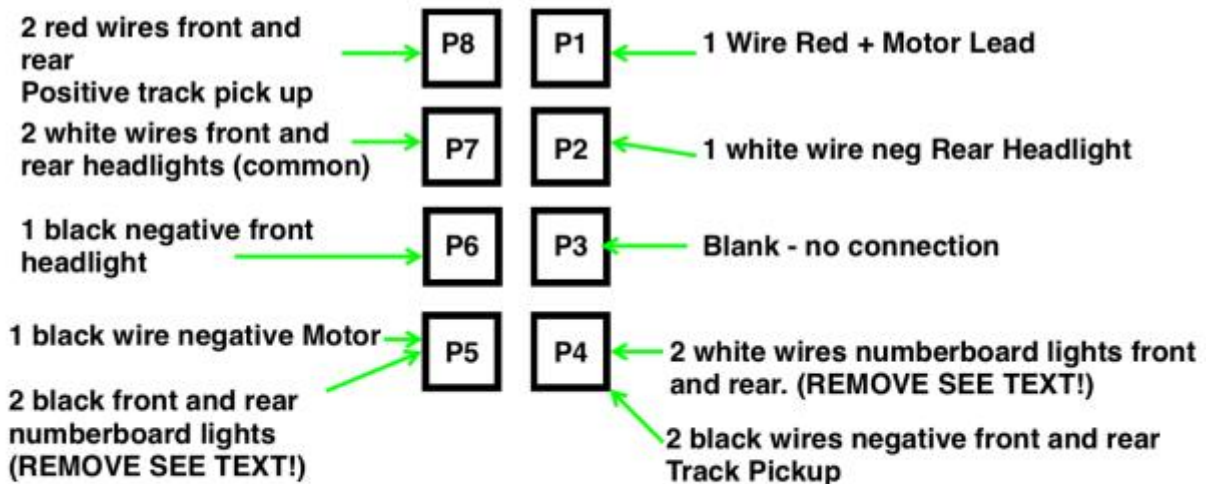
Modifications to front headlight light Tube

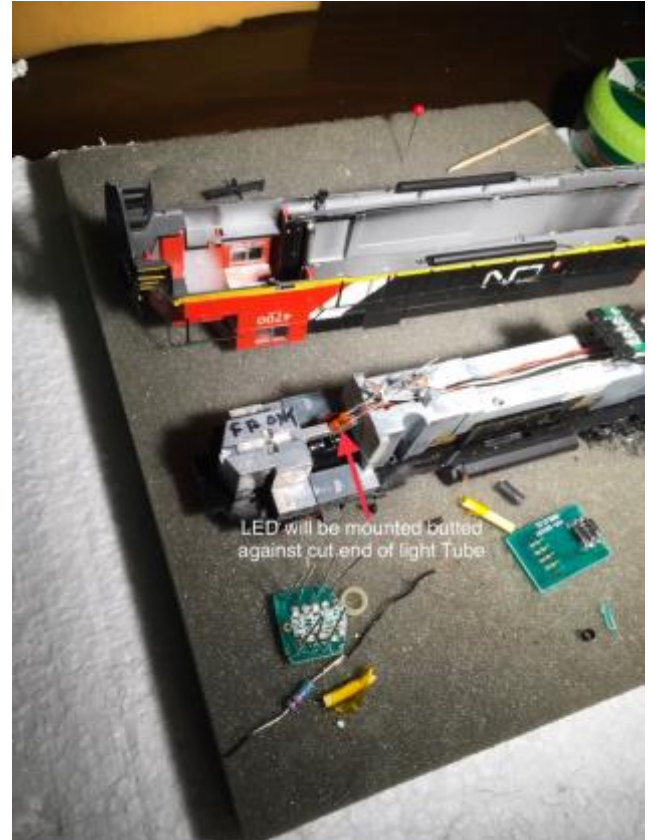


Original wire connections to 8 pin mini PC Connector

(Note that the wire colours do not conform to NMRA DCC standard)

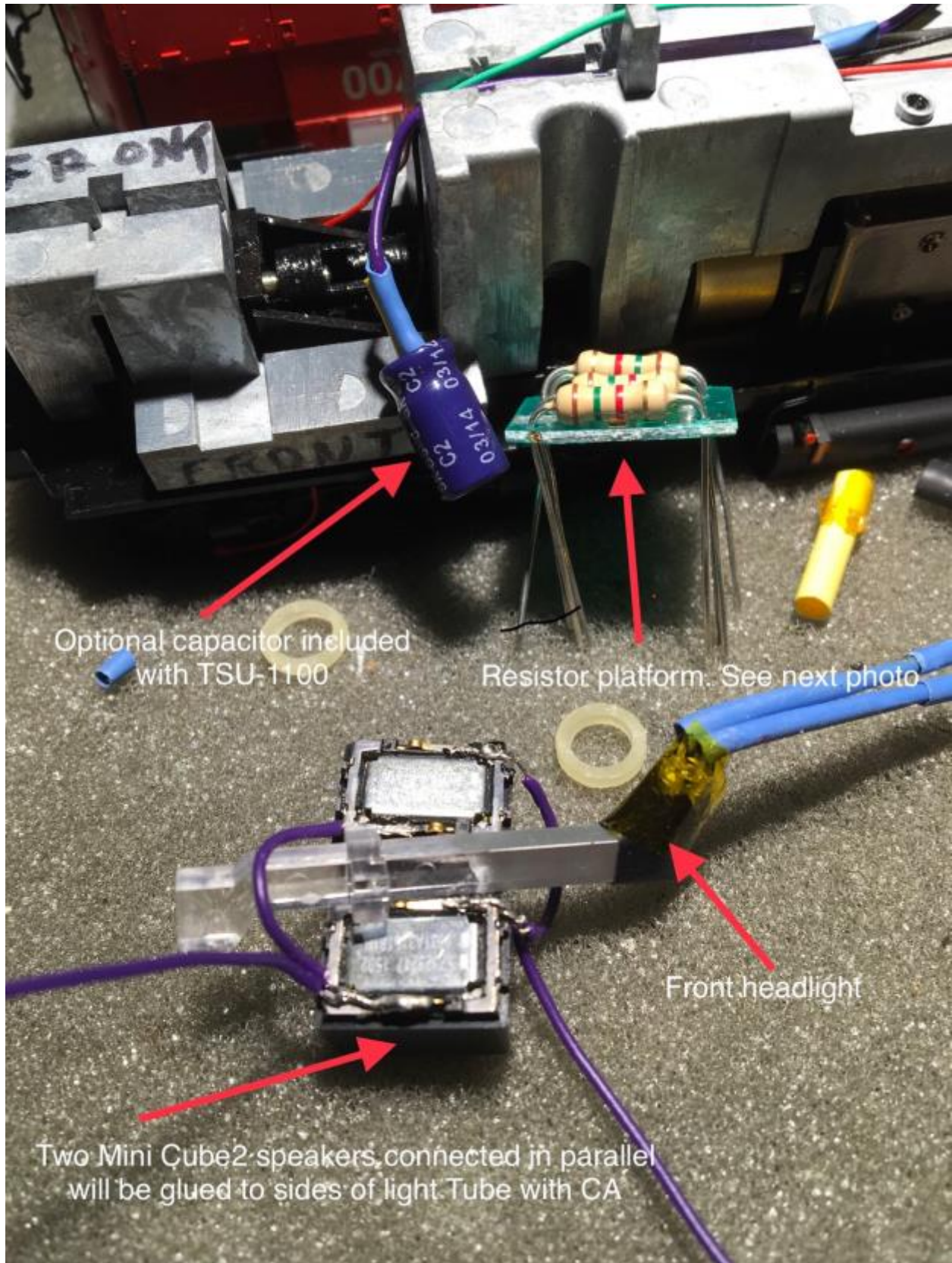
If using the TSU-1100 Decoder just take all the wires off the PC Connector, discard the connector and make the appropriate connections. Considerable vertical space can be saved by not using the 8 pin connector.





Modifications made to light Tube.

Use an angle cut if more vertical room is needed for the LED. I suggest using Golden White or Sunny White 3mm LEDs. I used Sunny White for the front and rear headlights and Golden White for the numberboards. The front numberboard light (mounted behind the front headlight will provide light to the cab. I connected the front and rear headlights to F(0), and the front and rear numberboard LEDs to FX outputs 3 and 4). If adding Ditchlights, best to connect the numberboard lights to one function output and use the 2 others for the 'alternating ditchlights'. Remember each LED requires its own current limiting resistor even if 2 LEDs are connected to only one output.



The speakers: Mini Cube2 miniature speakers from SoundTraxx

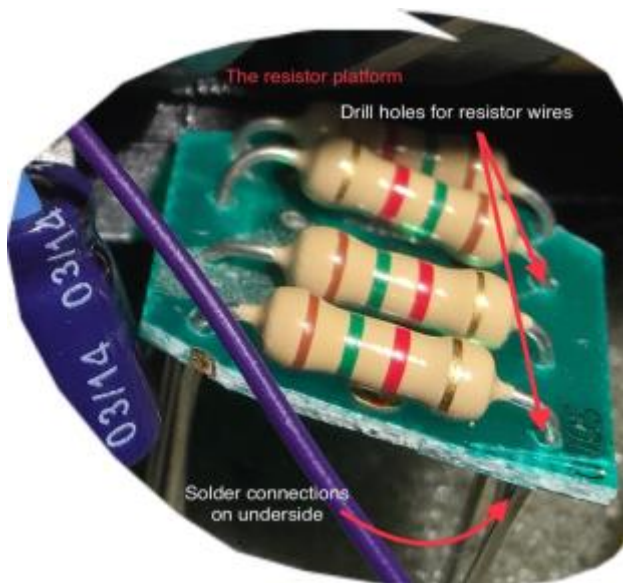
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The speakers are 32 ohm impedance each. SoundTraxx recommends using two connected in parallel for a total impedance of 16 ohms so as not to over drive the 1 watt amplifier of the Tsunami2 TSU-1100 Decoder. There must not be anything less than 8 ohms impedance across the decoder. If these speakers are mounted in series (64 ohms) there is not enough volume produced. As is, the sound volume is not expected to be as loud as emitted from SoundTraxx 8 ohm speakers, but is certainly to a scale HO volume. Care taken to insure sound-proofing of the speaker join to the Baffle (included), and secure mounting to prevent vibration all helps. Insure there are no loose tape ends that will cause vibration.

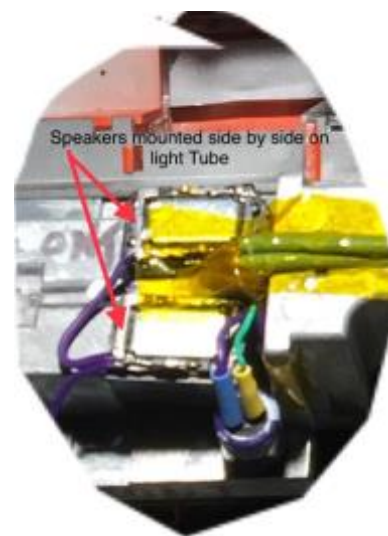
The resistor platform:

The excess wire from resistors is cut off and connections soldered on the other side. Be careful to cut any remaining tracers in the PCB board and not let any excess solder cause short circuits. I wrapped the entire resistor board in Kapton tape after making the appropriate solder connections.

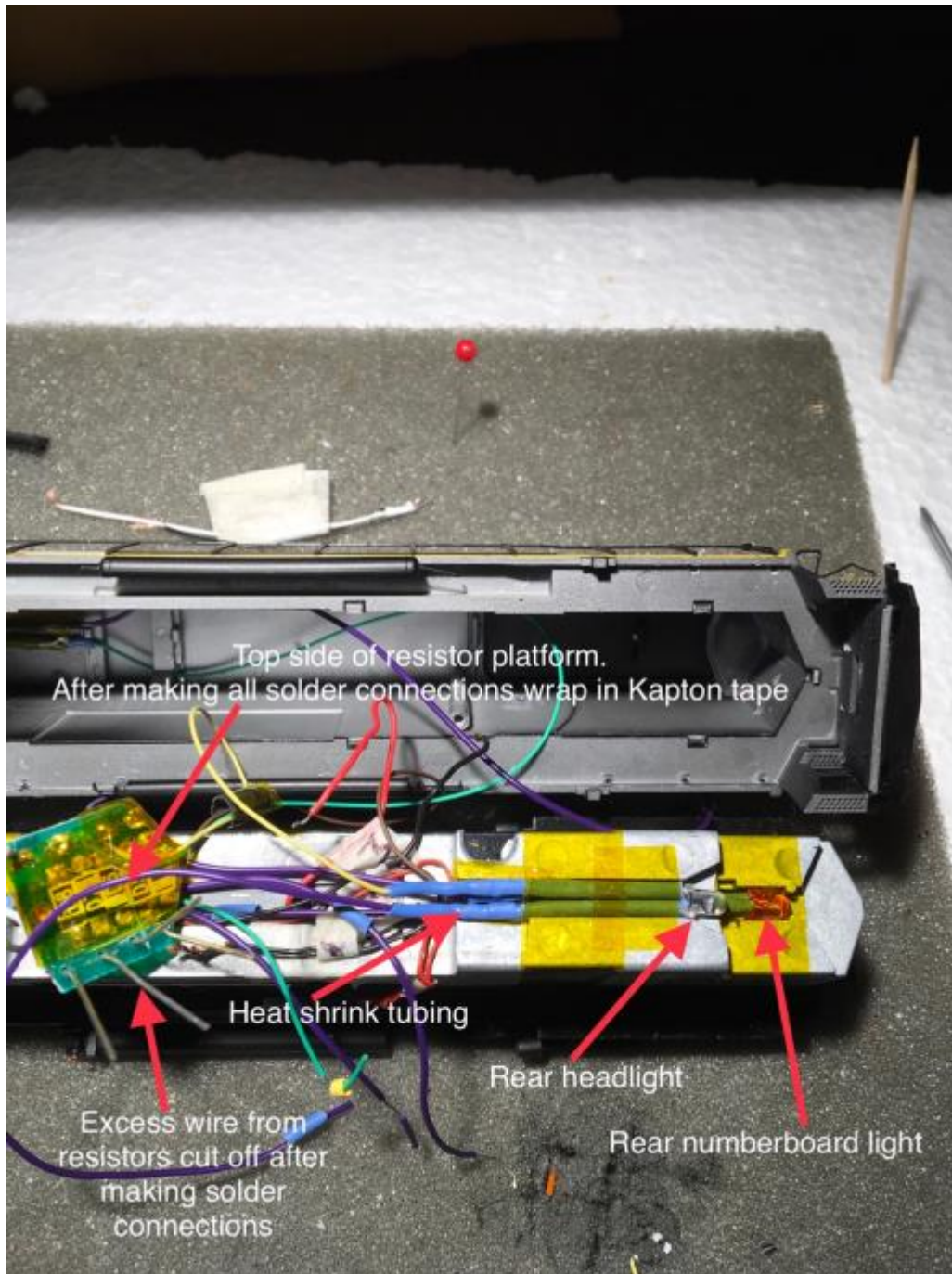
The resistor platform



Speakers mounted on light tube

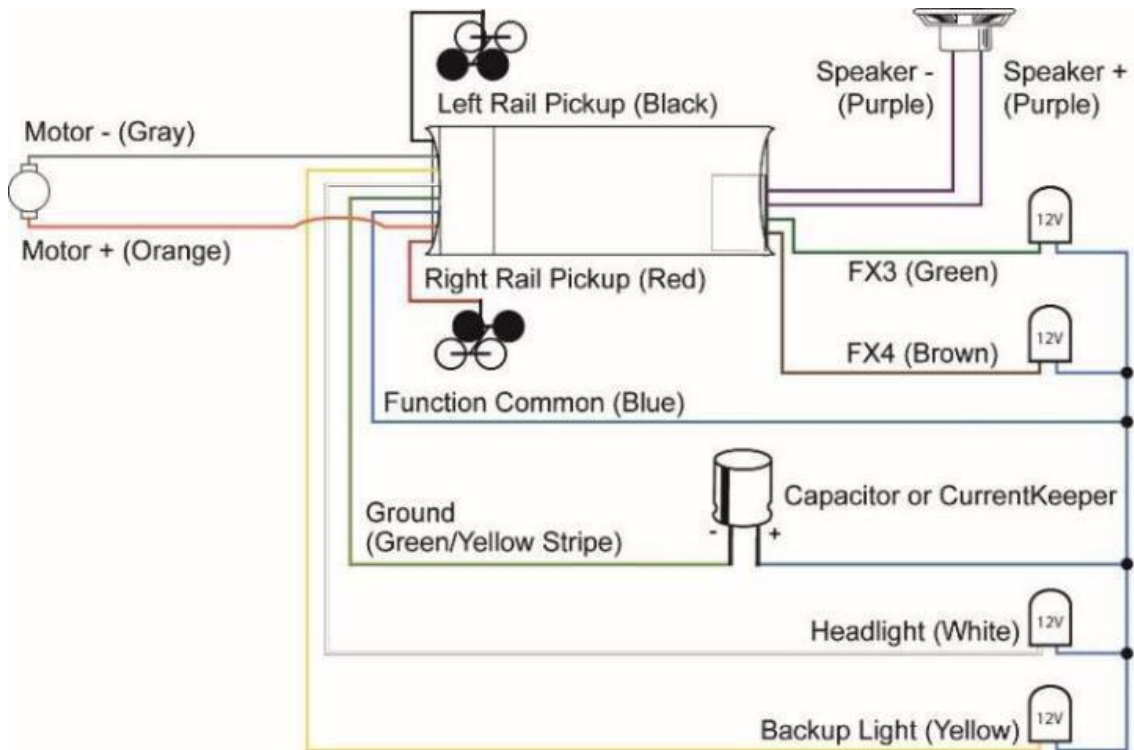


The resistor platform and location of rear numberboard and rear

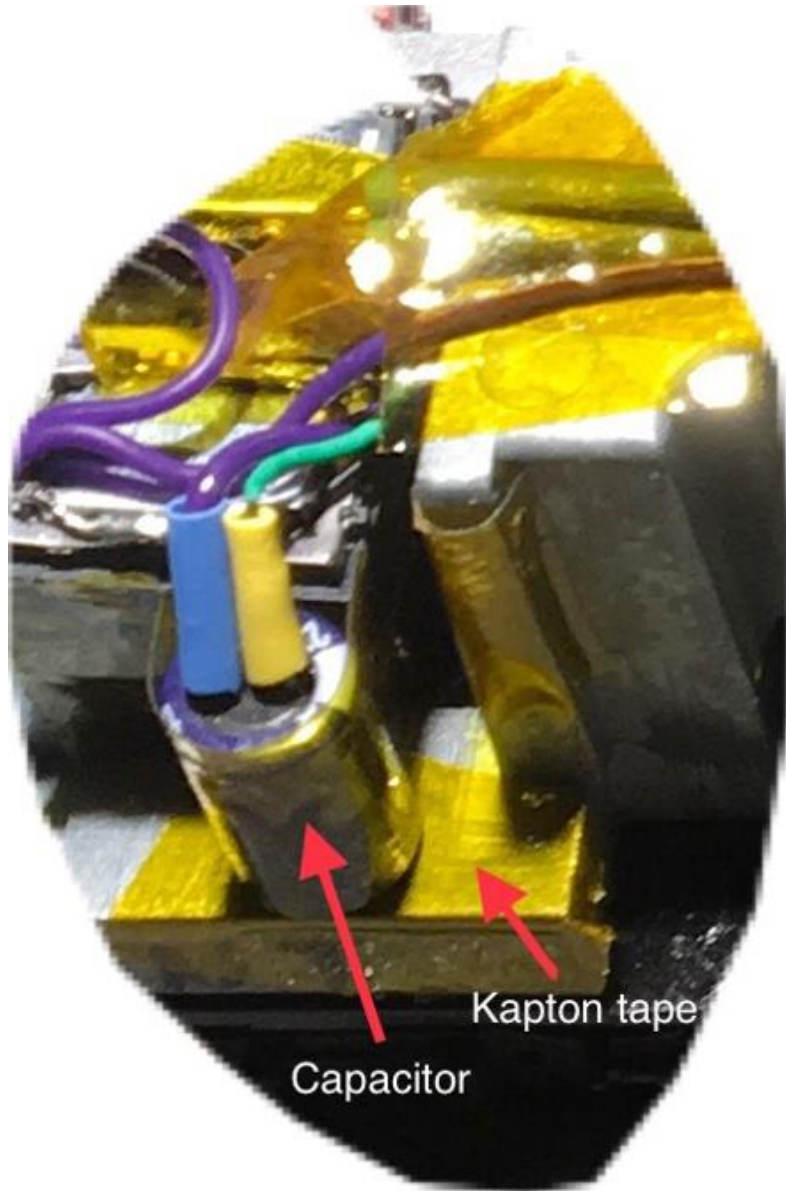


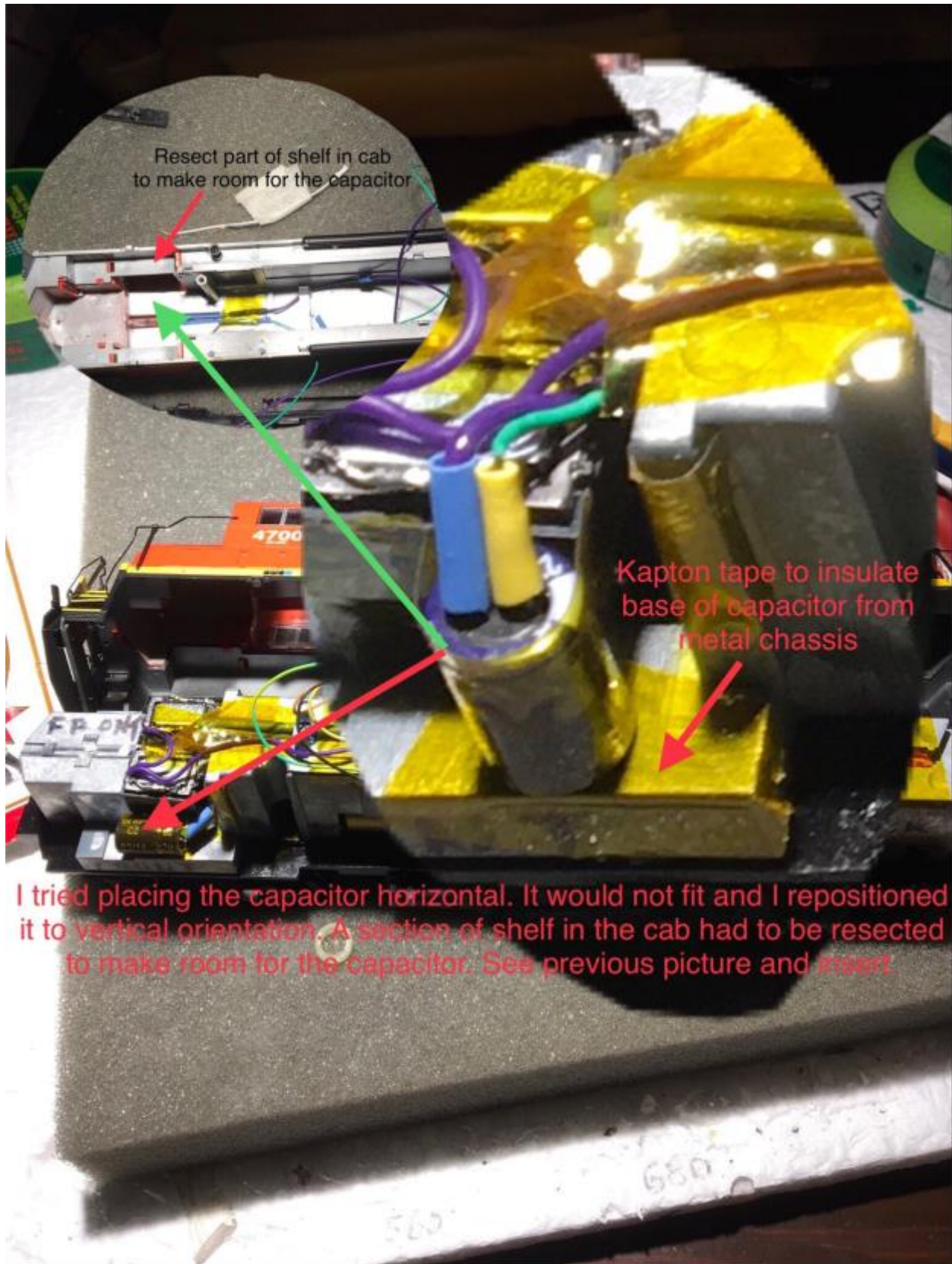
headlights. I used FX 3 and 4 for the numberboard lights.

The Wiring Schematic as supplied by SoundTraxx for the TSU-1100



The capacitor poses problems relative to accommodating for lack of space. I used the optional capacitor supplied by SoundTraxx with the TSU-1100 and finally settled on a vertical orientation located in the cab.





Accommodating the capacitor. Part of shelf in cab had to be resected.

The capacitor does not supply much power, certainly no where near a Current Keeper. I found with the excellent design of the P2K EMDGP38-2 and using the NCE P2KSR mobile Decoder that a keep alive was not necessary on my layout. Should you need more capacitance and want to use a Current Keeper, I don't think you will find room under the shell without removing some of the lead weight. Another option would be to use a 2 Wire micro connector and place the Current Keeper in an adjoining freight car if you don't mind your locomotive having a constant companion. I have done this with other installations and it works quite well.



OK let's just tidy up a bit and see if I can get the shell back on?

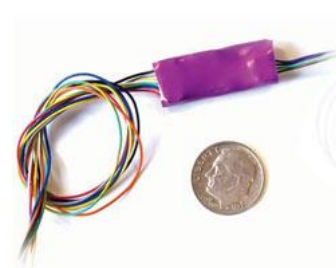
Before re-orienting the capacitor the next photo shows the wires in place and about to put the shell back on.



Did it! It's a real tight fit. No room for a Current Keeper, and the small

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miniature SoundTraxx Mini Cube2 speakers were necessary. 30AWG flexible wire and sparing use of heat shrink tubing were a big help. Mounting the resistors together on the recycled piece of pc board also made a big difference. The Sound quality is good for the size of the speakers. The motor control after setting CVs is excellent.



EMDGP38-2.

Tsunami2 TSU-1100 EMD Diesel
1 Watt 4 Function Outputs

SoundTraxx Mini Cube2 speakers



With Baffle 32 ohms



CN Spiritwood Subdivision
Doug Dyer
Victoria BC