

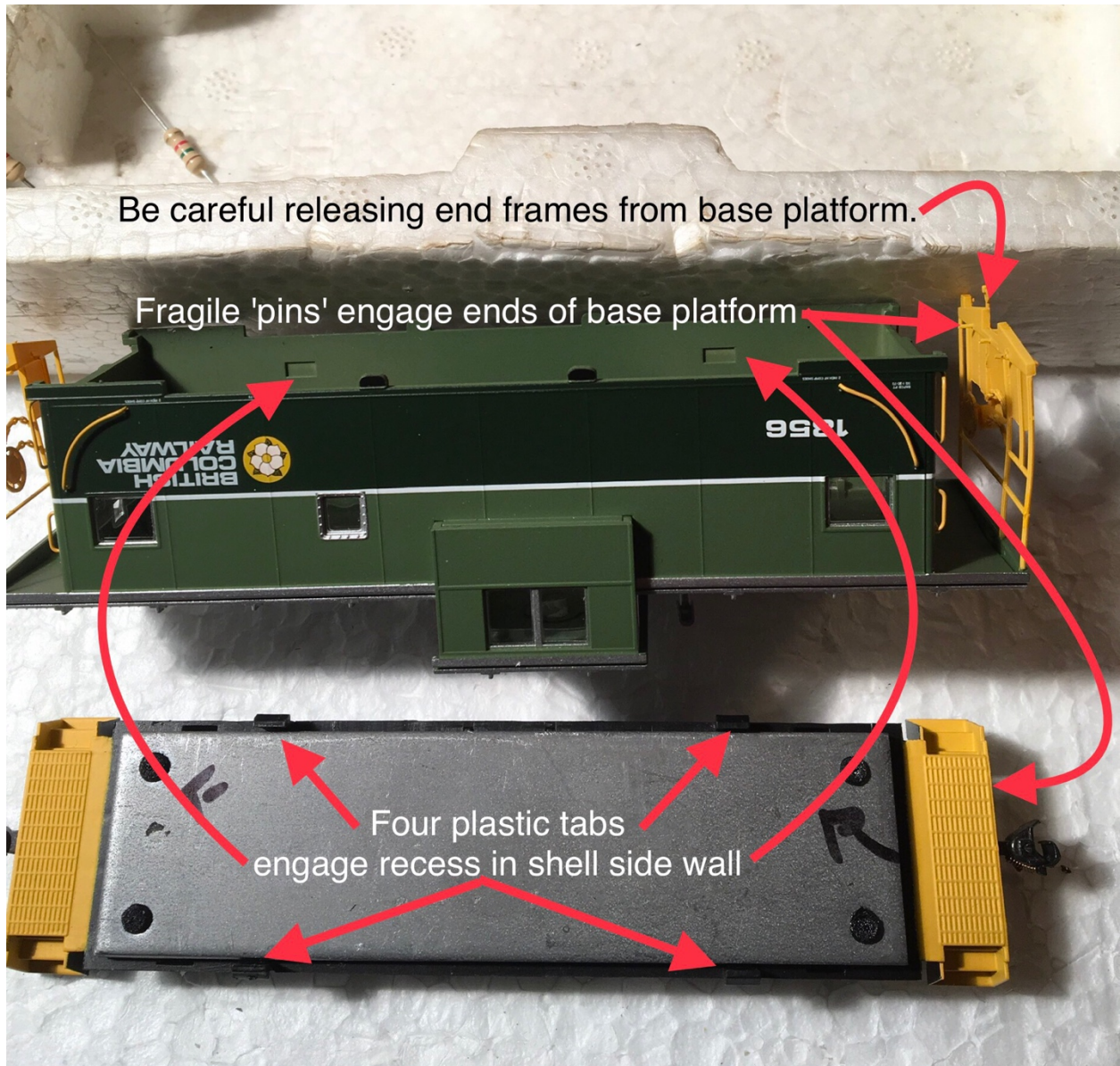
Installation of a SoundTraxx Sound Car Decoder into a BC Rail Caboose. British Columbia Railway 1856

Being a resident of British Columbia Canada, the British Columbia Railway always had sentimental meaning to me, and so this project of installing a SoundTraxx Sound Car Decoder into British Columbia Railway 1856 caboose was of special interest to me.



The British Columbia Railway started out as the Pacific Great Eastern, running from Squamish BC to Quesnel BC, connecting to the Grand Trunk Pacific in Prince George, serving the lumber and mining interests of British Columbia. After becoming government owned it finally started making profits for the BC government, and continued doing so for Canadian National after being leased to CN in July 2004. The railway has a colourful history including scandal, and was dearly loved by all British Columbians. Here are some opening remarks taken from Wikipedia: "BC Rail (reporting mark BCOL, BCIT), known as the British Columbia Railway between 1972 and 1984 and as the Pacific Great Eastern Railway (PGE) before 1972, was a railway that operated in the Canadian province of British Columbia between 1912 and 2004. It was a class II regional railway and the third-largest in Canada, operating 2,320 km (1,440 mi) of mainline track. Its

operations were owned by the public as a crown corporation from 1918 until 2004, when the provincial government leased operations for 999 years to CN. The provincial government, which promised when originally elected never to sell the railway, has announced that the crown corporation and its remaining operations and assets would be "wound down" and taken over by various departments of the Ministry of Transportation. The details of the sale/lease to CN, which are related to the OmniTRAX affair, have become the subject of protracted public inquiry as part of the proceedings of the trial surrounding a scandal known as the British Columbia Legislature Raids Affair, or "Railgate".



The model:

Taking the shell off the base involved prying loose the four tabs securing the shell to the chassis. The front and rear fences have to be carefully released from the base, being careful not to damage the fragile plastic pins that secure the front and back railings to the back edge of the platform deck. The couplers do not have to be removed prior to disassembly of the shell.

The SoundTraxx Sound Car Decoder has Bells, Whistles , Brake squeal, wheel clickety-clack, Generator and other sounds, and 4 function outputs for lighting effects. SoundTraxx consist technology allows you to sync the sounds with the locomotive pulling the freight by a simple wave of a magnet over a sensor in the decoder, thus emitting a sound simulating release of air brakes. Then pressing the mute key four times (F8) puts the Sound Car into the current locomotive address's consist.. By the same token, after spotting the car and uncoupling, you break up the consist by waving the magnet over the decoder's sensor again. Now you hear the Sound Car emitting sounds simulating turning the brake wheel and setting the brakes. Three sound cars in a consist are very effective and realistic. The four lighting output functions are very useful in a caboose or passenger car.

Parts list:

Soundtraxx Sound Car Decoder

Soundtraxx Current Keeper

Soundtraxx Mini Oval Speaker 8 ohm or round speaker 8 ohm included in some Sound Car pkgs

30 AWG flexible wire .. multiple colours

3 or 5 mm LED Red and appropriate current limiting resistor (1.5 K 1/2 watt)

Kapton tape, and miscellaneous parts such as heat shrink tubing, double sided foam tape

Rail power via electrical pick ups contacting wheels on the trucks.

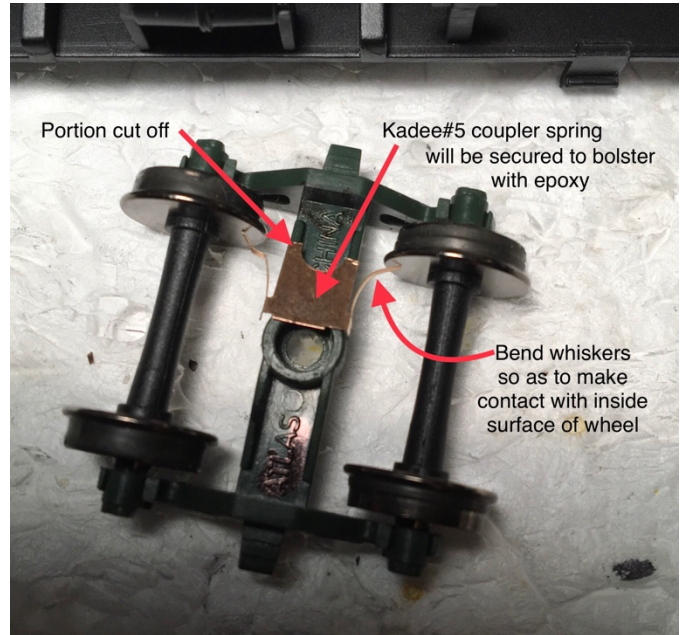
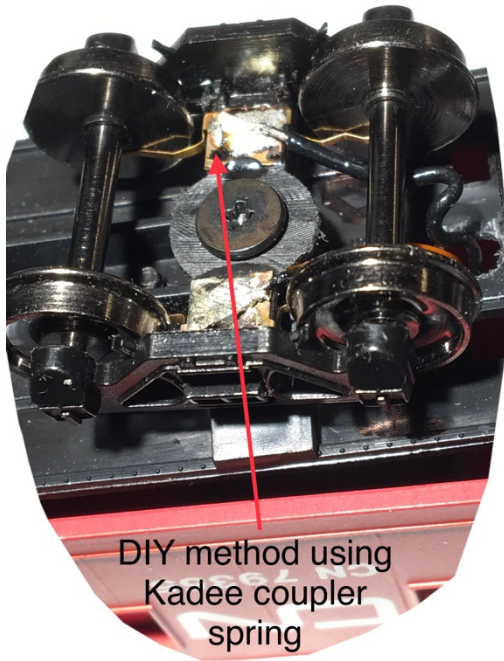
The first issue is getting power from the tracks. There are pre-wired trucks available for purchase, but it is easy to make your own truck rail electrical pick ups using the coupler Springs



from a Kadee #5 HO knuckle coupler. Solder a wire to this and attach to the truck bolster with epoxy. Make sure the axel insulators are on the correct sides, for positive and negative rail pick up.

Doing this to both trucks improves performance. This is what my caboose looks like after performing this task.

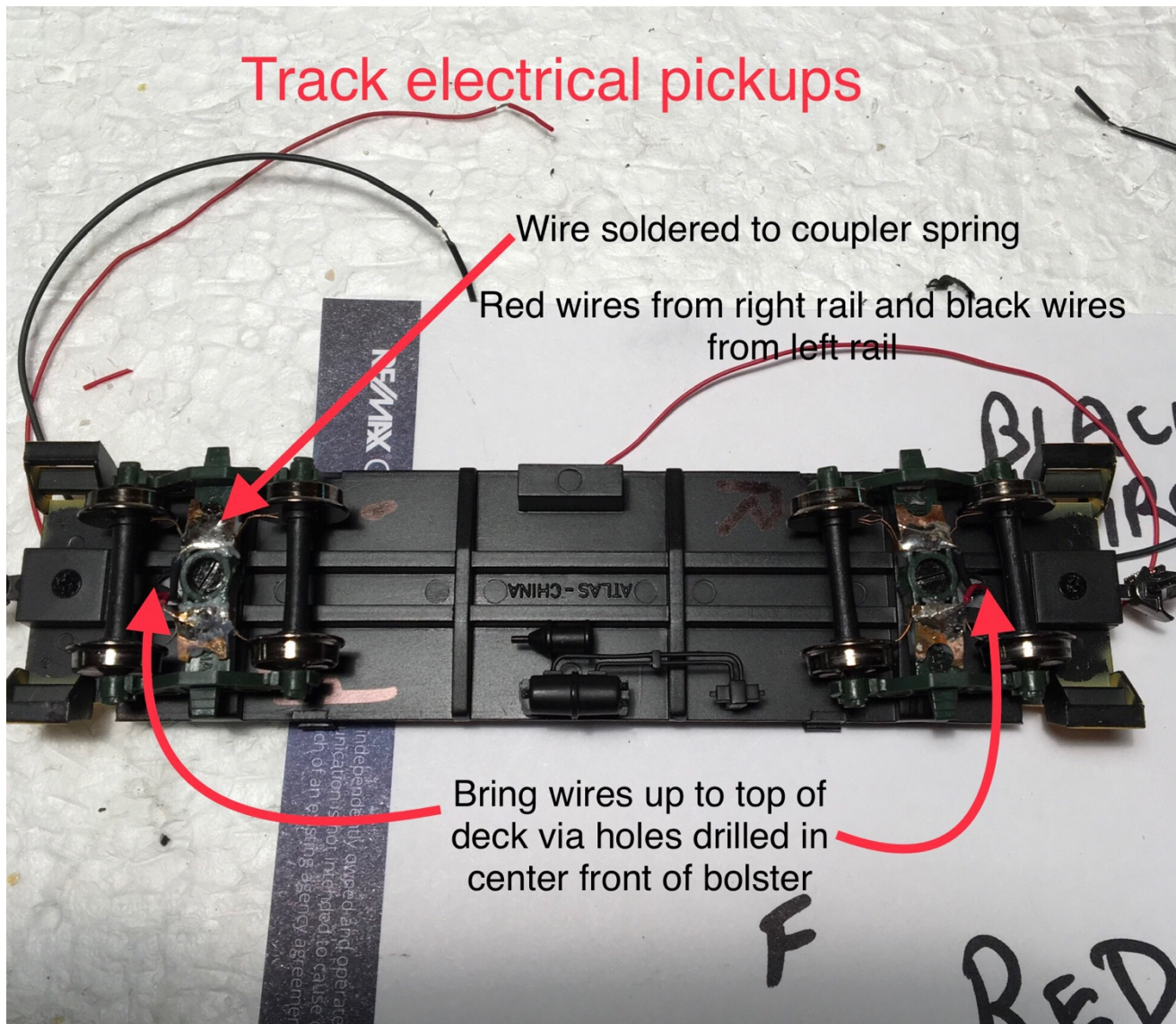
(Remember in iOS you can double tap any image to enlarge!)



Two coupler springs are used per truck in order to gather electrical power from all 8 wheels.



This is what the under carriage looks like after drilling holes in the Center line one each just in front of the truck bolsters to bring the wires up to the top deck.



As per convention the red wires bring power from the positive rail (the right side rail when moving forward, and the black wires bring power from the negative left side rail.

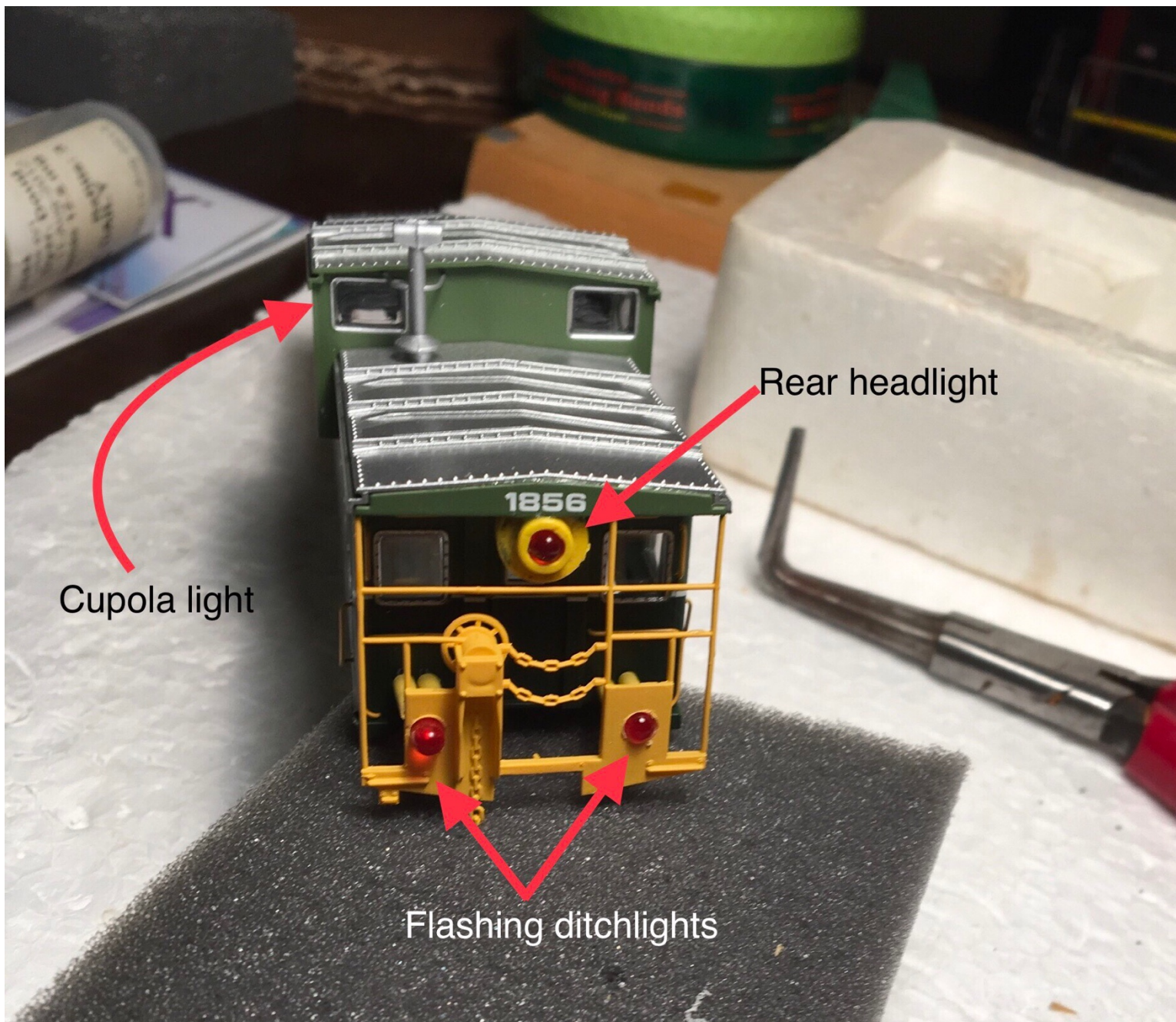
The lighting outputs:

The decoder has 4 Function lighting outputs. For the caboose project I used F(0) Forward (front headlight white wire) for the cabin light. (Operated by headlight button in Forward on the cab throttle.)

The rear headlight under the caboose roof, and the cupola light are wired to F(0) Reverse Function (Backup light - yellow wire). Operated by headlight button in Reverse.

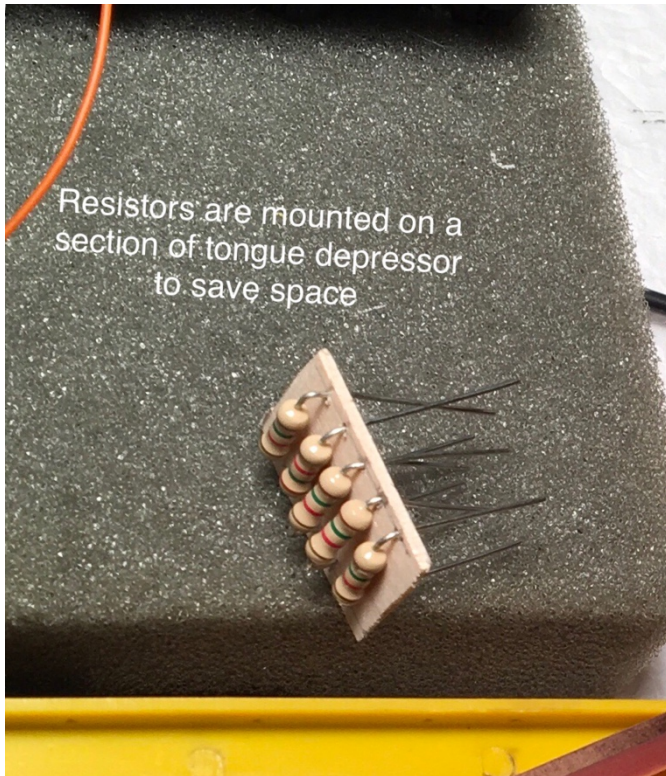
The rear alternating Ditch Lights are connected to Function outputs 5 and 6. (FX5 -Brown wire and FX6 - Green wire). These are operated by Function buttons F5 and F6 on the cab throttle.

Some notes for programming CVs to get the appropriate lighting effects are described at the end of the article.



Because five LEDs are used in the circuitry five current limiting resistors (1.5 K ohms) are also required. To save space I mount all the resistors on a piece of wood tongue depressor, soldering

the negative leads of each led to one side of the resistor and the appropriate output leads from the decoder to the other side of each resistor. My resistor platform looks like this:



Resistor Platform

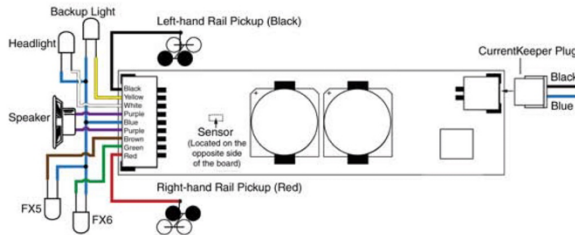
Space is always limited. Take time to plan where everything will fit in the shell. I used an 8 ohm round speaker and baffle from SoundTraxx. Five resistors, five LEDs, the Sound Car Decoder, and a Current Keeper all have to be accommodated. The wiring diagram supplied by SoundTraxx shows where all the connections are made. I have wired the cupola LED and the rear headlight LED to the yellow wire function output F(0) rear headlight controlled by Function button F(0) headlight.

(Remember in iOS you can double tap any image to enlarge!)

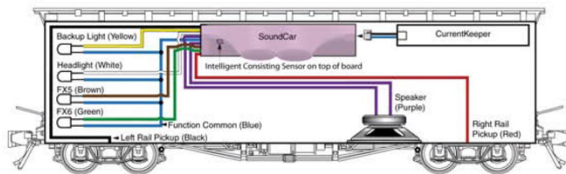
Planning on where to place components in a tight space can be challenging. I put the speaker

Tsunami™ SoundCar™ Wiring Diagrams

SoundCar Wiring Diagram



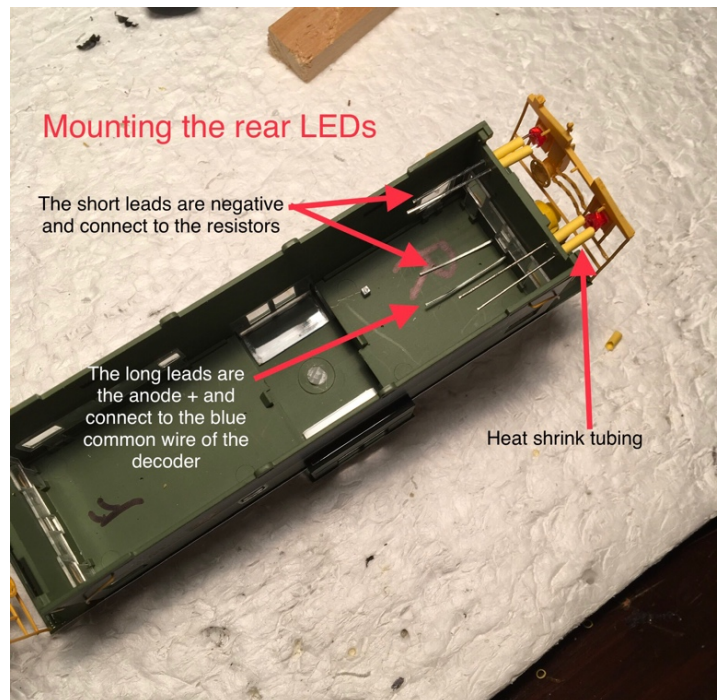
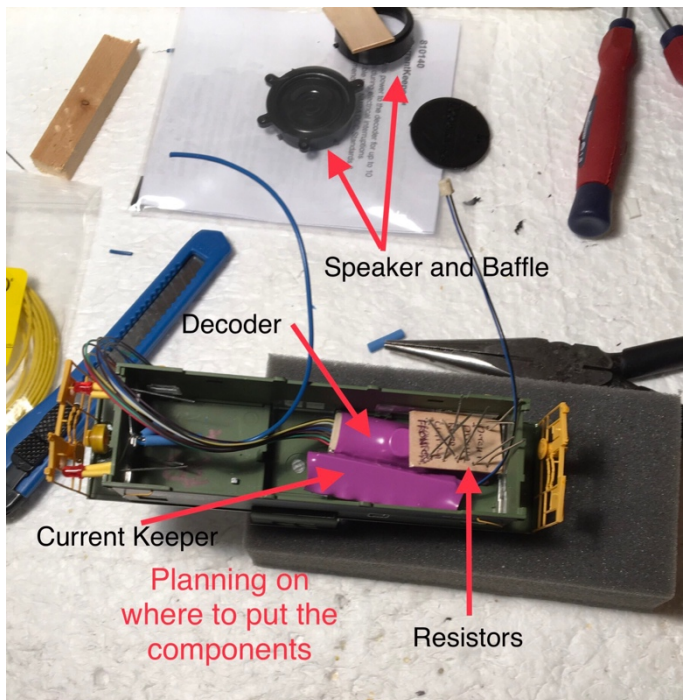
Installation Example



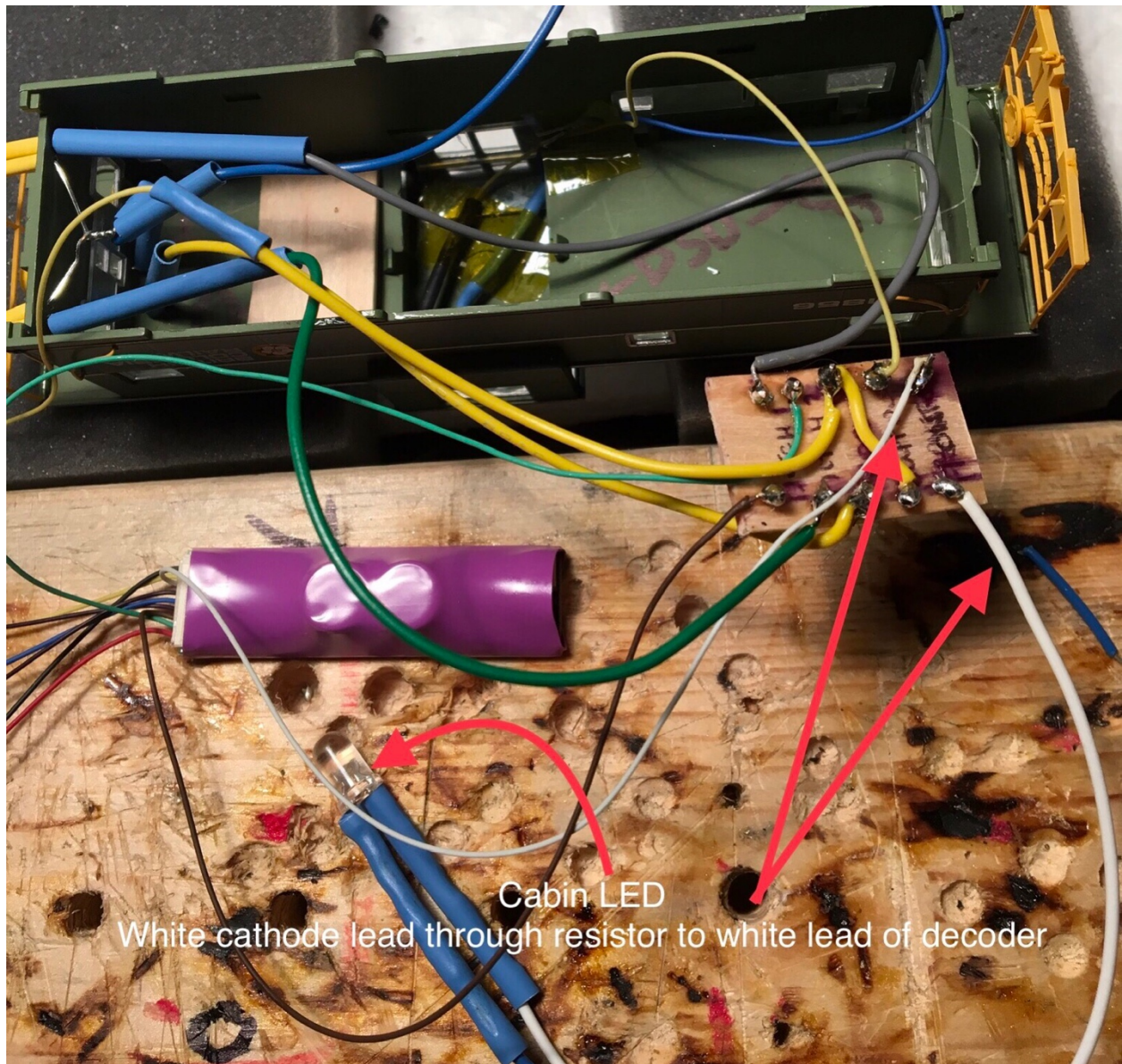
Note the location of the SoundCar on the roof of the model with the Intelligent Consisting sensor is facing outward for accessibility.



near the cupola facing up, and removed two window panes to facilitate sound escaping. It is crucial that the sensor of the decoder is mounted flush to the roof to facilitate its activation by

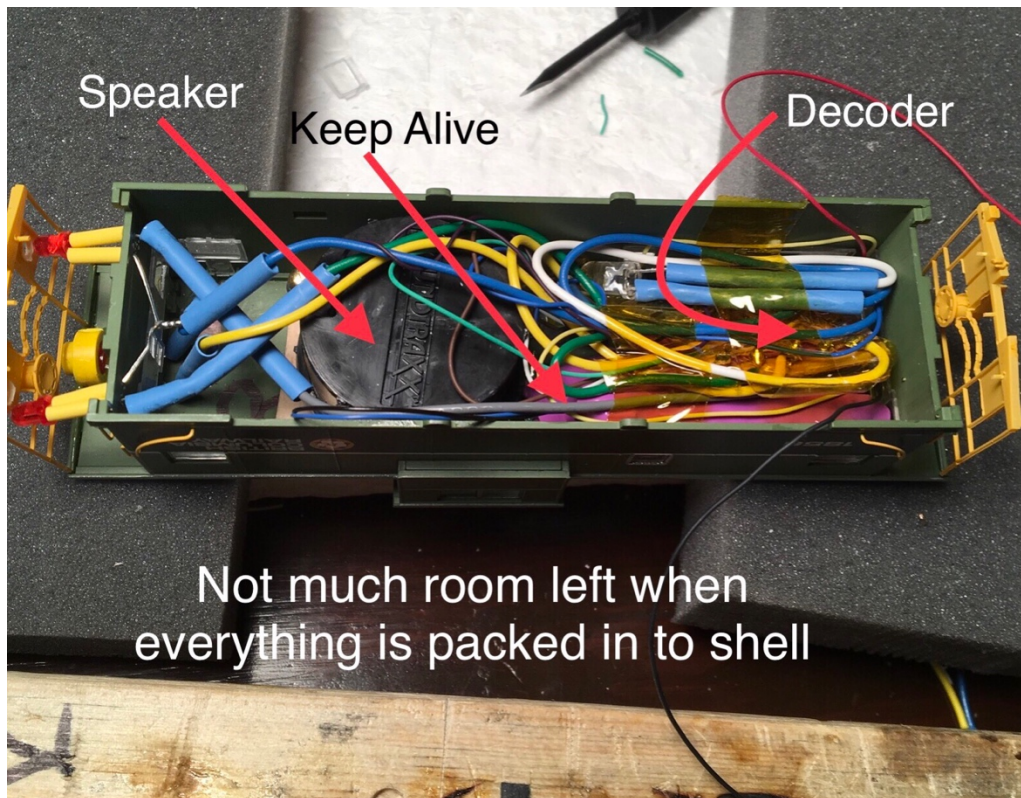
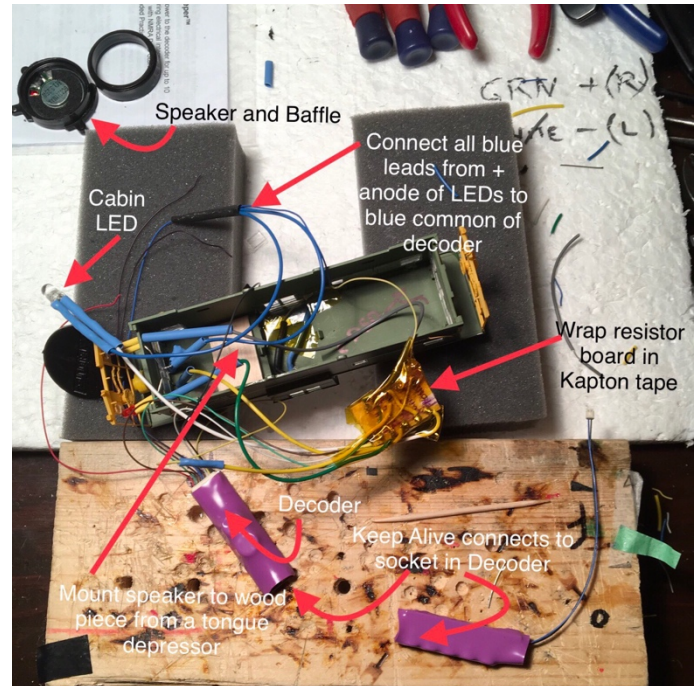
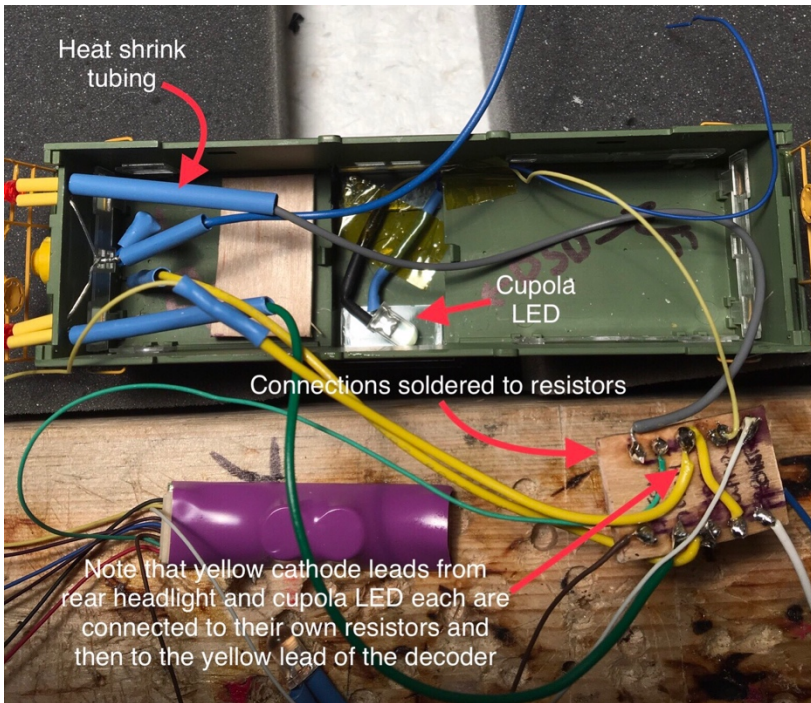


a magnet when consisting the decoder to the locomotive. Use double sided foam tape to secure the decoder to the roof, with the flat surface of the decoder (sensor side) adjacent to the roof surface.



Follow the wiring schematic supplied by SoundTraxx for making the proper connections.

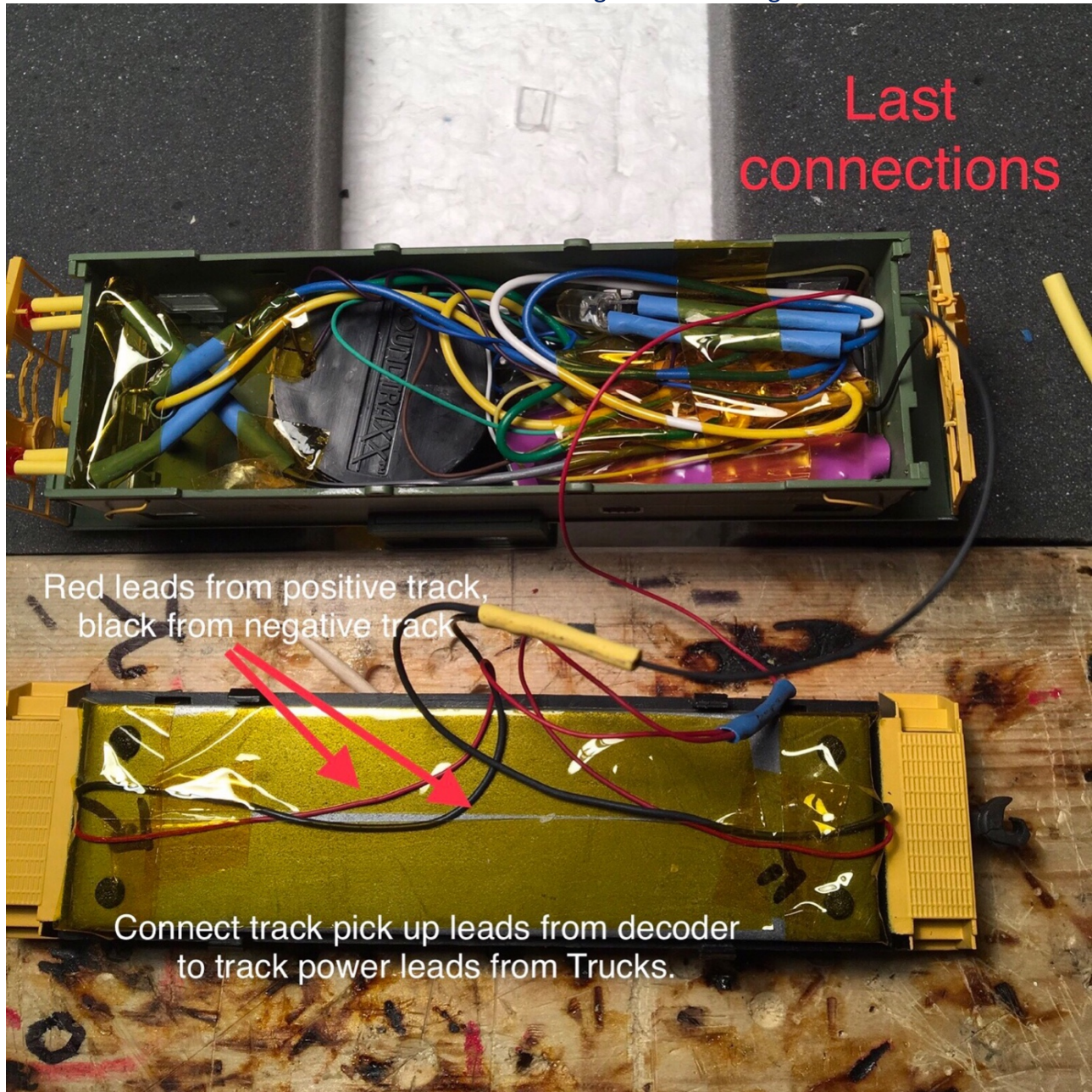
Note the common connection of the Cupola LED and the Rear headlight LED via the rear F(0) function output (yellow wire).



The final connections! All we need now is track power. The negative leads from the left side

Rail track pickups from the two trucks are connected to the negative black wire of the decoder, and the red leads from the positive right rail are connected to the red + track pickup lead to the decoder. Prior to making these solder connections I tested the decoder and LED lights to make sure all was well.

The remainder of the article discusses some CV settings for fine tuning the Sound Car. Valuable



information is available in the SoundTraxx Sound Car User Guide and Reference manuals.



British Columbia Railway 1856 Caboose

Programming CVs for Fine Tuning

Here are some notes I made for setting CVs on my Sound Car. BC Rail 1856 is programmed for automatic sounds. The bell is programmed to ring between speed steps 5 to 10. The front headlight F(0) forward Function button controls the cabin light, and the rear headlight F(0) reverse function controls the cupola and rear head light LEDs. The rear Ditch Lights are set for Ditch light type 1 and alternate flash. This is not necessarily prototypical, but does produce great visual effects using SoundTraxx's well thought out Hyperlight Effects. See the SoundTraxx manuals for information on making changes to satisfy your own particular tastes.

The CV programming is done using an NCE POWER PRO PH Pro 5 Amp DCC Command Station and a Pro Cab R throttle.

Sound Car Caboose British Columbia Railway 1856

Date: Jan 27 2019

Put on programming track. Wait for Current Keeper to discharge.

Programming on Program track:

Manufacturer 141

Decoder version 69

Address: Long 1856 Short 3 Long address activated Short address activated? Last query was activate Long address which I said yes to and 1856 car now does NOT respond to address 3 ..which is as it should be!

DC mode disable

Set up Config: stopped here.

Changed some CVs:

For **Alternating Ditch Lights**:

Alternating Ditch Lights on the Caboose Sound Car

Program CV 51 (FX5 Effect Select) with a value of 9 phase A, Crossing Logic OFF) and CV 52 (FX6 Effect Select) with a value of 25 (phase B) + 128 for LED Compensation mode.(137 and 153)

Current values for CV51 = 137 and CV 52 = 153 See pg. 19 of SoundTraxx Sound Car User's Guide.

CV 51 factory default = 0 now set to 137

CV 52 factory default = 0 now set to 153

CV 51 is FNX 5 Effect Select and CV 52 is FNX 6 Effect Select

Current values for CV51 = 137 and CV 52 = 153. Ditch lights Type 1 Crossing Logic Off

When automatic sound functions are enabled they respond to throttle speed step increases of the loco that the Sound Car is consisted with.

CV 198 is the **Automatic Sound Function** Enable CV.

Description

CV 198 allows you to set parameters for automatic sound control features in DCC mode.

Bit 7 - Bit 0

00000BELL Enable AHSIG Horn Enable AHXING Grade Crossing Enable

Automatic Grade Crossing Enable 0 = Effect disabled 1 = Effect enabled

Automatic Horn Enable 0 = Effect disabled 1 = Effect enabled

Automatic Bell Enable

0 = Effect disabled 1 = Effect enabled

Rest of bits Not used. Must be set to 0.

CV 193 was 15 now 5. (Automatic Bell set point ON)

CV 194 was 19 now 10 Automatic Bell set point OFF)

CV 198 now = 7. All 3 active bits are enabled. (Default = 0 for automatic signals off)
Automatic Bell, Automatic Whistle, and Automatic Grade Crossing signals are enabled. (1+2+4)
Automatic Whistle signal is enabled. When Sound Car is coupled to CN 3205 (Econami- PNP)
(See previous article) when speed step 1 forward, Sound car blows 2 short whistles. If reverse..3
short whistles. When stopped 1 short whistle.

Automatic Bell on at speed step 5 and off at speed step 11...bell on at speed steps 5 to 10
including 10.

Auto Grade Signal triggered at speed increase of 5 speed steps. CV 195 = 5. (Automatic Grade
Crossing sensitivity) Default was 4, now set to 5

On Tsunami 2 and Econami CV194 sets the time duration of the bell.

I have the front cabin light connected to F(0)f white wire and cupola light and rear headlight
connected to F(0)r yellow wire. When the caboose is not consisted with a loco, flipping the
direction button switches between front and rear lights. If consisted with a loco, the Sound Car
caboose gets its direction signal from the current direction of the loco it is consisted with. The
direction Mode however is not registered with the Sound Car until the headlight in the Sound
Car (in this case Address 1865) is switched off and on. This is a good thing in that this will allow
the reverse lights on the caboose Sound Car to be on while the loco is running forward. If you
want to put the front cabin light on while the loco is set to running forward, go to address 1865,
turn off the headlights, then turn them on again, and the forward cabin light comes on and the
rear light and cupola light turns off. Now if you want to turn on the rear light and cupola light in
the caboose, go back to the loco address on your cab, stop the loco forward motion and press
direction button for reverse. Now go back to address 1865 (Caboose Sound Car) turn the
headlight button off then on again while loco is still in reverse, and the rear light and cupola
light will turn on. Now if you want to move the loco forward, go back to loco address, press
direction button to forward, and the caboose rear light and cupola light remain on.

It maybe that setting FX5 and FX6 to be active in both forward and reverse directions will lessen
this hassle, and may be a better way to set this up. I have not experimented with this as yet.

CV 57 (FX5, FX6 Directional Control Enable) is used to configure the directionality of the FX5 and
FX6 function outputs. FX5 directionality is controlled by bits 0 (forward) and 1 (reverse), and
FX6 is controlled by bits 4 (forward) and 5 (reverse). Setting a bit to 1 enables the
corresponding function in the specified direction. Either function may be made bi-directional by
setting both the forward and reverse bits to 1.

CV 57 Directional Control for FX5 and FX6

Current default value of CV 57=51. Leave for now.

It maybe that setting FX5 and FX6 to be active in both forward and reverse directions is a better way to set this up. Note of course this assumes you have wired Functions FX 5 and 6 the same way I did?

For both to function in reverse only:

Bit 0 = 0

Bit 1 = 1 Decimal value : 2

for Fx 5

And for FX6

Bit 4 = 0 and Decimal value : 32

Bit 5 = 1

Total value : 34

So CV 57 = 34

Either function may be made bi-directional by setting both the forward and reverse bits to 1.

CV 39 controls Function button 5. Value 2(Default) activates Control of FX5 and value 4 activates FX 6: Total 6 in CV 39 will activate FX 5 output 5 and FX6 output 6 from Function button 5. (In Sound Car Function 4 is not defined and there is no FX 4 (output 4) Date: Jan 27 2019. Set F5 to turn on both flashing ditch lights. CV 39=6 (2..FX5, + 4 (FX6) = total 6.

CV 40 controls Function button 6

Set F6 to turn on left flashing rear light (FX6=4,) Bell=1, Short whistle =16, and Generator=32.

CV40 (F6 button)= 1+4+16+32=53!

As of Jan 27 2019 CV 40 = 53. CV 39 =6.

CV 39 (default value=2), changed to 6

CV 40 (default value = 4), changed to 53

See page 14 of Sound Car user guide to set these CVs. Note that the

Tsunami2 Decoder is different! See note

Set up Ditch lights (CN8502 (Tsunami2 Diesel Decoder)

Sound Car CN201422 (See previous article) and BC Rai I1856

CV 3 = 50. Default =3

CV 4 = 35. Default =0

CV 61 = 140 Default =0. CV 61 sets the F11 Braking Rate(Date: Jan 27 2019)

Additional Information The F11 braking rate is added to or subtracted from the decoder's base braking rate (deceleration)(CV 4) when the F11 button is pressed. Set this CV to the same value in your Tsunami-equipped locomotive to synchronize the F11 braking effect.

These settings are the same as those in CN3205 ECO PNP Decoder (See previous articles) so that Train Brake syncs with Sound Car and CN3205. Change to same values as loco you want to synchronize the Train Brake with.

I currently have Train Brake function mapped to Function 7

For best SoundCar functionality:

Set CV3 and 4 (Acceleration and Deceleration CVs) to same values as locos you are consisting with.

Helps to have all locos with similar settings

Set CV61 to same value as locos

Then:

SoundCar accelerates when the sounds do!

Match the loco speed and reacts to loco brake applications too!

Thank you



... For making such great equipment!



Doug Dyer
Victoria BC
CEO CN Spiritwood Subdivision
Date: Jan 30 2019