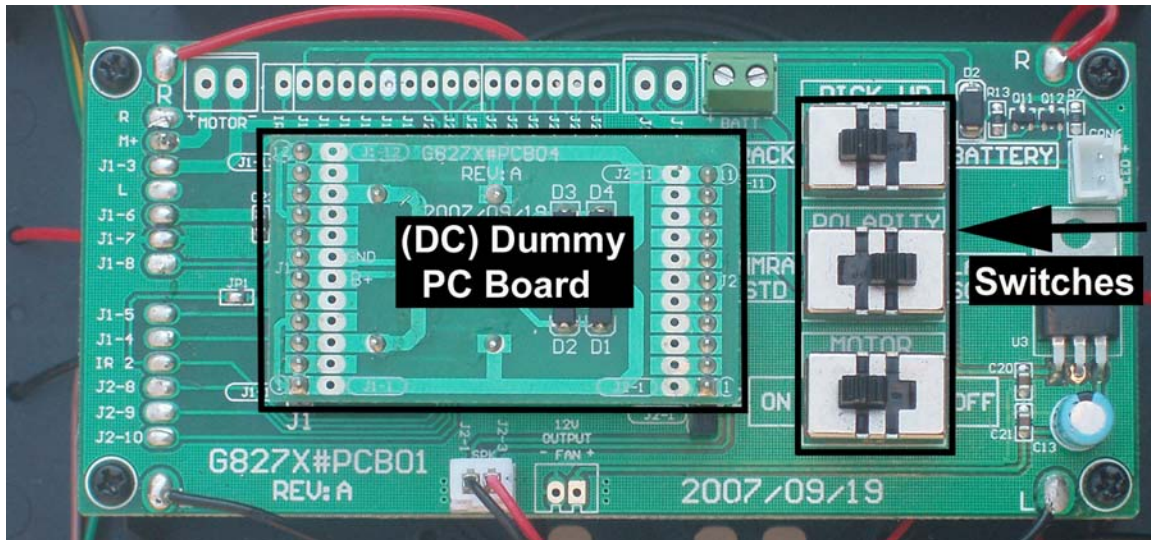


Phoenix 2K2 DC Sound Install for Bachmann's K27 Large Scale Steam Locomotive



The following installation instructions are provided to gain the full benefits of the socket in the K27 when used with the Phoenix 2K2 DC sound board. The Phoenix 2K2 sound board can be used with DC, DCC, and RC installs. This example set of instructions is for a DC install.

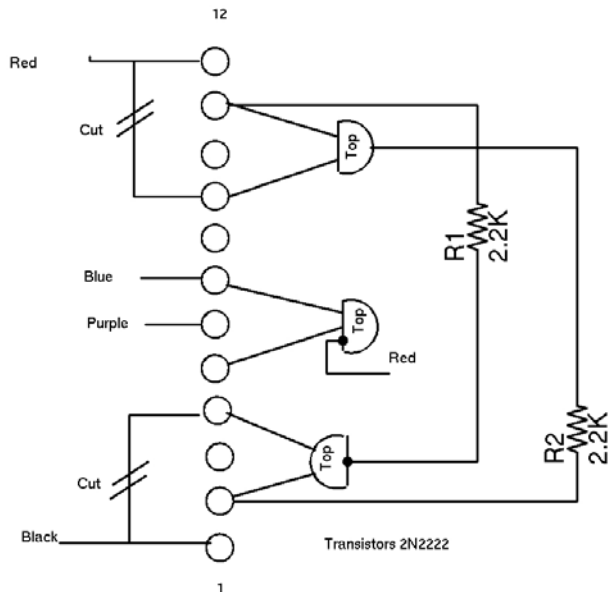
The first step is to install a speaker. The tender is designed to have a large 3 inch speaker installed under the main circuit board. Removing the 4 screws holding the board and moving it to one side provides easy access to the speaker area. Remove the 4 speaker placement screws, place the speaker in the space provided and reinstall the speaker holding screws. Phoenix sells a 3" speaker for this purpose. Next connect the Phoenix speaker wires at screw terminals **7** and **8** to the speaker and reinstall the screws on the main circuit board.

The following describes a DC install for the Phoenix 2K2 sound board in the K-27 using the (DC) Dummy PC Board. Either the solder pads on the engineers' side of the tender or the (DC) Dummy PC Board can be used to attach after market electronics. The (DC) Dummy PC Board is being used for this install since it allows the modeler to perform the installation at the workbench.

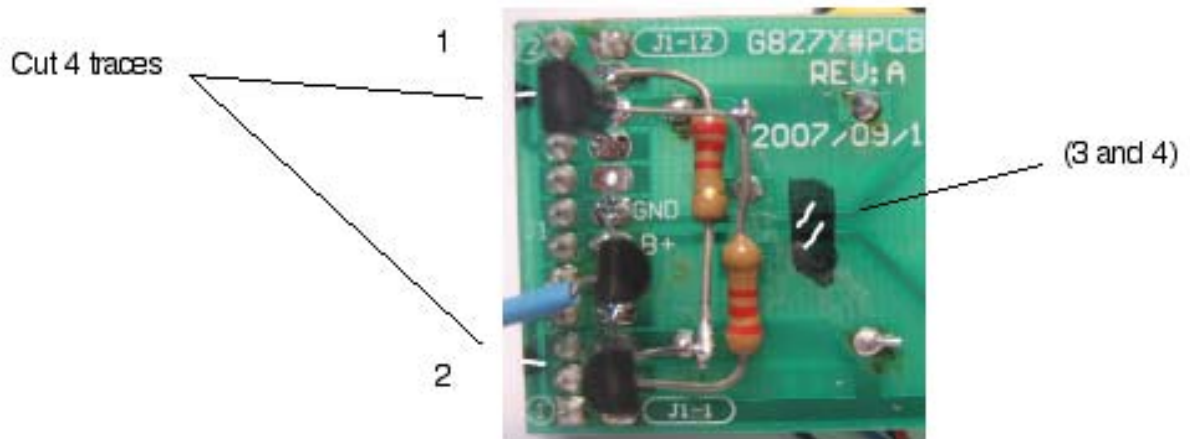
The first step is to remove the (DC) Dummy PC Board from the tender. All of the following connection points refer to the solder connections on the (DC) Dummy PC Board



Once removed from the tender, the (DC) Dummy PC Board needs to be prepared for use with the 2K2.



1. Install three 2N2222 or equivalent NPN transistors as shown in the circuit diagram and photo above
 - a. Install the first transistor with Collector in **J1:2**, Emitter in **J1:4** and the Base connected to one end of a 2.2K resistor
 - b. Install the second end of the resistor installed in a. to **J1:12**
 - c. Install the second transistor with Collector in **J1:11**, Emitter in **J1:9** and the Base connected to one end of a 2.2K resistor
 - d. Install the second end of the resistor installed in c. to **J1:1**
 - e. Install the third transistor with Collector in **J1:7**, Base in **J1:5** and the Emitter connected to the chuff input in step 5 below
2. Cut 4 traces as shown on the photo below
3. Install a .1uF capacitor to between **J1:5** and **J1:7** as shown in the photo below. The purpose of this capacitor is to remove any noise from the circuit.



To install the Phoenix 2K2 Sound decoder, connect the following wires between the Phoenix 2K2 board and the solder pads on the dummy socket. These wires can be most easily attached from the bottom side of the circuit board.

1. a red wire between **Pin 1** on the 2K2 and **J1:12** on the dummy board
2. a black wire between **Pin 2** on the 2K2 and **J1:1** on the dummy board
3. a purple wire between **Pin 9** on the 2K2 and **J1:6** on the dummy board
4. a blue wire between **Pin 16** on the 2K2 and **J1:7** on the dummy board
5. Connect the collector from the loose leg of the center transistor to the 2K2 **Pin 15** chuff trigger

To connect the Bell, Whistle, and optional set up the optional sound effects for your Phoenix P5 board, please refer to the instructions that come with your 2K2 sound board. Before operation, plug in the Phoenix battery to its battery connection on the 2K2 board.

Note1: The smoke unit needs to be in the off position. We are powering the lights along with the trigger circuit but do not have enough power for the smoke unit.

Note2: The chuffs in the K27 produce a slightly off time chuff common in the K27. If you desire a more regular chuff timing, turn on chuff averaging in your P5..

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