Improving the Programming Track on the Power Pro system

April 20, 2010

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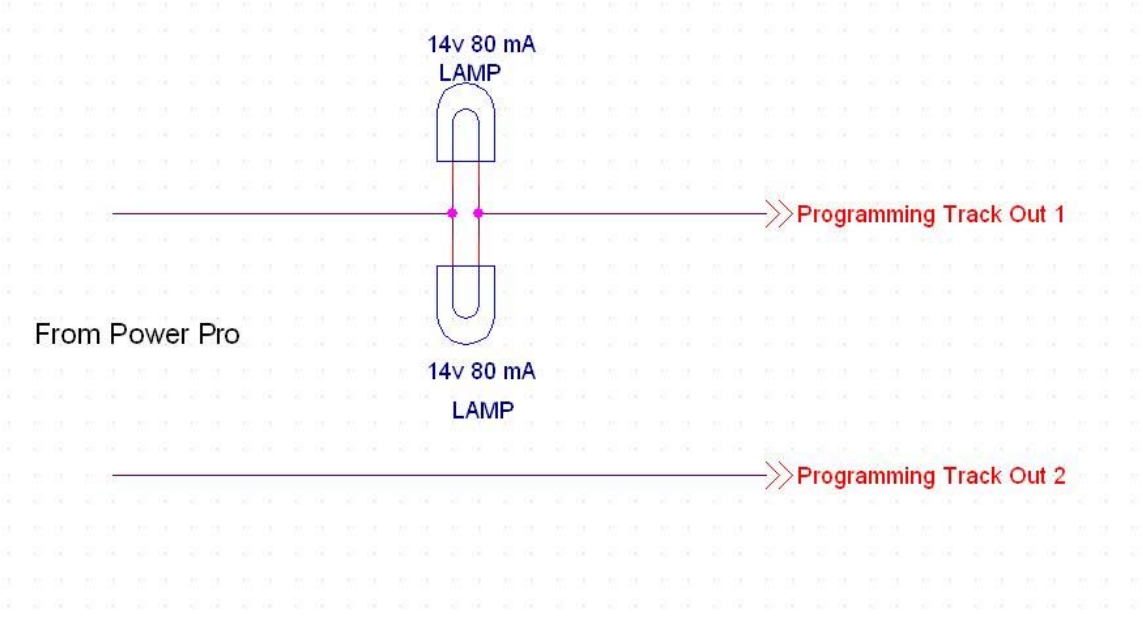
Overview:

The Power Pro system was designed long before sound decoders became the norm and as a result the programming track read circuitry does not cope well with sound decoders. Sound decoders typically have a large capacitor on their input and additional programming track current is required to read them.

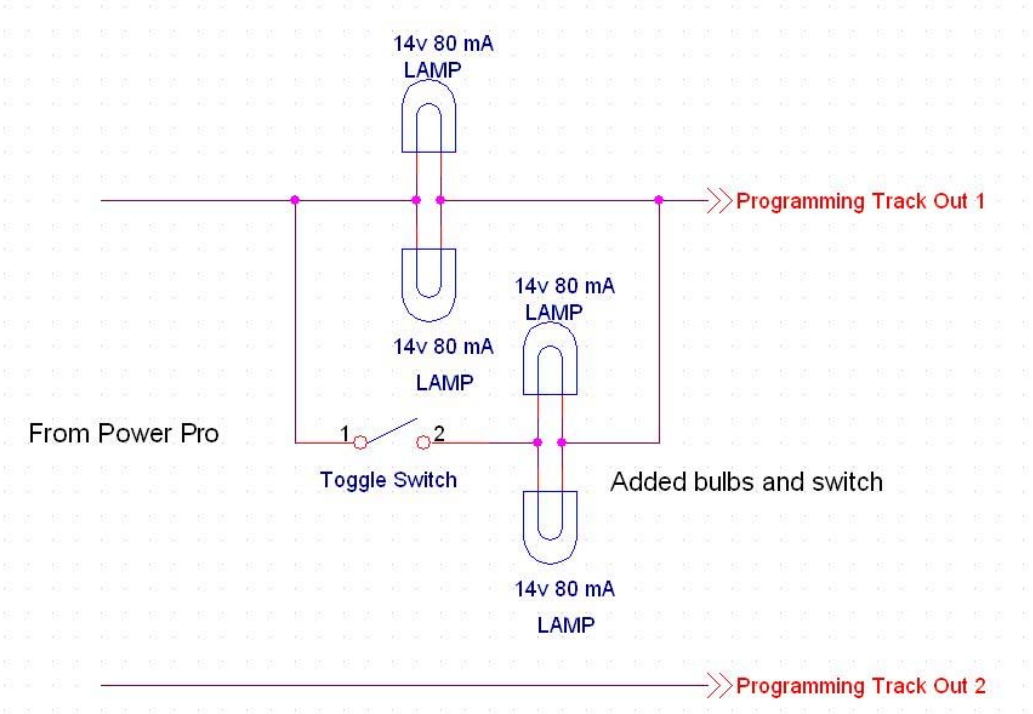
This paper will show you a fairly simple modification that increases the programming track current on the Power Pro to allow sound decoders to be read. A couple of additional chip components will also be changed to improve the ability of the read circuitry to see the read pulse from sound decoders.

Modifications:

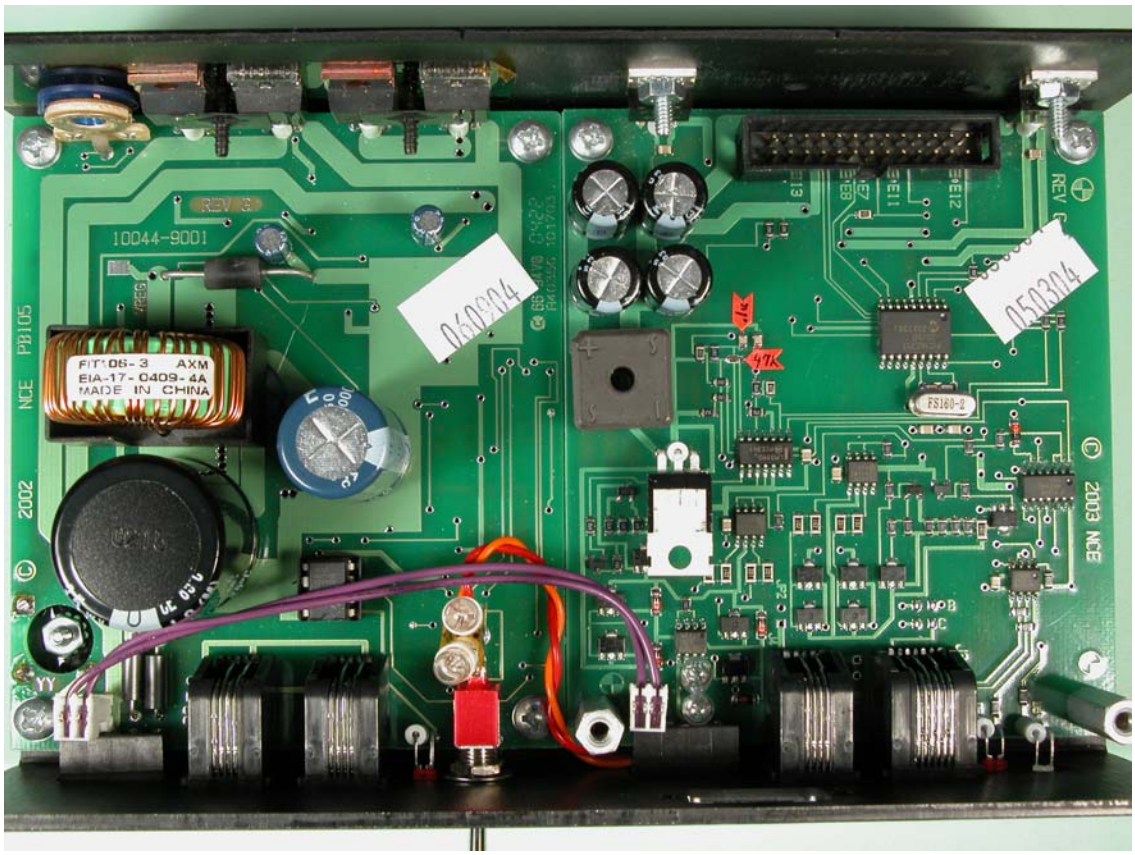
The programming track outputs on the Power Pro are protected and current limited by a pair of 14volt, 80 mA light bulbs that are connected in parallel. See schematic below:



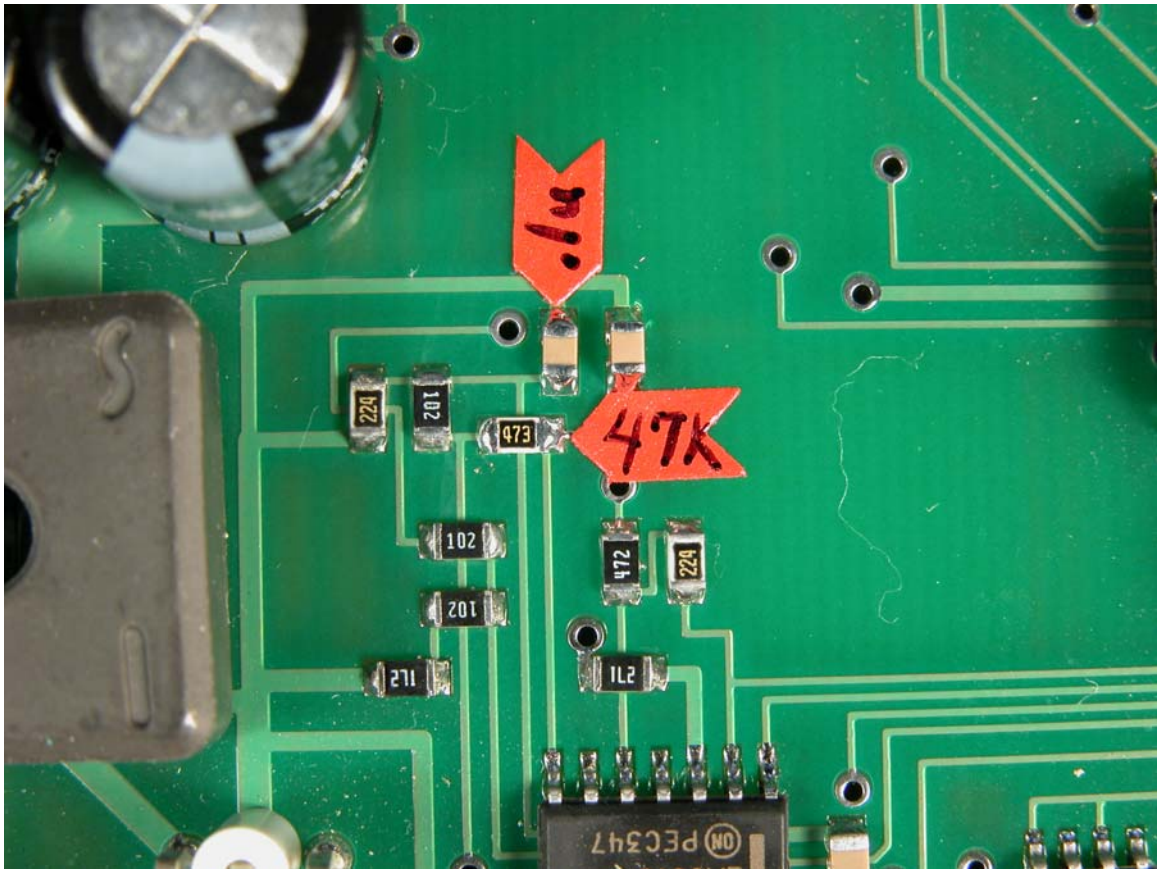
To increase the programming track current two additional bulbs are placed in parallel with the two bulbs that are already there. A SPST switch is added in-line with the additional bulbs so that the bulbs can be switched in only when they are needed for sound decoders. See the schematic below with the added bulbs:



Here is a picture of the Power Pro with the added switch and bulbs mounted on the front panel.



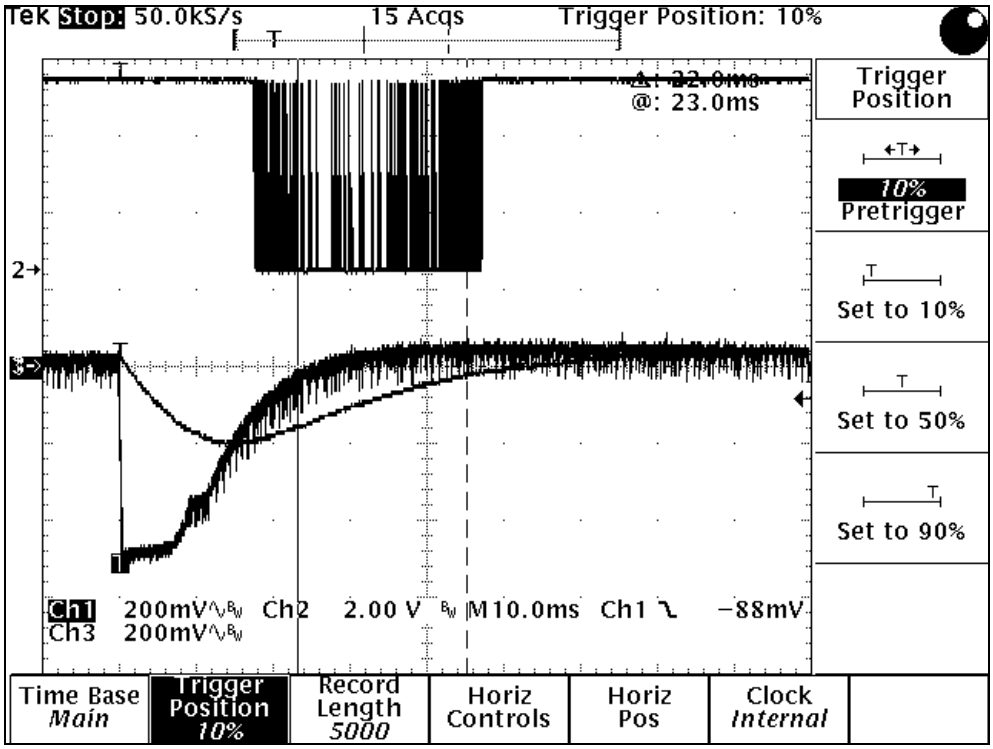
The picture above shows the Power Pro command station with the right side top printed circuit board removed for clarity. Notice that there are two red stickers on the right side pointing to a couple of chip components. The picture below shows a close up of this area of the board:



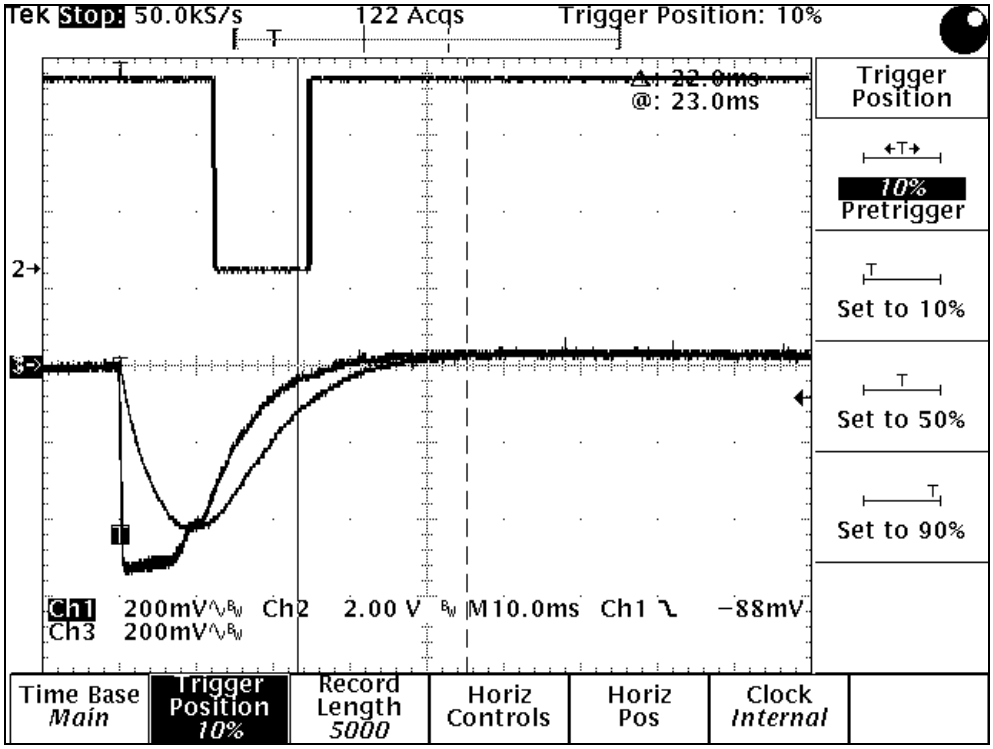
The two components at the tip of the arrows are the two parts that need to be replaced. The new parts to be installed are a 0.1 uF, 50 volt, 0805 capacitor, and the second part is a 47k ohm, 5%, 1/8watt, 0805 sized resistor.

Changing these components improves the noise on the programming track read back pulse especially when used with sound decoders with lots of input capacitance.

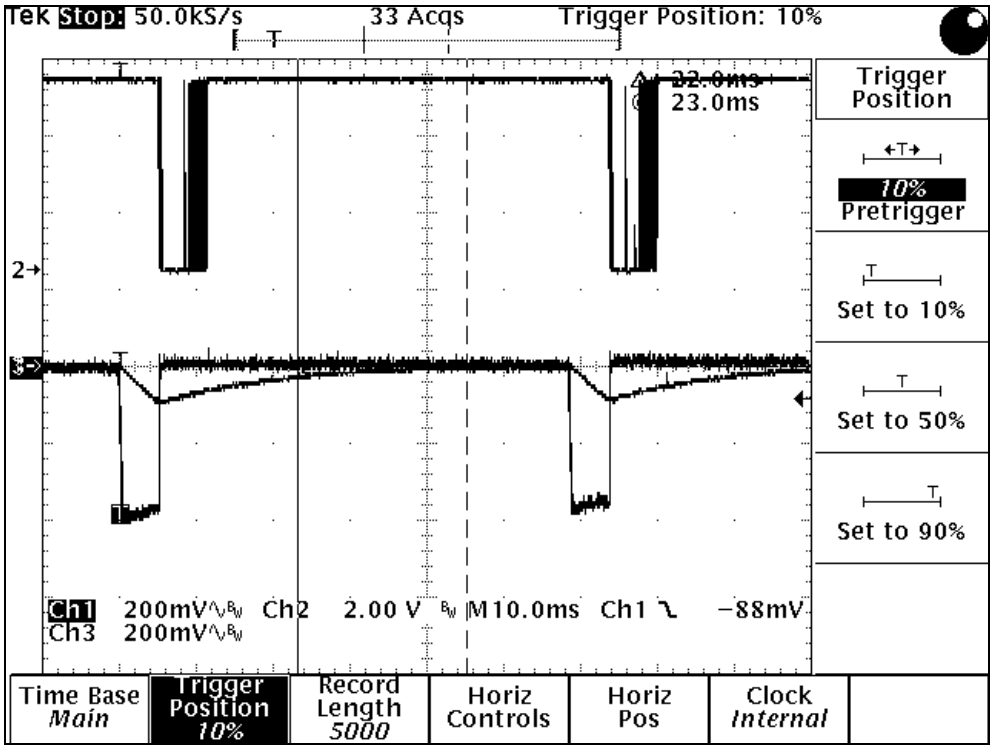
The scope plots on the following pages show the read pulse (top trace) for several different decoders before and after the modification of these two components. Don't worry if you don't know what it means; just look how much cleaner the read pulse (top trace) is after the modification.



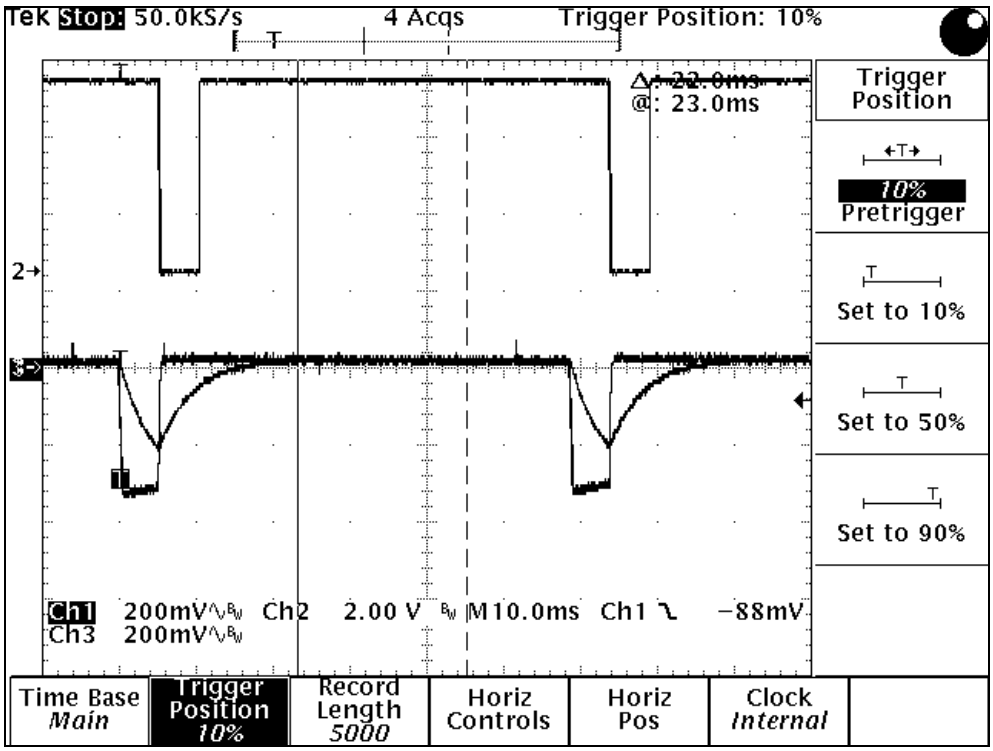
BLI / QSI read acknowledge before modification



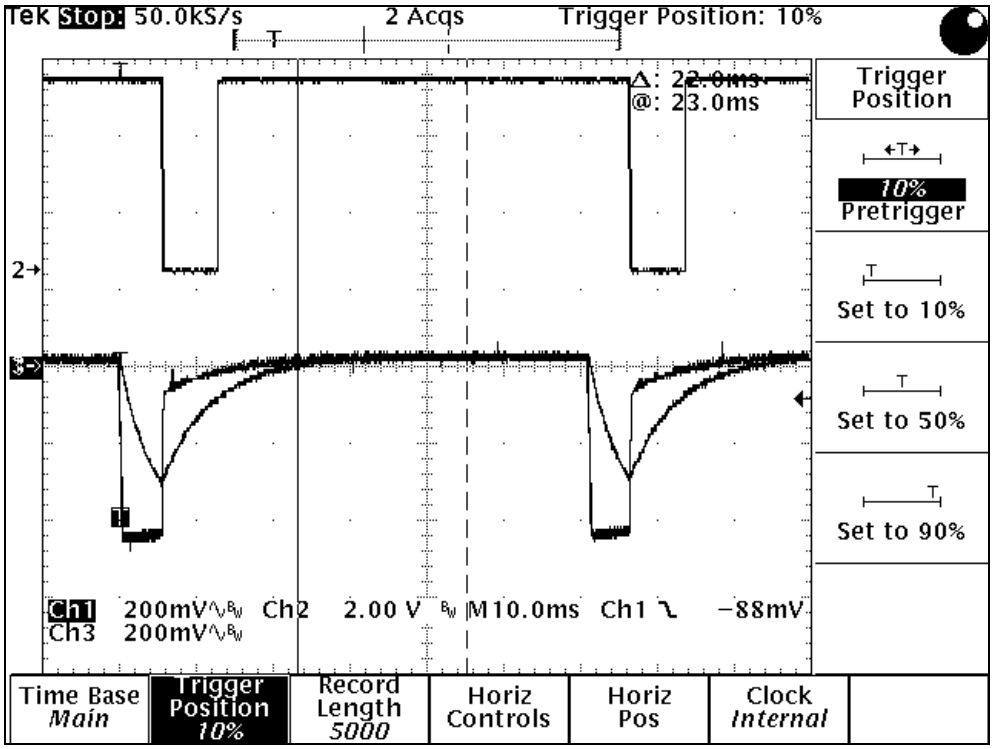
BLI / QSI read acknowledge after modification



NCE read acknowledge before modification

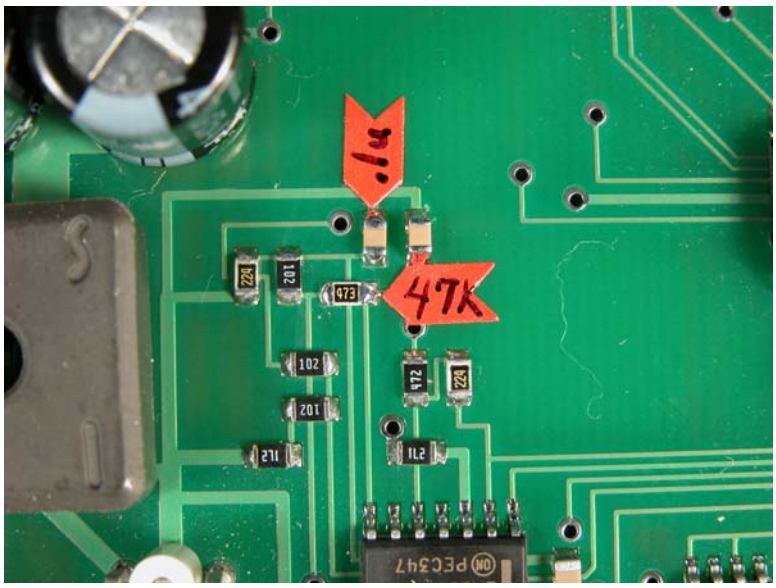


NCE read acknowledge after modification

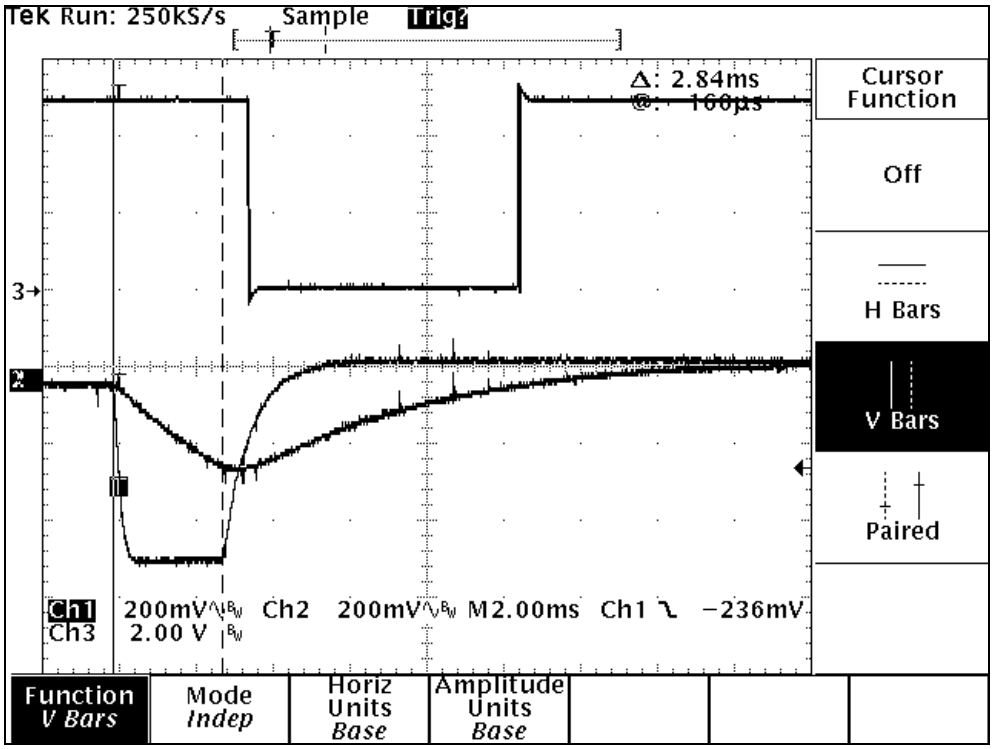


Tsunami read acknowledge after modification

Note: For QSI and Tsunami decoders 2 additional 14v, 80ma bulbs are switched in parallel with the 2 bulbs that are already in line with the programming track output. For NCE decoder pictures the extra bulbs are switched out



R14 changed from 220k to 47k, C15 changed from .01uF to .1uF, locations above. (Rev G board shown)



This is the read acknowledge from a Tsunami Micro after modification.