

## **AUDIO IMPROVEMENTS FOR DRAGON'S LAIR AND SPACE ACE BOARDSETS - January 2021**

Written by Shaun Wood

*Comments added by Matt Ownby - 6 Nov 2021*

### **INTRODUCTION**

Dragon's Lair boardsets are notorious for being noisy. It's especially noticeable during boot-up and the quiet moments when instruction cards are displayed.

There are three primary reasons for this..

The electrolytic capacitors in the audio circuits are old, dried out, and leaking.

The overall amplifier gain is set too high from the factory.

In order to compensate for the excessive amplifier gain, the volume controls are set too low.

### **PARTS NEEDED**

- 8 - 470uF 50V Capacitors
- 4 - 10uF 50V Capacitors
- 2 - 10 ohm 1/4W resistors
- 3 - 1K ohm 1/4W resistors

(note - Only use high quality "name brand" capacitors. Audio-grade preferably)

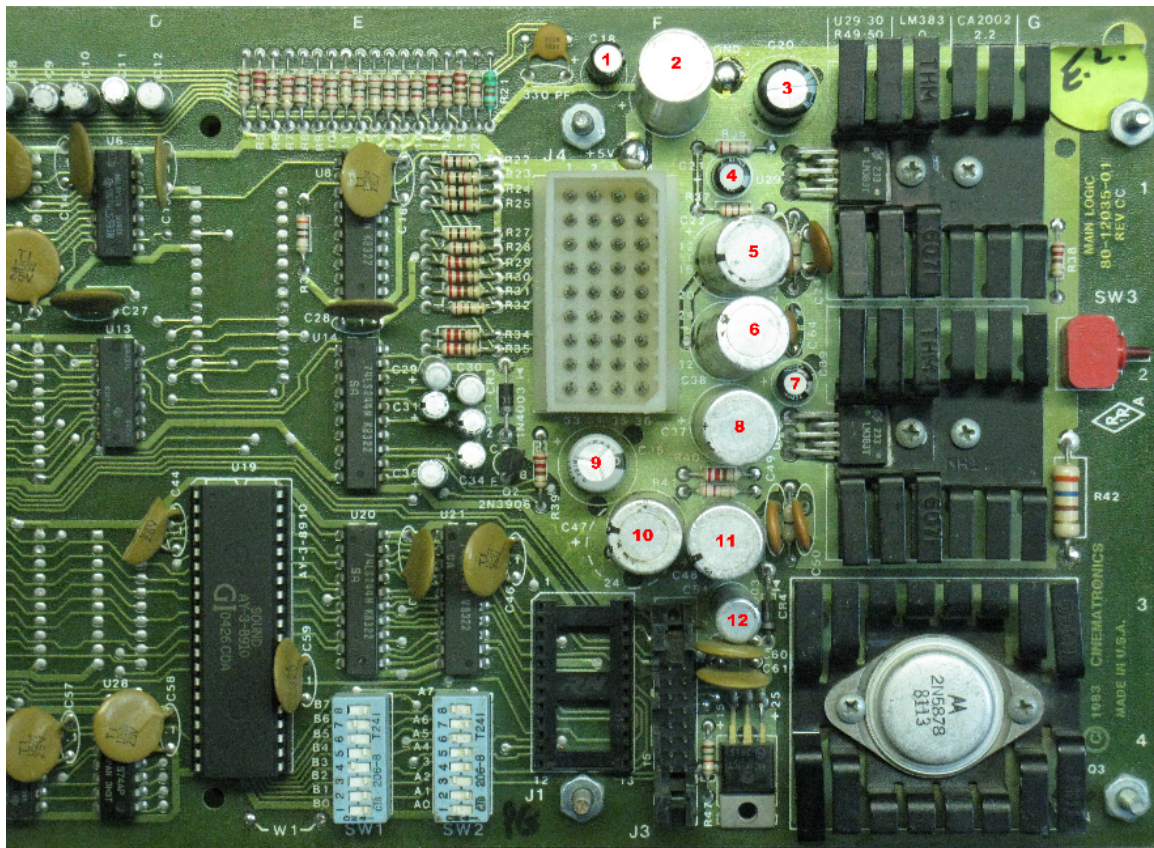
*Part's that Matt used:*

Description	Manufacturer	Manufacturer product number
470 uF cap	Nichicon	UKW1H471MHD1TO
10uF cap	Nichicon	UKW1H100MDD1TD
10 ohm resistor	Yageo	CFR-25JB-52-10R
1k ohm resistor	Stackpole	CF14JT1K00

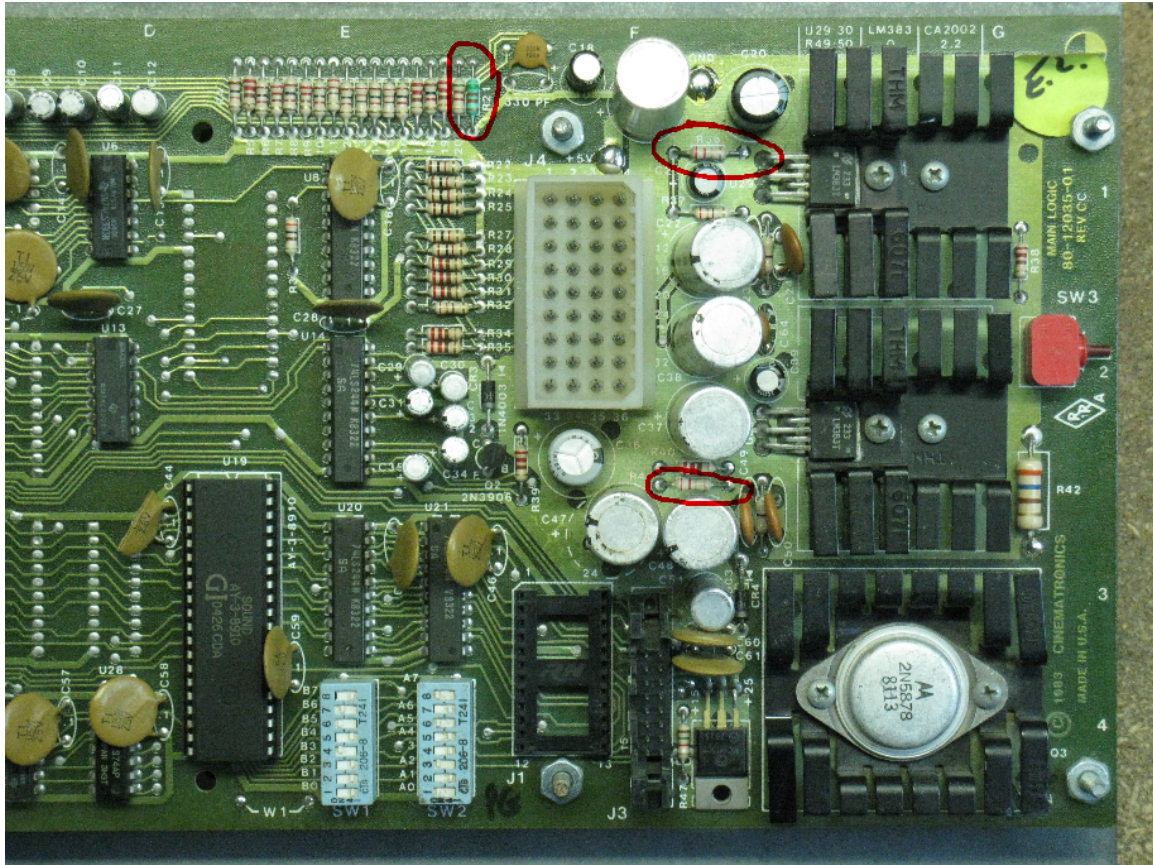
### **PROCEDURE**

Remove the 12 capacitors.

(C18, C19, C20, C21, C22, C38, C39, C37, C36, C47, C48, C51)



Remove the 4 resistors.  
(R20, R21, R36, R41)



## INSTALL NEW PARTS

### **Replace R36 and R41 with 10 ohm resistors.**

This lowers the amplifier gain from 100X down to 22X.

### **Replace R20 and R21 with 1K ohm resistors.**

This increases the beep sound's volume to match the new 22X gain.

### **Replace C18, C21 and C39 with new 10uF capacitors.**

### **Replace C19, C20, C22, C38, C37, C36, C47, and C48 with new 470uF capacitors.**

### **Leave C51 empty and fill the solder holes.**

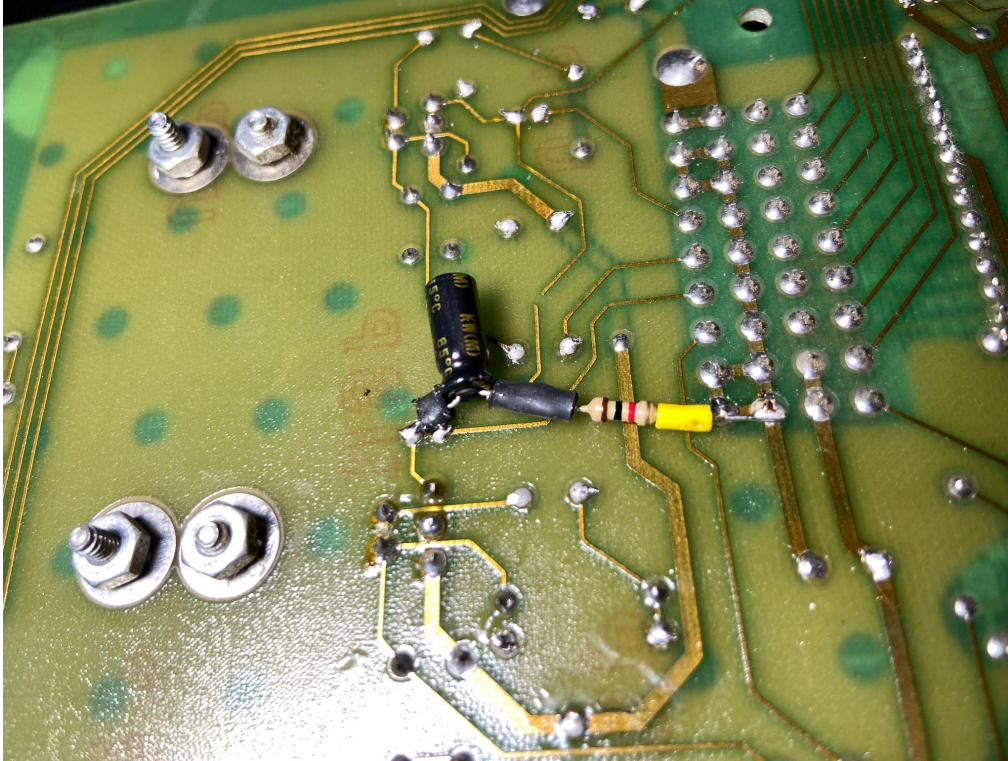
C51 is in parallel with C36. The new 470uF capacitor at C36 replaces both parts. If you just can't tolerate having a missing capacitor, then fill C51 with a 22uF 50V capacitor.

## UNDERSIDE OF BOARD

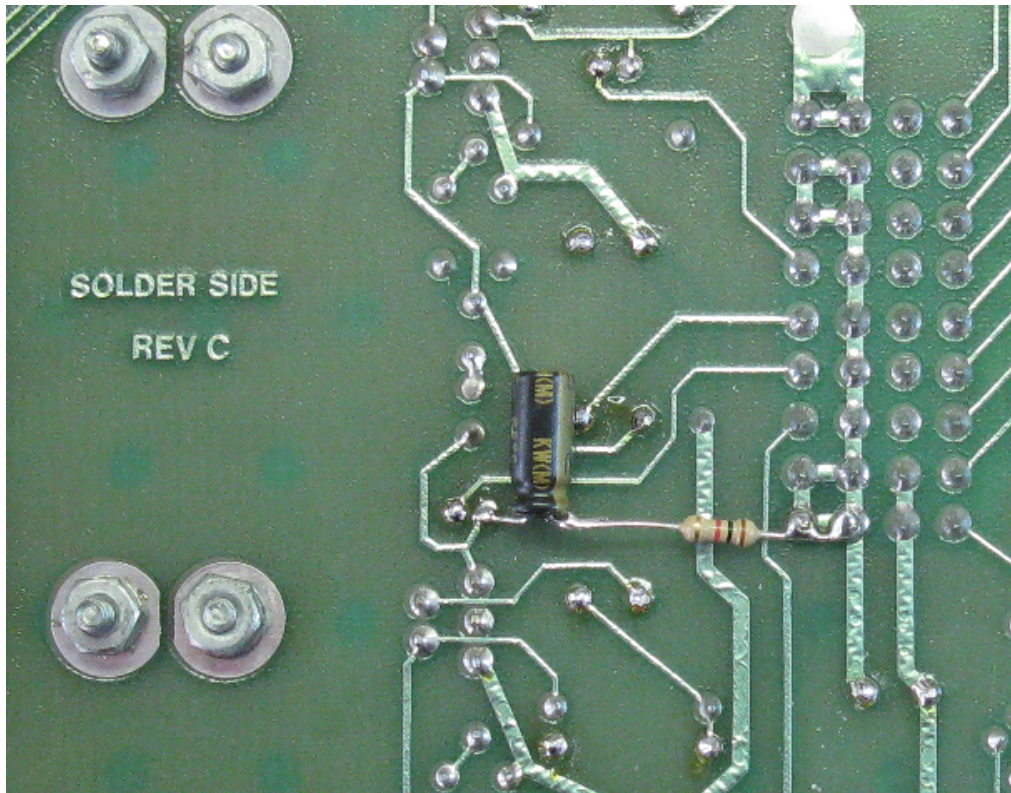


The Dragon's Lair board combines the sound output from the GI sound chip (beeps) with the laserdisc audio on the right channel. This second path for audio creates a lower input impedance for the laserdisc audio on the right side, and an imbalance in the volume control settings. To correct for this we must add a few parts to the left channel input.

**REV A**



## REV C



***Matt's notes: Important! C39 is oriented differently for rev A vs rev C boards. Make sure you check this!***

Connect the "+" lead of a 10uF capacitor to the "+" lead of C39 on the underside of the board.

The "-" lead of this new capacitor connects to a 1K resistor, and the other side of the resistor is connected to ground as shown in the picture above.

That's it. Reassemble your board to the mounting plate, and return to the machine.

You will find that proper sound adjustment will now be in the middle range of the volume pots.

My board, connected to a Pioneer LD-V8000 was completely silent after this modification.

However, a note about Dexter...

Dexter uses a Raspberry Pi to deliver audio to the game. Unfortunately, the Raspberry Pi is not designed for hi-fidelity audio.

even after this modification, there will still be some buzz/hum coming from the Dexter player, but it will be much quieter than it was.

Enjoy!

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