

Dual tones add-on card for TGSL metal detector

Abstract :

This article presents an add-on card for the TGSL metal detector.
It can be found onto the Geotech website : www.geotech1.com

The original TGSL metal detector has a mono-tone audio stage.
This card add a second tone to the detector.
A low tone for ferrous and an high tone for non-ferrous items.

The original schematic use an half of a LM358 as a battery tester.
This section will be re-build as a signal comparator and become a new ALL_METAL channel.

The original operation is kept. The owner shall choose between « Normal » mode together with AM (all metal)/Disc(Discrimination) selection and « 2 Tones » mode.

Functionnality cost : As mentionned before, the original battery tester will be lost.

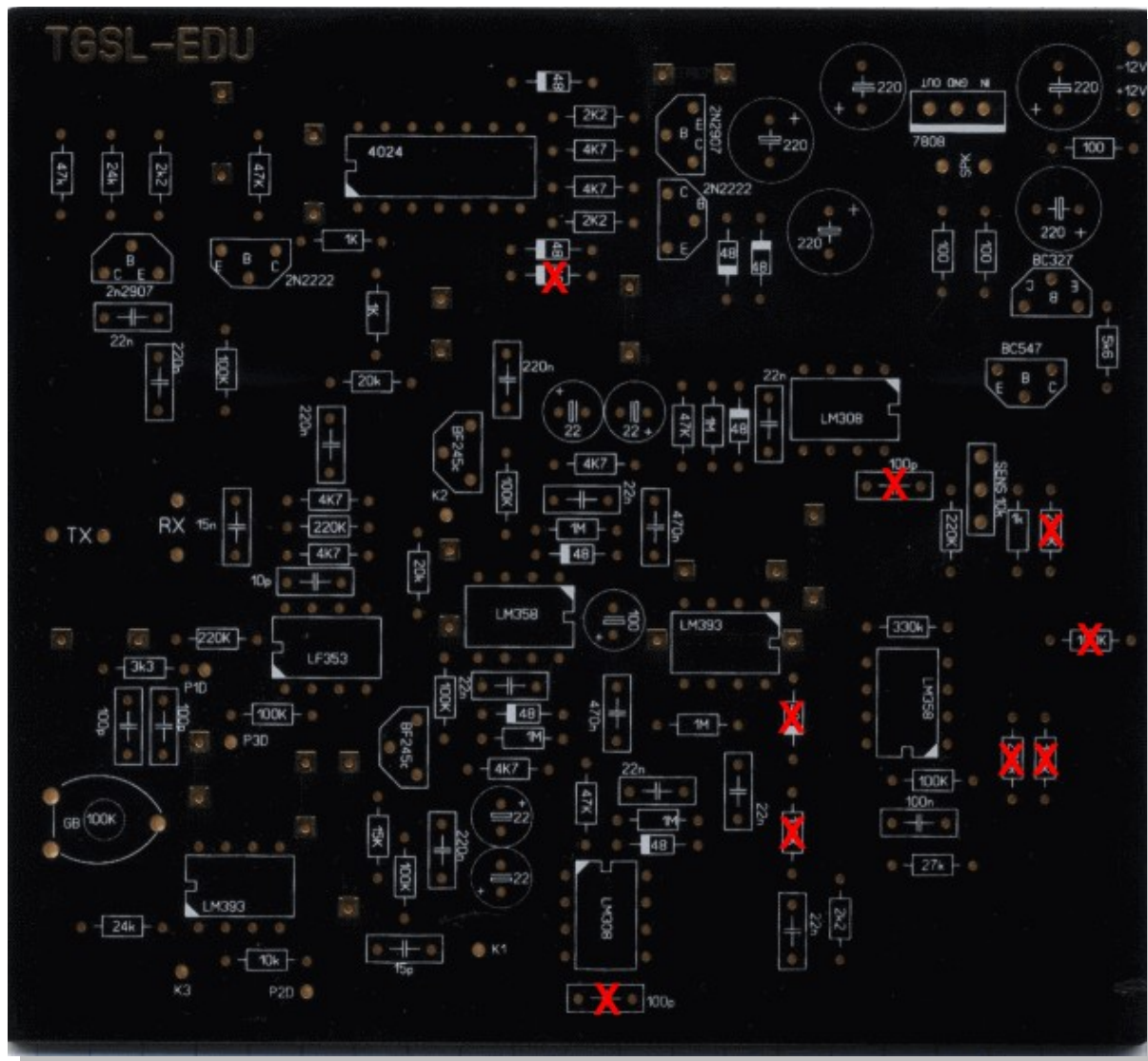
Note : This document applies only to TGSL and Add-on PCBs sold by Silverdog.
Website : www.silverdog.co.uk

Thank you to all the contributors and specially to Ivconic, Eduardo and Silverdog.

Part 1 : Removing parts from TGSL PCB.

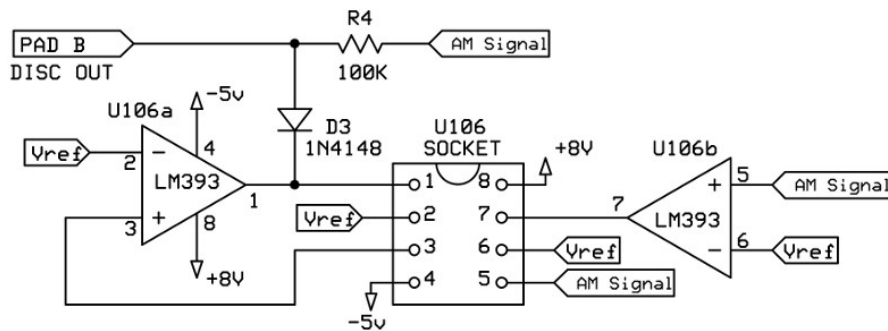
The mentioned parts need to be removed from the original PCB.

Note : if LM308 has been mounted, do not remove the 100pF capacitors.



Part 2 : Add-on card

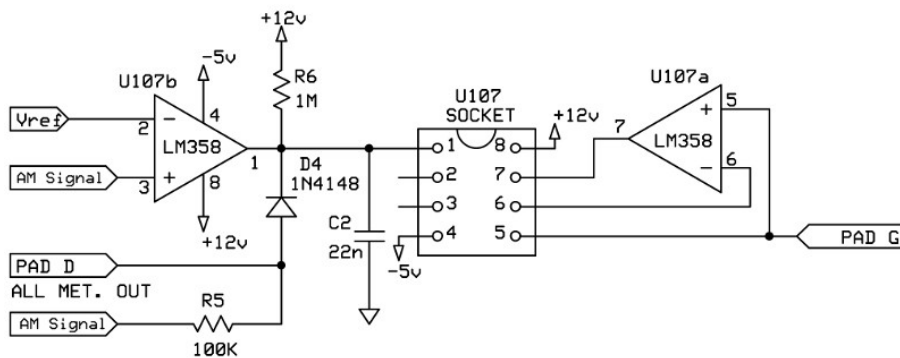
LM393 :



This part from the original design stays unchanged.

The output signal of the LM393 (DISC OUT) will be used to drive the 2 tones section.

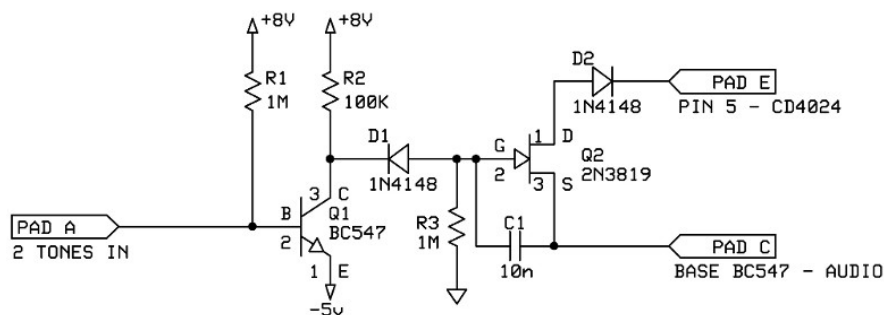
LM358 :



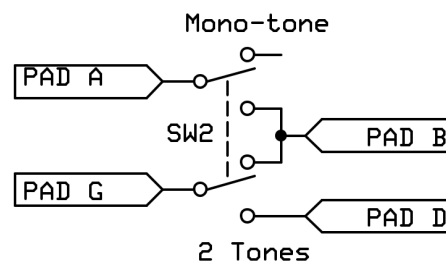
The half LM358 (U107b) originally used as a battery tester is now working like a comparator. It's a new ALL METAL channel.

It will drive the audio section (U107a) in place of the LM393.

2 tones :






This new section will drive the FET transistor in order to change the audio tone (higher pitch) when a non-metal target will be detected.

Mode switch :

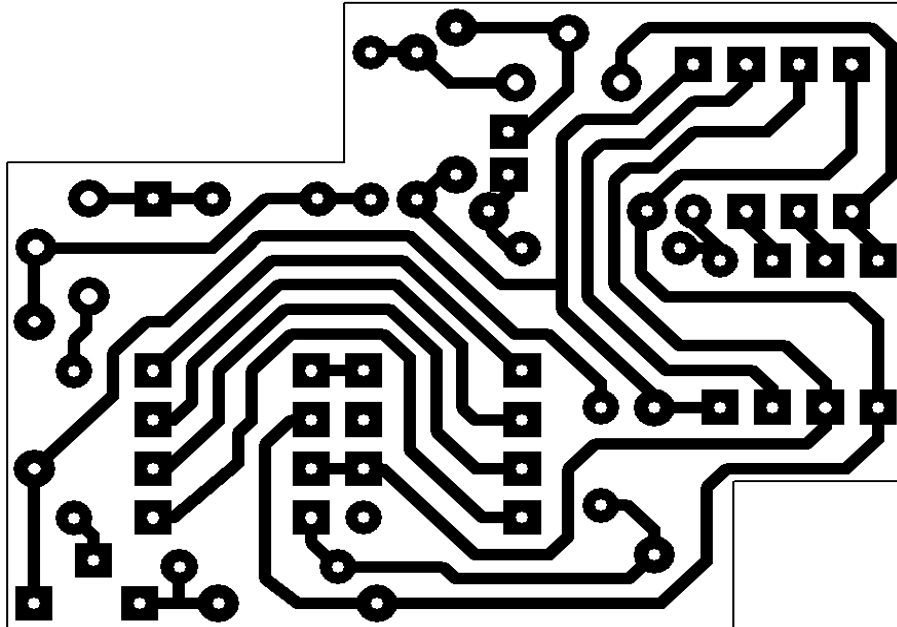
This switch allow to change from « normal » operation to « 2 tones » operation.
It works together with the Disc switch.

	Disc/AM. SW	Mono/2 Tones SW	Audio
Ferrous	AM	Mono	High
Ferrous	AM	2 Tones	High
Ferrous	DISC	Mono	None
Ferrous	DISC	2 Tones	Low
Non-Ferrous	AM	Mono	High
Non-Ferrous	AM	2 Tones	High
Non-Ferrous	DISC	Mono	High
Non-Ferrous	DISC	2 Tones	High

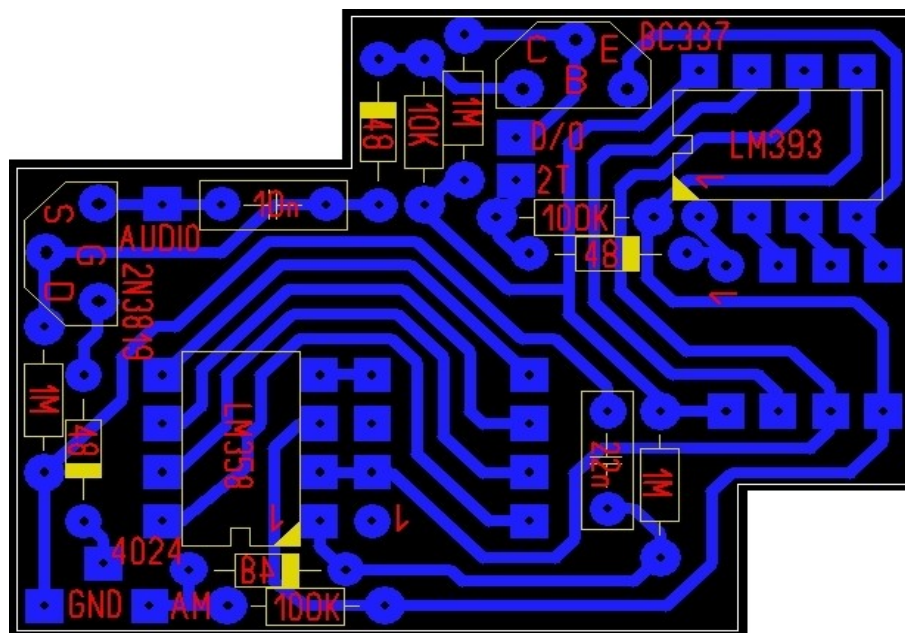
	Original All Metal Mode
	Original Discrimination Mode
	2 Tones Discrimination Mode

Circuit Board :

PCB :



Implementation :



Bill of material :**Resistors :**

- | | |
|--------|---------|
| - 10K | Qty : 1 |
| - 100K | Qty : 2 |
| - 1M | Qty : 3 |

Capacitors :

- | | |
|-------|---------|
| - 10n | Qty : 1 |
| - 22n | Qty : 1 |

Diodes :

- | | |
|----------|---------|
| - 1N4148 | Qty : 4 |
|----------|---------|

Transistors :

- | | |
|----------|---------|
| - BC337 | Qty : 1 |
| - 2N3819 | Qty : 1 |

I.C. :

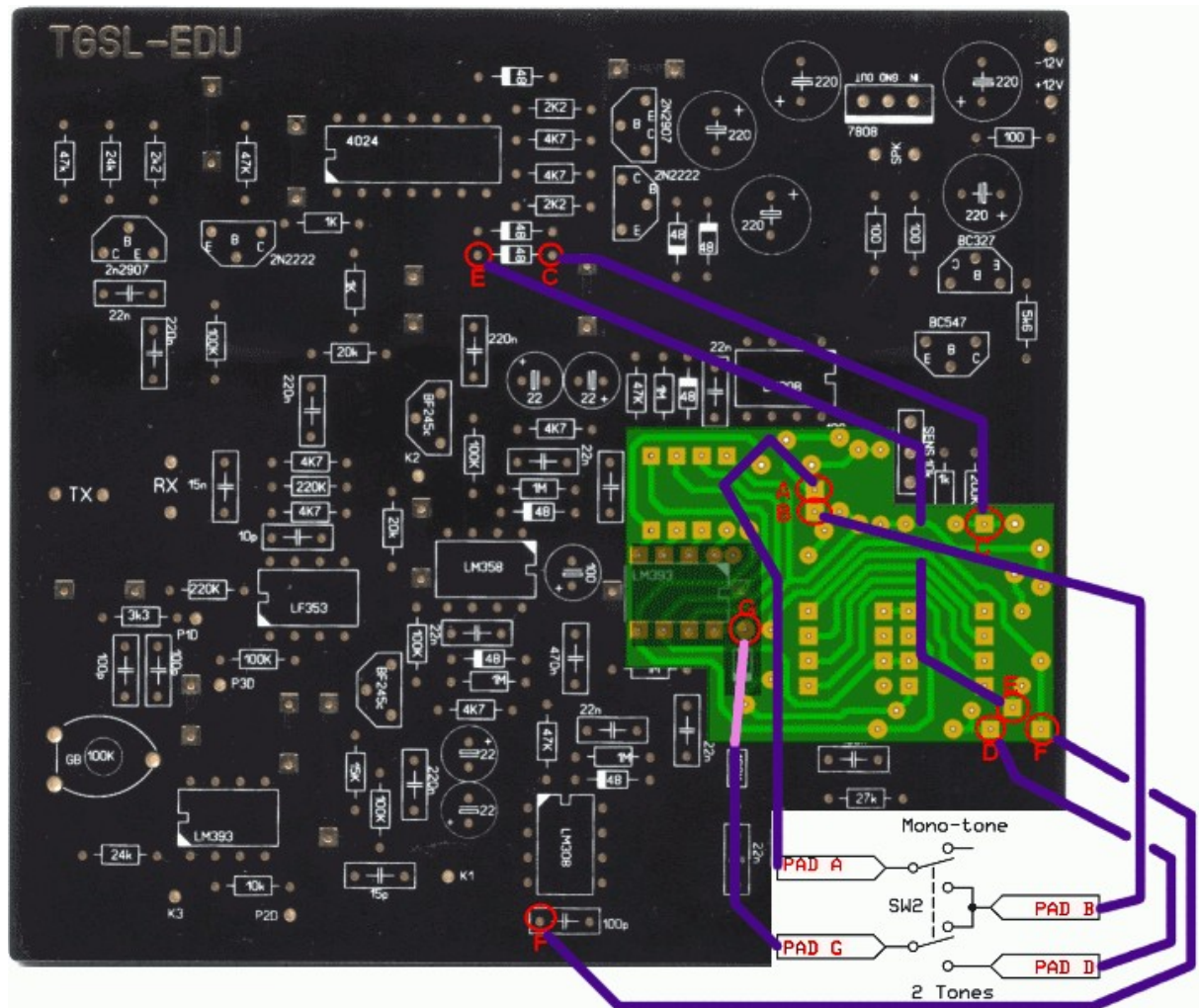
- | | |
|---------|---------|
| - LM393 | Qty : 1 |
| - LM358 | Qty : 1 |

Miscellaneous :

- | | |
|---------------------------|---------|
| - 8 pin DIL IC socket | Qty : 2 |
| - 4 way turned PCB header | Qty : 4 |



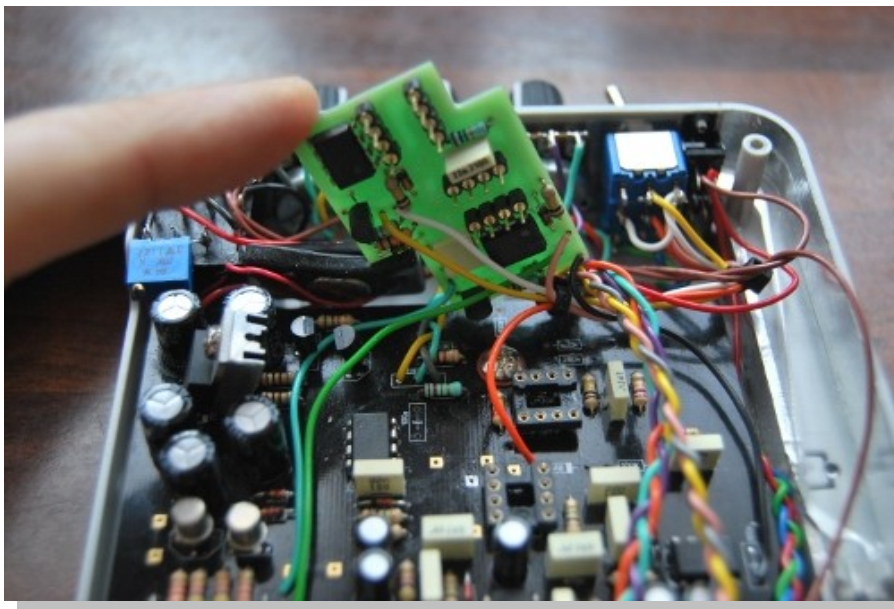
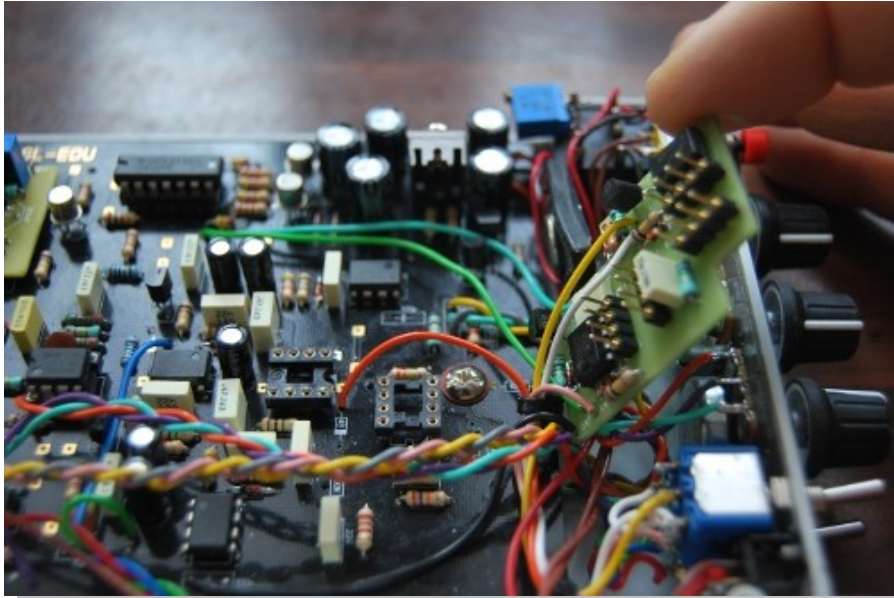
- | | |
|---------------|---------|
| - DPDT Switch | Qty : 1 |
|---------------|---------|

Wiring diagram:

Connect the switch as shown in this picture.

Note : The G pad is located on the main board under the add-on card.
On the next version V3, this pad will be on the add-on card just like the others.

Pictures :



Good luck,

Hugo