Some Safety Warnings

1. **With the power supply open and connected to AC mains (house) power, there is the possibility that you may contact AC mains (house) voltage.**

   Depending on the scenario, that can be fatal.

2. **The large aluminium electrolytic filter capacitors are considered hazardous, because of the combination of high voltage and high charge.**

   You need to 'treat them with respect'.

   When you remove AC mains (house) power from the power supply, these filter capacitors take time to discharge.

   To gauge discharge status, a voltmeter can be used to measure the voltage on the filter capacitors.

   For information on manually discharging the filter capacitors, see http://www.electronicrepairguide.com/capacitor-discharge.html

3. **In old power supplies, the thermal paste used between semiconductors and heatsinks, typically contained beryllium oxide (BeO).**

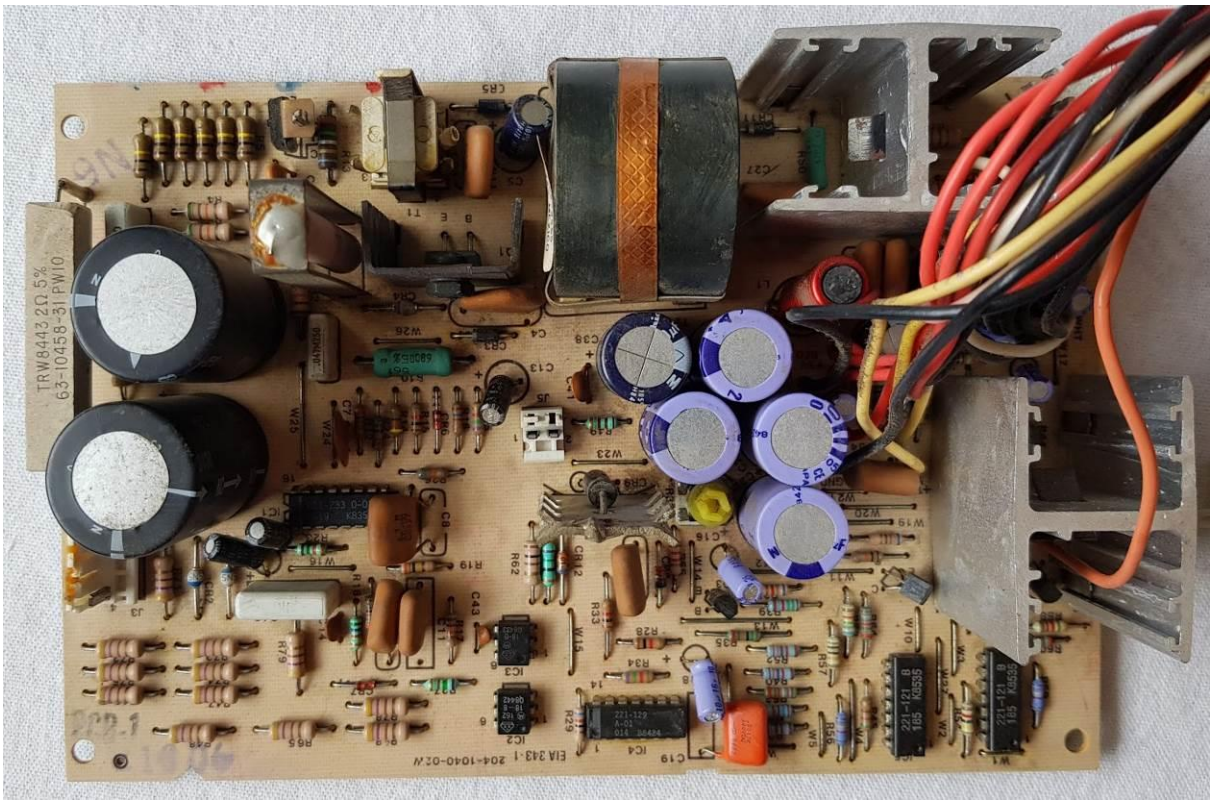
   Beryllium oxide is known to be carcinogenic.

Converting newer model IBM 5150 Power Supply from 120V to 240V

Based on the guide by Paul Axford for an older model power supply:
http://paulaxford.com/html/computer_collection/How%20to%20Convert%20the%20IBM%205150%20120%20VAC%20Power%20Supply%20to%20230%20VAC.pdf

Guide by Monotech PCs. No warranty whatsoever. Use at your own risk.

This is for a working 5150 power supply, that works on 110V (using your step-down transformer), with a 12VDC fan, and a PCB that looks like the following:



Parts needed:

Part	Qty	Digikey P/N	LCSC P/N	Jaycar P/N
10Ω 5W Resistor	1	A129454CT	C136506	RR-3250
1K 1W Resistor	12	1KWCT	C61312	RR-2774
13K 1/4W Resistor	1	13KQBK	C120082	RR-0599
33K 1W Resistor	1	33KWCT	C70845	RR-2810
100K 1W Resistor	3	100KWCT	C120463	RR-2822
220K 1W Resistor	2	220KWCT	C69875	RR-2830
560K 1W Resistor	1	PPC560KW-1CT	n/a	RR-2840
100nF 275VAC+ “X2” capacitor with 15 or 20mm pitch	2	P14779	C178453	RG-5236
1N5408 Diode	2	1N5408DICT	C36138	ZR-1018
SPST Relay w/ 12VDC coil & 250V 5A+ contacts	1	Z8454	C183556	SY-4066
1A Slow-blow 3AG Fuse	1	507-1526	C151100	SF-2226
High-temp silicone wire	1m	1738-1434	n/a	n/a

The **13K resistor** can be made up of **two or more common values soldered together in some heatshrink tubing**, such as 12K + 1K (as seen on the schematic), or 10K + 1K + 1K + 1K.

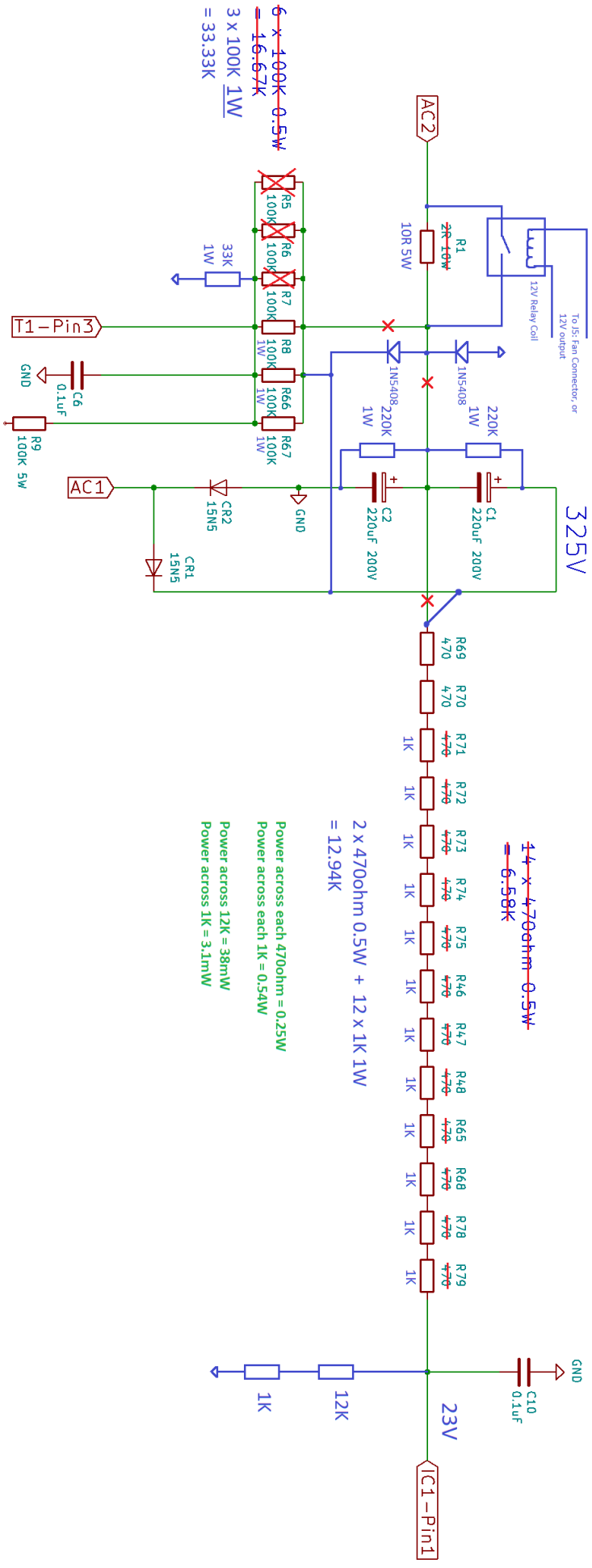
The high-temp silicone wire is optional, but makes things easier, as you can **safely let the flexible wire touch heatsinks.**

Tools needed:

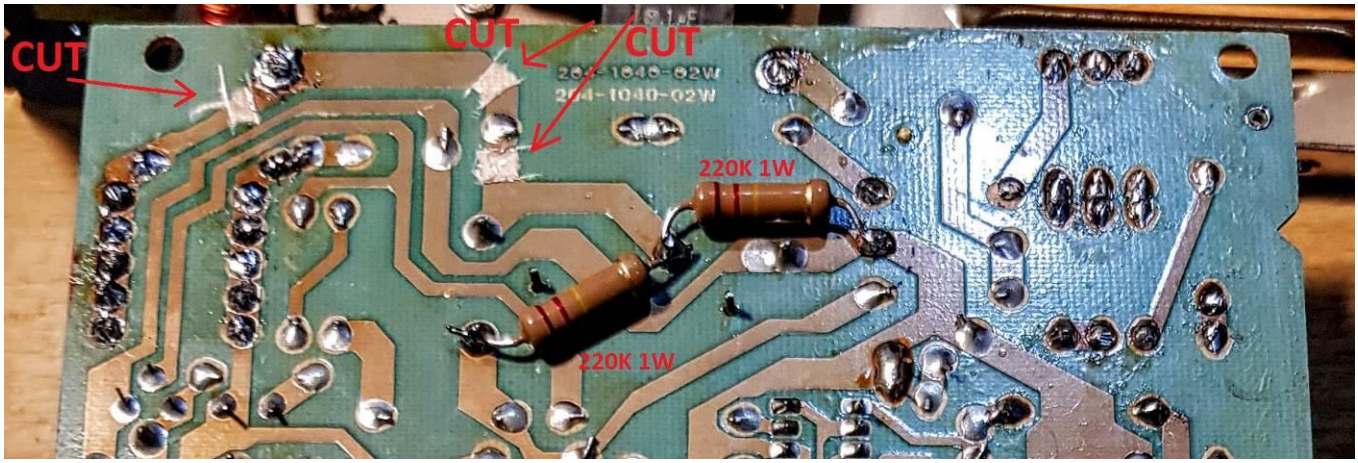
- Standard electronics repair equipment. **This is not a beginner's project**. Do not attempt if you don't know the basics, or don't know how to stay safe around high voltage.
- Torx T10H security screwdriver
- 1/4" nut driver
- 3.5" HDD to use as dummy load

Procedure (in no order):

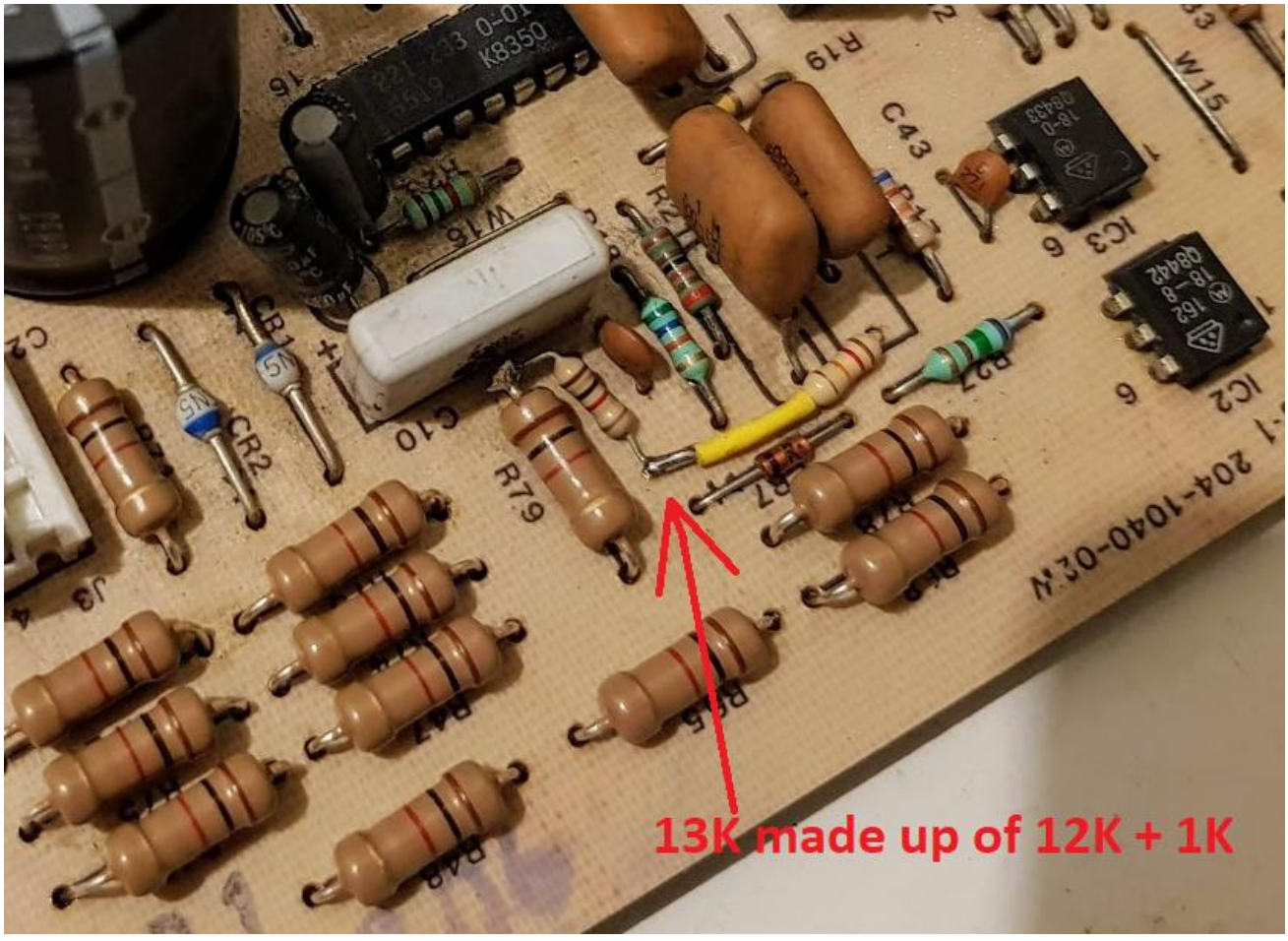
- ○ Replace the main 2A slow-blow fuse on the EMI filter board, with a 1A slow-blow fuse.
- ○ Replace the two 100nF "X2" film capacitors with 275VAC+ versions.
- ○ **Replace the 300K resistor** on the EMI filter board with a **560K 1W**.
- ○ **Remove** the following parts from the main PCB:
  - ○ R1 (2Ω 10W) (keep the posts)
  - ○ R5 (100K)
  - ○ R6 (100K)
  - ○ R7 (100K)
  - ○ R8 (100K)
  - ○ R66 (100K)
  - ○ R67 (100K)
  - ○ R71 (470Ω)
  - ○ R72 (470Ω)
  - ○ R73 (470Ω)
  - ○ R74 (470Ω)
  - ○ R75 (470Ω)
  - ○ R46 (470Ω)
  - ○ R47 (470Ω)
  - ○ R48 (470Ω)
  - ○ R65 (470Ω)
  - ○ R68 (470Ω)
  - ○ R78 (470Ω)
  - ○ R79 (470Ω)



- ○ **Cut three traces** as shown below
- ○ Install two **220K 1W** resistors as shown below, flat against the board

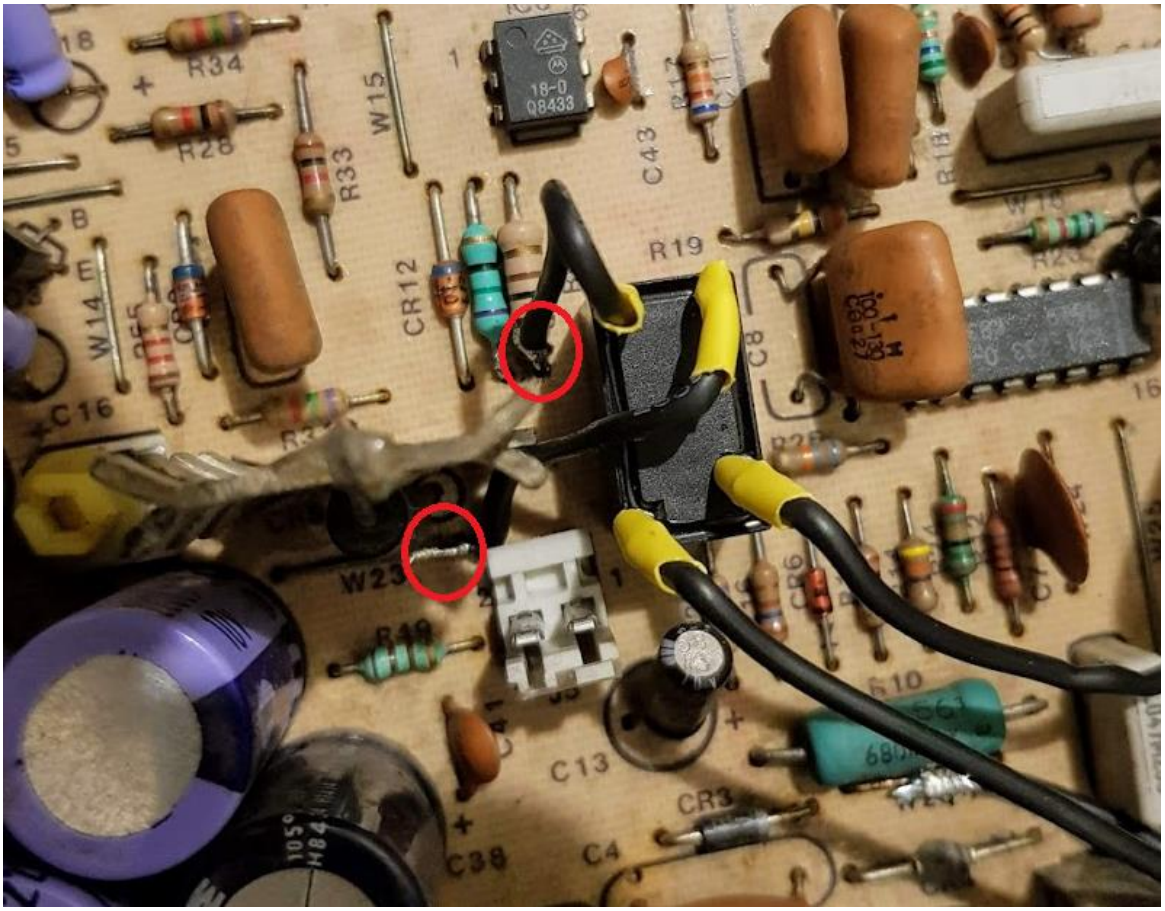


- ○ Install three **100K 1W** resistors at **R6, R8, R67**.
- ○ Install twelve **1K 1W** resistors where the **470Ω ones you removed** were.
- ○ Install a **10Ω 5W** resistor at **R1**, reusing the metal posts.
- ○ Install a **13K** resistor from **HV-Ground** to the **leg of R79 closest to C10**.
    - I took HV-GND from an unused hole meant for a larger capacitor size, as seen here:



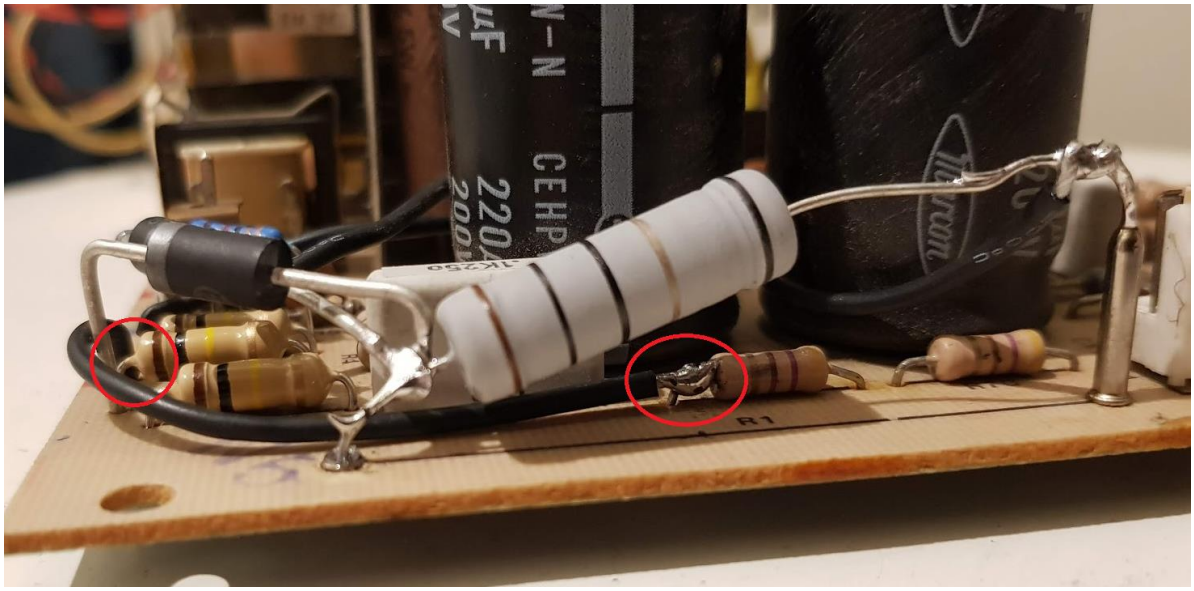
- ○ If your relay is small enough to fit there, **clean the PCB** at the **empty spot next to the fan connector**, and glue the relay there with cyanoacrylate, with connections facing up. If it's too big to sit flat in that empty area, find another way of safely mounting it.

- ○ Connect the **relay coil terminals** to the **fan connector.** Rather than connect directly to the fan connector, find two component leads that connect to the fan connector to solder to. I used jumper W23, and resistor R62 (the lead closest to the fan connector).



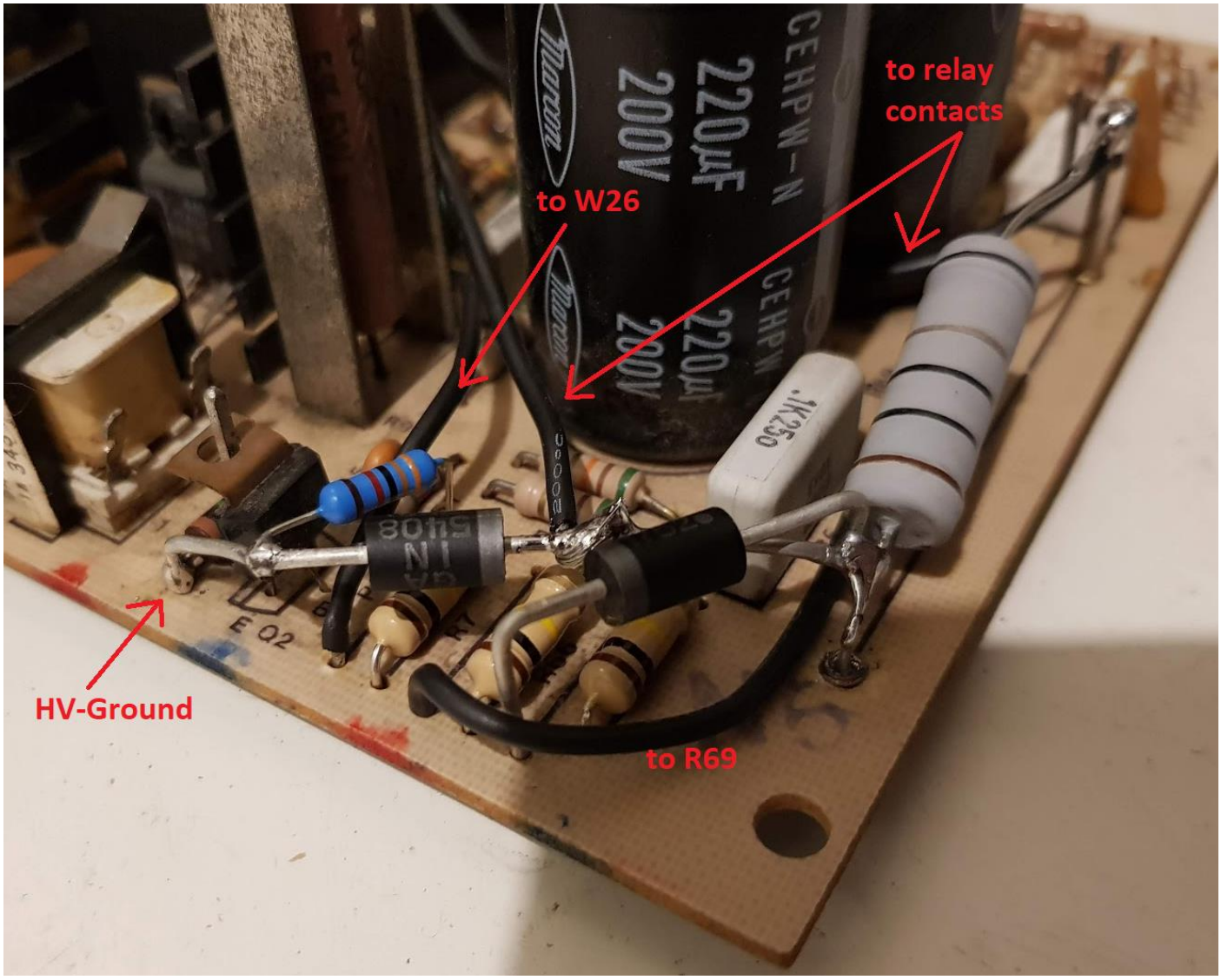
- ○ Connect the relay contacts **across R1** with wires.

- ○ Connect a wire from **R69**(lead farthest from AC-In connector (J3)) to **R7**(empty hole at edge of board).



- ○ Install a **1N5408** diode between **R1**(lead far from AC-In (J3)) and **HV-Ground**, with stripe facing R1.
    - I took the HV-Ground connection from the lead of R13 that is at the edge of the PCB.
- ○ Install a **1N5408** diode between **R66**(empty hole at edge of board) and **R1**(lead far from AC-In (J3)), with stripe facing R7.
- ○ Install a **33K 1W** resistor between **R5**(empty hole closest to large capacitors, NOT at edge of board) and **HV-Ground**.
    - Use the same HV-Ground connection as the first diode you installed.
- ○ Connect a wire from jumper **W26**, to **R5**(empty hole at edge of board).

The steps from this page and the previous, should equate to something like the following:



- ○ Test that **around 22VDC** is between **IC1-Pin1** and **IC1-Pin12**.
- ○ Test that **C1** and **C2** both have **under 180V** across them, as they're rated for 200V max (mine were good, at 164V and 167V), and they should be **within 10V of each other**. **They should both add up to between 300 and 350V**, depending on your line voltage (mine was 331V with exactly 240V line voltage).
- ○ Test PSU output voltages.

Done! Enjoy.