

# ***PAS3-Z-PSU power supply upgrade***

## **Assembly And Installation Instructions v2b 06-2025**

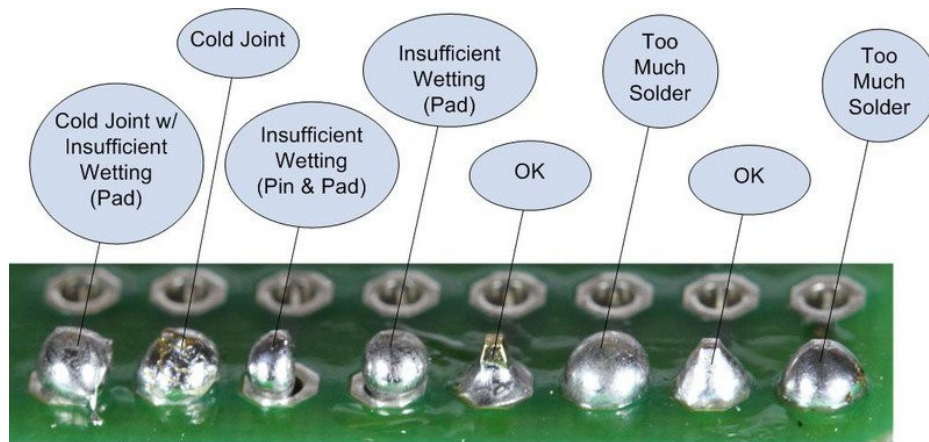
### **Overview**

- This is a power supply upgrade for the PAS3 that can be used with the original Dynaco PC5 & PC6 circuit boards or as part of our complete Z-mod (Z-PC5/Z-PC6 only) upgrade, which replaces all the circuits in the PAS2/3/3X.
- It is designed to replace the original selenium rectifier as well as the original silver multi cap can capacitor.
- Remove the selenium rectifier and we strongly recommend that you also remove the multi cap capacitor.
- None of the resistors that were originally connected to the multi cap tabs will be re used.
- You should end up with large hole and four smaller holes where the multi cap was installed.
- In most cases, the metal frame of the 12X4 socket was also used as the STAR GROUND. To this star ground, connect one wire from the GND pad on the power supply pcb, located next to the B+IN pad.
- This will be your new main power supply ground connection.

### **Solder Examples**

We cannot stress more the importance of good soldering practice. 95% of all issues with a build that we come across is bad soldering. Dry/Cold solder joints are most of the issues.

**Please Ensure That Your Soldering Skills Are Very Good, See The Below Examples.**



## **PCB Assembly**

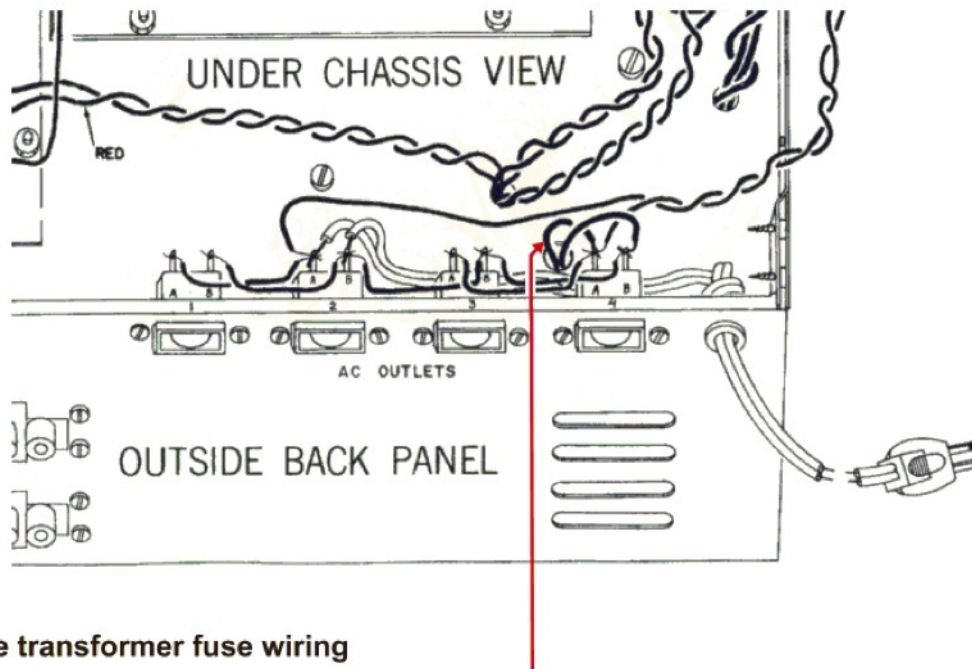
- First, solder all the resistors in place, and then the smaller capacitors, and then the larger capacitors.
- Be sure to confirm all the electrolytic capacitor orientations, as a reversed polarized capacitor can easily vent (or even explode) when presented with high-voltage.
- Confirm twice, solder once.

## **Testing**

### **Remember, Safety First, Second and Last.**

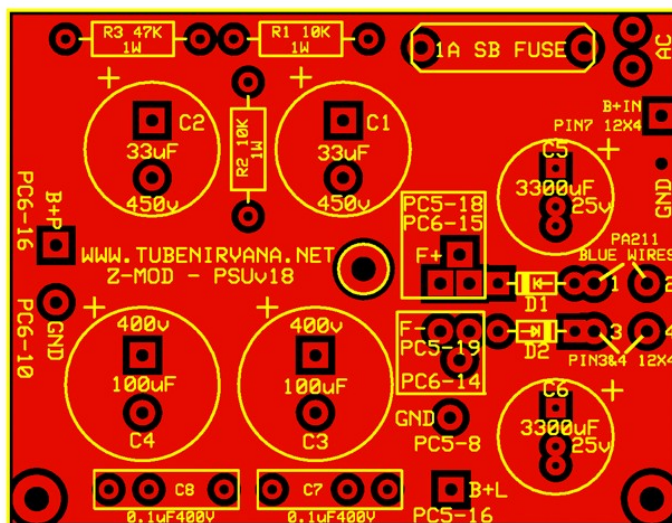
- Before testing, visually inspect the PCB for proper parts placement and soldering quality connections.
- Wear safety eye goggles, as an exploding power-supply capacitor will spray hot caustic chemicals.
- Make a habit of using only one hand, with the other hand behind your back, while attaching probes or handling high-voltage gear, as a current flow across your chest can result in death. In addition, wear rubber-soled shoes and work in a dry environment.
- If possible, use a Variac and slowly bring up the AC voltage, while looking for smoke or part discoloration or bulging.
- Measure the voltage between ground and the B+ outputs for both PC-5 and PC-6.
- The voltages should be within about 10% of the values marked on the schematics.
- Only after you are sure that both heater and B-plus power supplies are working well, should you attach the line-stage amplifier to a power amplifier.
- A note about resistors:
- Some 1/2W resistors look like the size of 1/4W, but they are in fact 1/2W and can generally be told apart from 1/4W as they tend to have thicker gauge leads. They are perfectly fine to be used in 1/2W placings. Also, a 1W resistor may be the size of a 1/2W resistor, with modern and different materials, manufacturers are able to decrease the size of a component.

## Incorporating The Power Supply PCB And Its Fuse Into The Upgrade



### Prepare transformer fuse wiring

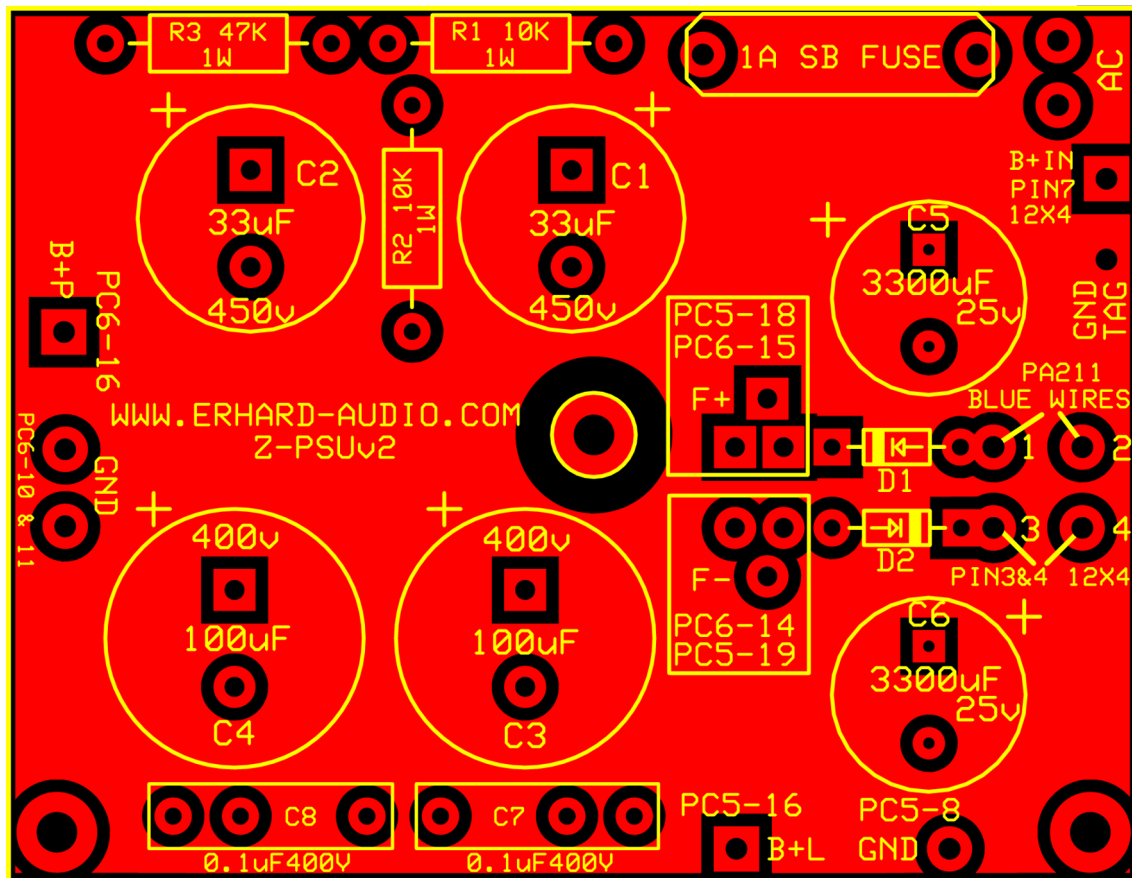
Disconnect the transformer wire connected to AC Outlet 4, terminal A. Pull it back through the hole to the top side. Label it **Pwr Sw**. Connect a new wire to AC outlet 4, terminal A and pass it through the hole to the top side. Label the new wire **Pri**.



connect the wire marked **Pwr Sw** to this pad

connect the wire marked **Pri** to this pad

## Power Supply PCB



**Tube Nirvana Z-PSU Power Supply**

This power supply replaces the original multi cap and selenium rectifier  
All indicated voltages are nominal and may vary slightly

**CAUTION - HIGH DC & AC VOLTAGES PRESENT!**

Tube Nirvana Z-PSU Power Supply

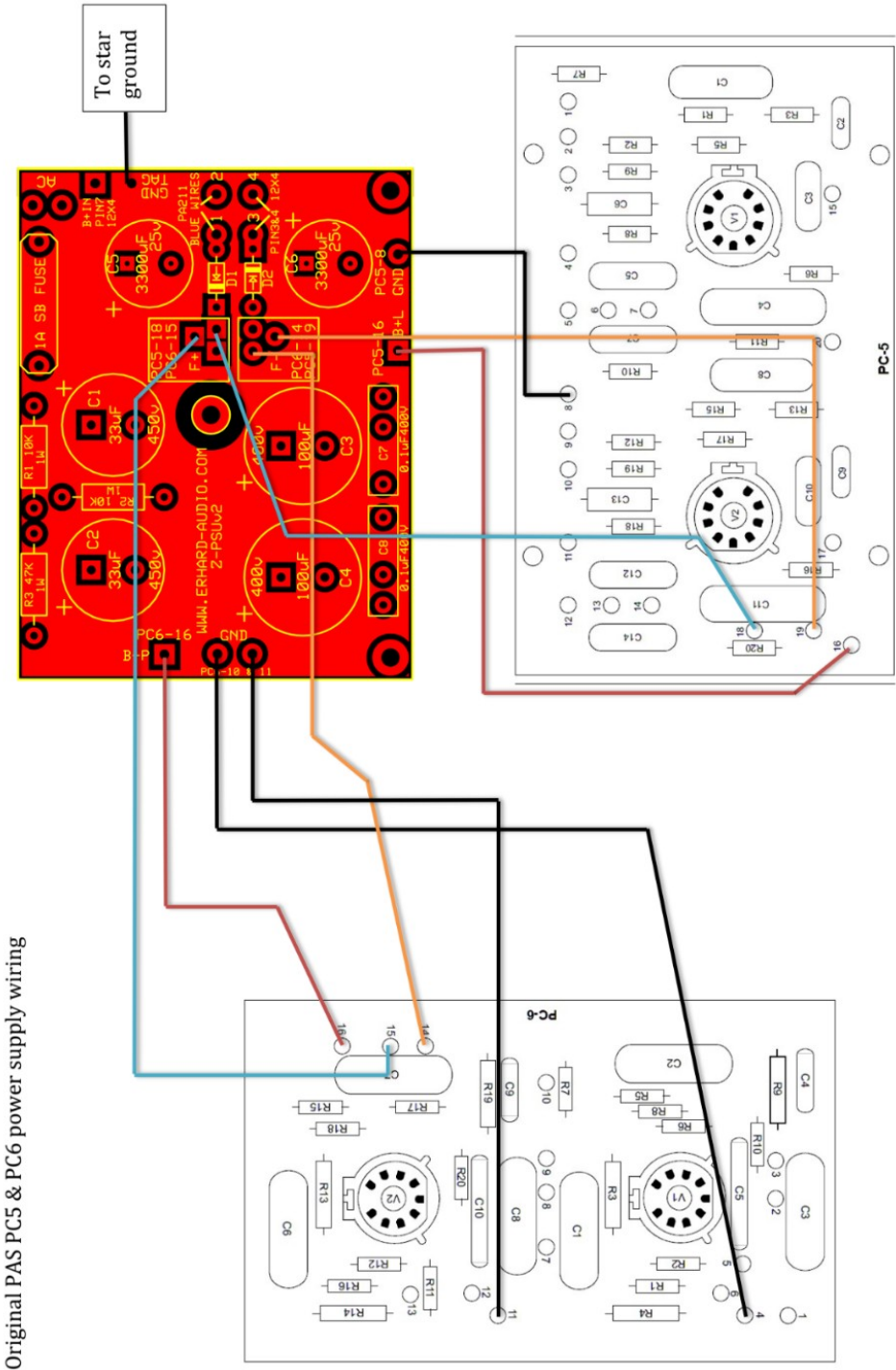
This power supply replaces the original multi cap and selenium rectifier

All indicated voltages are nominal and may vary slightly

**CAUTION - HIGH DC & AC VOLTAGES PRESENT!**

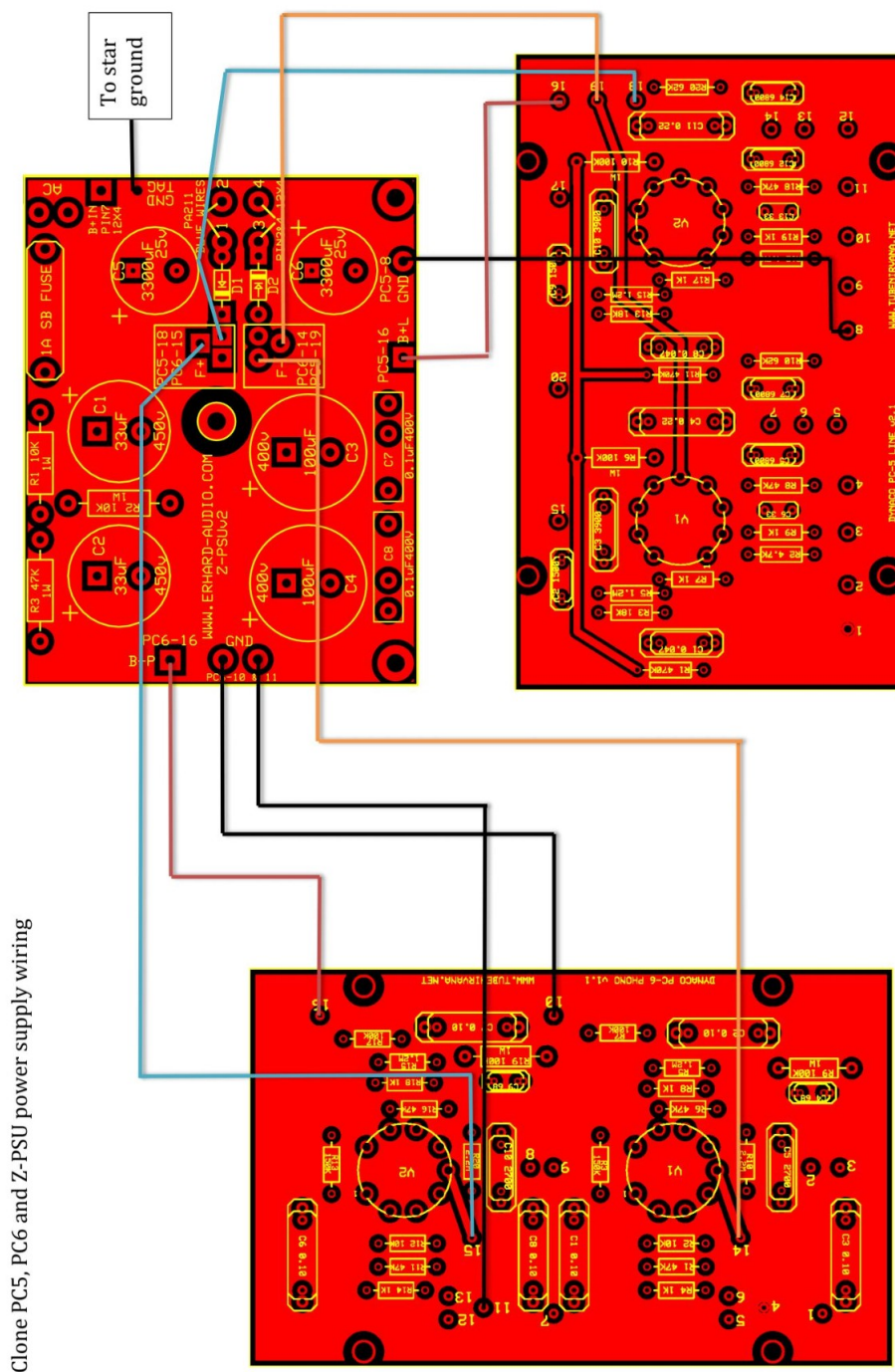
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Power Supply Wiring For Original Dynaco PC5 & PC6





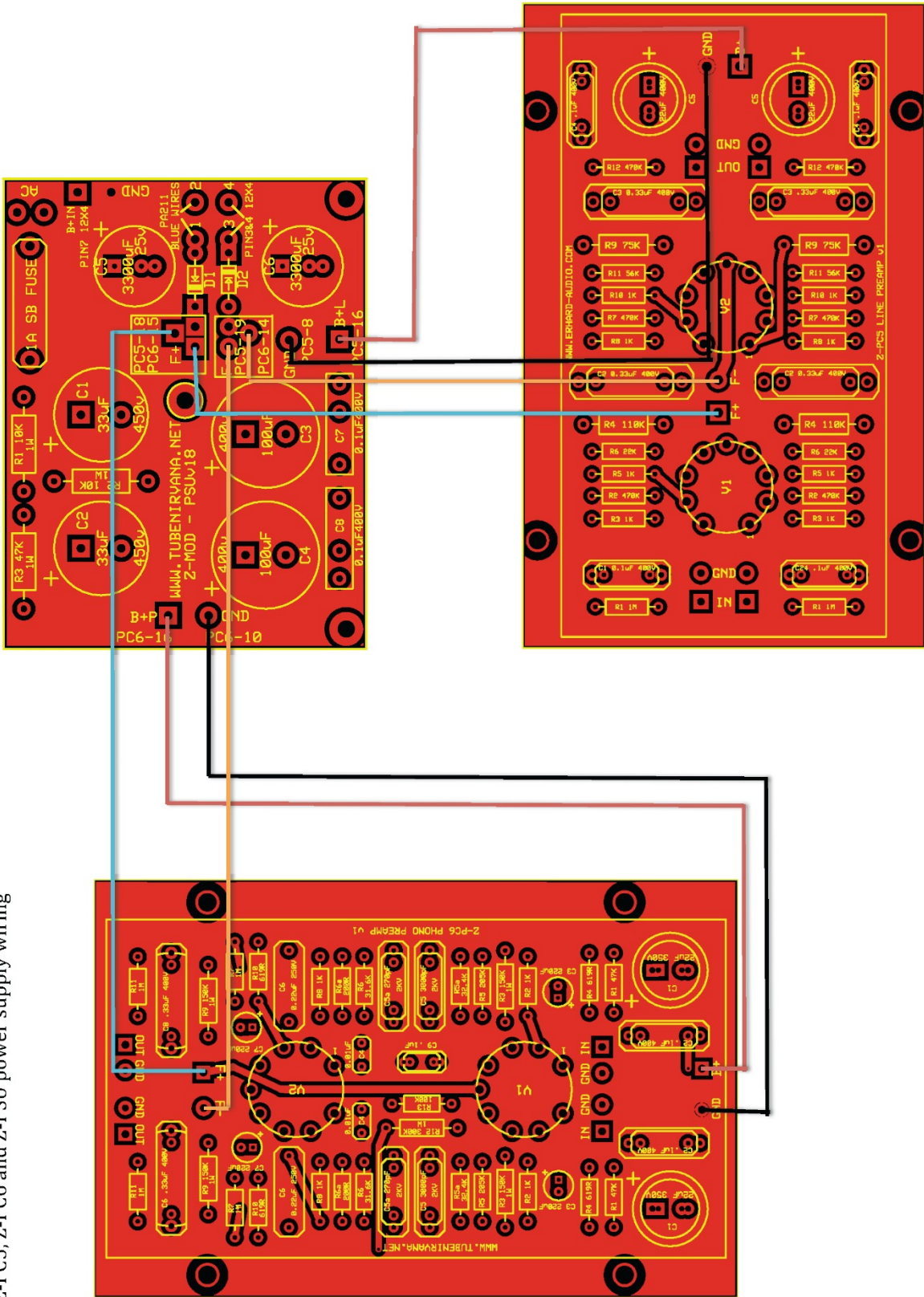
## Power Supply Wiring For Clone PC5 & PC6





Power Supply Wiring For Z-PC5, Z-PC6 And Z-PSU

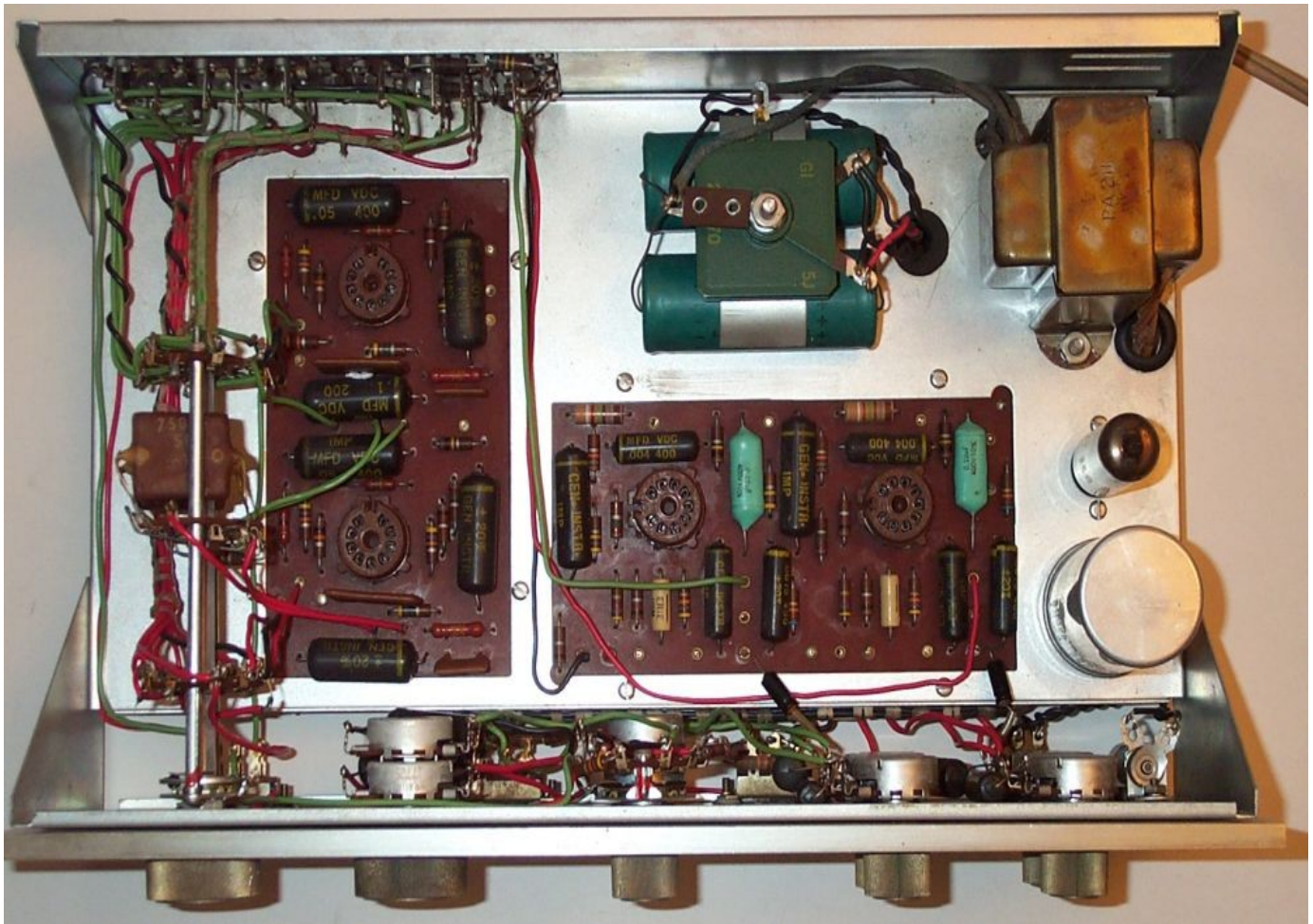
Z-PC5, Z-PC6 and Z-PSU power supply wiring



### A Note About Ground Wiring.

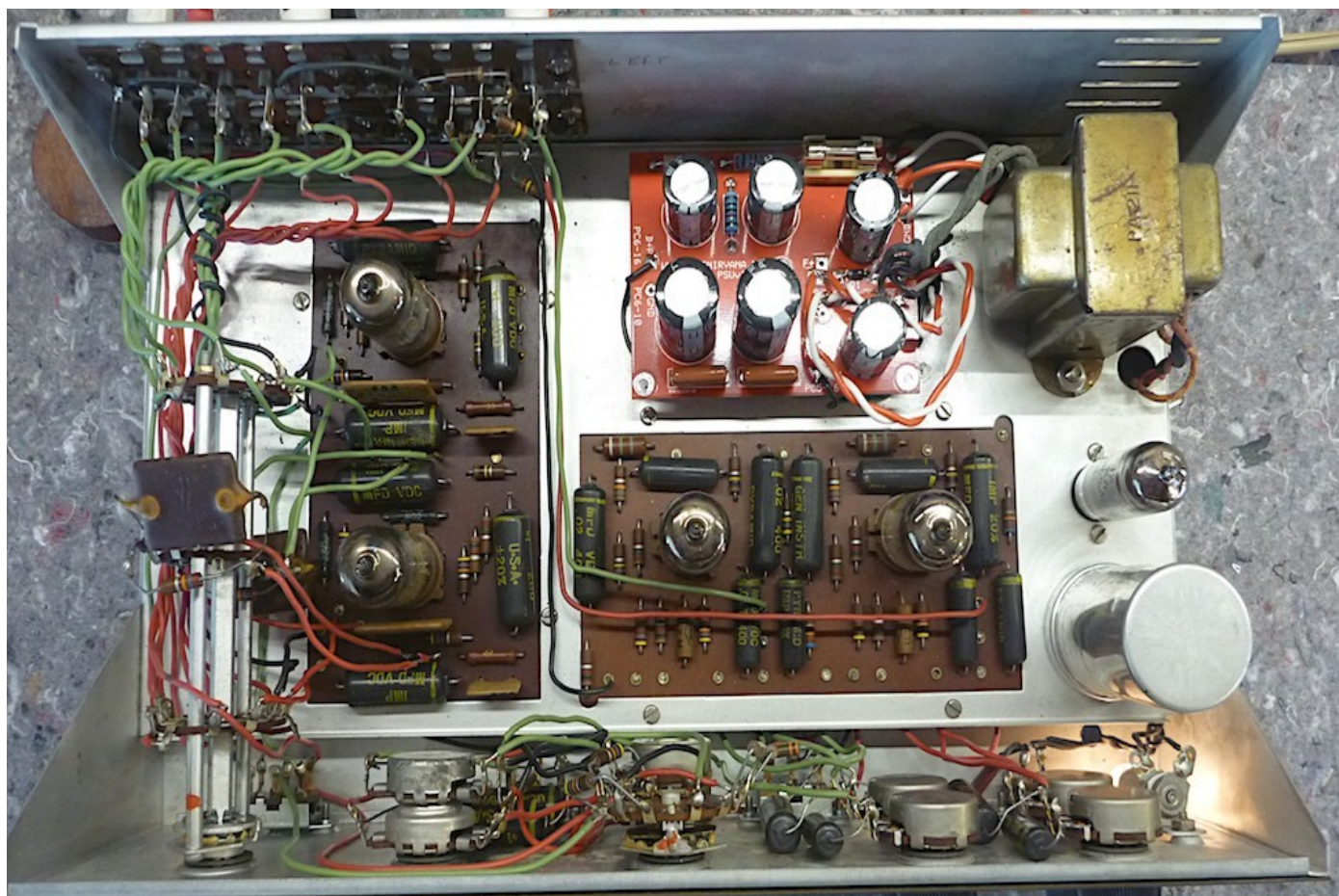
- Please follow the above wiring diagrams as best as you can.
- There should only be **Two** connections to the chassis star ground. One being the center tap wire of the PA211 transformer and the other being the ground connection from the Z-PSU pcb as shown in the diagrams. If you are using a three way power cord with a ground wire, that too should be connected to the chassis star ground.
- **All** power supply grounds should be connected as shown in the above diagrams and **Not** to star ground!
- **All** signal grounds should be connected to the respective pads on the Preamp PCB's and RCA jacks. Do not connect any signal grounds to the star ground.
- We are looking for the **Least** amount of ground connections, just the bare minimum required, to try and avoid any possibility of ground loops!

### Typical PAS2/3 Before The Installation Of The Z-PSU Kit.



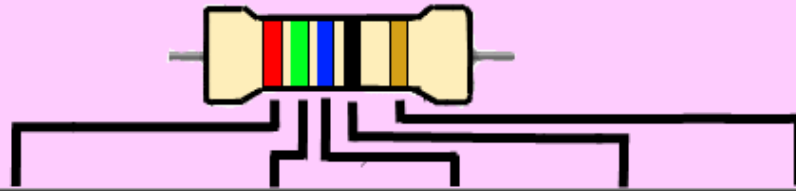


### Typical PAS2/3 After The Installation Of The Z-PSU Kit.



- This shows a typical installation of a Z-PSU pcb in a PAS2.
- Note, even though with this installation the metal multi cap is still installed, all the wiring to it has of course been removed as the Z-PSU replaces the multi cap.
- The Z-PSU pcb is mounted using the supplied threaded spacer and screws. Use the center hole on the Z-PCU pcb for mounting to the metal spacer.
- This metal spacer is installed in the same hole where the original long screw was installed into, which held the large capacitors and selenium rectifier.

### 5 Band Resistor Color Coding



COLOR	1ST BAND	2ND BAND	3RD BAND	MULTIPLIER	TOLERANCE
BLACK	0	0	0	$\times 1\Omega$	
BROWN	1	1	1	$\times 10\Omega$	$\pm 1\%$
RED	2	2	2	$\times 100\Omega$	$\pm 2\%$
ORANGE	3	3	3	$\times 1000\Omega$	
YELLOW	4	4	4	$\times 10000\Omega$	
GREEN	5	5	5	$\times 100000\Omega$	$\pm 0.5\%$
BLUE	6	6	6	$\times 1000000\Omega$	$\pm 0.25$
VIOLET	7	7	7	$\times 10000000\Omega$	$\pm 0.10$
GREY	8	8	8		$\pm 0.05$
WHITE	9	9	9		
GOLD					$\pm 5\%$
SILVER					$\pm 10\%$

## How To Read Capacitor Codes

Large capacitors have the value printed plainly on them, such as 10.uf (Ten Micro Farads) but smaller disk types along with plastic film types often have just 2 or three numbers on them?

First, most will have three numbers, but sometimes there are just two numbers. These are read as Pico-Farads. An example: 47 printed on a small disk can be assumed to be 47 Pico-Farads (or 47 pF as some like to say)

Now, what about the three numbers? It is somewhat similar to the resistor code. The first two are the first and second significant digits and the third is a multiplier code. Most of the time the last digit tells you how many zeros to write after the first two digits, but the standard (EIA standard RS-198) has a couple of curves that you probably will never see. But just to be complete here it is in a table.

Third Digit	Multiplier (this times the first two digits gives you the value in Pico-Farads)
0	1
1	10
2	100
3	1,000
4	10,000
5	100,000
6 not used	
7 not used	
8	.01
9	.1

Now for an example: A capacitor marked 104 is 10 with 4 more zeros or 100,000pF which is otherwise referred to as a 0.1uF capacitor.

Most kit builders don't need to go further, but I know you want to learn more. Anyway, Just to confuse you some more there is sometimes a tolerance code given by a single letter. I don't know why there were picked in the order they are, except that it kind of follows the middle row of keys on a typewriter. So a 103J is a 10,000 pf with +/-5% tolerance

	Tolerance of capacitor
D	+/- 0.5 pf
F	+/- 1%
G	+/- 2%
H	+/- 3%
J	+/- 5%
K	+/- 10%
M	+/- 20%
P	+100% , -0%
Z	+80%, -20%

Picofarad (pF)	Nanofarad (nF)	Microfarad (uF)	Code	Picofarad (pF)	Nanofarad (nF)	Microfarad (uF)	Code
10	0.01	0.00001	100	4700	4.7	0.0047	472
15	0.015	0.000015	150	5000	5.0	0.005	502
22	0.022	0.000022	220	5600	5.6	0.0056	562
33	0.033	0.000033	330	6800	6.8	0.0068	682
47	0.047	0.000047	470	10000	10	0.01	103
100	0.1	0.0001	101	15000	15	0.015	153
120	0.12	0.00012	121	22000	22	0.022	223
130	0.13	0.00013	131	33000	33	0.033	333
150	0.15	0.00015	151	47000	47	0.047	473
180	0.18	0.00018	181	68000	68	0.068	683
220	0.22	0.00022	221	100000	100	0.1	104
330	0.33	0.00033	331	150000	150	0.15	154
470	0.47	0.00047	471	200000	200	0.2	254
560	0.56	0.00056	561	220000	220	0.22	224
680	0.68	0.00068	681	330000	330	0.33	334
750	0.75	0.00075	751	470000	470	0.47	474
820	0.82	0.00082	821	680000	680	0.68	684
1000	1.0	0.001	102	1000000	1000	1.0	105
1500	1.5	0.0015	152	1500000	1500	1.5	155
2000	2.0	0.002	202	2000000	2000	2.0	205
2200	2.2	0.0022	222	2200000	2200	2.2	225
3300	3.3	0.0033	332	3300000	3300	3.3	335

**We cannot take ANY responsibility for mains, and for that matter, ALL high voltage AC and DC wiring you carry out. We have described in this, and all of our other manuals, as best as we can, on how to wire up these high voltage connections. You MUST take EXTREME care, that no wires are shorted together, or to the chassis, or any other part of the assembly and PCB's. All these high voltages can be life threatening, and can hurt you or others if carried out incorrectly. Use your meter in the continuity setting to make sure no high voltage wires are shorted together or to chassis ground. Apart from bodily harm, incorrect high voltage wiring can and will damage components! You are totally and solely responsible for all high voltage wiring and the general assembly of this kit! We have wired our prototype amp exactly as described in this and all of our other manuals, so we know that the amp will work as designed and intended!**

**If you are unsure of how to carry out some of our instructions, PLEASE contact us via e-mail, we provide, as part of our service, full support for this and all of our kits! No question is stupid. The ONLY stupid question is the one you do not ask!**