

V8 CRCRC Power Supply Build Guide

This PCB is designed for Class A power amplifiers that require a dual rail power supply. The original intent was for use in monoblock amplifier builds. It can also be used for stereo builds. For each rail the circuit uses a bank of 2 capacitors, then a pair of filter resistors, followed by a single cap, another pair of filter resistors, and a final cap. Bleeder resistors are included in the circuit. This PCB can be used with dual secondary transformers OR center tapped transformers.

The grounding is configured as a “Star Ground”. There is a connection from Audio Star Ground to Chassis / Earth Ground via a CL-60 Thermistor. The Chassis Ground connection point may be made either through a screw or wire.

The board accommodates LEDs and their associated dropping resistors. Oftentimes one LED is used on-board to indicate power supply operation, and other LED is installed via wires to be a front-panel “power on” display.

Project Difficulty: **NOVICE** **INTERMEDIATE** **EXPERT**



Questions?

You're probably not alone!

Post your question(s) on the DIYAudio forums.

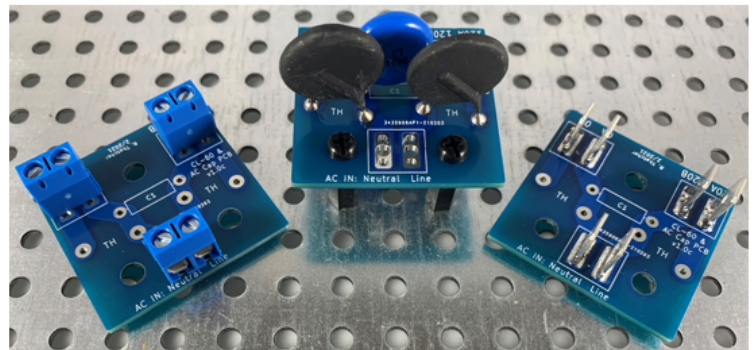
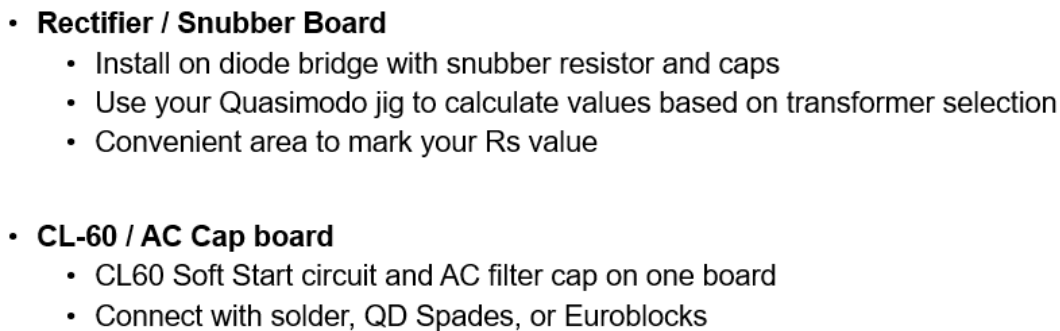


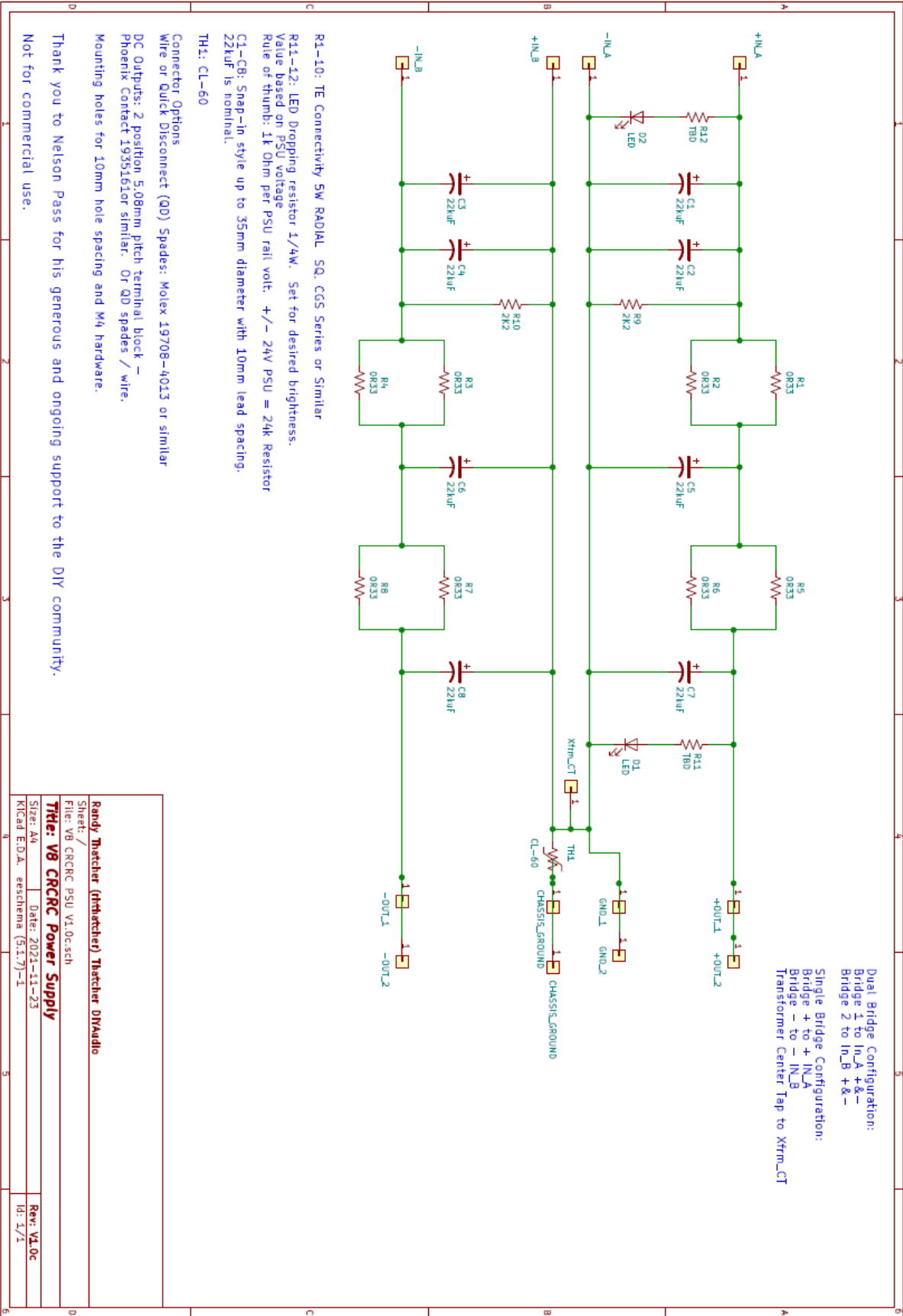
This project uses line/mains voltages and has large power supply capacitors. The voltages in this board can kill – even at miniscule current. If you are not competent / confident with working with these voltages, please seek advice from either a qualified electrician, or an audio DIYer who is competent and experienced in this area. Always work safe and work smart!

The PCBs are offered without any warranty, guarantee provided, or liability taken.

| Version / Date | | Revision History |
|----------------|---------------|----------------------------------|
| V1.0a | 24 March 2023 | Original Release. |
| V1.0b | 24 March 2023 | Updated resistor part number |
| V1.0c | 17 March 2025 | Added additional wiring diagrams |

- Mounting holes compatible with 10x10 grid
- 115 x 146mm
- Recommended for mono builds
- 2 Caps, Resistors, Cap, Resistors, Cap





Power Supply BOM for V8 CRCRC Power Supply PCB

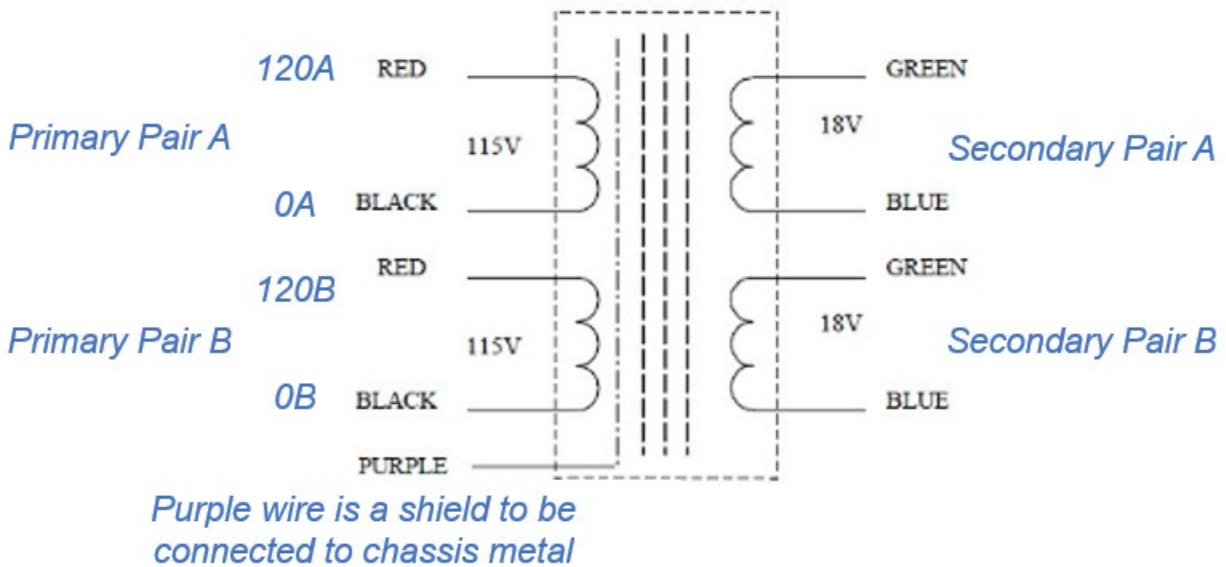
NOTE: BOM is for SINGLE CHANNEL. Multiply Quantity x 2 for 2 channels!

This table contains example part numbers and part recommendations. Any good quality similar parts will work with no detriment to the sound.

| ID | Qty | Value | Digikey Part Number | Comment |
|---|------|---|--|---|
| Power Supply Board | | | | |
| R1-8 | 8 | 0R22 – 0R33 5W | A103692-ND A137379-ND A102472-ND | Use TE Connectivity 5W Radial Resistors for this PCB 13.00mm x 9.00mm 5mm Lead Spacing |
| R9-10 | 2 | 2k2 5W (3k3 is also OK) | A102461-ND A131251-ND | Use TE Connectivity 5W Radial Resistors for this PCB 13.00mm x 9.00mm 5mm Lead Spacing |
| R11, 12 (<25V Rails) | 2 | 25k 1/4W | 24.9KXBK-ND | "Rule of Thumb" - 1k Ohm per PSU volt Increase R for dimmer LED. No need to be exact. |
| R11, 12 (25-35V Rails) | 2 | 36k 1/4W | 13-MFR-25FTE52-36KCT-ND | |
| R11, 12 (35-50V Rails) | 2 | 47k 1/4W | 13-MFR-25FRF52-47KCT-ND | |
| Filter Capacitor Options - 10mm Lead Spacing, up to 35mm Diameter. | | | | Voltage rating must be greater than rail voltage! Below are several options. |
| C1-8 | 8 | 22k uF, 25V | 338-2431-ND | < 25V Rails |
| | | 27k uF, 25V | 338-2255-ND | < 25V Rails |
| | | 33k uF, 25V | 338-1613-ND | < 25V Rails |
| | | 47k uF, 25V | 1189-3900-ND | < 25V Rails |
| | | 22k uF, 35V | 338-1485-ND | < 35V Rails |
| | | 27k uF, 35V | 1189-3914-ND | < 35V Rails |
| | | 33k uF, 35V | 338-2260-ND | < 35V Rails |
| | | 22k uF, 50V | 338-1599-ND | < 50V Rails |
| | | 33k uF, 50V | 338-3814-ND | < 50V Rails |
| TH1 | 1 | CL-60 | KC006L-ND | |
| D1-2 | 2 | Blue LED | 732-5019-ND | LEDs are both on positive rail. Use one for on-board and another for front panel |
| Other | 5 | Screw Terminal Blocks 2 position | 277-1667-ND | OPTIONAL - For connection to amp PCB and/or Bridges |
| Other | 10 + | Quick Disconnect Blades | WM14275CT-ND 36-1287-ST-ND | |
| CL-60 / AC Cap PCB | | | | |
| C1 | 1 | 3300pF, X1 Safety Rated | 399-9513-1-ND | |
| TH1-2 | 2 | CL-60 | KC006L-ND | |
| Other | 3 | Screw Terminal Blocks 2 position | 277-1667-ND | Optional. Or use QD blades (next line item) |
| Other | 6 | Quick Disconnect Blades | WM14275CT-ND 36-1287-ST-ND | |
| Rectifiers / Snubber PCBs | | | | |
| Rectifier Bridges | 2 | | GBPC3510-E4/51GI-ND 641-1380-ND | |
| Snubber C | 2 | FILM 10000PF / 10nF / .01uF | 495-4975-1-ND | |
| Snubber C | 2 | FILM 150nF / .15uF | 495-77011-1-ND | |
| Snubber R | 2 | Metal Film 1/4W - Value TBD | TBD if not using Antek | Use Quasimodo test jig to determine value |
| Snubber R for Antek | 2 | Metal Film 1/4W – 20-22R for Antek Transformers | RNF14FTD20R0CT-ND | Antek Transformers – use 20-22R |

Transformers – Preparing for Wiring the Amplifier

It is critical to identify transformer wire pairs for your build. Below is an example diagram for a shielded toroidal Antek Transformer (example: AS-3218) with added notes in blue text.

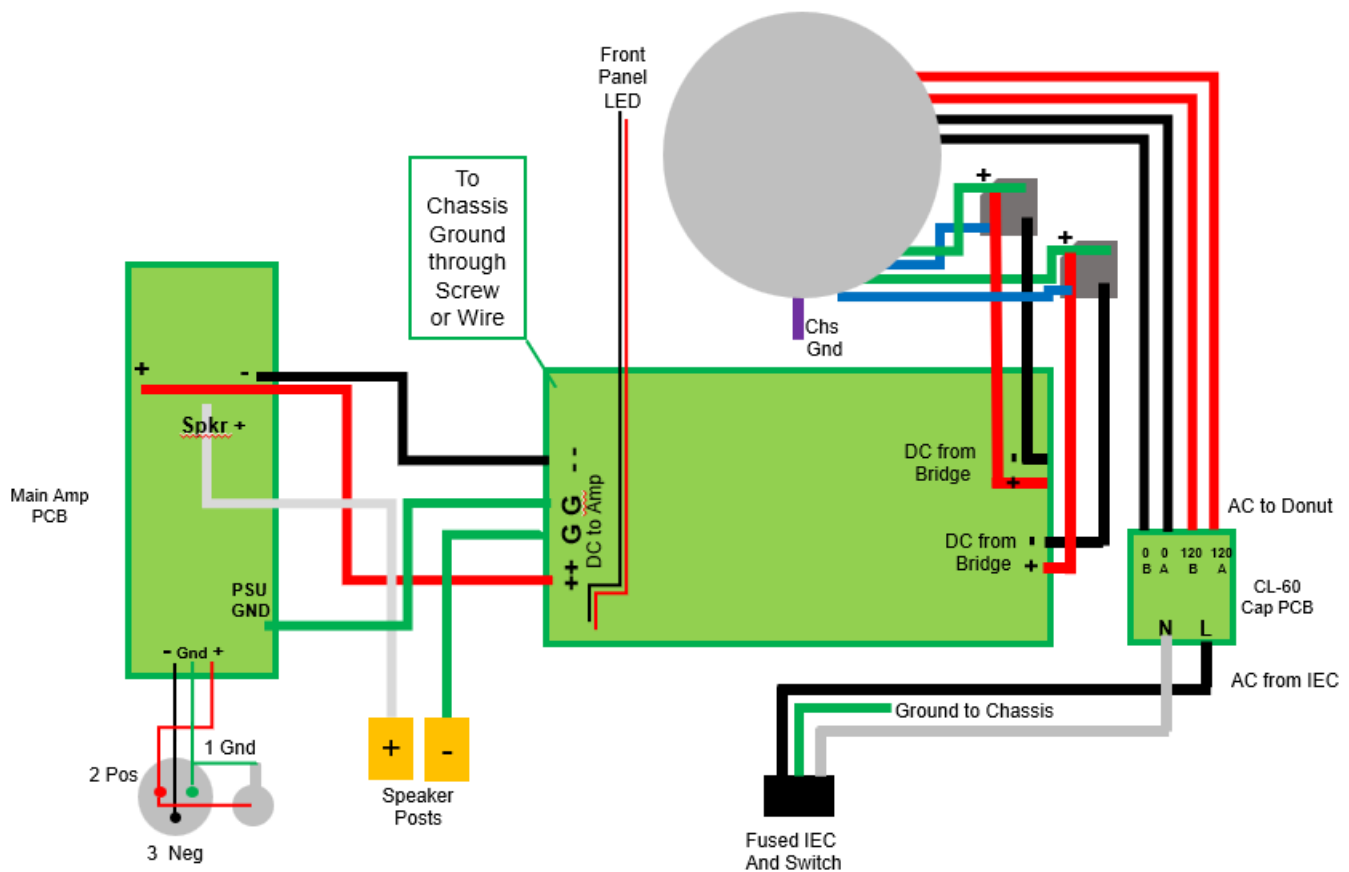


Identifying Wire Pairs

- Confirm transformer wiring pairs (120A / 0 A, 120B / 0B, secondary pairs)
 - How to identify which wires are pairs
 - Use DMM set to Ohms or Continuity “buzzer”.
 - Pairs will “buzz” or read as a few Ohms.
 - For Antek Transformers:
 - Find red / black pairs, twist each pair, and tape or heatshrink to hold together as a pair.
 - Find blue / green pairs, twist each pair, and tape or heatshrink to hold together as a pair.
 - Other transformers – refer to transformer datasheet and/or label on transformer for wire colors.
 - Verify pairs with DMM, twist each pair, and tape or heatshrink to hold together as a pair.

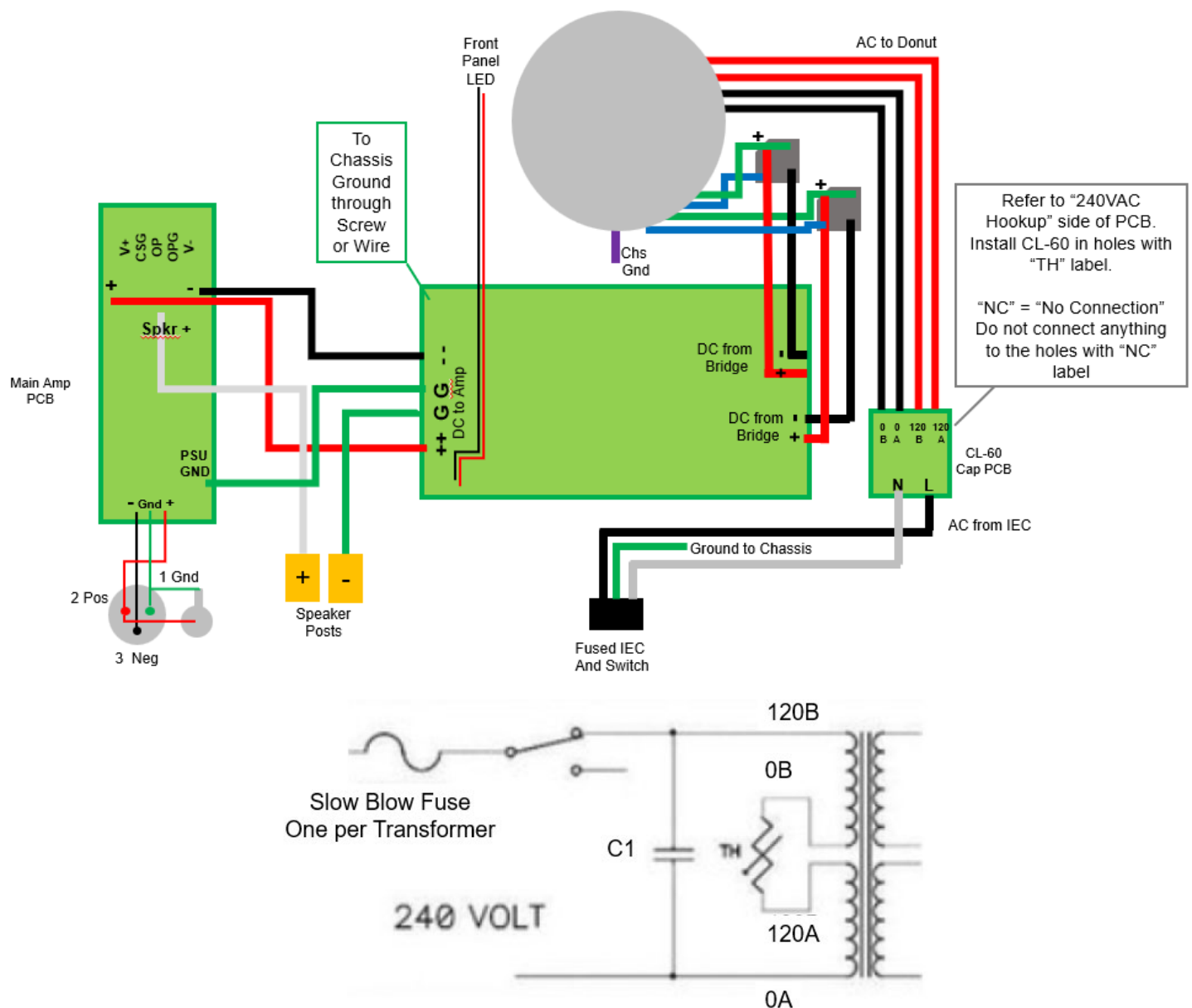
Amplifier Wiring Concept – Monoblock Configuration with V8 Power Supply PCB – 120V Mains

- Twist wires!!!
- If using Antek shielded transformer, attach purple wire to Chassis.
 - Option 1: Direct to Chassis
 - Option 2: Connect to “Chassis Ground” termination point on PSU PCB
- Confirm transformer wiring pairs (120A / 0 A, 120B / 0B, secondary pairs)
 - Use DMM set to Ohms or Continuity “buzzer”. Pairs will “buzz” or read as a few Ohms.
 - For Antek Transformers:
 - Find red / black pairs, twist each pair, and tape or heatshrink to hold together as a pair.
 - Find blue / green pairs, twist each pair, and tape or heatshrink to hold together as a pair.
 - Other transformers – refer to transformer datasheet and/or label on transformer for wire colors.
- 120VAC wiring application using an Antek transformer (2 secondary pairs) is shown below.



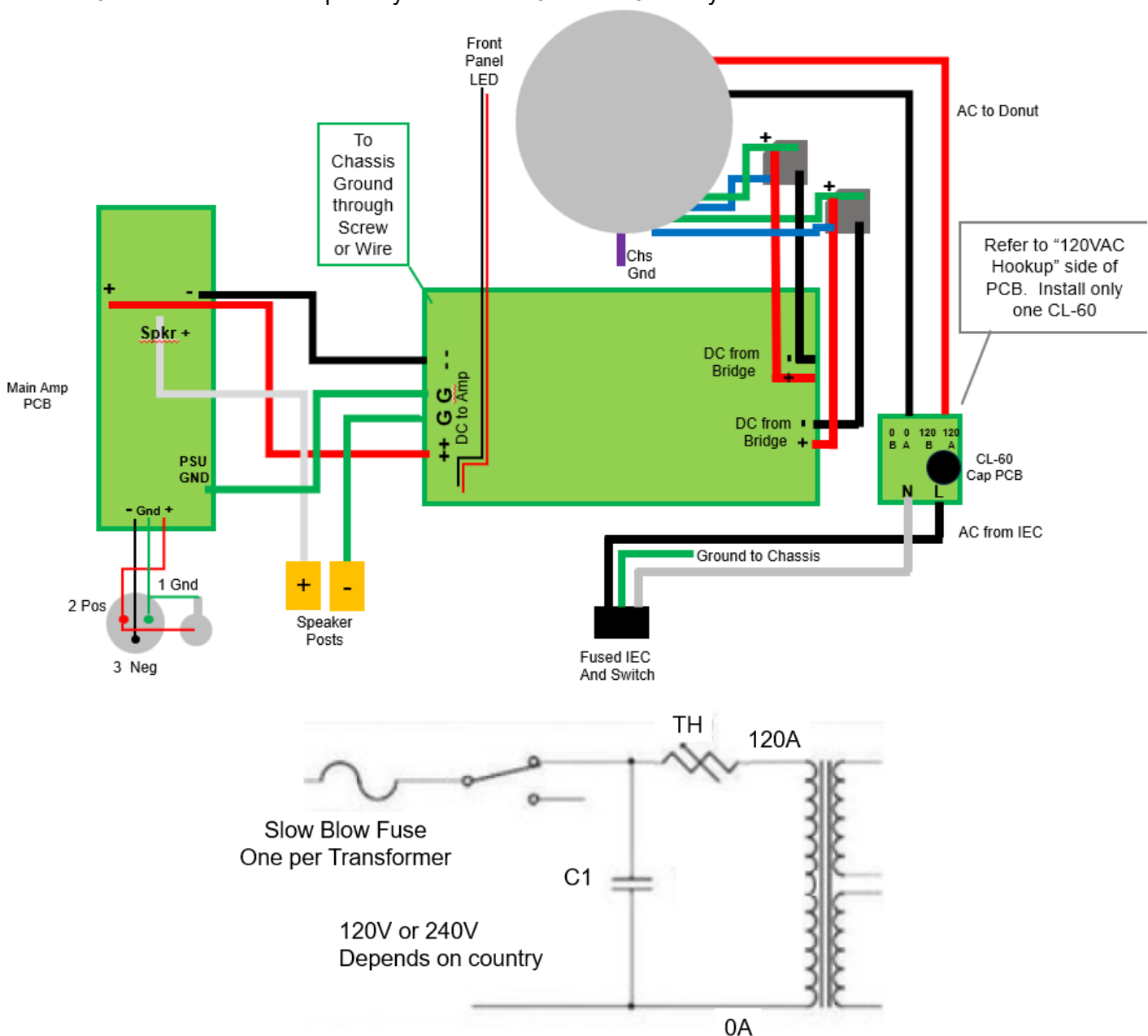
Amplifier Wiring Concept – Monoblock Configuration with W12 Power Supply PCB 240V Mains – Transformer with Two Pairs of Primary Wires

- Twist wires!!!
- If using Antek shielded transformers, attach purple wire to Chassis.
- Confirm transformer wiring pairs (120A / 0 A, 120B / 0B, secondary pairs)
 - Use DMM set to Ohms or Continuity “buzzer”. Pairs will “buzz” or read as a few Ohms.
 - For Antek Transformers:
 - Find red / black pairs, twist each pair, and tape or heatshrink to hold together as a pair.
 - Find blue / green pairs, twist each pair, and tape or heatshrink to hold together as a pair.
 - Other transformers – refer to transformer datasheet and/or label on transformer for wire colors.
- 240VAC wiring application using Antek transformers (2 secondary pairs each) is shown below.



Amplifier Wiring Concept – Monoblock Configuration with V8 Power Supply PCB 120 or 240V Mains – Transformer with One Pair of Primary Wires per transformer

- Twist wires!!!
- 240VAC wiring application with one pair of primary wires per transformer is shown below.
- For each CL-60/AC-Cap PCB
 - Install Line wire from dedicated fuse to CL-60 PCB
 - Install Neutral wire from IEC to CL-60 PCB
- CL-60 PCB Wiring – use “120VAC” hookup side of PCB
 - Install C1
 - Install CL-60 between “Line” and “120A” only.
 - Wire Transformer primary wires to “120A” and “0A” only.



Test / Checkout Sheet

| Test | Result | Target |
|---|--------------------|--|
| BEFORE POWER UP, amp board(s) <u>not</u> connected | | |
| Measure Resistance from IEC Ground Pin to output GND connector | | 10-15 Ohms |
| Did you verify transformer wiring pairs with DMM then twist and tape/heatshrink them in pairs? | | YES |
| Did you wire up the transformer wires as shown? | | YES |
| Confirm rating of installed fuse. Some fuse holders ship without fuses by default. Some ship with HIGH values. | | TBD – based on transformer and mains voltage |
| DO NOT PROCEED UNTIL ALL OF THE ABOVE TESTS HAVE PASSED | | |
| POWER UP, amp boards <u>not</u> connected | | |
| Set DMM to DC Volts (VDC) <ul style="list-style-type: none">Positive Rail: Measure + to GND for each set of outputsNegative Rail: Measure - to GND for each set of outputs | | ~1.4x transformer secondary voltage Example: 18V Transformer = ~+/- 25V rails |
| Unloaded voltage – Channel 1 | + Rail: - Rail: | |
| Unloaded voltage – Channel 2 | + Rail: - Rail: | |
| DO NOT PROCEED UNTIL ALL OF THE ABOVE TESTS HAVE PASSED | | |
| POWER UP, amp boards connected | | |
| Loaded voltage – Channel 1 | + Rail: - Rail: | ~1.2-1.3x transformer secondary voltage Example: 18V Transformer = +/- 22-23V Rails |
| Loaded voltage – Channel 2 | + Rail: - Rail: | |