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L5 Signature Phono Stage



Construction Manual

Version 3.00, October 2019

audionotekits@rogers.com

1-613-822-7188

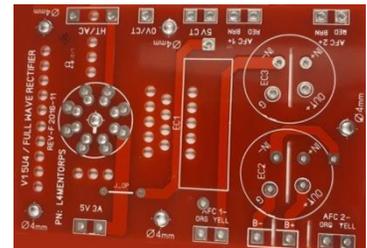
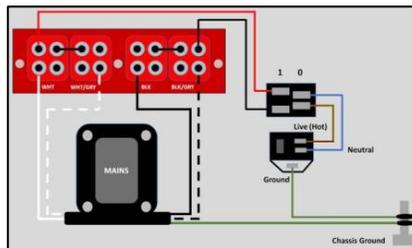


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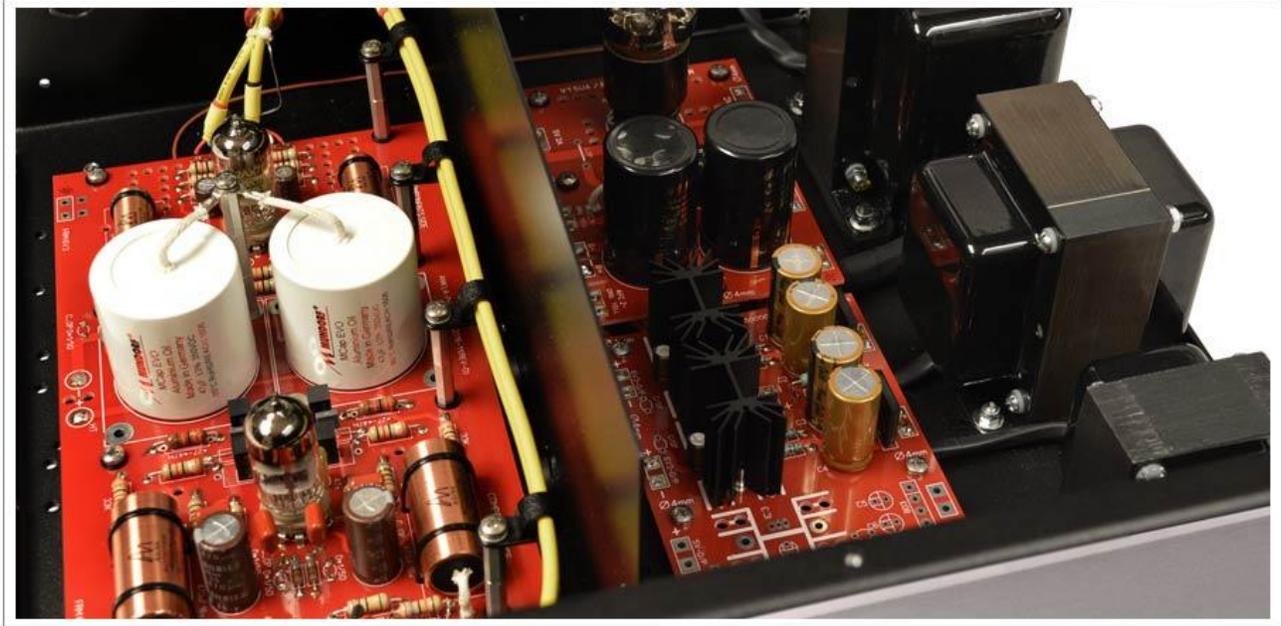
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Section 1

Introduction

Thanks for purchasing the ANK Audio Kits L5 Signature Phono Stage. This Phono Stage represents a stunning addition to our L5 product line and we believe it is truly one of the finest phono stages on the planet! And our goal is to provide you with the highest quality kit that you will build from scratch with these instructions.



This is very high end and sophisticated piece of audio equipment that will surely become a showpiece of your sound system. We're excited that you've chosen to join us in enjoying and appreciating superb audio and we've created this manual to help guide you through each step of the assembly process with as much detail and clarity as possible. To facilitate the build process, the manual has been divided into a number of sections, each focusing on a separate aspect of the system: follow the sections in order and we guarantee you not only a problem-free experience, but a pleasant time doing so. If you are new to building kits, or if at any time you feel as though you need help or advice, feel free to contact us and we will do whatever it takes to get you on the right track.

1.1 About ANK Audio Kits

Audio Note (UK) started out in the early '90s developing several DIY audio kits while they were building up their finished product business. DIY Audio has a long history and it was an opportunity for knowledgeable customers to take advantage of world class designs and components. Audio Note (UK) was focused on using the very finest materials and components custom-made to their specifications, across their entire product line — from custom film and electrolytic capacitors to tantalum resistors, transformers, binding posts, wires, etc. The Kit1 300B single-ended integrated amplifier was born during development of the Meishu and it proved to be extremely popular worldwide. The ANKit business was born!

As the finished product business and dealer network started to flourish, Audio Note (UK) eventually moved the kit business off into a separate division; thus, in 2004, Audio Note Kits started up and was supported by a website so that customers not located near Audio Note (UK) dealers could order kits and have them shipped direct. Kit development continued in earnest during the 2000s with development assisted by Audio Note (UK) engineering. Audio Note (UK) parts were used throughout the kits, depending on the various levels and budgets. By 2013, ANK Audio Kits (as it came to be called) had developed a wide product range covering all areas of two channel audio: a single-ended 300B product line, an EL34 Class AB and single-ended product line, digital to analog converters, pre-amplifiers, phono stages, and Audio Note (UK) speaker kits. The end result today is that customers worldwide with DIY skills can now build an entire high end audio system to their liking. With the introduction of higher product levels in 2013 and the release of the Level 5 Mentor Pre-amplifier and the DAC 5.1 Signature, some customers wanted these high end products assembled by a professional builder. As a result, ANK Audio Kits began offering this service for some Level 4 and 5 products so that a significant investment in a kit could be turned into a work of art! Since ANK Audio Kits was born in 2004, over 2,500 kits have been shipped to customers worldwide. Clearly, there is a real demand for high end audio kits and ANK Audio Kits has been delivering the goods now for 15 years.

We believe and hope that you will have a great experience building your kit and we look forward to hearing from you about your experience.

Regards,

Brian Smith — Director ANK Audio Kits



1.2 Basic Operation of the Phono Stage

1.2.1 Overview

ANKits is pleased to announce the new L5 Signature Phono Stage. Who doesn't love listening to the magic of a vinyl record? The development of the L5 Signature Phono Stage started in earnest to aim for the ultimate phono stage utilizing the NOS 5U4G rectifier tube. The new L5 Signature Phono Stage joins our Mentor Pre-amplifier and DAC 5.1 making what we are calling the 'Triple Threat'. Back in the early days of the kit business Peter Qvortrup once mentioned to me "we still don't know how much information is in those grooves". Maybe we now know! Experience the magic yourself with the L5 Signature Phono Stage in either DIY kit form or as a Professional Series build.

1.2.2 Specifications

Input Tube:	1 x 12AX7
Output Tube:	1 x 6922
Rectifier Tube:	NOS 5U4G

Outputs: 1 x SE Pair RCA or Balanced O/P via XLR connectors to a pre-amplifier or integrated amplifier

Sturdy PCB with 2oz copper traces and thick grounding/HT traces
Chassis: 3mm Aluminum with Black Powder Sandtex

Ability to adjust RIAA values to customize

Quiet operation

Width:	43 cm (17")
Height (Including feet):	20.3 cm (8")
Depth:	44.5 cm (17½")
Weight:	15.0 Kilos (33 lbs)

1.2.3 Design Elements

Power Supply Board

The goal was to start with the ultimate Power Supply to provide superior dynamics, detail, and an ultra black background. Based on the Mentor Pre-amplifier power supply technology, it incorporates a shunt design with two unique 4-pole Chokes, a pair of 4-pole Mlytic Power Supply capacitors and Audio Note (UK) Kaisei electrolytics. Housed in the Mentor chassis this phono stage is for serious vinyl audiophiles who demand the ultimate in analog reproduction.

Phono Board

A new Phono board has been designed to take advantage of the very latest in modern grounding techniques. We are using two massive 47uf Mundorf EVO Oil film capacitors situated in the center of the board for maximum silence.

Rel-Cap RIAA Capacitors x 4 on Phono Board
Audio Note (UK) Copper Foil Capacitors x 4 on Phono Board
Mundorf EVO Oil film capacitors on Phono Board

Takman non magnetic 1W Resistors on Phono Board (Kit version)
Audio Note (UK) Tantalum 1W Resistors Phono Board (Professional Series version)

Audio Note (UK) Silver RCA jacks

Audio Note (UK) AN-A Shielded Cable custom terminated
AN-V cable (optional for +\$200, standard on Professional Series version)

Aluminium faceplate as standard, Black faceplate available for -\$100

1.3 Equipment

Here is the list of equipment that will be required:

- ❖ Philips screwdriver
- ❖ A pair of quality wire strippers
- ❖ A large, organized work area
- ❖ Soldering iron station with wet sponge
- ❖ Lead-based solder (4% Silver is recommended)

1.3.1 Overview of the Kit

In your kit you will find a series of kit bags containing all the hardware, wire, and parts for the associated sections of the Phono Stage. See the Parts List files on the disk to match up the parts in the kit bags with the lists. There is also a Master list for the kit.

1.4 Tips and Suggestions

We have learned a lot about kit building over the last decade from our customers and I'd like to share some tips with you to ensure a successful project. Please read through this section thoroughly, it will give you a good idea of what's ahead and help ensure your success!

1.4.1 Soldering

We highly recommend using lead-based solder with some silver content¹ on the build. You should use lead-free ONLY if you are experienced using it and confident. Lead-free solder requires a higher melting temperature and thus is more difficult to use. We don't recommend lead-free solder for first-time builders.

We suggest that you practice your soldering before starting on the kit. Feel free to request practice parts with your kit so that you can practice tinning wires and making nice solder joints. The key is a good soldering station with a sponge, the right temperature, a good size tip, and experience; remember, tips can wear out so make sure your tip is working. (You can also check out YouTube videos for soldering lessons and examples.) The solder should flow freely; if it's forming balls then there is likely a problem with the tip, the temperature, or (sometimes) the surface. Feel free to contact us for help!

¹ For example, WBT-0800.

1.4.2 Components

Using the Ohm setting on your multimeter is very useful when building a kit. It's a good, practical way of measuring resistors and continuity and is much easier than reading the color codes on the side. (With practice, the color codes can also be a good way to determine the resistance, but that method is better left to experienced builders.)

1.4.3 Resistor Sizes

Resistors today, particularly metal film resistors, are often smaller than you might expect. It used to be that the difference between a 1/2W and a 1W resistor was obvious: the 1W was considerably larger. That way of looking at things sometimes now no longer applies. Please be assured that all resistors supplied with ANK Audio Kits are rated at least per the specified wattage: in some cases, a higher than specified wattage may be supplied.

1.4.4 Capacitor Manufacturers and Voltage Ratings

Occasionally, depending on parts availability, we may use capacitors from different manufacturers. These will always be of equal or higher quality! As a result, some of the pictures in the manual may look a bit different at times. With regard to voltage ratings, normally, the voltage rating of the supplied capacitors will be exactly what you see on the parts lists. Occasionally, a part may be supplied with a higher voltage. Think nothing of it!

1.4.5 Electrolytic Capacitors

For those who have not built a piece of electronics before, here is a little lesson on capacitors. There are basically two types of capacitors that we use in the kits: electrolytic and signal capacitors. Of these, electrolytic capacitors require special attention. Electrolytic capacitors are "polarized," which means they have a POSITIVE (+) and a NEGATIVE (-) lead and typically have values like 100uf 450V, 10uf 160V, or 470uf 35V. *These capacitors need to be installed correctly or else they will possibly blow up at some point!*

Each electrolytic capacitor will have a *wide stripe* on the NEGATIVE side. Always ensure that this stripe (NEGATIVE) is positioned correctly. There are several keys on a printed circuit board to help you to know how to position the capacitor:

1. There may be a "+" on the board indicating where to position the POSITIVE lead.
2. The segmented half of the circular stencil on the board shows where to position the NEGATIVE lead. The unsegmented ('half-moon') part of the circle is where the POSITIVE lead goes.
3. The POSITIVE lead goes to a square solder pad while the NEGATIVE lead goes to a round solder pad.

1.4.6 Diodes

When installing diodes note that they are oriented with a stripe — *match the stripe on the diode with the banding (//) stencil on the board.*

1.4.7 Hardware/Mechanical

Not all of us are mechanically oriented. So, the kit is well laid out such that all the hardware is provided and bagged in individual sections, so things should make sense. Start thinking mechanically because about a third of the kit is mechanical. The first thing to remember is that good hardware is beautiful: we use all stainless steel metric hardware in the kits. It truly is a thing of beauty: don't rush your hardware! Here are a few helpful things to understand:

- ❖ We use British metric hardware (M3, M4, M5, screw size 10mm, 15mm, etc..) as opposed to the American imperial system (5/1000th or 50/1000th, 1 inch, 3/4 inch). Please familiarize yourself with the hardware in the kit.
- ❖ The screws will be called M3 or M4, which is the diameter of the shaft. The length of the shaft will be in millimeters, so you will encounter things like an M4 screw 16mm, a PAN head screw (which is a round spherical head), or a COUNTERSUNK or FLAT head screw (a screw head that needs to be flush with a surface — for example, under a transformer). So if you are asked to use an M3 16mm CSK screw, this is an M3 size (obviously), which is a thinner shaft diameter than an M4; 16mm is the length of the shaft; and the head type is CSK, which is a countersunk or flat head screw.
- ❖ Once you have the screws mastered, look at the matching nuts such as M4 nut or M3 nut and corresponding washers.
- ❖ Standoffs are common in the kits (again, they are either M3 or M4 size, with different lengths). They are typically threaded, so the screw goes into them.
- ❖ If any of the hardware is confusing or something is not fitting right, please email us.

1.4.8 Wire Stripping and Tinning

When it comes to wires, we typically use 18 gauge (thicker) and 22 gauge in the kits. It's PTFE: Teflon silver-plated copper wire. Basically this is classed as hook-up wire; we typically twist wire for you when it needs to be. The other wire we use is called shielded cable, like an AN-A (Audio Note (UK)) for signals. This is two-conductor wire: one is for the Signal and the other (a big Ground braid wrapped around the Signal wire) is the shielding, which helps prevent the cable from picking up noise. You should practice stripping some 18g or 22g wire, and then try tinning this wire; this is the process of adding solder to the bare wire so that the invisible coating on the wire is burned off. This makes for easy soldering to a PCB, an RCA connector, or a transformer terminal. So it's a good idea to practice this a little before starting the kit.

1.4.9 Wire Color

In the earlier sections of this manual, particularly those sections dealing with the Mains transformer and Choke wires, the colors of the wires should match the color of the wires in your kit. If they don't, or if you're unsure about things, contact audionotekits@rogers.com. Later on, at the Interwiring stage, there may be some differences between the descriptions (or pictures) of the color of wires that you will connect and the color of the wires supplied with your kit; for example, depending on inventory, we may supply a Black-Red twisted pair instead of a Green-Red (or vice-versa). Don't worry! Just be sure to check the wiring diagrams carefully and connect the correct points together and all will be well!

1.4.10 Optional Finishing Touches

From time to time we get asked about some of the build details of the ANK Finished Products that you can see in the pictures in the "Assembled Kits Gallery!" (<https://ankits.smugmug.com/>) on our website. It's important to understand that these stunningly beautiful products were done by an accomplished professional builder with decades of experience and that some particulars of the build may be beyond most of us. However, experienced builders who want to incorporate some of these finishing touches should feel free to do so. While we don't officially support or supply parts for these optional enhancements, there's no reason why you couldn't or shouldn't do them if you want to and feel that you can handle them. Without getting into the details (you're on your own here), what you'll want to get hold of are: heatshrink (to bundle wires), cable ties (to secure large capacitors), stacked (male/female) standoffs and cable clamps (to elevate and secure Signal cables), and cable sleeving. You can get some of these from your local hardware store (for example, 1/4" Cable Clamps) and other, more specialized, parts from online distributors such as Grainger, Digi-Key, Mouser, or Cable Ties and More. If you do decide to dress your build with some of these, please send us a picture or two. We'd love to see what you did!

1.5 Build Process

1.5.1 Some Good Rules of Thumb for Building Your Phono Stage

- ❖ Take your time, prepare, and try and work on a small task each time you start to build the kit.
- ❖ Instead of rushing through another section — use the end of your session to check your work. Always ask yourself if the step you are performing makes sense.
- ❖ Have fun with your build and savour the experience. Take the time to do a really good job!
- ❖ Feel free to contact us via email audionotekits@rogers.com if you have any questions or suggestions during your build — and feel free to send us pictures, etc. We'd be pleased to give you tips along the way.

1.5.2 Organization of this Manual

We've divided the build and the manual into the following sections:

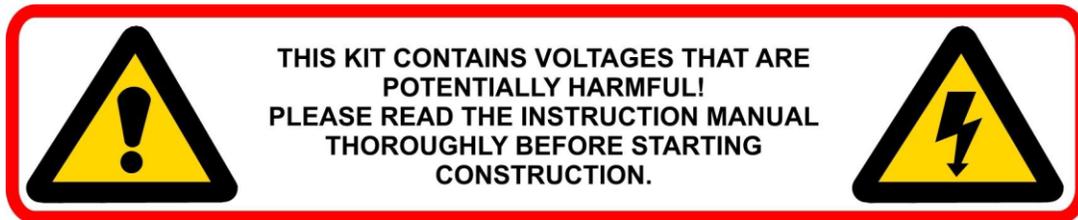
1. Introduction
2. Mechanical Assembly and Initial Mains Transformer Wiring
3. Choke Installation
4. Power Supply Board Installation
5. Super Regulator Board Installation
6. Power Supply Interwiring
7. Phono Board Installation
8. Interwiring
9. Testing
10. Finishing Touches
11. Final Thoughts

Appendix



This manual is an early version. Please provide any feedback to ANK Audio Kits via phone or email (audionotekits@rogers.com) at any stage of the build.

1.5.3 Electrical Safety Warning



Please be aware of proper electrical safety.

There are sufficient voltages in this kit to give you a very nasty and harmful shock, so be very careful when powering on, debugging, and probing around.

Please contact ANK Audio Kits via phone or email (audionotekits@rogers.com) to discuss any precautions necessary when building the kit if you feel unsure about what you are doing at any stage of the build.

Section 2

Mechanical Assembly and Initial Mains Transformer Wiring

In this section we will install the feet, IEC socket, Rocker Switch, and the IEC board. Before we begin, It's a good idea when you receive the kit to do a complete inventory. You should see the following parts:

- ❖ 1 Mains Transformer (PLPT-A)
- ❖ 2 4-Pole Chokes (DCH01 and DCH02)
- ❖ 1 Gold Shunt Resistor

The kit bags will have a complete list in each bag that you can check the parts against.

- ❖ Hardware Kit Bag – All hardware in individual bags corresponding to each section
- ❖ IEC Bag – Rocker Switch, etc.
- ❖ Power Supply Kit Bag – PCB and all associated parts and tube
- ❖ Super Regulator Kit Bag – PCB and all associated parts
- ❖ Phono Kit Bag – PCB and all associated parts and tubes
- ❖ Chassis Fittings – speakers posts, RCAs, feet, etc.
- ❖ Wire Bag – various wires required for the kit

2.2 Installing the Feet

Let's start by installing the feet on the chassis — this will make it easier to work with as we install the transformers, Choke, etc.



- Turn the chassis upside down.
- Take a foot and insert an M4 screw with washer into it — it might be tight but just push it in.
- Install each foot in the hole in the chassis closest to the corner and secure it with an M4 nut on the inside of the chassis. Don't over tighten the screw; you could damage the foot.

When completed your feet will look like the picture below. You're on your way!



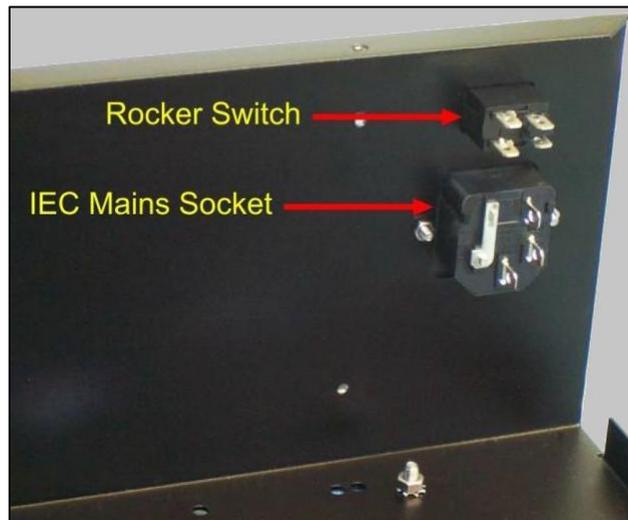
2.3 Installing the IEC Socket and Rocker Switch

- Take the IEC socket and install it in position as shown below, with the fuse holder on top and the GND lug on the bottom. Use M3 10mm CSK flat head screws and nuts to secure it.



Have a look at the picture below: Note the orientation of the Rocker Switch with the smaller pair of tabs towards the side of the chassis and the larger pair towards the middle.

- Install the self-locking Rocker Switch by pressing it in from the back of the chassis; it will snap into position.



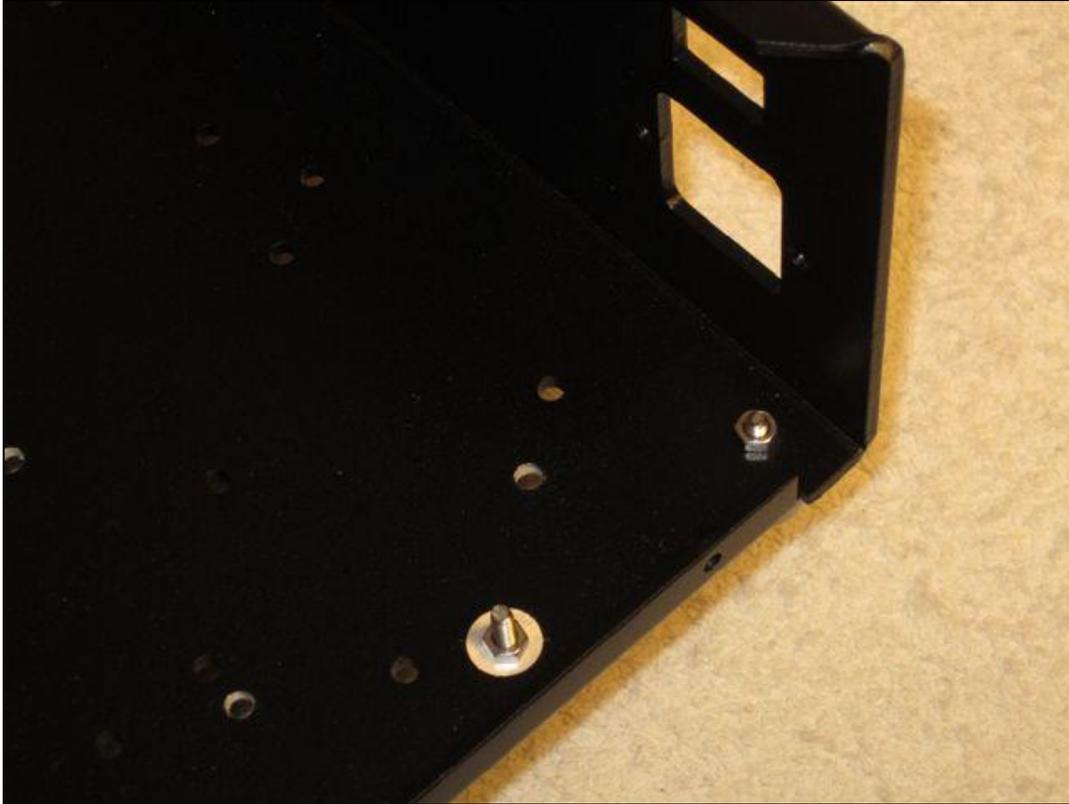
The correct orientation of the IEC and Rocker Switch

Here's a view of the rear of the chassis:



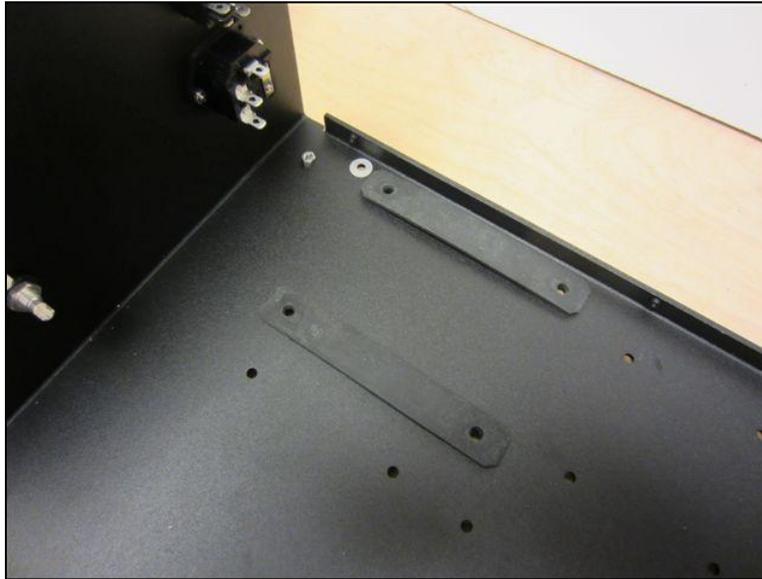
2.4 Installing the Chassis Ground Screw

- Insert the M4 16mm Chassis Ground screw (from underneath) into the unpainted position near the corner of the chassis, as shown below:

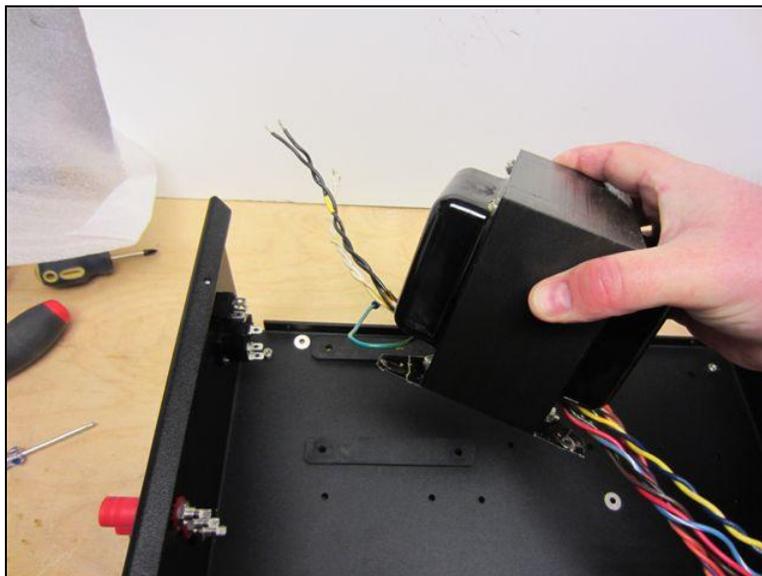


2.5 Installing the Mains Transformer

We'll begin by installing the rubber strips:



- Install the rubber strips on the chassis where the PLPT-A Mains transformer will go.
- Next, have a look at the picture below and position the Mains transformer in the chassis such that the two White, two Black, and the one Green wires go towards the back of the chassis. These wires are the Primary.



- Secure the Mains transformer to the chassis using the M4 10mm screws, washers, and nuts provided.

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2.6 Preparing the Mains Ground Wire

Now let's prepare the Mains (Green) Ground wire.

The Mains transformer has a Green wire coming out of it — this is a ground wire that attaches to the Chassis Ground screw on the chassis. We'll trim this wire to the proper length; then we'll strip the end of the wire and tin it.

This manual was developed while building the first post-prototype unit. The wire lengths suggested for the Mains and Choke wires — and the interwiring between boards and components — is based on the positions of those elements at that time. As with all products, over time, there will be revisions — most likely to boards, occasionally to the chassis. These revisions might alter the relative positions of these elements and could affect the suggested lengths of wires. *Therefore, we strongly recommend: 1) that you measure wire lengths yourself, for your unit, and 2) that you always 'add a little': having a wire a little too long is far preferable than finding out that it's too short; this is particularly true of transformer wires. While it's possible to splice any wire that, for one reason or another, is too short, it's really not something you'd want to have to do. And, finally, let's remind ourselves of the carpenter's proverb: "measure twice, cut once."*

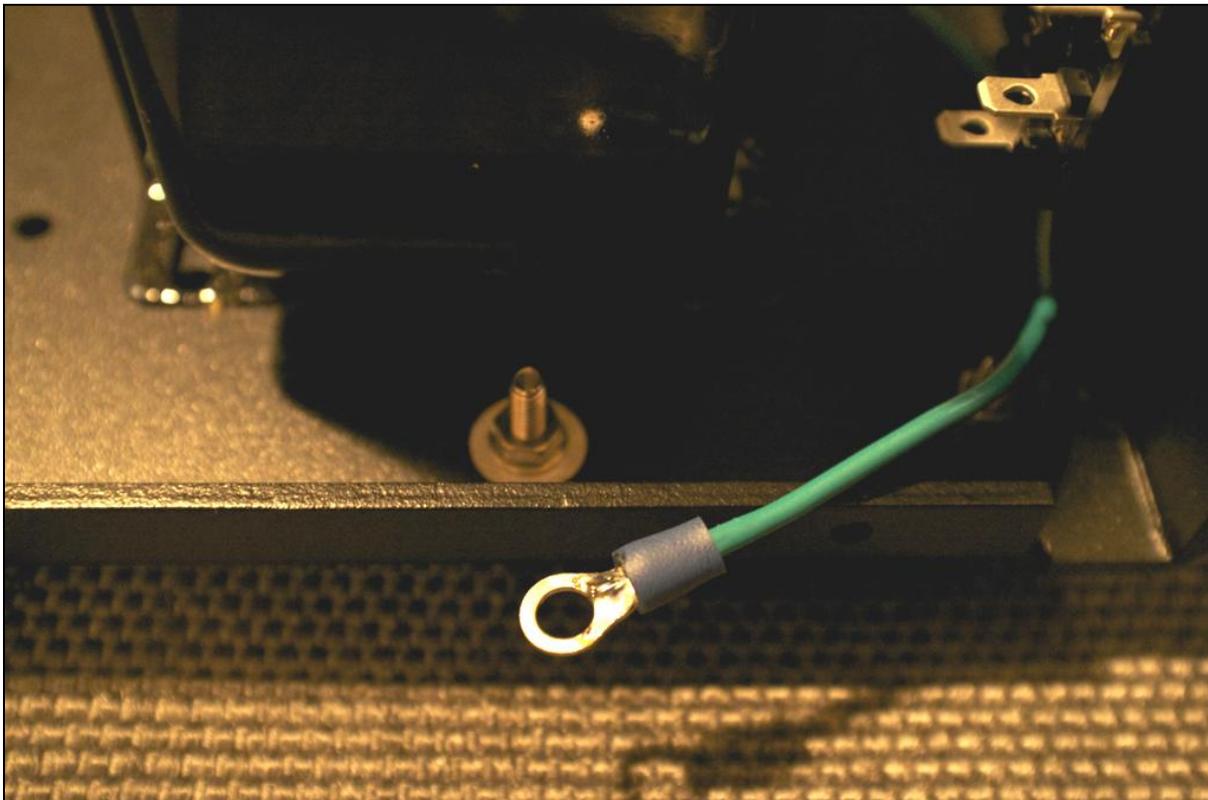
- Trim the Green wire to the length needed, strip 1/2" from the end, and tin it. Insert the Green wire into the provided ground lug and solder it in place. Do this by adding solder through the front of the lug, as shown on the next page.



Add a fair bit of solder and apply heat for possibly as much as ten seconds, as the solder must “take” to connect to the lug. The lug will get hot so don't touch it for awhile; let it cool! When you are done you should have a nice smooth solder joint.



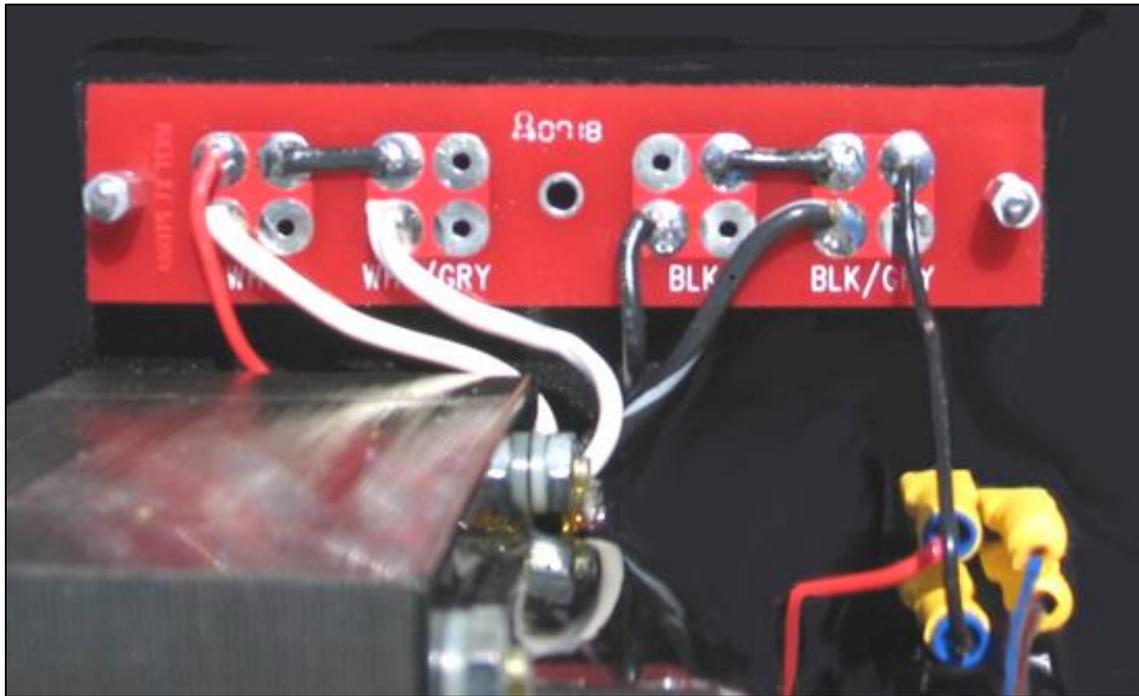
Here's a picture of the completed Mains Ground wire:



We'll attach it to the chassis a bit later.

2.7 IEC Board Wiring

Now we'll wire the IEC board, which will make the remaining wiring from the Rocker Switch to the Mains transformer much easier to implement. Before we do so, have a look at what we want to accomplish:



After you've read through the steps that follow, if you are in any doubt as to the IEC/Rocker Switch/IEC board wiring, please contact audionotekits@rogers.com



Note that there are 4 pads with 4 solder tabs each. The 4 solder tabs within each of the 4 tabs are electrically equivalent and it doesn't matter which of the 4 solder tabs you use.



We suggest that when you cut these wires give yourself a little slack, then tin the ends by adding solder to the exposed wire so that the solder melts to it and clip the tinned wire to a length of about $\frac{1}{4}$ " so that it can fit through the hole. Obviously you will want to make these connections while the Board is NOT secured to the rear of the chassis. We also recommend that you solder on both the top and the bottom, making sure that you leave 1–2mm of room for the exposed tinned wire to be visible so that the solder will stick to it. A common beginner mistake would be to push the wire all the way into the hole with the wire insulation pressing against the pad; take our advice and you'll have a really good smooth solder connection on top and bottom of the board for these Mains Primary wires.

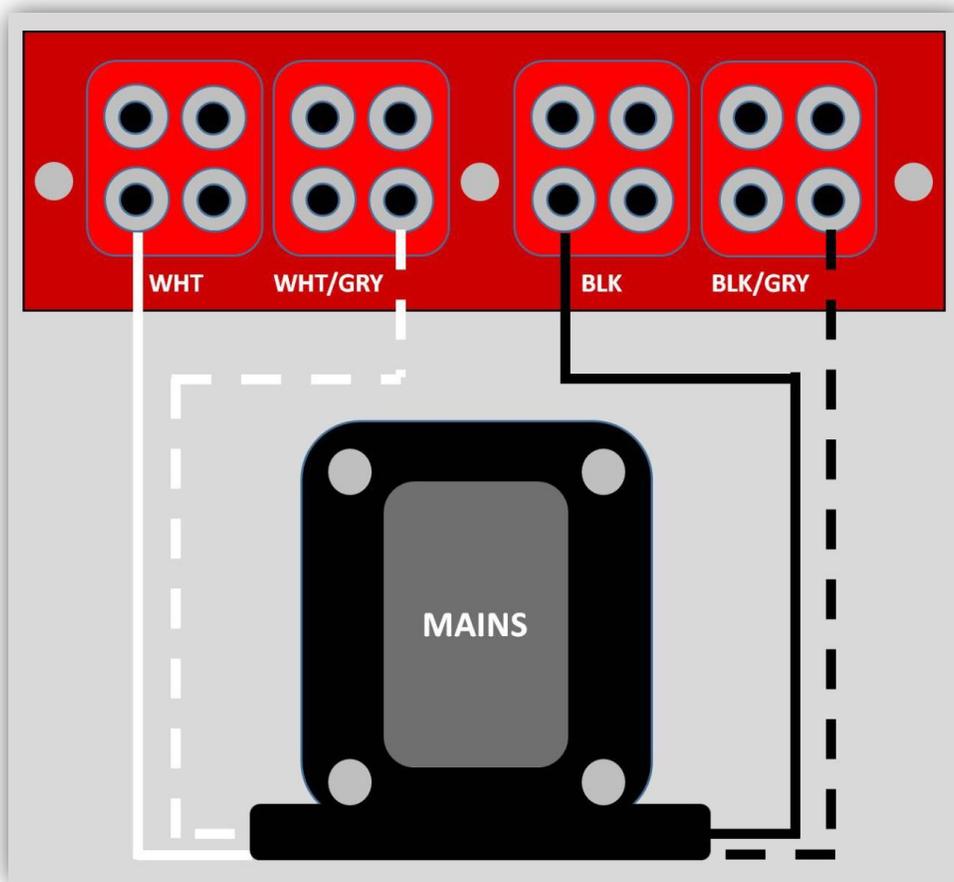
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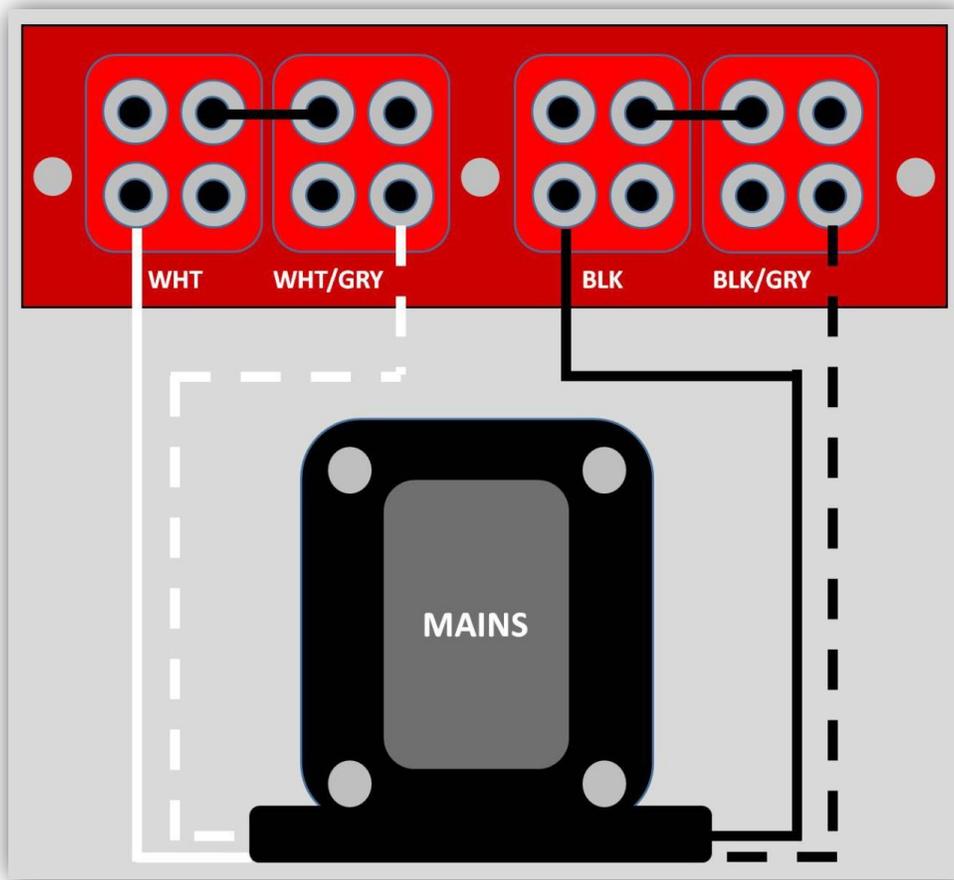
Wiring for 120V Operation²

- Cut the four wires (White, White/Grey, Black, and Black/Grey) coming out of the Mains Primary to the lengths you'll need to reach the IEC board when it's situated on the rear of the chassis, as shown above. *Note: you can connect the wires from the top or the underside of the board, as you prefer. In the picture on the previous page they are connected from the top side.*
- Strip and tin the ends. (You can add some heatshrink if you like.)
- Connect these four Primary wires to the IEC board, as shown below. Cut off the excess wire.



² The wiring for 240V is given in the Appendix.

- Add the two jumpers as shown. (You can use some left over Black Primary wire or bare wire, as you prefer.)

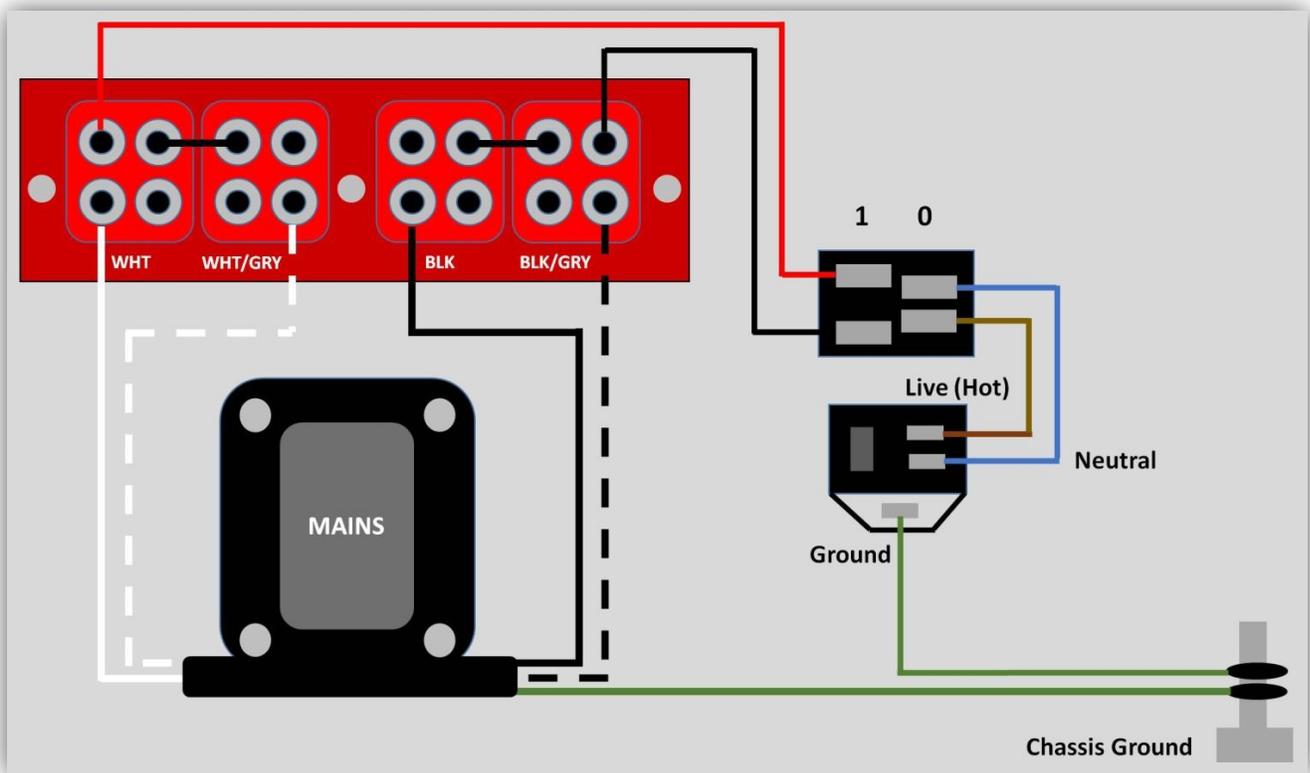


Referencing the diagram below, complete the IEC/Rocker Switch wiring as shown. Regarding the aesthetics, you have several options:

1. Solder the Red and Black wires from the Rocker Switch to the front of the board (see picture above). You can use either of the unused holes on each tab.
2. Solder the Red and Black wires from the Rocker Switch to the underside of the board.
3. Solder the Red and Black wires from the Rocker Switch to the front through the plastic insulating board (by drilling 2 holes in it³).

The choice is yours.

- If you haven't done so already, peel off the paper covering on the plastic insulating board.
- Tin and solder the unprepared ends of the half-prepared Red and Black⁴ wires in the IEC bag onto the IEC board, as shown.



³ Peel off the cover first! There's a nice picture of how to do this in the Appendix. *Be aware, though, that the Appendix shows the 240V wiring, so use the jumpers as shown above for 120V.*

⁴ Or Orange or whatever we've supplied. The color doesn't matter so long as you make the connections shown.

2.8 Connecting and Mounting the IEC Board

Again, referencing the diagrams on the previous page,

- Push the crimped ends of the Red and Black wires coming from the IEC board onto the left (wider spaced) lugs of the Rocker Switch, Red on top, Black below. Apply the pressure necessary to position the wires correctly onto the lugs.
- Using the prepared Blue–Brown⁵ twisted and crimped pair of wires, connect the IEC socket: Blue (Neutral) from the middle lug, Brown (Live/Hot) from the top lug — to the right (narrower spaced) lugs of the Rocker Switch, Blue on top, Brown below. Again, apply the pressure necessary to position the crimps correctly onto the lugs.
- Take the Green wire that is prepared at one end with a ground lug and at the other end with a crimp. Attach it to the bottom lug of the IEC socket.

Next, let's test these important connections. Using your multimeter's Continuity setting, verify the following:

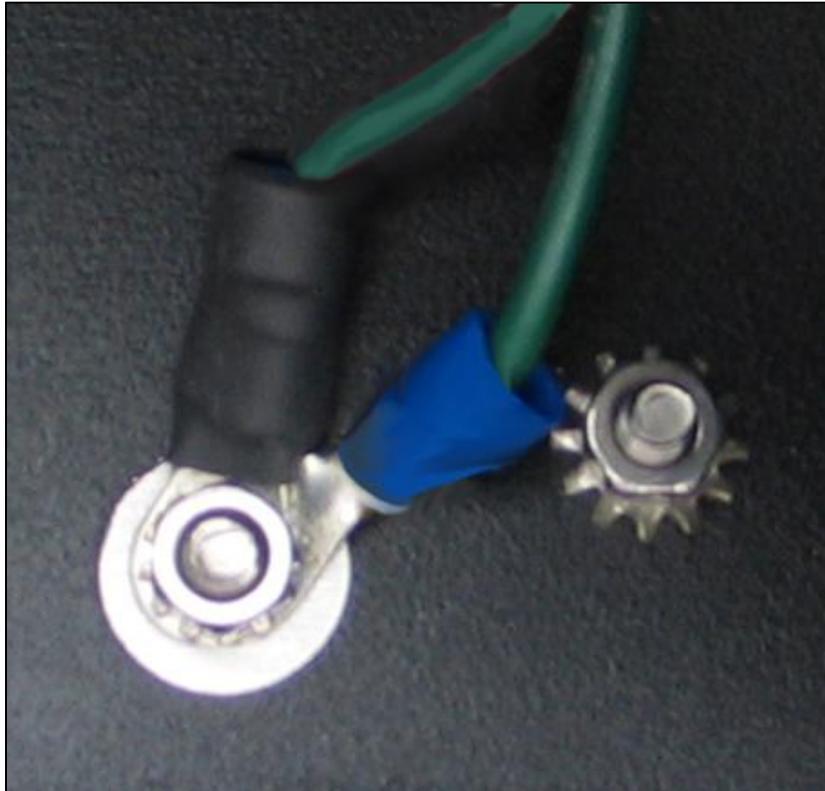
- IEC Socket Ground to Chassis Ground
 - IEC Socket Neutral to IEC PCB White solder tab
 - IEC Socket Line (Hot) to IEC PCB Black–Grey Solder tab
- Finally, mount the IEC PCB to the back of the amplifier above the Mains transformer: use a 30 mm M3 screw, a short standoff, then the PCB, another short standoff, and finally the plastic insulating board and a nut.

⁵ Or whatever color we've supplied. Again, it's the connections that matter, not the color.

2.9 Chassis Ground Connections

Finally, let's make two Chassis Ground connections.

- Retrieve the Green Mains Ground wire and the Green IEC Ground wire and, using a nut, loosely secure the two grounds to the Chassis Ground Screw, as shown below.
- Take the prepared 10R Ground cable and attach it as well to the Chassis Ground screw. (We'll attach the other end to the Phono board later.)



2.10 Installing the RCA Jacks

- Next, we'll install the RCA jacks for the input and output to the Phono Stage.

For each RCA jack,

- Insert into the chassis — from the outside, in the following order:
 - ❖ The white insulating washer with the raised ring facing inwards into the hole
 - ❖ The RCA jack
- Attach, from the inside, onto the protruding jack:
 - ❖ The other white insulating washer
 - ❖ The ground lug
 - ❖ The nut (don't immediately tighten this more than one or two turns)
- Bend the ground lug up about 30 degrees and position at about 2 o'clock. *Make sure it is away from the chassis.*
- Tighten the jack *such that the inner lug is facing up/open*; it'll make soldering much easier.

Make sure everything is snug and well tightened. We'll wire the jacks later.

Time for a break!



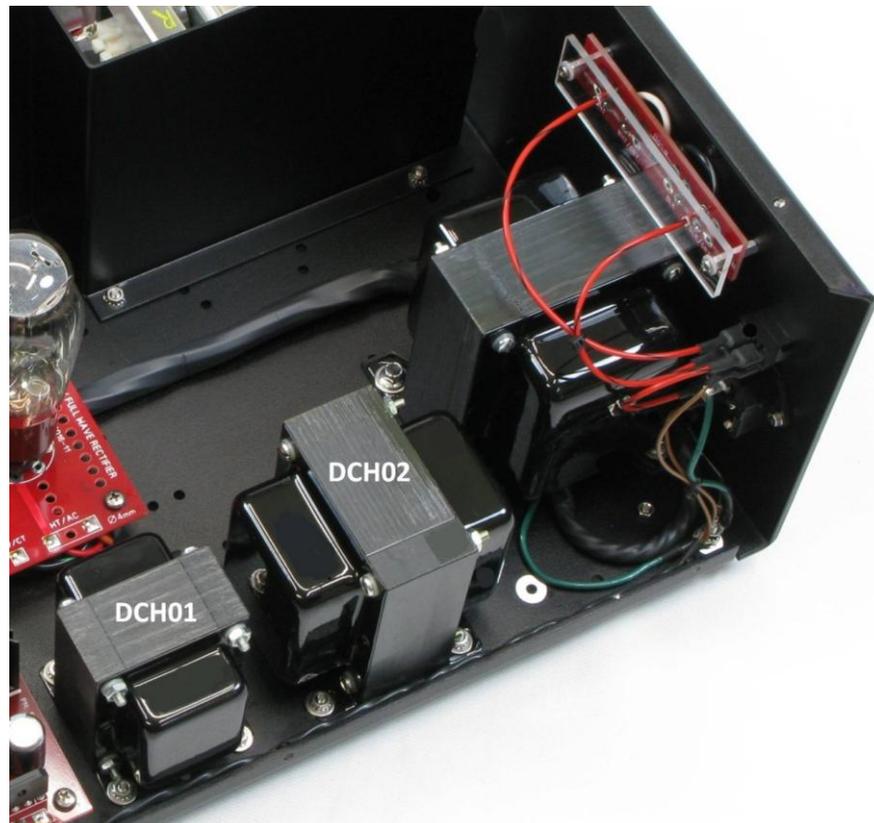
Section 3

Chokes Installation

3.1 Overview

The heart of the L5 Signature Phono Stage is a very sophisticated Power Supply with a large Mains transformer (PLPT-A) along with two substantial 4-pole Chokes (DCH01 and DCH02). In this section we'll install the 2 4-pole Chokes. A Choke is an inductor that is used to smooth the Power Supply voltage.

3.2 Installing the Chokes



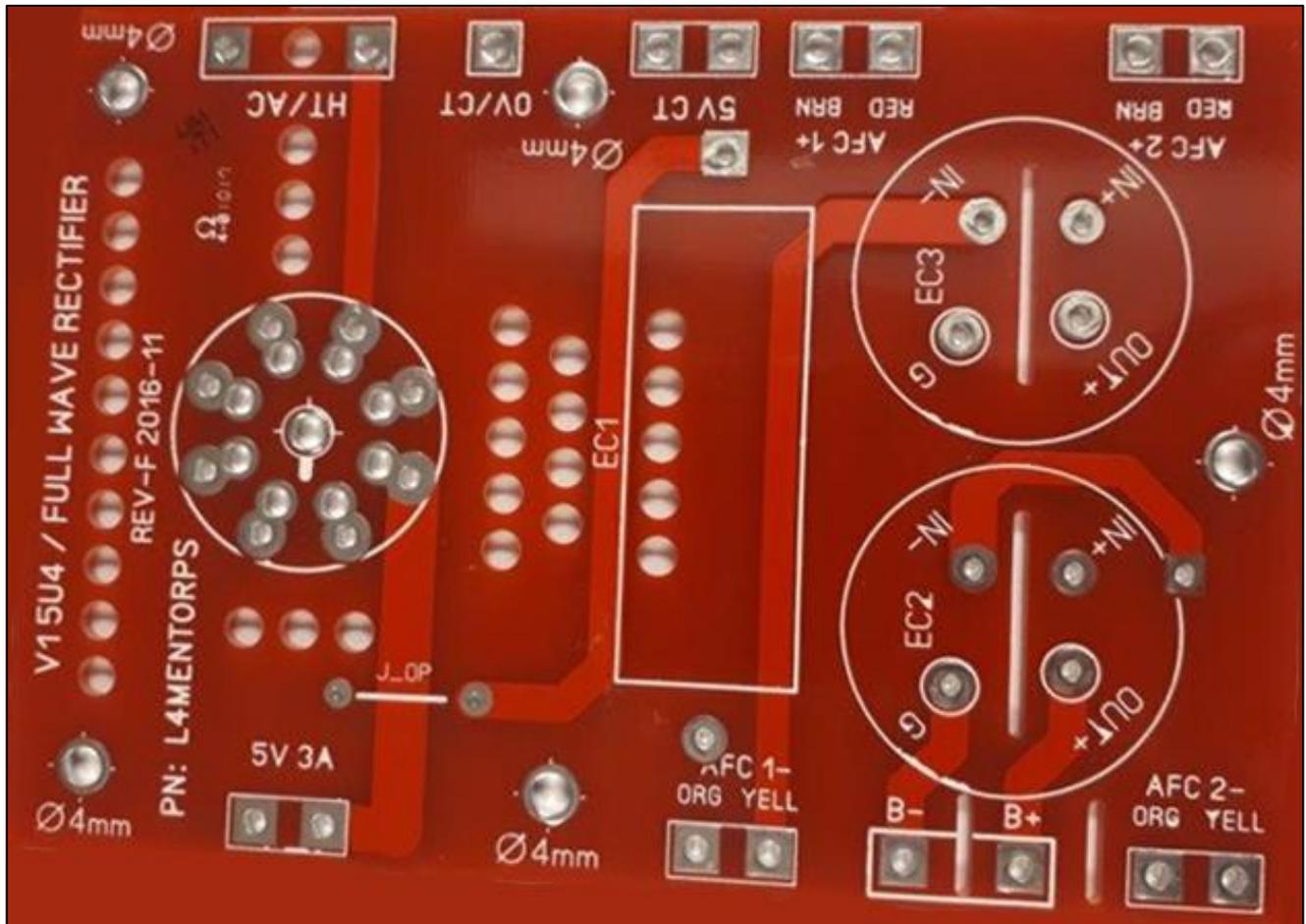
- Install the larger Choke (DCH02) in the position shown above *with the wires coming out of the Choke towards the center of the chassis*. Secure with 4 M4 10mm pan screws and nuts.
- Similarly, install the Smaller Choke (DCH01) into position as shown — *again with the wires coming out of the Choke towards the center of the chassis*, and secure with 4 M4 10mm pan screws and nuts.

Section 4

Power Supply Board Installation

4.1 Overview

Here's a view of the Power Supply board, showing the 5U4G rectifier tube placement and the 2 4-pole capacitors.



4.2 Installing the Valve Base

We'll begin by installing the 8-pin valve base for the 5U4G rectifier.



Use masking tape to secure the valve base to the board prior to soldering. *The key is to make sure the valve base is level!* if you have a base that is soldered in on an angle then your tube will lean over! Solder from the underside of the board. Use just a little solder to secure each pin to the board and start with two pins which are opposite to each other to make sure the base stays level — then you can add more solder. In the end you can fill up the entire valve base hole. *Be very careful not to let any solder bridge to the next pin as this will cause a short!* If you wish to — or think you need to, you can 'touch them up' from the top, then back once again to the bottom, and all should be well. When you do the touch ups just give them a very short bit of heat and a tiny bit of additional solder.

- Install the 8-pin valve base. *Be very careful to align the tab 'cut-out' on the top of the valve base with the tab stencil on the board.* Take your time soldering on the underside of the board as it requires a fair bit of heat and solder to adhere the pins to the board. No rushing!

4.3 Installing the Capacitors

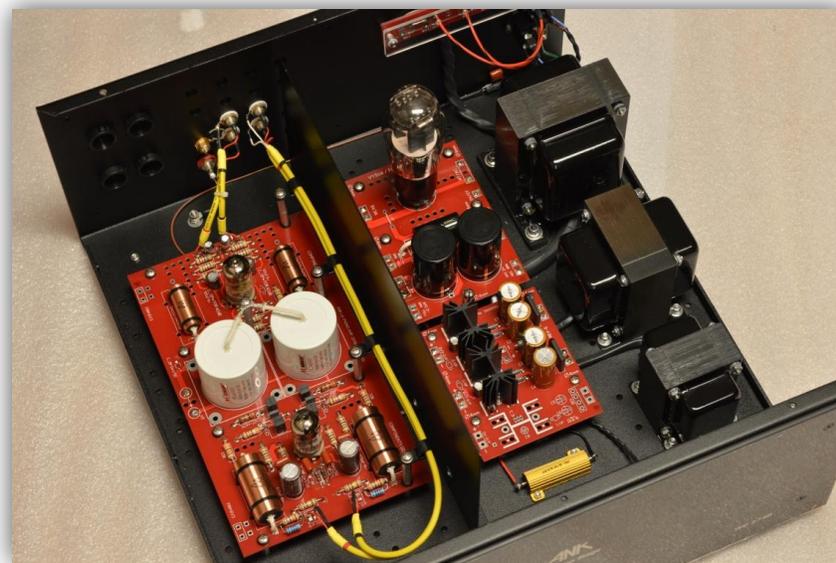
- Install the Mundorf MCap at EC1.
- Install the 2 4-pole MLytic Power Supply capacitors at EC2 and EC3. These can only go in one direction.
- Install the 5 standoffs.

4.4 Shield Installation

- On the underneath of the shield, locate the hole that has no paint on it — this will match up with a hole on the chassis that is also unpainted in order to ensure a good grounding of the shield when installed in the chassis.



Here you can see the correct positioning of the shield:



You'll also see several holes in the shield panel: these will be used in the interwiring to route wires from one side of the Phono Stage to the other.

- Install the supplied grommets in the shield and secure it in place using 3 M4 10mm screws and nuts place; insert the screws from underneath the chassis.

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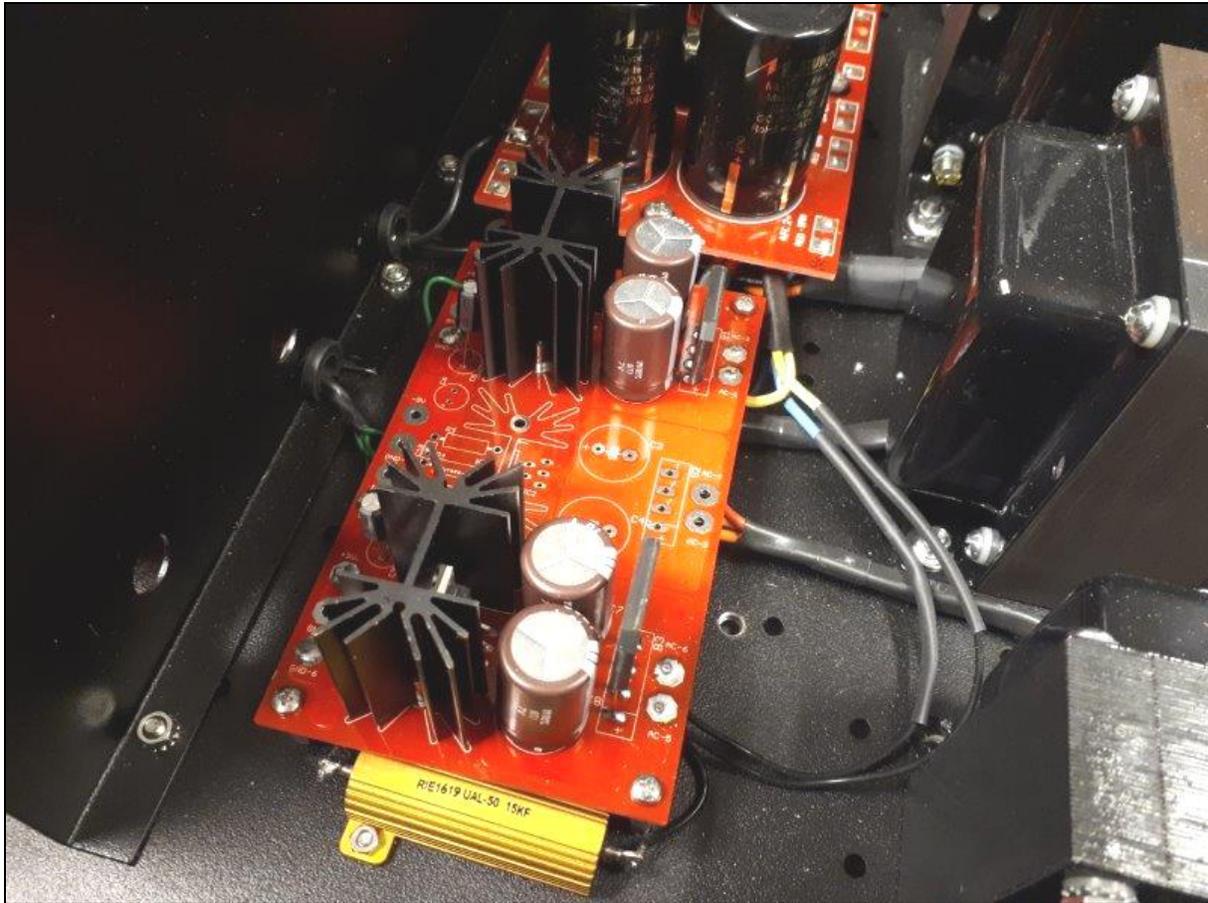
audionotekits@rogers.com

Section 5

Super Regulator Board Installation

5.1 Overview

Here's a picture of the completed board in the chassis:



This board takes the AC from the Mains transformer and supplies the 6.3V AC for the filaments for the Phono board. It uses "super quiet" 5-pin regulators.



Some pictures show a section that is not used. In fact, it will be used later for the LED installation.

5.2 Parts List

Quantity	Designation	Description	Part Number
1		PCB	
2	B1, B3	Bridge Rectifier	GBU4M-BPMS-MD
4	C1, C2, C7, C8	4700uf 25v cap	604-1058-nd
2		Heat Sink	FA-T220-25E
2	IC1, IC3	Regulator	LT1963AE
2	R5, R1	1K	A105957CT-ND
2	R6, R2	4K ⁶	PPC14.0KXCT-ND
2	C5, C9	47uf	604-1054-ND
2	on heat sink	HS pads	926-1475-nd

5.3 Installing the PCB Resistors

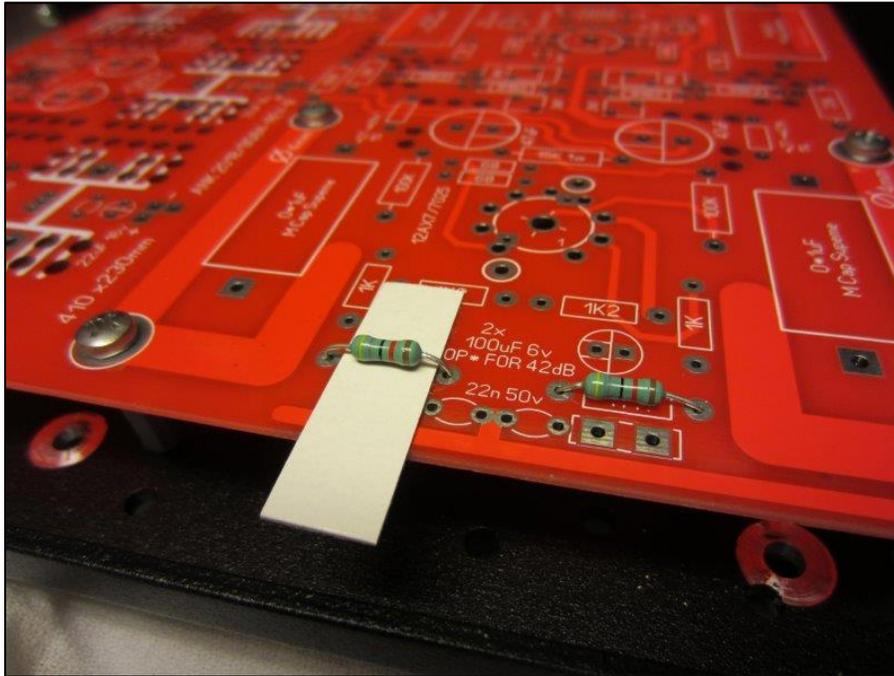
A quick lesson about resistors:

- ❖ A resistor that reads 100R means that it is 100 ohms; the 'R' stands for resistance
- ❖ A resistor that reads 2K7 means it is 2700 ohms; the 'R' is assumed and the K (which stands for Kilo or 1000) is positioned like the decimal place, so it's like reading 2.7K ohms (K = multiplied by 1000) — but it's shortened to 2K7
- ❖ Another example is the 1M resistor, which is 1 Mega ohms

Use an ohmmeter to measure each resistor to verify its correct value. We've included a resistor chart in the Appendix.

It's a good idea to orient your resistors so that the color codes can be read from left to right; it makes it easier to spot any issues. *It's also a good idea to not have the resistors installed right against the board*, for a couple of reasons: 1) it's better for heat dissipation, and 2) in some cases there are circuit traces running under the resistors — and we really don't want resistors touching them. So, as shown below (on a board from a different kit), we recommend using a narrow piece of cardboard cut to size as a 2–3mm spacer: this will still let you solder while ensuring that the resistor is not pressing against the board.

⁶ The resistors for R1 and R2 need a ratio of 4:1.



Be sure to solder on the underside of the board and check that you have nice little “volcanoes” on each solder joint. (While it's not necessary, you can solder these through hole resistors on the top as well. If you hold the heat when soldering on the bottom for an extra 1/2 second or so, usually just enough solder will flow through so that it forms a nice volcano on the top without the need to touch it up.) When you clip a lead be sure to clip above the volcano so you don't slice off the nice joint. You can cup your hand over where you're cutting to keep the clipped lead from flying off and you can wear protective glasses. Hopefully we didn't make any mistakes and you got all the right resistors. If not, just drop me an email (audionotekits@rogers.com) and we'll get it straightened out ASAP!

Definitely take your time on this board; be patient and do not rush as there is some tight soldering that is required.

Quantity	Designation	Description	Part Number
2	R5, R1	1K	A105957CT-ND
2	R6, R2	4K ⁷	PPC14.0KXCT-ND

Install the R1, R2, R5, and R6 resistors on the Super Regulator board following the parts list below:

Take your time. When you're done, here's a way to be absolutely sure the connections are good:

1. Set your multimeter to the Ohm position.
2. Touch one end to one resistor lead above the PCB (not the solder pad to which it's connected).

⁷ The resistors for R1 and R2 need a ratio of 4:1.

3. Touch the other end to a distant point that is directly connected (i.e., with no additional resistance) to the other end of the resistor. (You'll may have to flip the PCB over and back to determine where to position the lead.) You'll be able to read the value of that resistor and assure yourself that both leads are properly soldered. *Note: If some part of this path has a large capacitor in it, it may take a little time to register the value of the resistor you're expecting.*

5.4 Installing the Capacitors

Quantity	Designation	Description	Part Number
4	C1, C2, C7, C8	4700uf 25v cap	604-1058-nd
2	C5, C9	47uf	604-1054-ND

Electrolytic Capacitors

Reminder: Electrolytic capacitors are "polarized", which means they have a + (POSITIVE) and a - (NEGATIVE) lead and need to be installed correctly or else they will likely blow up!

Most electrolytic capacitors will have a wide stripe on the NEGATIVE side. (When they don't, they'll have some other indication of the POSITIVE and NEGATIVE leads.) Always ensure that this stripe (NEGATIVE) is positioned correctly. There are several keys to know how to position the capacitor:

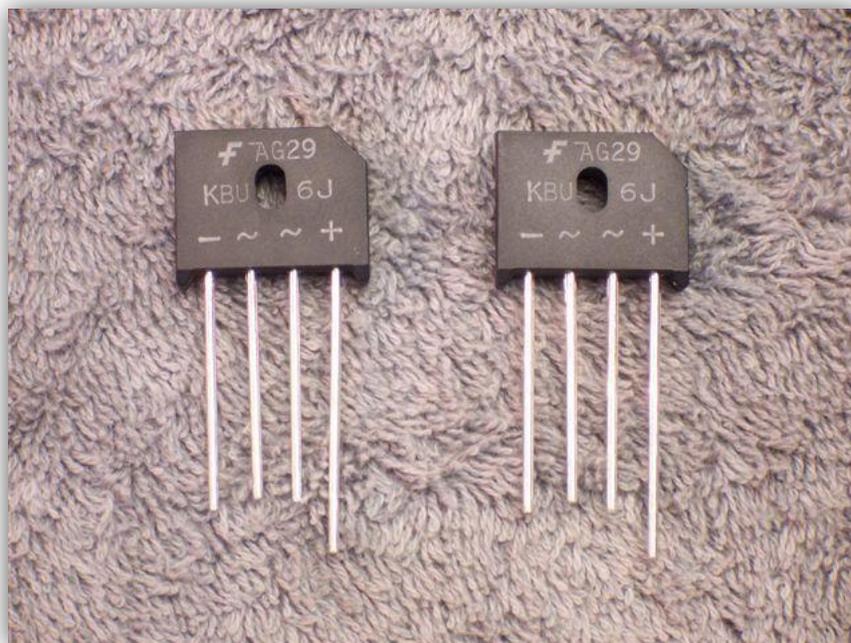
1. There may be a "+" on the PCB indicating where to position the POSITIVE lead.
2. The segmented half of the circular stencil on the PCB shows where to position the NEGATIVE lead. The unsegmented ('half-moon') part of the circle is where the POSITIVE lead goes.
3. The POSITIVE lead goes to a square solder pad while the NEGATIVE goes to a round solder pad.

- Install the 4 4700uf capacitors at C1, C2, C7, and C8.
- Install the 2 47uf capacitors at C5 and C9.

5.5 Installing the Bridge Rectifiers

Quantity	Designation	Description	Part Number
2	B1, B3	Bridge Rectifier	GBU4M-BPMS-MD

A Bridge Rectifier accepts an AC voltage and generates a DC voltage which, in the Phono Stage, is used as the filament voltage. You'll see a notch on the Bridge Rectifiers (part number: GBU4M): match the notch with the '+' (POSITIVE) stencil on the board.



The Bridge rectifier has an edge notched on it that lines up with the board.

- Install the 2 GBU4M⁸ Bridge Rectifiers at B1 and B2.

⁸ The picture actually shows a slightly different part number; you can just ignore it.

5.6 Installing the Regulators

Quantity	Designation	Description	Part Number
2	IC1, IC3	Regulator	LT1963AE

First, let's have a look at how a regulator is attached to a heatsink.

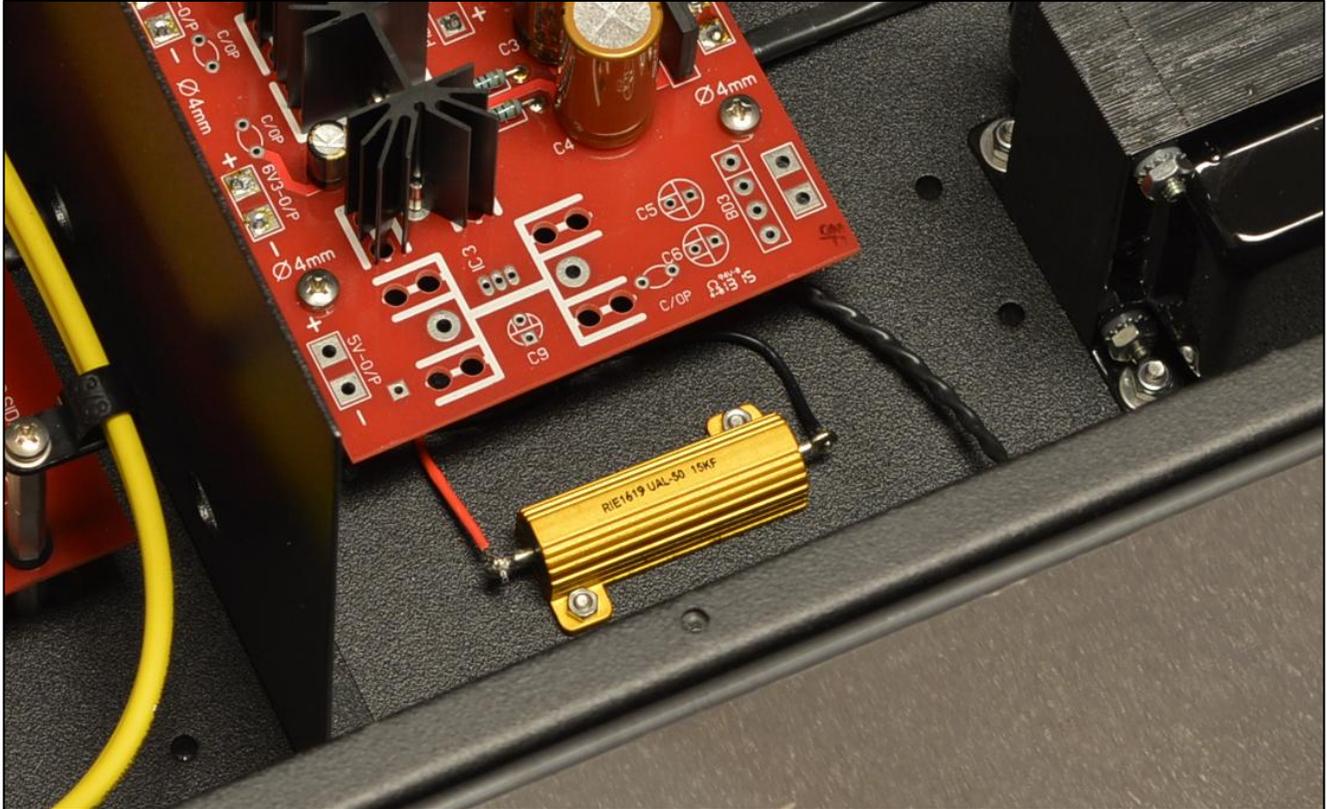


- Take an M3 PAN head screw and mount a regulator on a heatsink as shown above. The heatsink is the same front and back.
- Insert a regulator and heatsink into the board at IC1.* Make sure that the regulator is inserted straight by doing the final tightening of the screw while holding the regulator and heatsink in position on the board where it will go. Solder the 3-pin regulator and the heatsink from underneath the board. Again, use whatever props you need to get it straight.
- Follow the same process and install the other regulator at IC3.

-
- Install the Super Regulator board in the chassis using the provided standoffs and screws.

5.7 Installing the Shunt Resistor

Next we will install the 10K 50W Gold Shunt Resistor into the chassis. There are holes pre drilled in the chassis at the front of the chassis in front of regulator board.



5.8 Preparing the LED Installation

- Refer to the LED installation package to install the LED wiring on the Super regulator board.

Congratulations! That's it for this section.



Another cup?

Section 6

Power Supply Interwiring

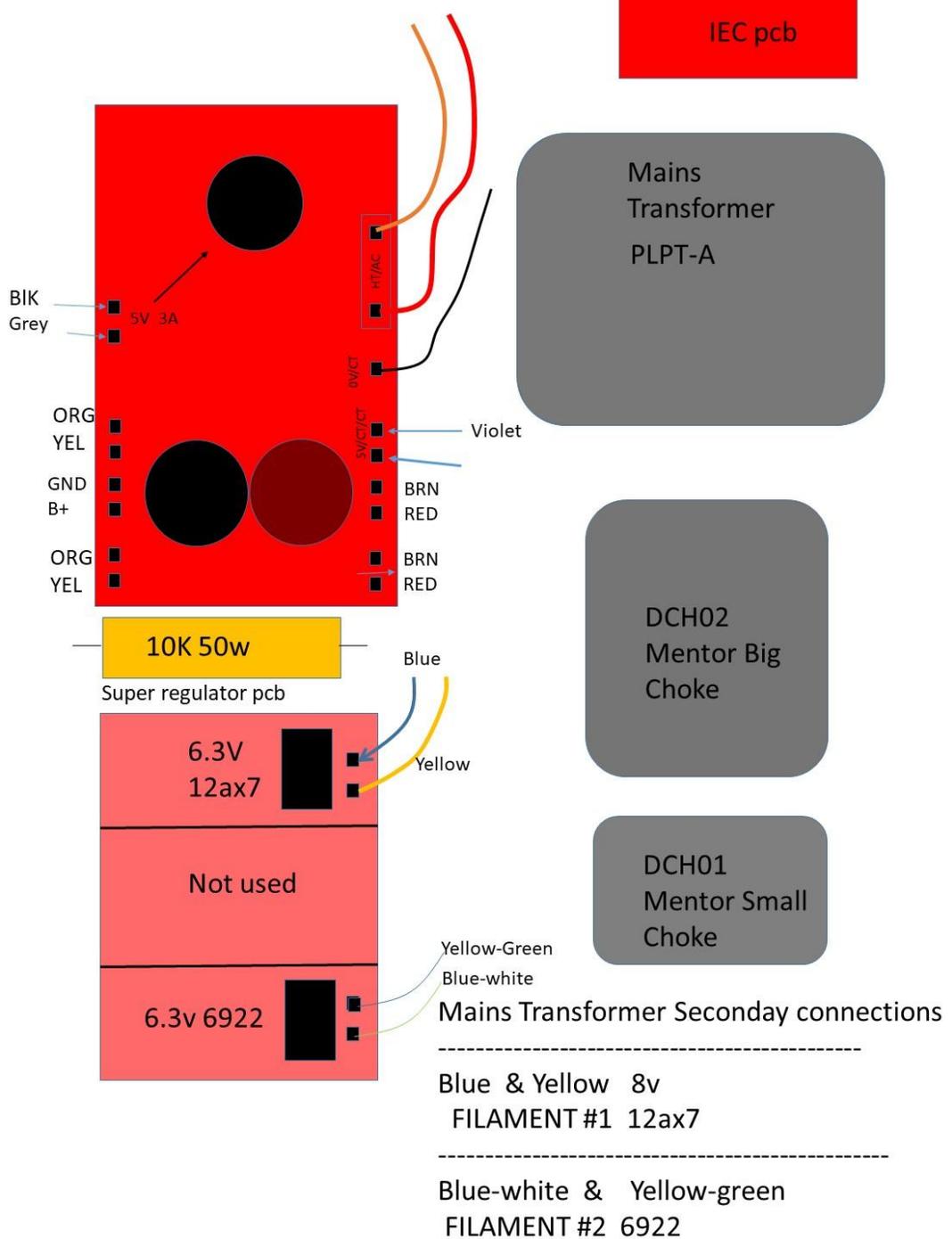
The information needed to complete the Power Supply interwiring is contained in the PDF file "Power Supply Interwiring."



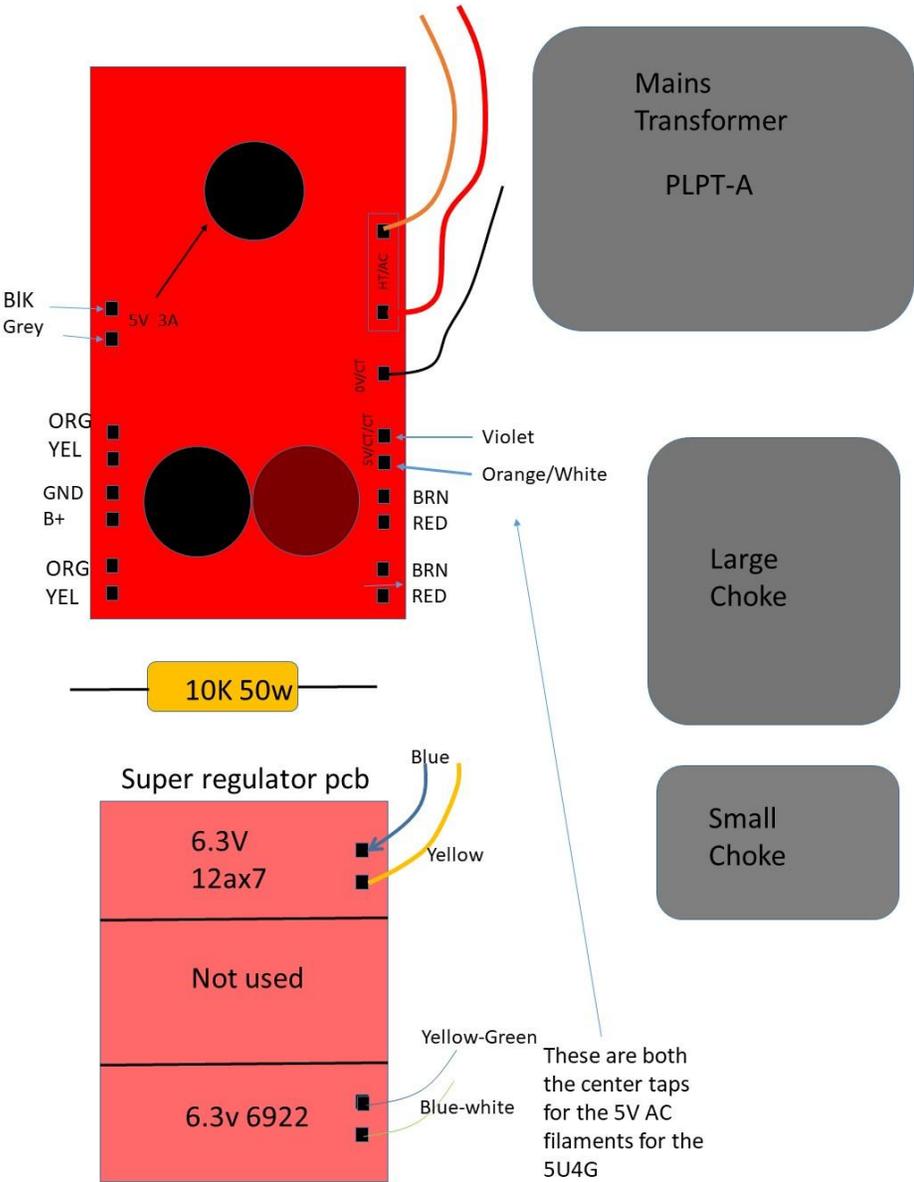
As appropriate in the this section and in the later interwiring, route wires through the grommet in a way that makes the most sense in terms of neat routing. The picture below shows one way of doing it:



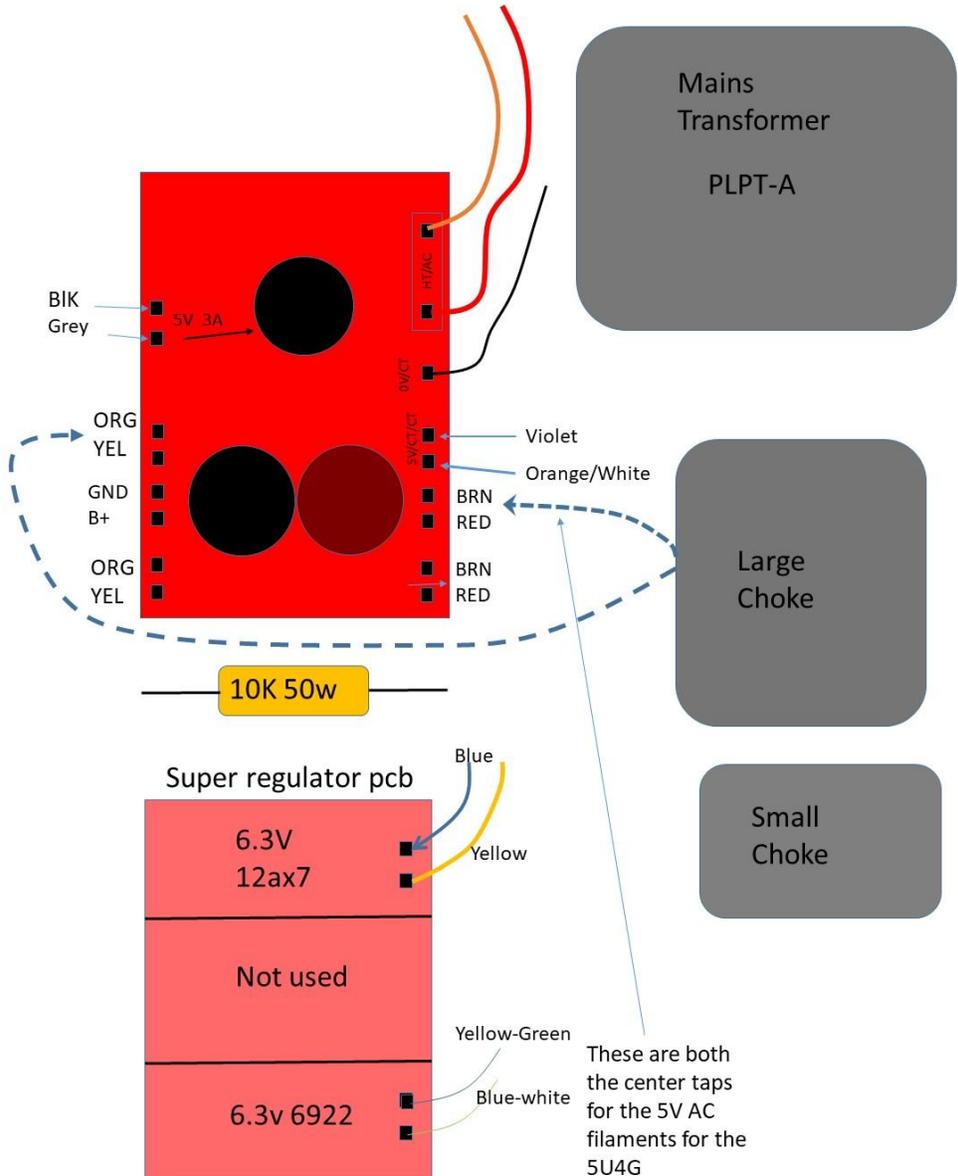
L5 phono Power supply



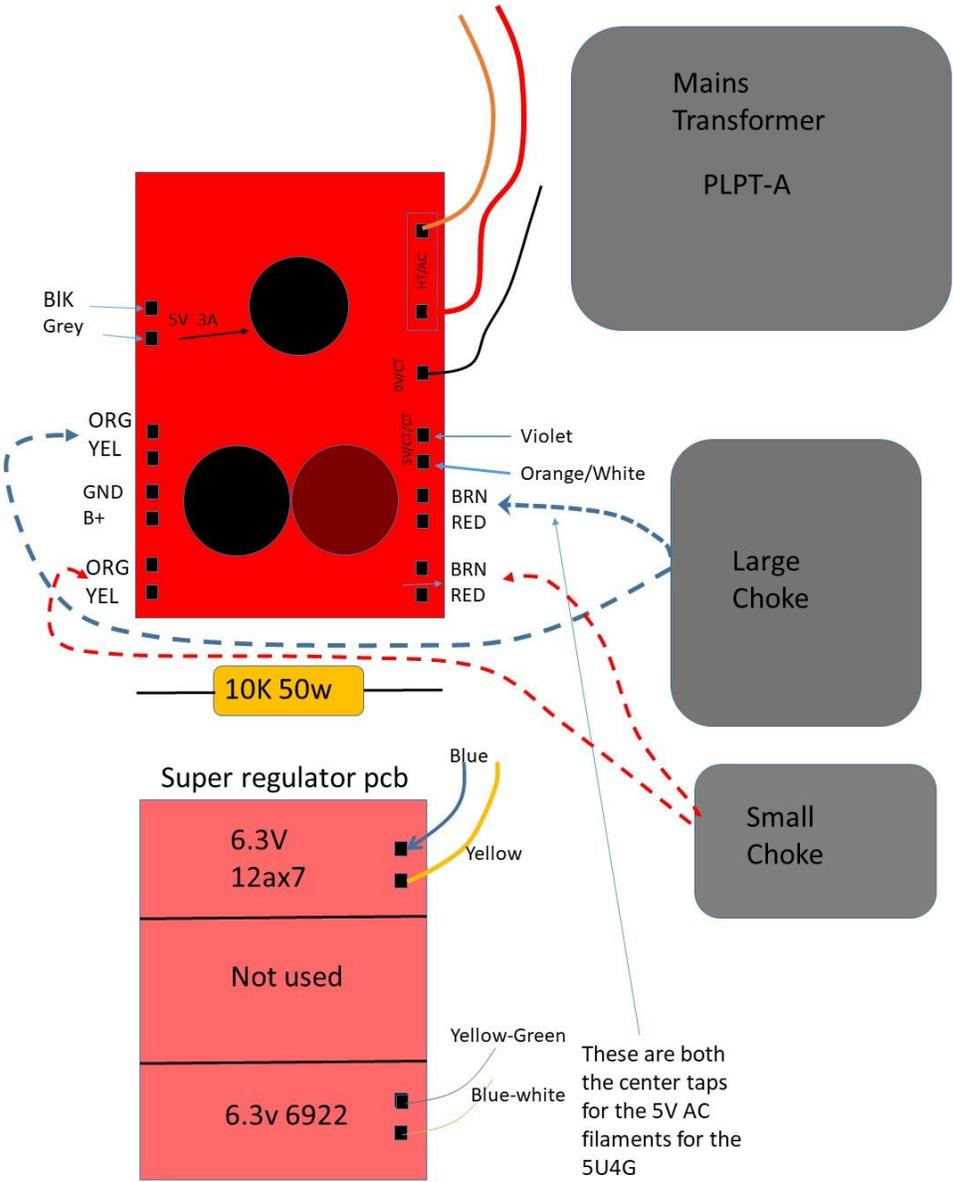
L5 Phono Wiring



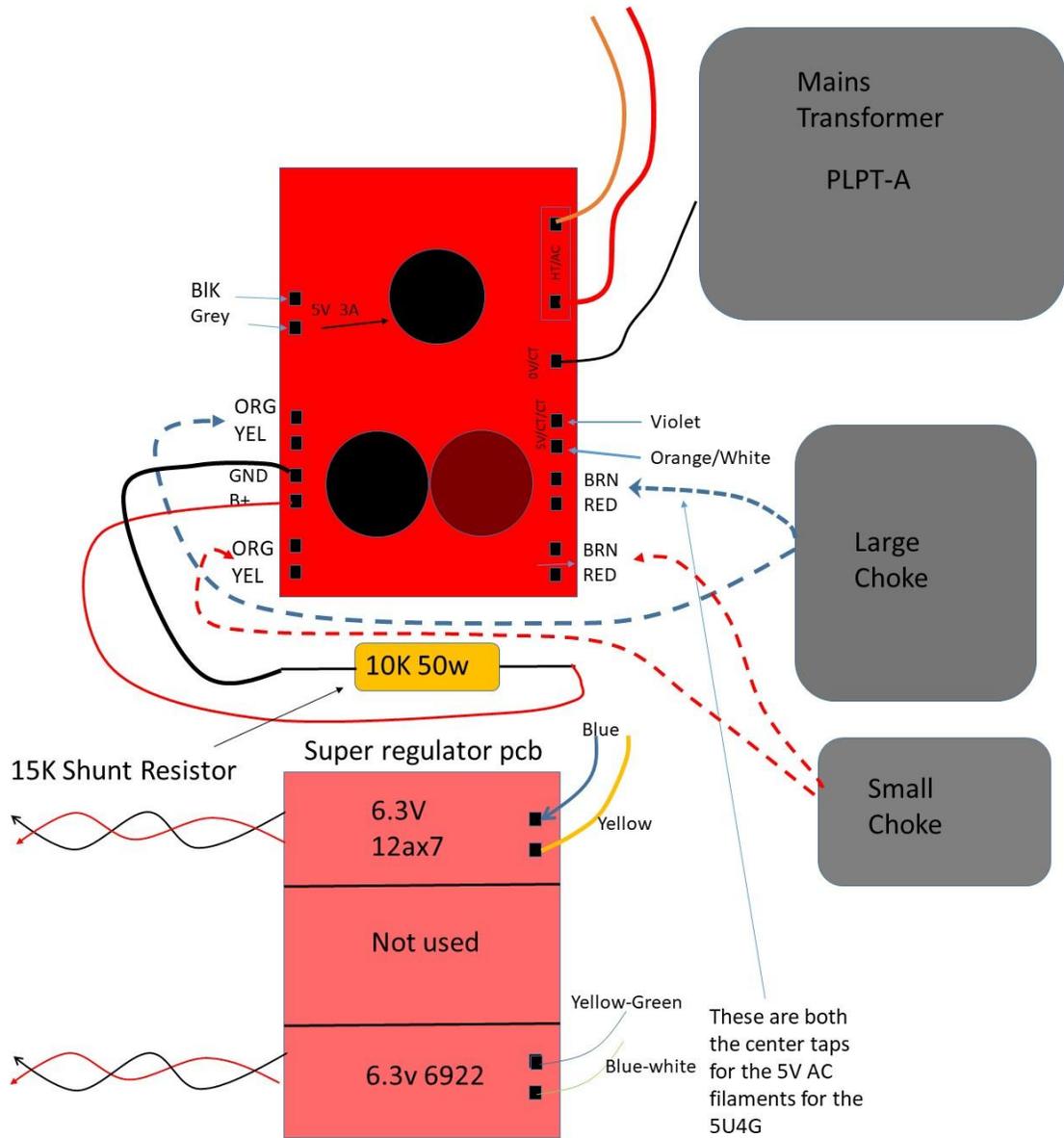
Large Choke DCH02 Wiring



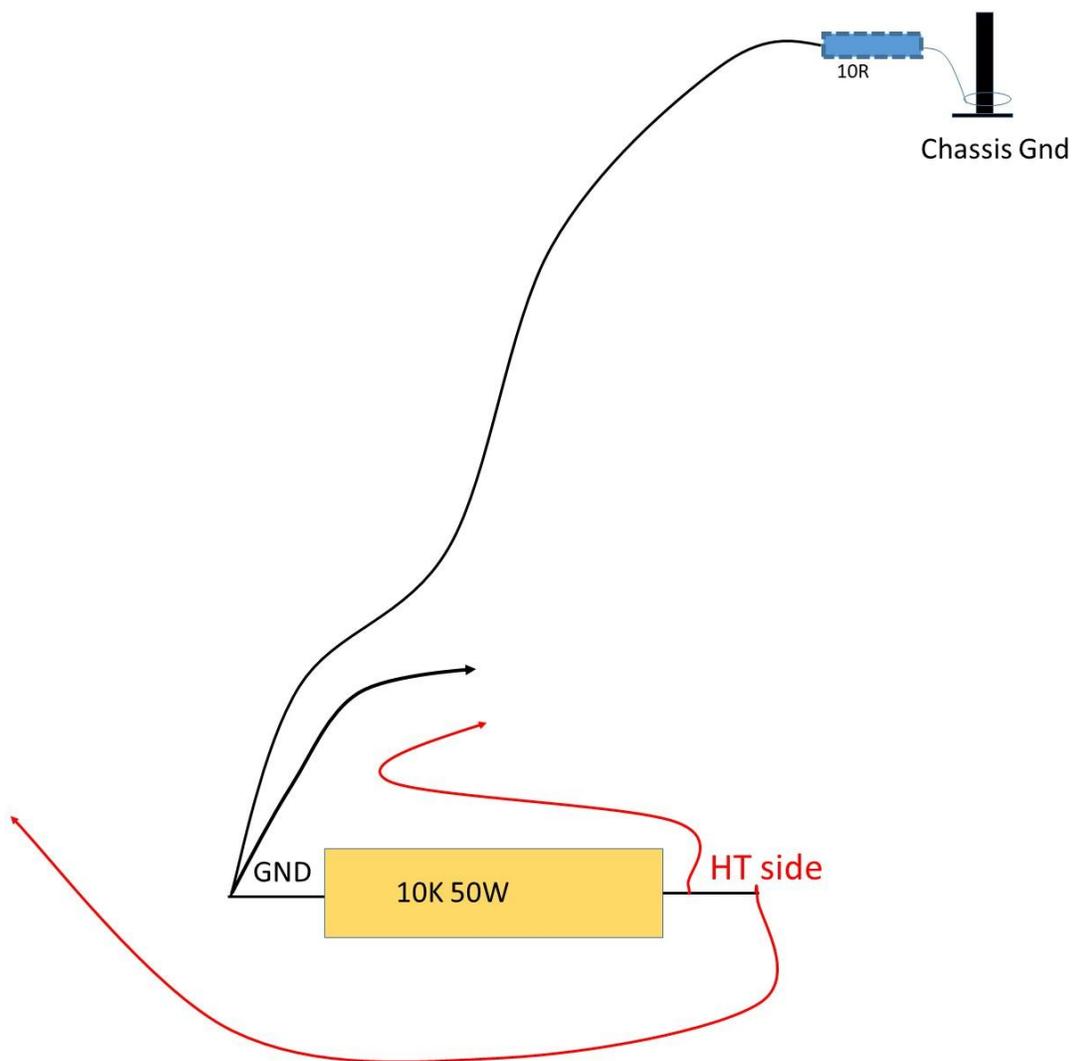
Small Choke DCH01 Wiring

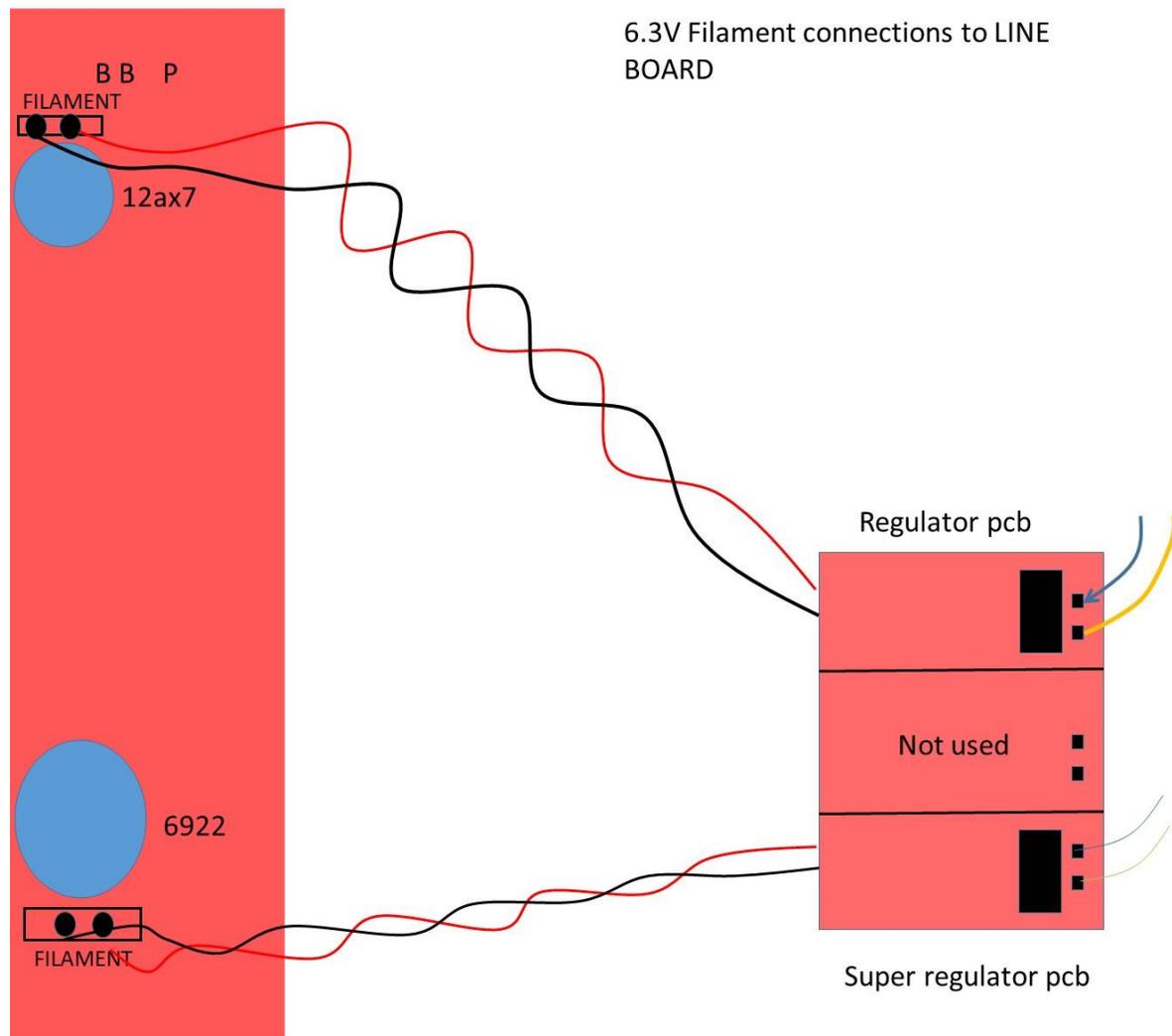


12ax7/6922 filaments



Chassis Ground Connection





At this point we suggest you just solder the twisted Red and Black wires to the Super Regulator board and later we will connect to them the Phono board. For now, leave them quite long.

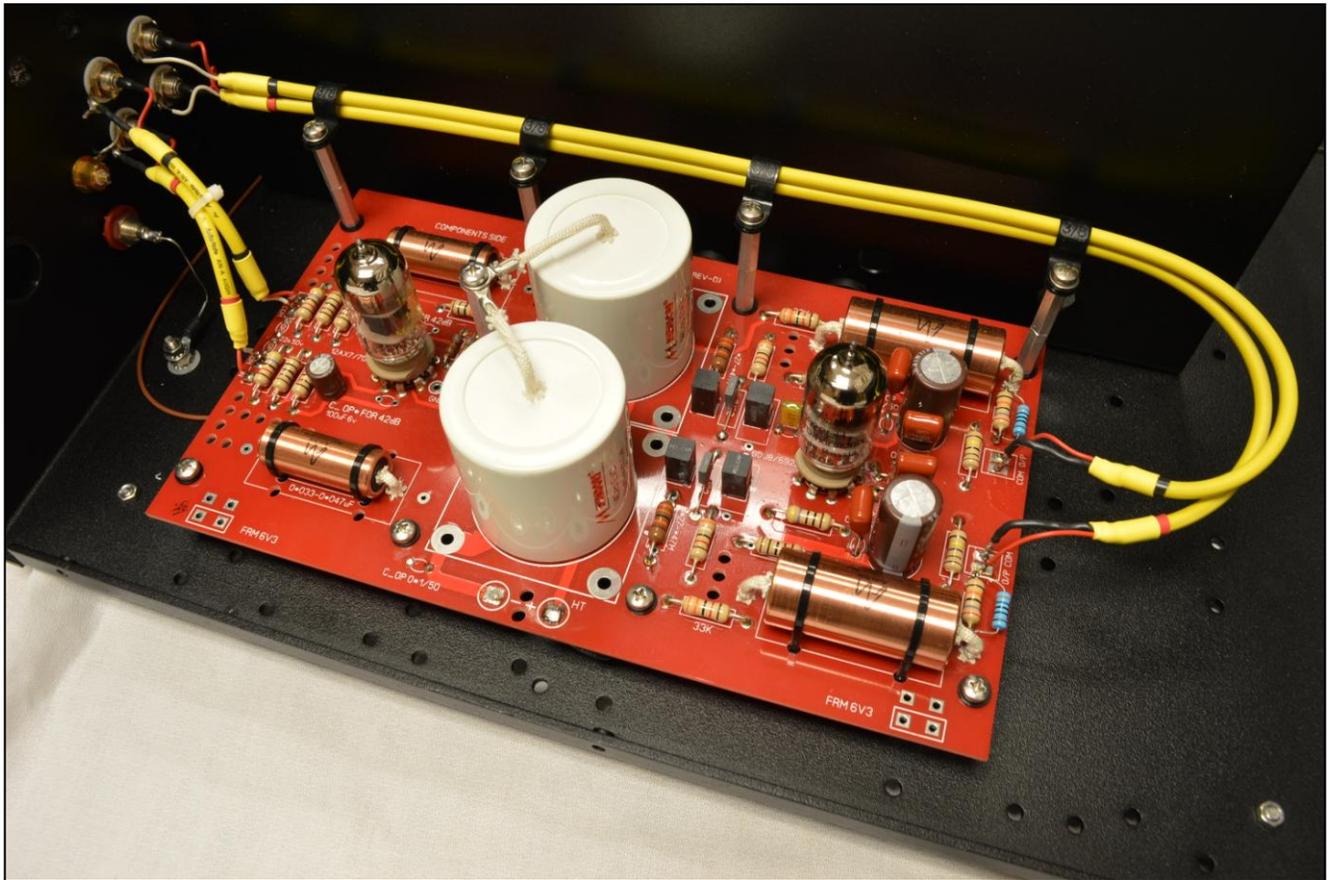
Well done if all that is done! You've completed the wiring of the Power Supply. Congratulations!

Section 7

Phono Board Installation

7.1 Overview

Let's look at the other side of the chassis. The Power Supply provides the High Tension (HT) voltage to the Phono board, along with the 2 filament voltages; that's a lot of building just for those 3 things! The circuit uses a 12AX7 input tube and a 6922 output stage; a lot of careful grounding has been performed on the board and the large EVO oil capacitors are a big part of the grounding strategy.



And here's a shot of the completed early stage Phono board. There will be a few differences between what you see above and the build instructions. Please follow the manual.

7.2 Parts List

Here is the parts list for the Phono board:

Quantity	Value	Other
Tubes		
1	6922	
1	12ax7	
Valve Bases		
2	9-pin CMC valve base	
Resistors		
2	47K Takman non magnetic	1W
4	1K Takman non magnetic	1W
2	1K2 Takman non magnetic	1W
2	100K Takman non magnetic	1W
4	68R Takman non magnetic	½W
1	15K Takman non magnetic	1W
2	39K (39K2) Takman non magnetic	1W
2	33K Takman non magnetic	1W
2	470R Takman non magnetic	1W
2	1M Takman non magnetic	1W
2	270R Takman non magnetic	½W
2	2M2M2 (1M82)	1W
2	330K Takman non magnetic	1W
Capacitors		
2	100uf 10V electrolytic capacitors	
2	470uf 16V electrolytic capacitors	
2	.22 uf Audio Note (UK) Copper Foil capacitors	
2	.1uf Audio Note (UK) Copper Foil capacitors	
2	47uf Mundorf EVO Oil film capacitors	
RIAA Capacitors		
2	Rel-Cap RIAA Capacitors 2N7	
2	Rel-Cap RIAA Capacitors 8N2	

As you can see in the picture on the previous page, the values of the components are printed right on the board, so we suggest you take the resistors in the Phono board parts bag and use a ohmmeter to measure each value. Hopefully we didn't make any mistakes and you got all the right resistors and quantities. If note, give us a call and we'll set things right.

- Install the resistors into position on the Phono board, carefully bending the leads and using the technique we mentioned earlier to allow a little space between the resistors and the board.

7.4 Installing the Valve Bases

- Next, install the two 9-pin valve bases — they only fit in one way so you can't go wrong!

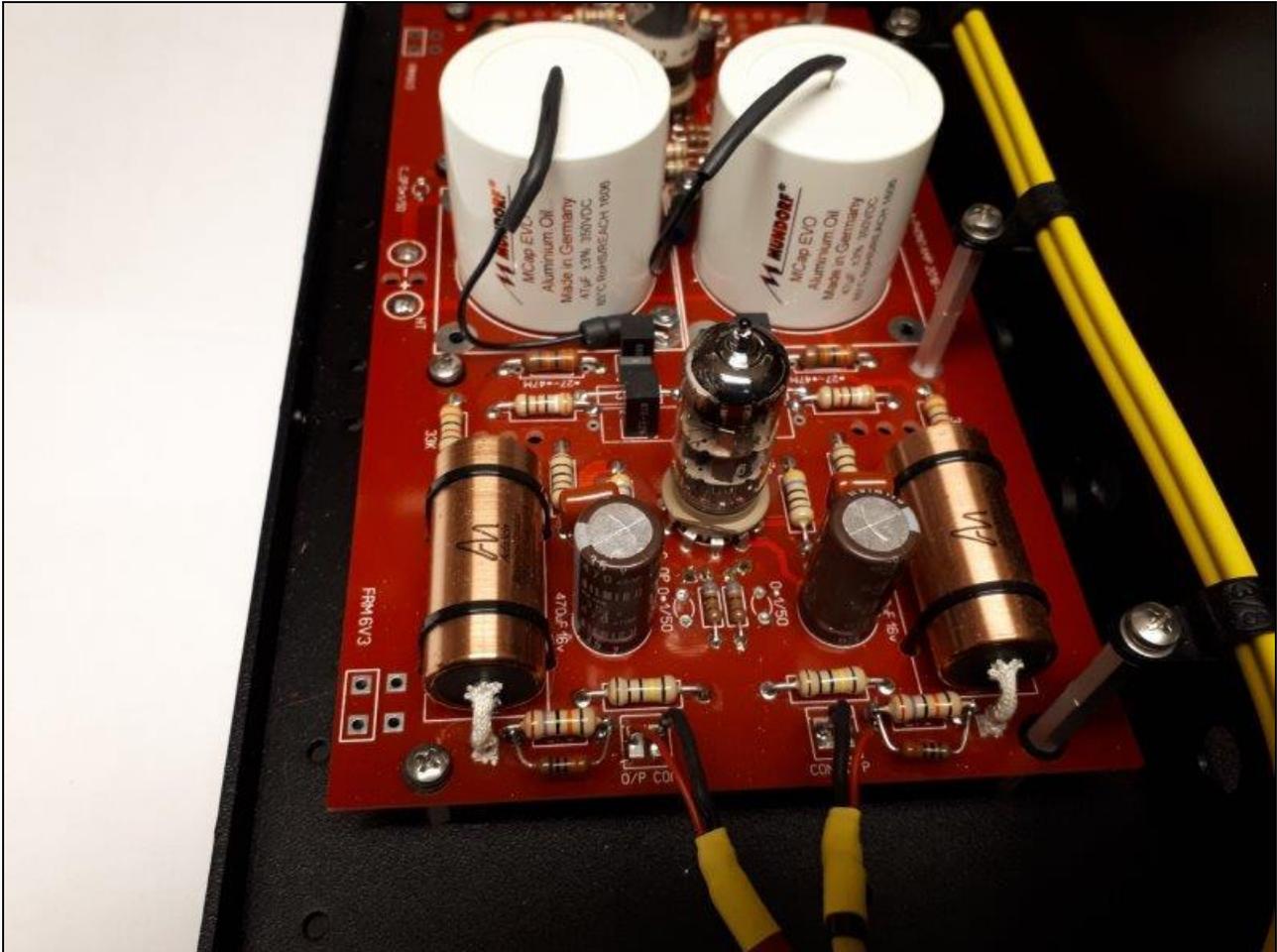
7.5 Installing the Capacitors

Quantity	Value
2	100uf 10V electrolytic capacitors
2	470uf 16V electrolytic capacitors
2	.22 uf Audio Note (UK) Copper Foil capacitors
2	.1uf Audio Note (UK) Copper Foil capacitors
2	47uf Mundorf EVO Oil film capacitors
2	Rel-Cap RIAA Capacitors 2N7
2	Rel-Cap RIAA Capacitors 8N2

- Install the 2 100uf 10V electrolytic capacitors, ensuring they are installed with the correct polarity.
- Similarly, install the 2 470uf electrolytic capacitors.
- Install the 2 .22 uf Audio Note (UK) Copper Foil capacitors. These are non-polarized and can go either way. We recommend considering the printing when you orient them, for a neat look.
- Similarly, install the 2 .1uf Audio Note (UK) Copper Foil capacitors.
- Install the 4 Black rectangular Rel-Cap RIAA capacitors 2N7 and 8N2. There is no polarity, so they can go either way.

And, finally,

- Install the 2 big White 47uf Mundorf EVO Oil film capacitors, as shown below.



They are film capacitors so there is no polarity, but we suggest you install them with the writing as shown. These capacitors are connected between the High Tension (HT) voltage and Ground. The capacitors go into the board and then are soldered on the underside of the board: the lead on the top now must be connected to a specific ground point on the PCB, as shown in the picture on the next page.

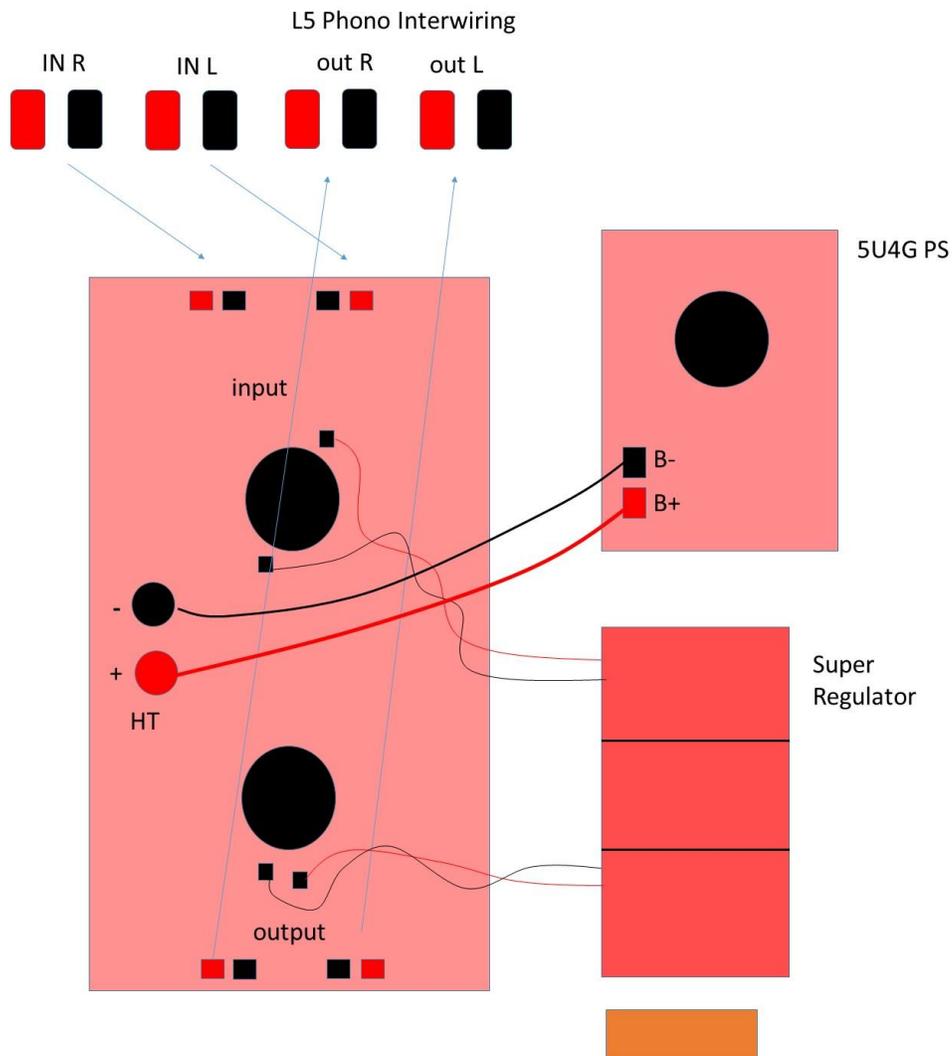
Section 8

Interwiring

8.1 Overview

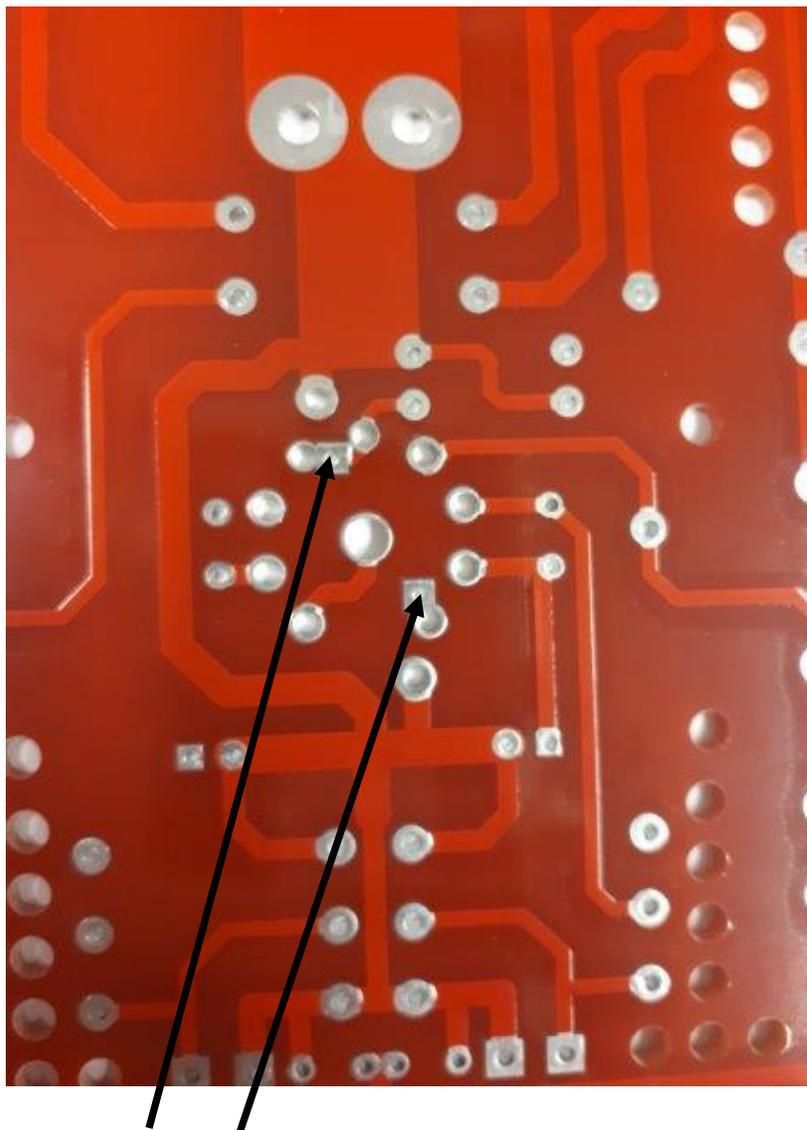
With the Phono board completed let's tackle the interwiring between the Phono board and the input and output shielded wiring, along with the Power Supply and the Super Regulator boards and the Chassis Ground.

8.2 Interwiring

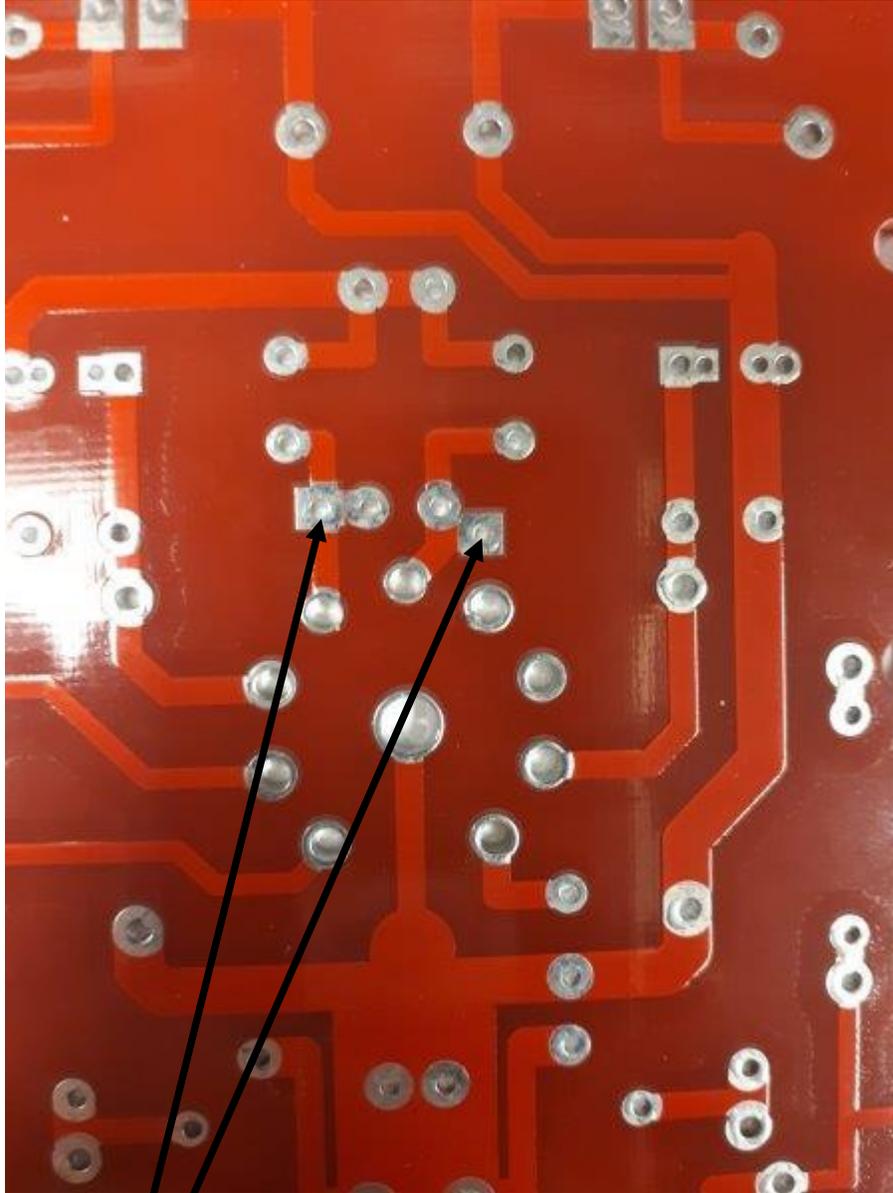


Let's look at each section of the interwiring, with all the completed boards. Referencing the graphic on the previous page,

- Use 18g Red PTFE (Teflon-coated) wire to connect the B+ on the Power Supply board to the HT (+) on the Phono board.
- Similarly, use 18g Black PTFE wire to connect the B- on the Power Supply board to the – location beside the HT on the Phono board.
- Next, connect the DC filament voltages for the Phono board tubes. You can see the additional little holes on the Phono board for this wiring, so take the twisted Red/Black 22g wire that is connected to the output of the Super Regulator board and connect them to one of the tubes.



These are the two filament holes used for the input 12AX7 tube



These are the two filament holes used for the 6922 output tube.

8.3 Connecting the Third Chassis Ground Wire

With the filaments connected and the HT/Ground connected we need to look at two more areas: the first would be the Chassis Ground wire with resistor and capacitor attached — this is the prepared wire with a ground lug that we connected earlier to the Chassis Ground Screw (near the Mains transformer).

- Take this wire and connect it to one of the IN grounds (marked COM) on the board; this is basically where an RCA Signal and Ground would connect to the board and this Chassis Ground wire will connect to the Ground side.

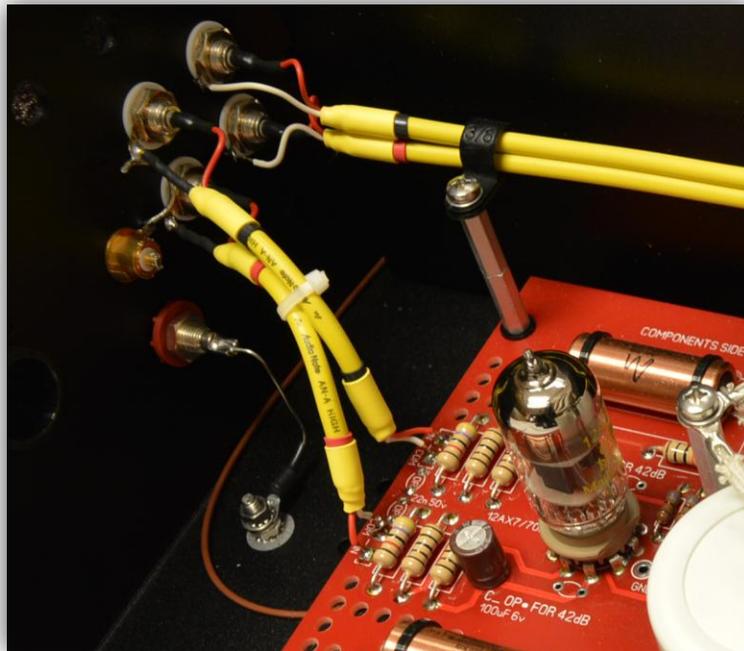
8.4 Connecting the Shielded Audio Note (UK) AN-A Input and Output Cables

The AN-A cable is basically a shielded cable with a Ground sheaf around it and two Signal conductors, Red and White. We've prepared the cable: the Red lead is the Signal and the White lead is tied to the Ground sheaf. This AN-A will need "tinning" as there is a coating on the stranded wire.



When working with the RCA jacks we use the following procedure:

- ❖ Tin the RCA Red (signal) and Black (ground) leads
- ❖ Put a puddle of solder in the center of the RCA jack
- ❖ Tin the ground tab on the RCA jack
- ❖ Heat the solder puddle and slide the Red tinned lead into the center of it; it should adhere immediately
- ❖ Heat the tinned Black lead as it makes contact with the ground tab on the RCA; similarly, it should adhere immediately



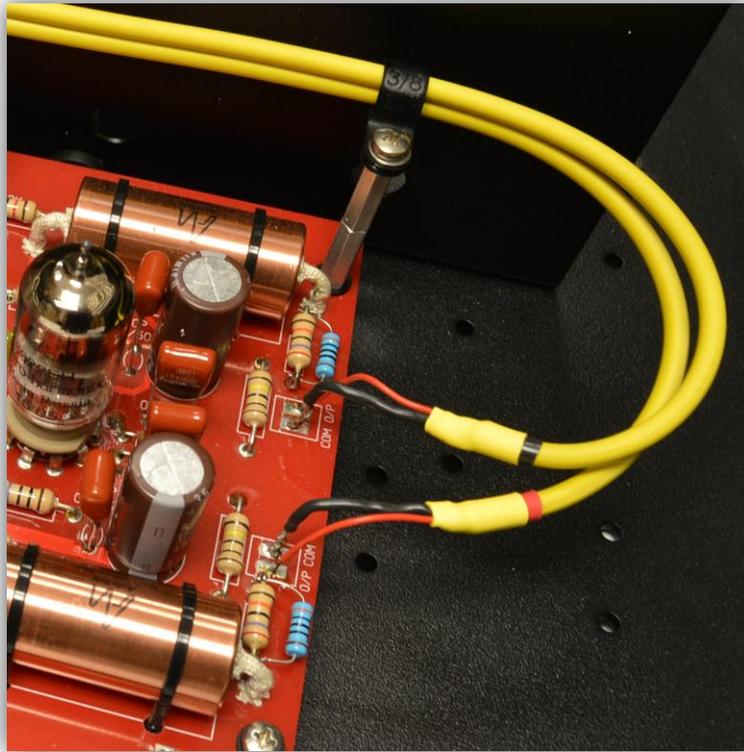
- Connect the Red wire to one of the input RCAs and the White wire to its Ground post.
- Do the same for the other channel.
- On the Phono board side the White/Ground sheaf are connected to the Ground input and the Red to the Signal.

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- On the output side you will do the same; these connections are marked O/P and COM, as shown below:



Section 9

Testing

9.1 Overview

It's time do to some testing to make sure that the Phono Stage has been correctly wired and that things are working the way they're supposed to.



Our plan is as follows:

- ❖ With no tubes installed, power the Phono Stage on to verify that the fuse does not blow.
- ❖ Install the 12AX7 and 6922, then power on to make sure that the tubes glow.
- ❖ Install the 5U4G rectifier and measure a key DC voltage.
- ❖ Test for sonics and hum. If all is well, play in a proper system, enjoy!



Before testing, it's a good idea to blow some air into the unit to make sure that there are no small pieces of wire or solder floating around.

9.2 Installing the Fuse

Tubes Installed At This Point: None

Let's start by installing a 1A⁹ Slo-Blo fuse from the IEC bag.

- If the fuse holder is already installed in the IEC plug, use a screwdriver, a flat edge, or your fingers to pull it out; you may need to squeeze it to completely remove it.
- Install the fuse in the small plastic fuse holder and insert it into the IEC. (You can ignore any lettering like '240V only' — there is only one fuse holder type for all world voltages.)



- Turn the Phono Stage on. If the fuse does not blow, continue to the next step. If it does, jump ahead to "Debugging." Turn the Phono Stage off.

⁹ If all is well you can change to a 2A fuse.

9.3 Initial Tests

Let's begin by doing some basic tests, with the Phono Stage off.

A good place to start is to measure resistance. Let's have a look at the Chassis Ground, an important (almost) universal ground point in the Phono Stage.

Try this:

- ❖ Place your multimeter in Connectivity mode
- ❖ Put one probe on the Chassis Ground
- ❖ Check the following points to verify that there is zero ohms or close (a couple of ohms is OK) between these ground points:
 - IEC Socket Ground
 - GND on the Phono board

Let's move on to our first real power-up.

9.4 First Power-Up

IMPORTANT NOTE

Follow the turn-on procedure carefully. **DO NOT AT ANY TIME ONLY INSTALL THE 5U4G RECTIFIER TUBE WITHOUT ANY OTHER TUBES INSTALLED.** The reason for this is that the rectifier is counting on having a specific load to drive. If the rectifier is used without other tubes installed then the unit will 'see' significantly higher DC voltages, which can overextend the Power Supply capacitors. You could possibly start hearing cracking noises and then who knows what, as they are beyond their maximum voltage ratings.



PLEASE BE AWARE OF PROPER ELECTRICAL SAFETY.

There are sufficient voltages in this kit to give you a very nasty and harmful shock, so be careful when powering on, debugging, and probing around.

If the initial resistance checks are OK then you can install the 12AX7 and 6922 tubes.

9.5 Voltage Check

 *If you're using a Variac take into consideration that the voltages you'll be measuring are going to be a percentage of the full DC voltages: for example, with the Variac at 90V AC instead of 120, you can factor in that the DC voltages will be down by 25%.*

Install the 5U4G rectifier tube.

Tubes Installed At This Point: All

Turn the Phono Stage on.

Worst Case Scenario

Installing the 5U4G rectifier provides the Phono Stage with the various DC voltages (including the HT) that it needs to operate; usually, if there is a problem with the build, it's going to be noticed here. *It's possible that, if there is a major problem, the fuse will blow — or you may get a burning resistor or even see some smoke. If anything alerts you that there is something drastically wrong then turn off the unit ASAP, unplug it, and contact us at audionotekits@rogers.com before proceeding.* We'll be happy to provide you with advanced troubleshooting advice. Note: we may ask that you send us high quality digital pictures of the internals of the Phono Stage.

Make the following measurement: On the Phono board, measure the HT (+ and -): you should have about 260V DC. Turn the Phono Stage off.

Well done if all these checks are good! Let's move on to the sound check.

9.6 Sound Check

Now that we have a Phono Stage with a key correct DC condition it's time to see if we can get some sound. We recommend hooking up your turntable to your preamplifier and the rest of your system, including a pair of "cheap" speakers! — to verify that it is working correctly.

 *When the Phono Stage turns on you may hear a hum for about 15 seconds; then it will disappear. The reason for this is the voltages are settling: it's kind of like throwing a rock in a swimming pool; it takes a bit of time before the ripples (or, in our real world case, the DC voltages) settle.*

If this checks out, congratulations! You should have a working L5 Signature Phono Stage. Feel free to contact us to share your excitement.

Section 10

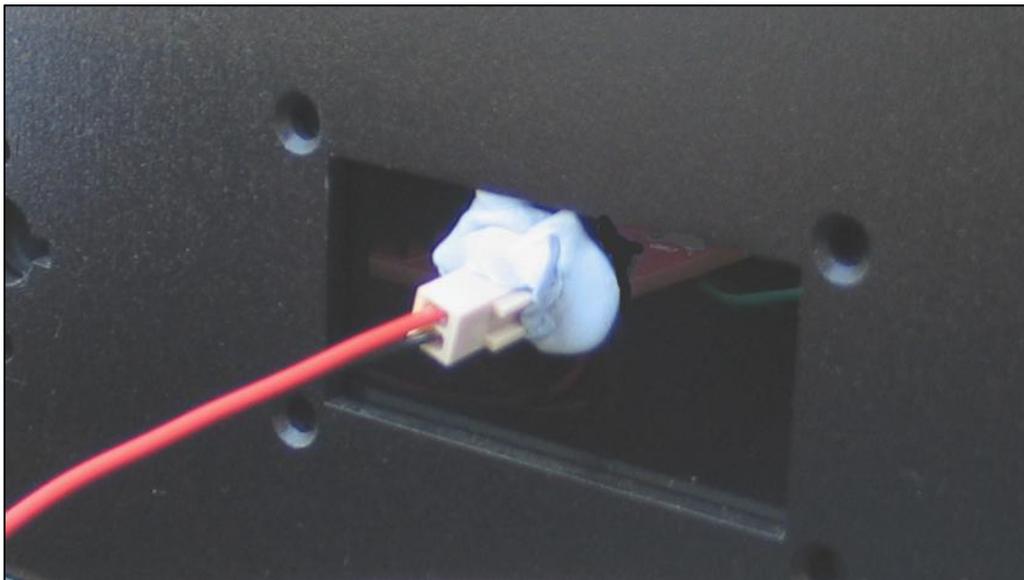
Finishing Touches

10.1 Installing the Front Faceplate

- Remove the protective films from the front and back of the front faceplate.
- Install the front faceplate using four Black M4 CSK flat head screws.

10.2 Installing the LED

- Carefully trim the LED leads so that they are not exposed.
- Glue or attach (with some Blu Tack) the LED holder to the front panel so that the LED protrudes through the designated hole, as shown below:



10.3 Last Looks Inside

Before you close things up, it's not a bad idea to do a final visual inspection, particularly to assure yourself that none of the interwiring is too close to things that get hot — like the tubes and the 10W resistors on the tag strips.

10.4 Installing the Chassis Top

- Install the chassis top using the provided hardware.

Section 11

Final Thoughts

11.1 Congratulations

If you've made it to this point then CONGRATULATIONS! — you are ready to insert your L5 Signature Phono Stage into your system and enjoy it.



11.2 Cables

In our experience, a high quality power cable and good interconnects should make a noticeable improvement to the sound.

11.3 Tube Rolling

We feel that the sound of the ANK Audio Kits L5 Signature Phono Stage is truly sublime. It provides a highly detailed and transparent presentation with gorgeous sonics. Rolling some quality new production tubes and/or some nice NOS tubes in the 12AX7, 6922, and 5U4G positions will allow you to tailor the sound to your particular preferences.

11.3.1 12AX7



The 12AX7 dual triode tube can be substituted by the premium NOS 7025 low noise tube or a number of other current production tubes at very reasonable prices. *Before considering any other tube substitution please mail me at audionotekits@rogers.com to discuss it.*

11.3.2 6922



The sound of the ANK Audio Kits DAC 2.1 Signature is very highly regarded and it is one of our most popular kits. It provides a detailed and transparent presentation with gorgeous sonics. Rolling some nice NOS tubes will allow you to tailor the sound to your particular preferences. The 6922 dual triode tube can be substituted by the readily available 6DJ8 at very reasonable prices. *Before considering any tube substitution other than a 6DJ8 please mail me at audionotekits@rogers.com to discuss it.*

11.3.3 5U4G



The directly-heated 5U4G full-wave rectifier is a 1930s design and there are classic era NOS 5U4G tubes available at reasonable prices. Of course, audio lore is that the one to have is the Western Electric 274B rectifier, if you can find one and have \$1,000 or so burning a hole in your pocket. Alternatively, you can use the Chinese 5Z3P(A); a well regarded NOS military grade version made by Shuguang may still be available. *Beyond these, do not substitute any other 5V rectifier for the 5U4G type for which the L5 Signature Phono Stage was designed; there are some significant differences between a 5U4G and other rectifiers, with respect to voltage drop and current specifications, and the result of a substitution is unpredictable and could damage your Phono Stage.*

11.4 Thanks

Thank you for investing in the ANK Audio Kits L5 Signature Phono Stage and congratulations on working your way through the build. Please email us at audionotekits@rogers.com and let us know how everything went: were there any errors in the manual or instructions, parts lists, etc.? Your ideas regarding greater clarity or tweaks will also be truly appreciated.

If you have some suggestions that you feel would help other kit builders please also let us know. We can put them on a support page for other users. We'd also like to see some great pictures of your build process or your final build. We can post them on our website or on our Facebook page. And we'd love a review from you regarding the sound.

We hope the unit brings you many years of joy and we look forward to hearing from you.

Appendix

Resistor Color Codes (5 band)

	Black	- 0
	Brown	- 1
	Red	- 2
	Orange	- 3
	Yellow	- 4
	Green	- 5
	Blue	- 6
	Violet	- 7
	Grey	- 8
	White	- 9

Resistor color codes are read from the color that is nearest the edge of the resistor - that is treated as the first column.

The first column of a 5-band resistor is the 100's column, followed by a 10's column, followed by a units column.

The fourth band is a multiplier (or decimal point shifter). The multiplier can use the additional colors silver and gold. These are used for very small values and turn the multiplier into 0.01(silver) and 0.1 (gold). For the standard colors, it determines how many times the column value is shifted to the left (i.e. multiplied by 10)

The fifth column is a tolerance value. These can be quite complex but we will not concern ourselves with these.

Examples

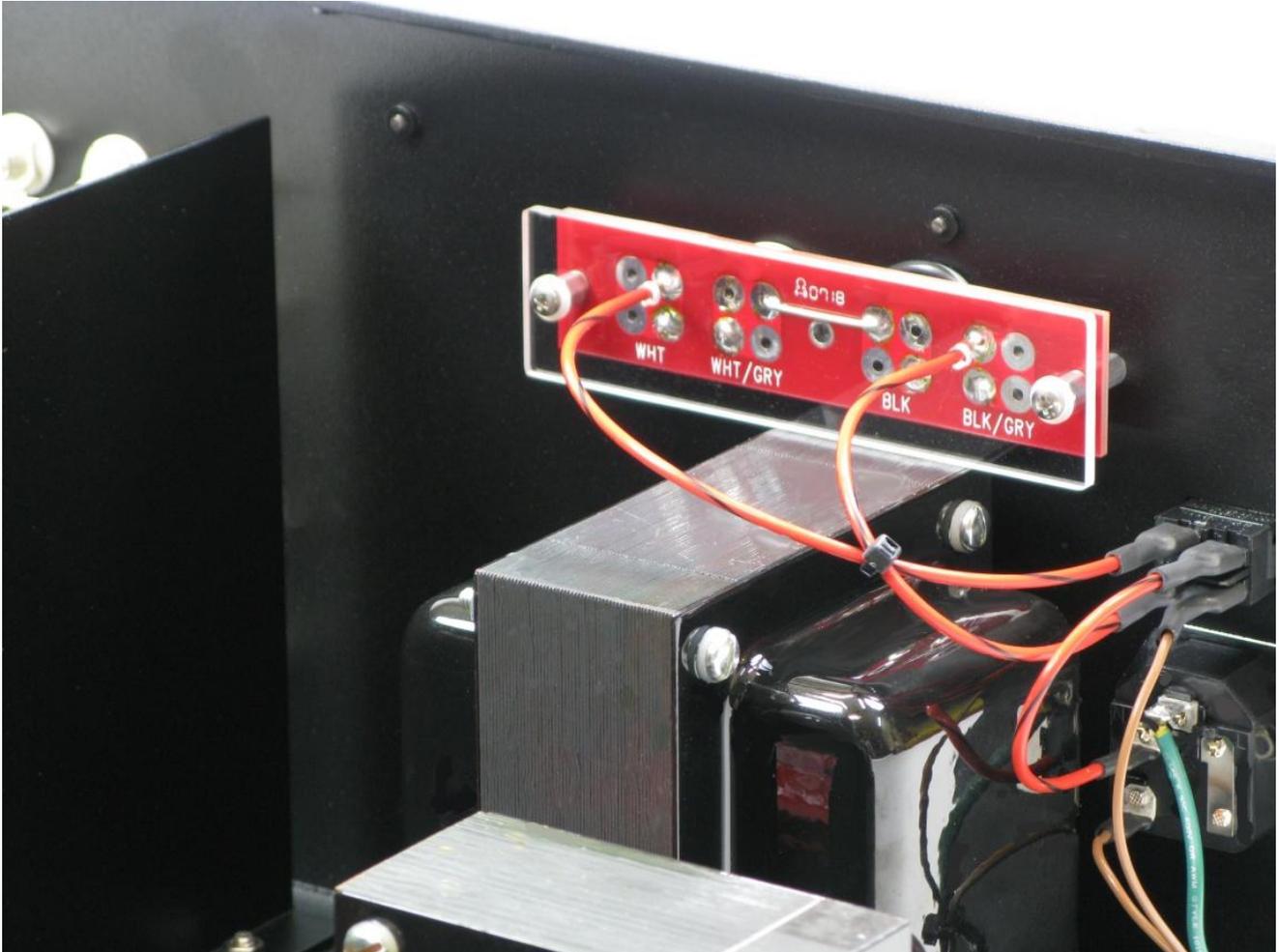
100R				
	1	0	0	x 1
680R				
	6	8	0	x 1
820R				
	8	2	0	x 1
1K				
	1	0	0	x 10
2K2				
	2	2	0	x 10
2K7				
	2	7	0	x 10
3K3				
	3	3	0	x 10

10K				
	1	0	0	x 100
68K				
	6	8	0	x 100
82K				
	8	2	0	x 100
330K				
	3	3	0	x 1,000
220K				
	2	2	0	x 1,000
470K				
	4	7	0	x 1,000
1M				
	1	0	0	x 10,000

You can also find an 'Interactive Resistor Color Code Calculator' on our website (available from the [Links](#) page).

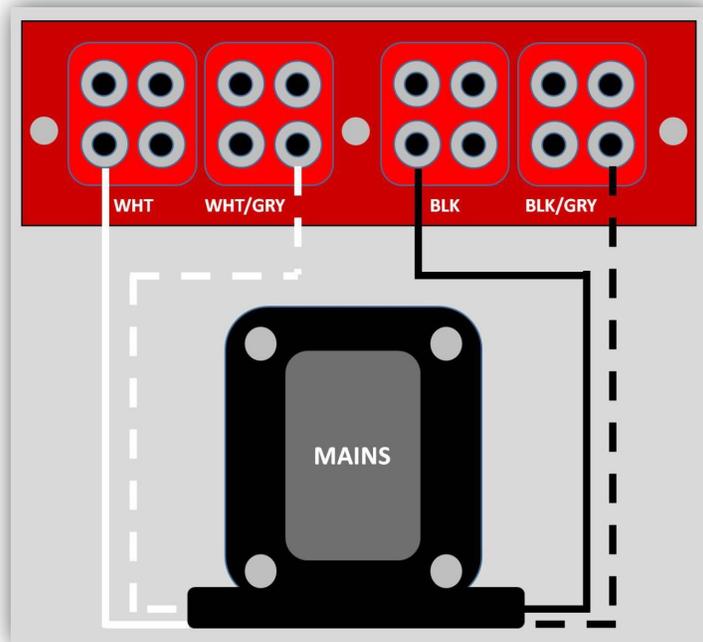
Wiring for 240V Operation

This section describes how to wire the IEC PCB for 240V. Before we do so, have a look at what we want to accomplish:

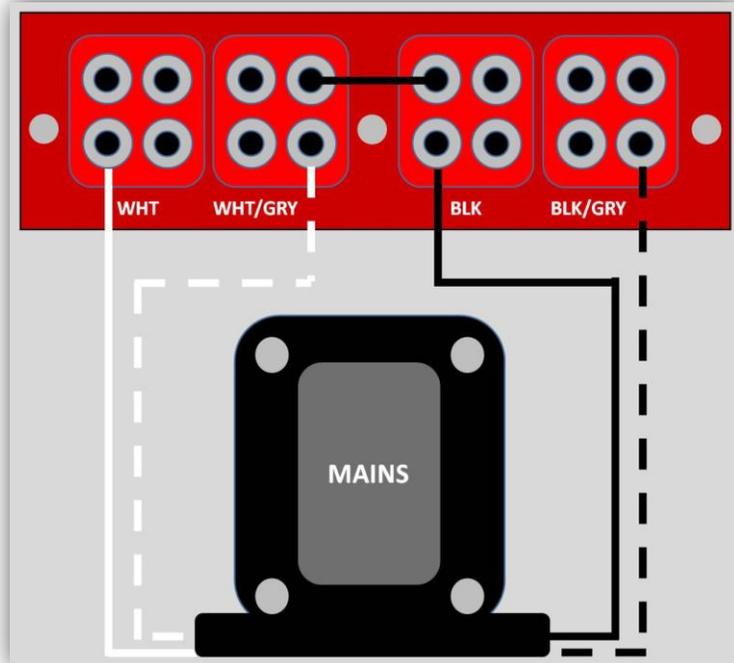


- Cut the four wires (White, White/Grey, Black, and Black/Grey) coming out of the Mains Primary to the lengths you'll need to reach the IEC PCB when it's situated on the rear of the chassis. *Note: you can connect the wires from the top or the underside of the board, as you prefer. In the picture above they are connected from the underside.*
- Strip and tin the ends. (You can add some heatshrink if you like.)

- Connect these four Primary wires to the IEC PCB, as shown in the diagram below. Cut off the excess wire.



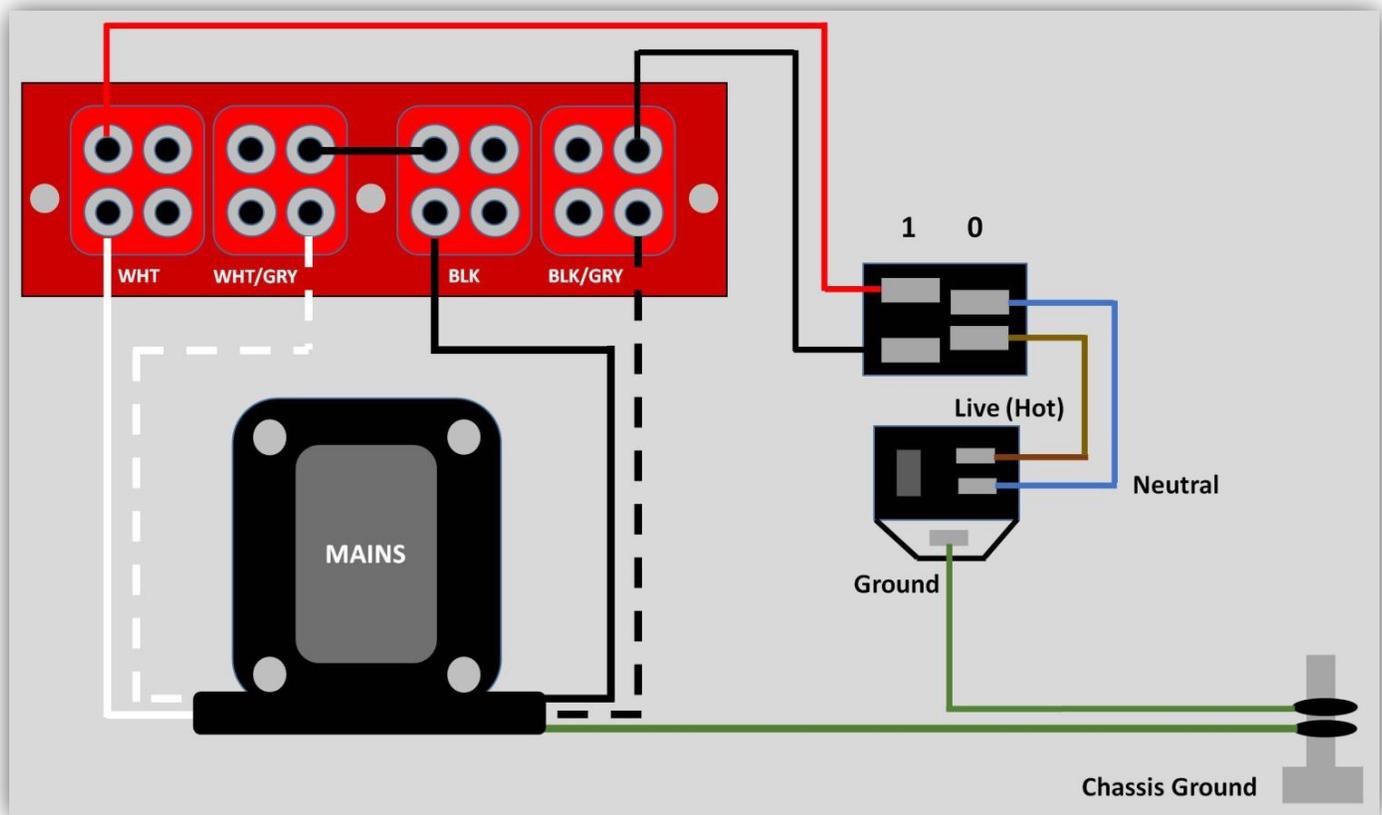
- Add the jumper as shown below. (You can use the left over end of the Black Primary wire or a bare wire, as you prefer.)



Referencing the diagram below, complete the IEC/Rocker Switch wiring as shown. Regarding the aesthetics, you have several options:

1. Solder the Red and Black wires from the Rocker Switch to the front of the board (see picture above). You can use either of the unused holes on each tab.
 2. Solder the Red and Black wires from the Rocker Switch to the underside of the board.
 3. Solder the Red and Black wires from the Rocker Switch to the front through the plastic insulating board (by drilling 2 holes in it¹⁰), as shown in the picture above,
- The choice is yours.

- If you haven't done so already, peel off the paper covering on the plastic insulating board.
- Tin and solder the unprepared ends of the half-prepared Red and Black¹¹ wires in the IEC bag onto the IEC PCB, as shown or in an electrically equivalent position.¹²



¹⁰ Peel off the cover first!

¹¹ Or Orange or whatever we've supplied. The color doesn't matter so long as you make the connections shown.

¹² Each of the four pads has four connected solder pads so you have some flexibility as to how to do this.