

Introduction:

ZinAmp's SSD PreAmp is a Solid State Discrete PreAmp circuit for line-level sources.

It sits between a line source (CD, Streamer, Phono-stage) and provides some additional gain, a volume control, selector switch and a choice of EQ settings.

Technical questions can be emailed to help@zinamp.co.uk



What to Do:

Assembly of your pre-amp is straightforward. Little soldering is required. There are two main boards - the pre-amplifier module and its linear-regulated power supply.

There are additional boards for the RCA input array, volume control, selector switch and EQ switch. Wiring is simple with plug-and-socket connectors.

Please follow the steps in the order indicated. Some are tests to ensure each stage has been completed correctly. Do not skip steps or miss out tests, as you will introduce undiagnosable problems that you will only discover at the end!

What NOT to Do:

We strongly advise against assembling everything, switching on and expecting it to simply "work". In spite of the easy-to-connect wiring, this is a complex device and can be unforgiving if wired or assembled incorrectly. Unforgiving means some parts may be burned or destroyed due to being incorrectly installed. Please follow the steps as indicated and if unsure, email help@zinamp.co.uk

Support and Returns Policy - please read

We appreciate that not everyone has the same skills or experience. Analogue audio electronics is a notoriously unforgiving area for the unsuspecting. We urge you to take great care. This starts with reading these instructions before beginning your build and to reach out to us for help if you are not sure.

We have devised the following policy to help you decide what to do in the event of a mishap. Electric shocks, explosions and damage conjure emotions that perhaps we didn't foresee. We empathise that you may feel anger towards our product if things go wrong - and we hope this is temporary. We are here to help. The following three situations cover most of the likely scenarios. If you believe our stance on any of these to be unfair or undermine your rights, then please contact us before you begin. The last thing we want is for you to have a pile of unusable metalwork and electronics with our name on it - as this is bad for our brand and for your confidence in us.

1. I started on this and I realise it's not for me:

No problem. If you are able to put everything back in the box undamaged and ship it back to us within 28 days, we will refund you the purchase price in full. If you want us to finish the amp for you, we will invoice you the difference between the self-assembly and assembled product, plus shipping. This second option is available for up to six-months from purchase. Please note, refunds take up to 14 days to materialise as we need to check the contents of the returned box.

2. I had a major mishap and I think I blew something:

Ok, send us an email and tell us what happened, with pictures, if possible. If there was smoke or cracking sounds, the chances are a module is damaged and needs replacing. We sell replacement modules; the prices of most of these are on our website. Please note that in this event, we are unable to offer refunds. We will - however - still try and help you complete your build; as economically as we can.

3. I bought this over a year ago and have only now started building it. Can you help me?

Unlimited help and support via email is available for 12 months. If you email us after this period, we will try and answer your questions. If you run into difficulty and damage any modules, we cannot guarantee being able to sell you a compatible replacement as we update our products frequently. We may be able to repair your existing modules, but please be aware there is a charge for this and we ask that you cover postage both ways.

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Basic Architecture:

The pre-amp circuitry is on the main central board. This includes both left & right channels. The circuit is arranged as follows:

1. Gain Stage
2. Gain Selection Switches
3. Defeatable EQ Filter (Fletcher-Munson)
4. Current Buffer/Follower Stage

Additional Boards connect to the host board via ribbon cables. These are:

5. Selector Switch
6. RCA Input/Output Array
7. Volume Control
8. EQ Switch

The Audio Signal chain looks like this:

Input Socket -> Selector Switch -> Volume Control -> PreAmp module -> Output socket

Note: The volume control is ahead of the PreAmp. This ensures that the pre-amp is very unlikely to clip and that its output impedance is as low as possible.

B-EX Bass Extension Module:

ZinAmp's B-EX Bass Extension system is an optional upgrade for this pre-amp. B-EX is an all-analogue bass extension module that boosts low-frequencies to compensate for the natural roll-off of your loudspeakers.

It extends the bass 'reach' of your system and is a practical alternative to a subwoofer

The amount of achievable bass compensation varies from speaker to speaker and is better suited to power amps of 75W and higher.

The B-EX Module replaces the EQ switch and the front panel is modified to accommodate a dial that allows the amount of bass-extension to be adjusted.

<https://zinamp.co.uk/projects/pre.html#B-EX>

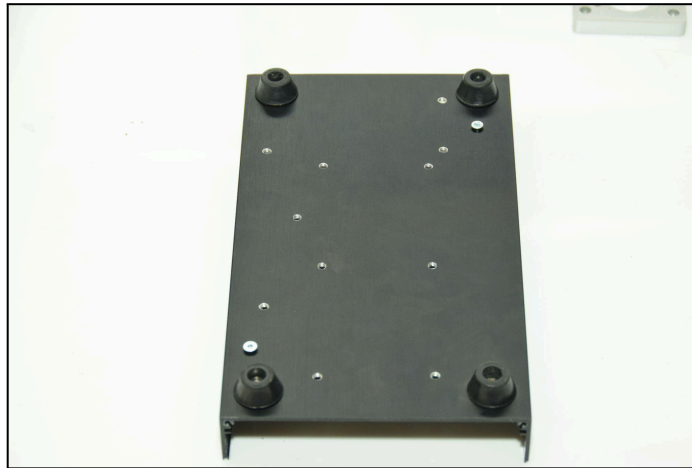
Assembly:

1. Check the holes in the enclosure are tapped

The metal enclosure has a number of holes in it. All of the 3mm and 4mm holes need to be tapped with M3 or M4 thread-tap. This may already be done, depending on the configuration of kit you have purchased. The larger holes i.e. those on the back and front panels.

2. Attach Rubber feet to Base

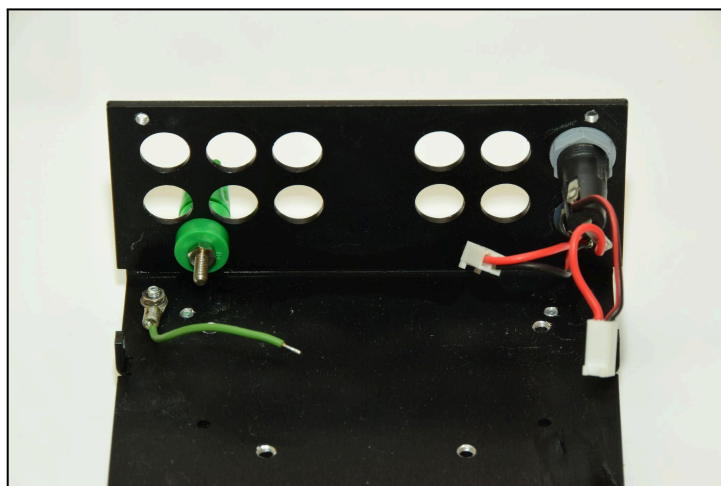
Depending on your kit configuration, you may or may not have feet attached to the box. These are screwed into the corners with M3 machine screws. Place a washer on each machine screw and punch a hole through the rubber foot with a screwdriver; this will allow the screw to protrude unhindered.



Enclosure Base with feet attached

3. Fit the Ground, Fuse and Power Terminals into the back panel

The In some cases these may already have been fitted

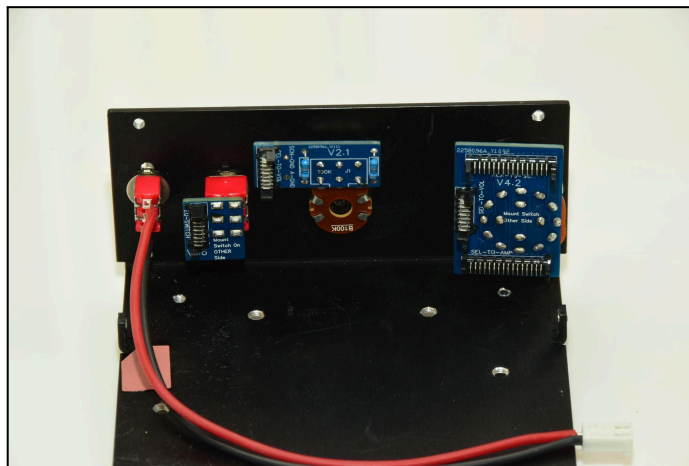


1. **Ground Wire** - 5cm green wire, connected to chassis
2. **Earth Pillar** - on back panel - green 4mm banana socket
3. **Fuse Holder** - fit a 1.5A slow-blow glass fuse and solder 5cm lengths of hookup wire terminating in a Molex KK254 connector block
4. **DC Socket** - Solder 5cm lengths of hookup wire - black -ve and red +ve. Terminate in a Molex KK254 connector block. Black on the left, Red on the right.

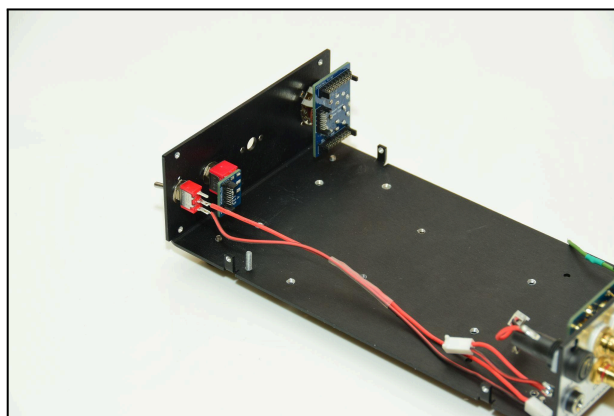
Note: Test the polarity of the DC socket by connecting the 18v DC adaptor. Use a multimeter and check the polarity is +ve on the red wire and -ve on the black wire. Getting this wrong may cause untold damage!

4. Install Switches and Volume Pot into the Front Panel

The power switch may already be fitted



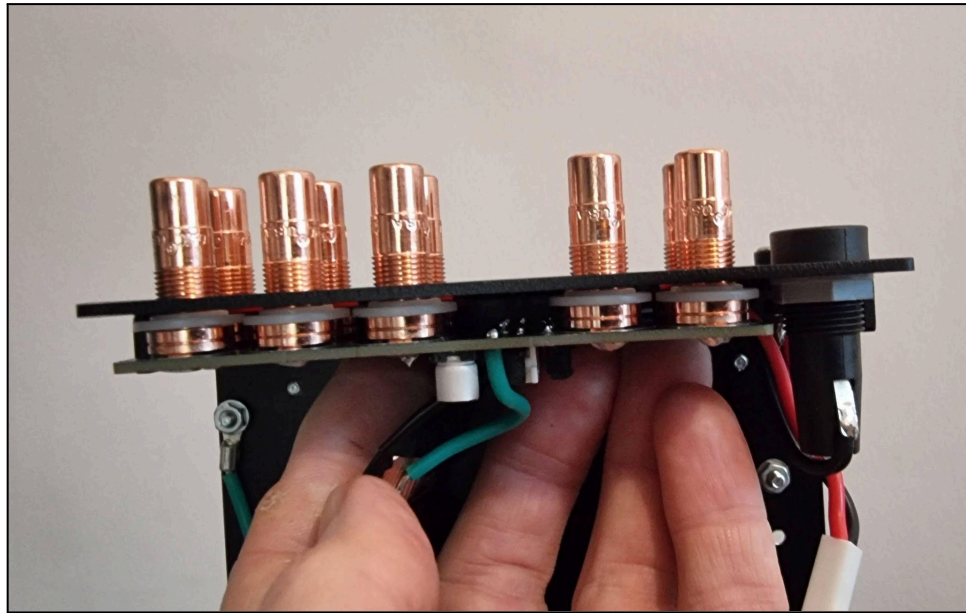
1. **Selector Switch** - observe the right way up by the writing on the PCB
2. **Volume Pot** - observe the right way up by the writing on the PCB
3. **EQ Switch** - observe the right way up by the writing on the PCB
4. **Power Switch** - The flat on the screw barrel of the switch should face 'up'. Solder two lengths of hookup wire - 220mm long, terminating in a Molex KK254 connector block. Connect the two lower pins of the switch. Leave the upper pin disconnected.



5. Fit RCA Array in Rear of Enclosure

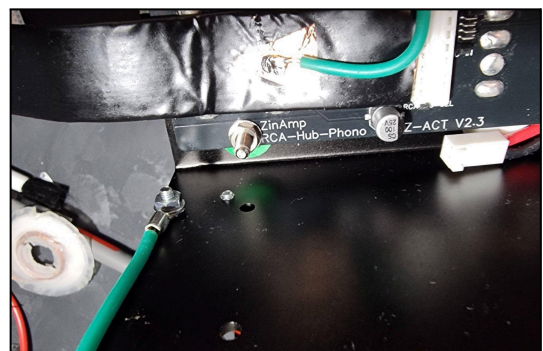
The RCA array inserts into the rear panel and is held in place with the nut of each RCA socket. The nylon shoulder washer goes in the inside and the plain washer on the outside, then the collar-nut.

This can be fiddly, so to avoid dropping washers on the floor, hold the RCA array with the RCAs pointing up and bring the metal enclosure down over the RCAs. Remove the metal collar-nuts and the outer washers and insert the RCAs into the rear of the enclosure as shown below. The shoulder washers should be on the inside:



Place a flat washer over each connector on the outside of the metal wall. Washers are coloured; red for right-channel and white for left-channel. Fit each collar-nut finger-tight for now.

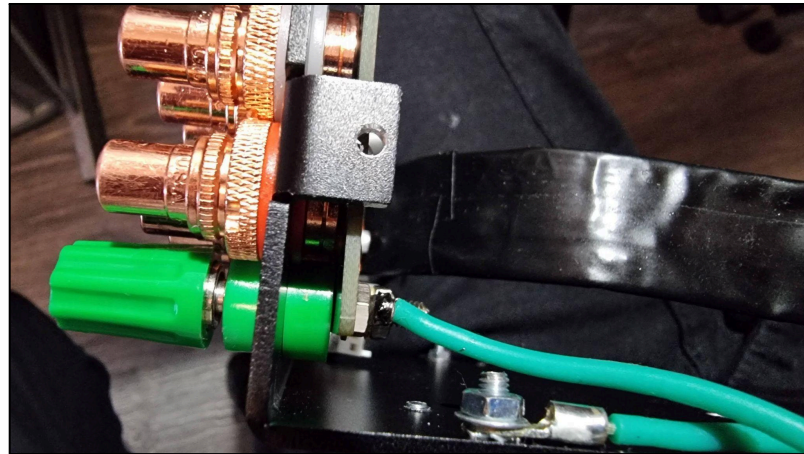
The green grounding pillar has a spacer on it (left). This fits between the RCA array and metal wall, as shown below (right):



Pass the grounding pillar through the metal hole, spacer and board and fit the first nut and washer to retain the pillar. Tighten this nut.

Tighten the RCA rings, ensuring the shoulder washers are all located in their holes.

Fit the second nut and the ground wire to the ground pillar and tighten.



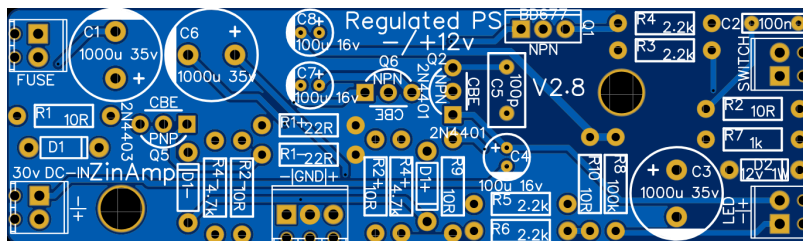
The collar-nuts need to be firmly but not over-tightened. This can be done with small grips, but these can scratch the collar-nut and other parts of the metalwork. For best results, use an RCA tool - [like this one](#) - from HiFi collective in the UK.



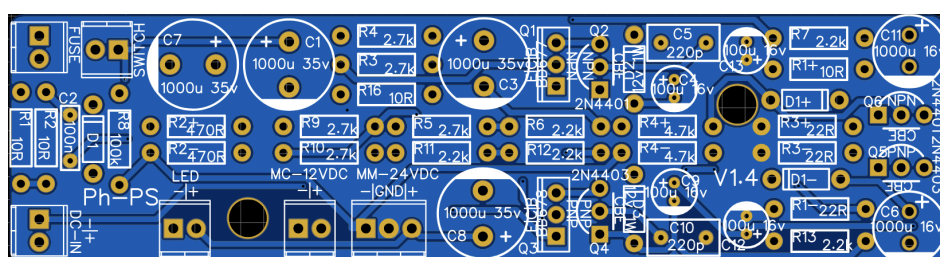
6. Install and Test the Power Supply:

Install the power supply module as shown on the following page. This sits in the right-hand portion of the base and is held in place with two nylon screws. These screw holes are diagonally offset, making it easier to spot them in the base.

There are two versions of this module - they both work in the same way but have slightly different layouts.



Type 1 - SWITCH terminal at right-hand end



Type 2 - SWITCH terminal at left-hand end

Connect the power supply terminals in the following order:

- DC-IN - two-pin connector
- FUSE - two-pin connector
- SWITCH - two pin connector

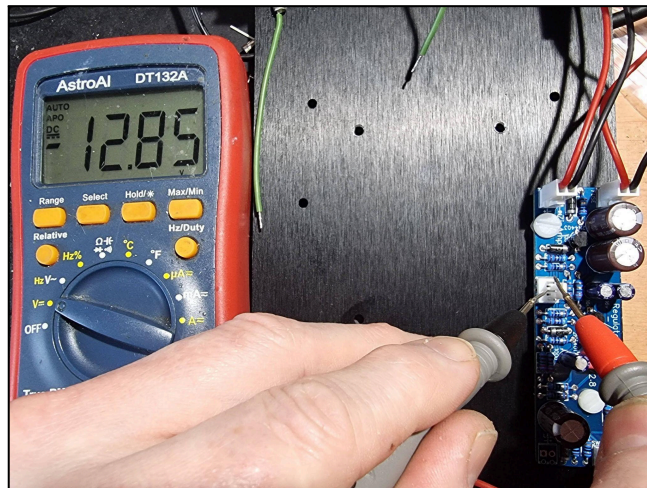
Ensure you have identified these before connecting - avoid plug and pray!

Power Test

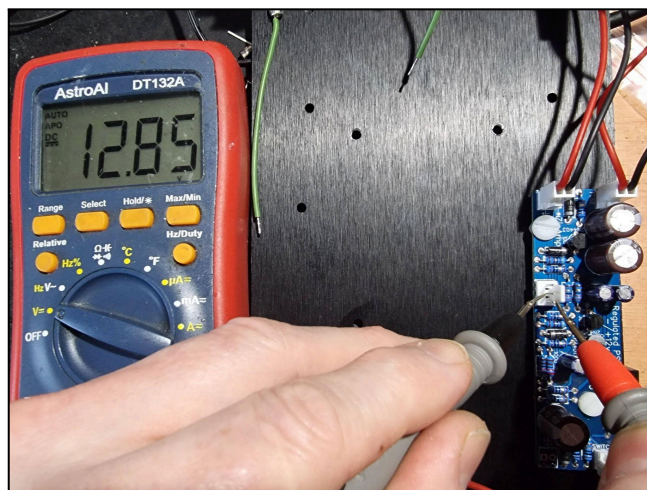
Connect the 30v DC power supply to the back of the enclosure and switch on at the front. We need to check the voltages at the output terminals of the power supply.

Set your multimeter to DC and carefully place the black probe down into the centre terminal. Care must be taken not to short the adjacent pin with your meter probe.

Note: the power supply voltages take a few seconds to reach 12v. This is intentional as it prevents thumps and cracks in the audio path at switch-on.



Negative Terminal - approx -12v



Positive Terminal - approx +12v

Place the red probe on the -ve terminal and note the voltage - it should read approximately -12v. Then check the +ve terminal - it should read approximately +12v i.e. similar. If you are seeing readings different from this, email help@zinamp.co.uk before continuing.

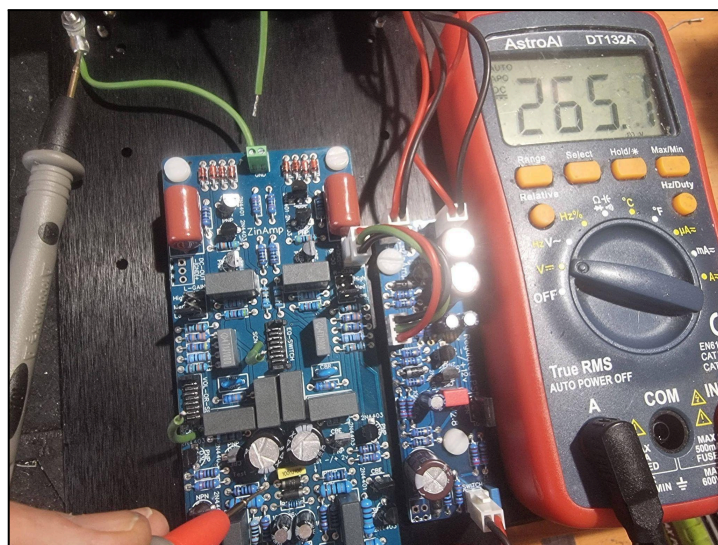
7. Install and test the Pre-Amp Module

Fit the pre-amp module to the bottom of the board as shown. There are four nylon screws with which to fix this module in place.

Insert the chassis ground wire into the ground terminal and connect the power cable as shown.

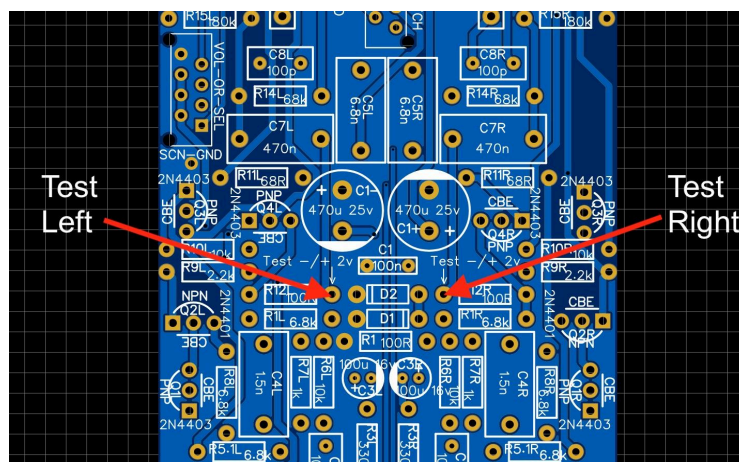
Before connecting anything else to the preamp module, we need to perform a line voltage test. This is very simple to do and tests that the pre-amp circuit is correctly biased. If it is not, then you are unlikely to get a signal from the amp.

The image shows two voltage check-points. These need to show a DC voltage of between -2v and +2v - i.e. near to zero-volts.



Meter showing 265mV or 0.265v at the test point on the left channel

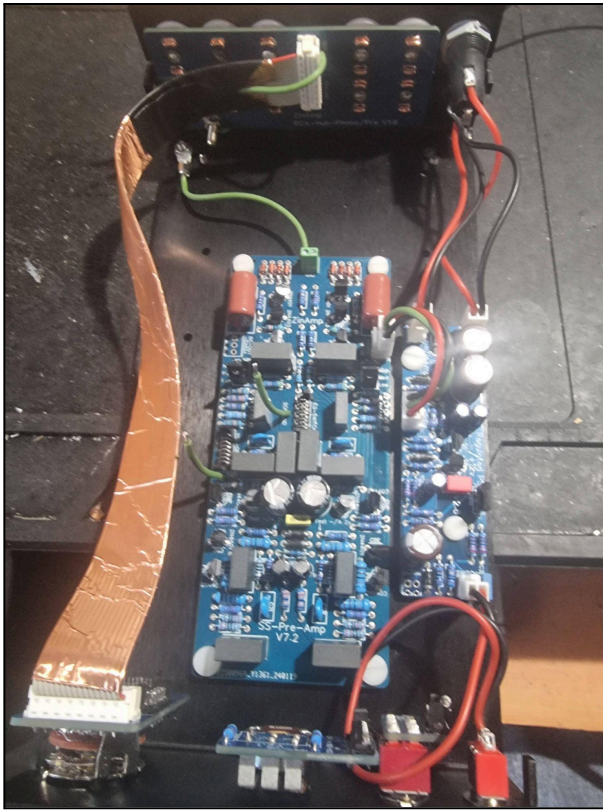
Repeat this test for both left and right channels using the points shown below:



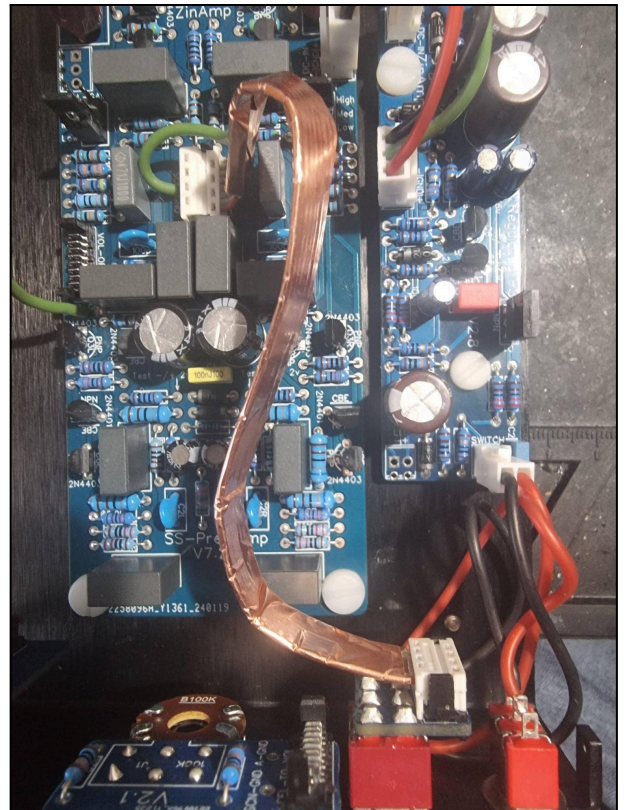
Place the black probe of your meter on the ground screw in the chassis floor and the red probe on each of the measuring points shown in turn i.e. one at a time. The voltages want to be very similar. E.g if the left reading is 1v and the right reading -2v, there may be a problem. If, for example, they both read 0.5v, we're ok to proceed.

8. Connect Boards with Ribbon Cables

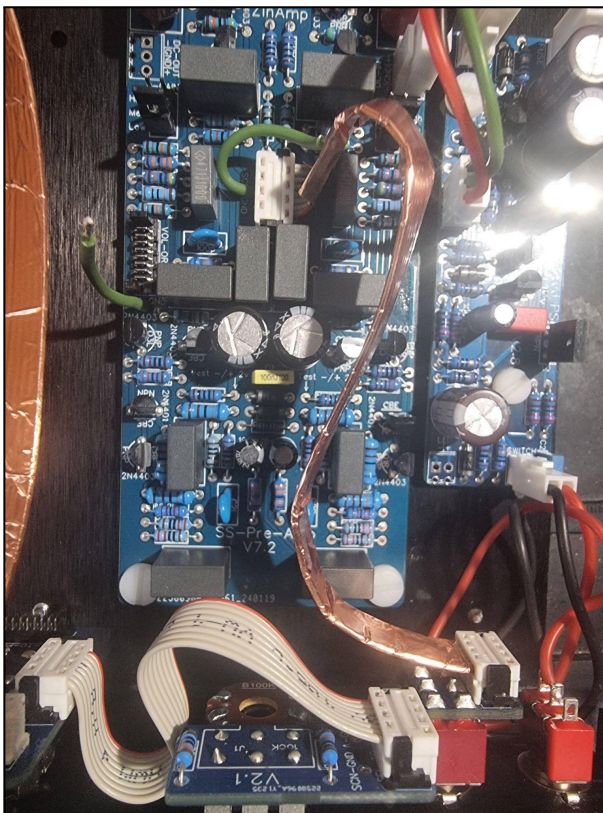
Make the following connections using the ribbon cables provided:



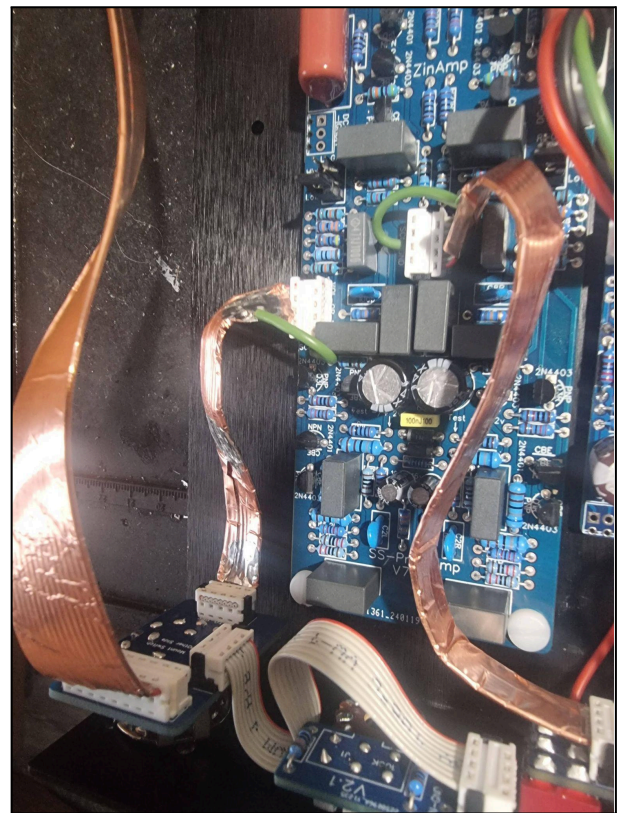
1. RCA board to Selector Sw.



2. EQ Sw. to PreAmp



3. Selector Sw. to Volume Pot



4. Selector Sw. to PreAmp

Note: Some of the ribbon cables above are screened in copper. This is optional for this line preamp. Unscreened ribbon cables should work perfectly well and you should not experience any hum or other noise as a result.

9. Audio test

Connect a line level audio source, like a CD player to Input 1. Turn the selector switch fully anti-clockwise to select input 1.

Connect a power amp to the volume controlled output RCAs. This is the pair of outputs on the far right. Only connect a power amp to the far-right RCAs

WARNING

DO NOT CONNECT YOUR POWER AMP TO THE OTHER OUTPUT RCAs. THESE ARE FOR LINE-OUT AND WILL GIVE YOUR POWER AMP A FULL LINE SIGNAL THAT MAY CAUSE DAMAGE.

Use the volume control to control the signal output

10. Fit Lid and Front Panel and Dials

The bag of screws provided are used to fix the front panel and lid. The counter sunk screws go in the side holes. The pan-head screws in the back and the Allen bolts in the front.

DON'T OVER-TIGHTEN - Aluminium threads strip easily!!

Dials require an allen key key to tighten them.

11. Final Clean

Clean off any finger marks or first using a fibre cloth sprayed with a little water-based glass cleaner (windex etc). Don't use metal polish or anything abrasive, nor any solvents. Don't use WD40 or metal-polishes like Autosol or Brasso as these can damage the Anodise finish.

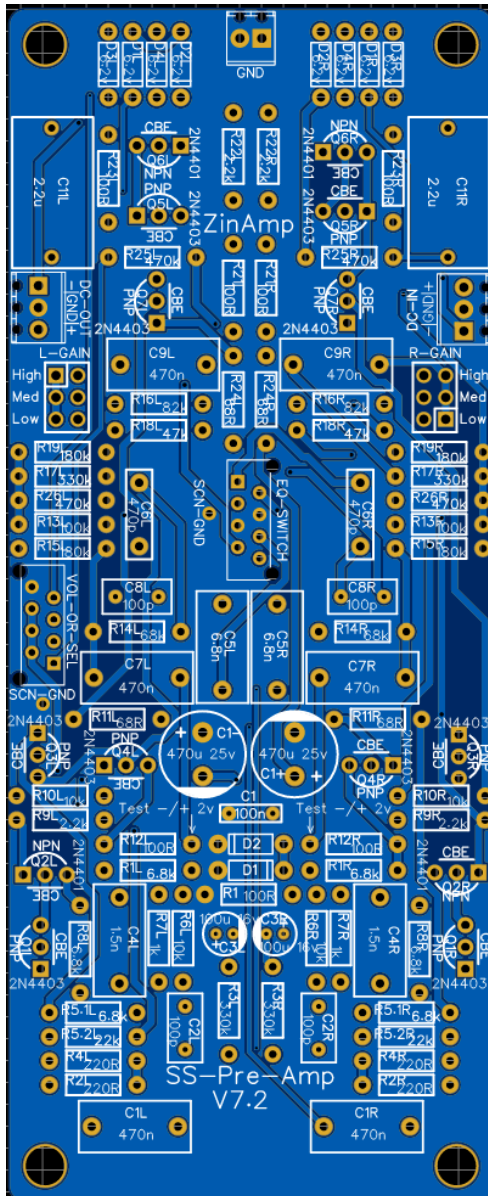
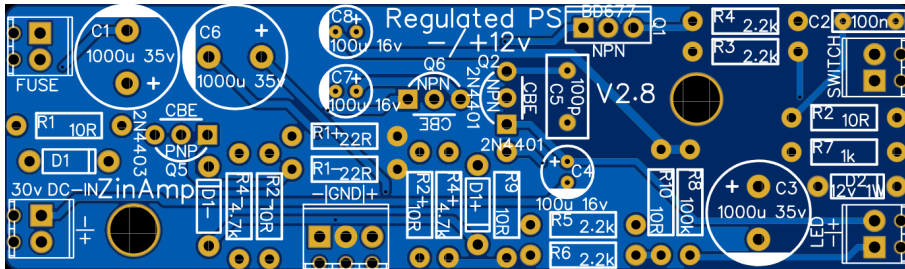
You may find a nice lustre can be applied to the anodised finish by wiping a small quantity of petroleum jelly (Vaseline) into the bodywork and front-panel and wiping off with a soft cloth. Use sparingly and apply evenly. An even lustre takes time and care but is worth the effort and is surprisingly resilient to further finger-marks.

Appendix A

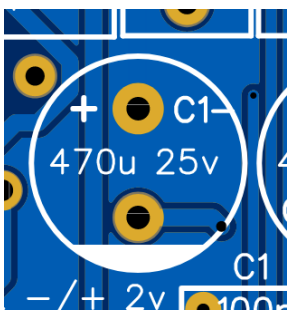
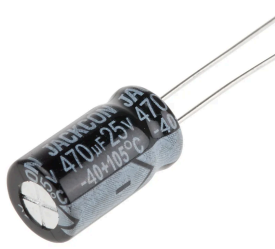
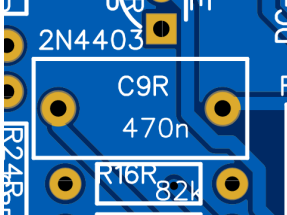
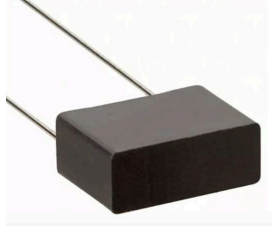
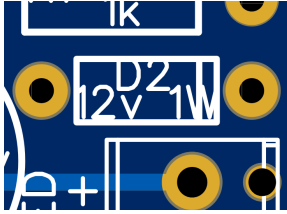
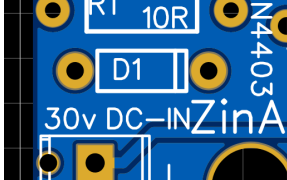
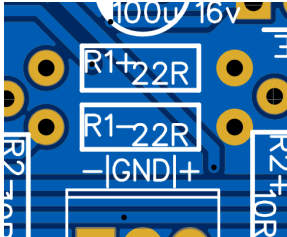
If you are assembling the power supply and preamp boards yourself (i.e. soldering in components), then please read the following. These are pointers and useful tips that will help you to avoid mistakes during assembly.

PCBs

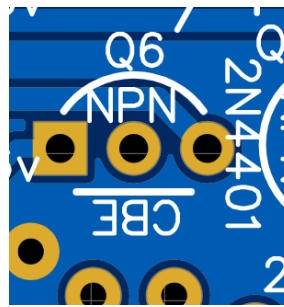
The power supply and pre-amp PCBs are shown below. The following pages provide a more detailed view of the components on them.



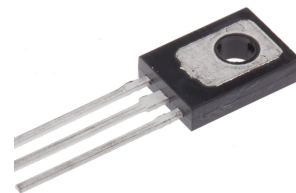
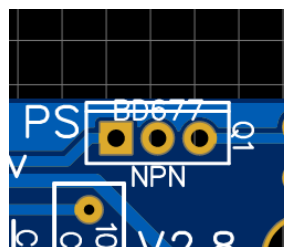
Component Types

Electrolytic capacitors are generally used to store charge and smooth ripple in the DC power supply. They are indicated with a 'C' prefix. They have a polarity and the +ve pin is indicated by the '+' sign. The white area indicates the negative pin. These will be marked on the body of the capacitor itself. Getting these the wrong way around usually causes them to burst, blow or bloat (visibly)		
Film Capacitors are used in the signal path for EQ filtering and electrical decoupling. They are indicated with a 'C' prefix. They are bipolar meaning they can be fitted either way around		
Zener Diodes are used to regulate or limit voltage. A zener is indicated on the board by its component name with a 'D' prefix and a voltage value. It may also have a power rating. The example here shows D2 as a 12v Zener rated at 1watt. A zener has a polarity and this is indicated by the markings on the board and the component.		
Diodes are used to block current in one direction whilst allowing it to flow in the other. These should not be mixed up with zeners as they also have a 'D' prefix. A diode has no voltage marking, just a component number. It must be inserted as indicated by its markings. The example here shows D1 as a diode.		
Resistors are used in a variety of applications - generally to limit the flow of current. They have no polarity and are indicated with an 'R' prefix.		

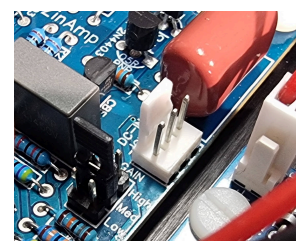
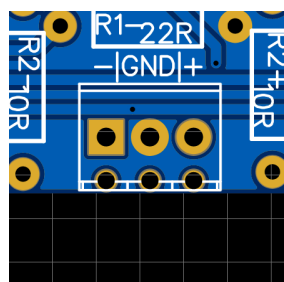
Bipolar Transistors (TO92 package) are used for switching, current regulation and signal amplification. They can be one of two types (PNP or NPN) and have a pin orientation (e.g. CBE). These are all marked on the boards. Care must be taken to ensure NPN and PNP types are not mixed up and are inserted the correct way around. CBE refers to Collector|Base|Emmittor.



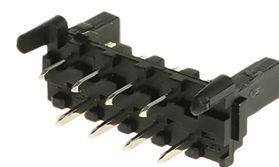
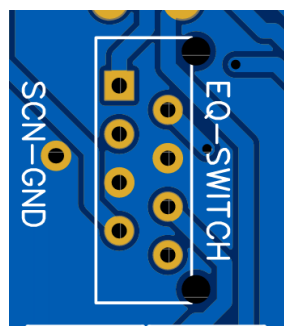
Bipolar Transistors (SOT32 package) are used for current regulation. There is only one and it's an NPN type with a pin orientation of ECB i.e. Emmittor|Collector|Base. These must be fitted the correct way around. In this example, the metal back of the transistor faces away from the edge of the board i.e. on the side marked BD677. The plastic front faces the side marked NPN.



Molex PCB Headers come in 2-pin and 3-pin types. They are soldered into the board with the shroud-tab inbound to the board. If these are soldered in the wrong way around, you can lift the shroud off of the pins, turn it round and place it back down on the pins - using small pliers.



Molex Picoflex Connectors are used to connect ribbon cables to the board. They come in different sizes - (8-pin and 16-pin). They have a way around which becomes obvious when attempting to fit them. The pins are small, so use a small solder tip to avoid joining adjacent pins with stray solder.



Jumper Pins are found on the pre-amp board and they allow the gain of the pre-amp to be adjusted (low | med | high). There are two sets of pins - one for the left and one for the right channel. Each set of pins should have a single 'jumper' on it. We recommend setting this to 'Low' initially. Use a small soldering tip for these to avoid shorting adjacent pins with stray solder.

