

PAS-NG/NGT New Generation Tube Preamp

Assembly, wiring and installation instructions

This kit is based on our most popular PAS2/3 upgrade kits, and will give you an outstanding tube preamp performance comparable to units on the market costing two to three times more!

We offer two versions of our PAS-NG. With and without tone controls.

Instead of providing you with one large cumbersome manual, we provide you with the individual pcb kit instructions. This will allow you to construct each pcb, and when completed, simply install that pcb into the chassis and when all individual pcb's and parts are installed, proceed with the wiring, checking of all connections, power up, testing and enjoying your favorite music.

Although it is not essential that you have an understanding of tube circuitry, it is however important that you know and are comfortable with assembling pcb's, know how to read and identify resistor color codes as well as capacitor codes.

Here are some useful links to help you read resistor colors, as well as identifying capacitor codes, if not sure, just use your digital multi meter to check the resistors value, and if you have a capacitance meter or your digital meter has the ability to read capacitance, use that as well.

We are assuming that you are familiar with audio kit building and good wiring practices, being able to read and understand wiring diagrams as well as high voltage AC and DC handling. This kit IS NOT recommended for a first timer/beginner!

<http://www.digikey.com/en/resources/conversion-calculators/conversion-calculator-resistor-color-code-4-band>

<http://www.buildcircuit.com.au/capacitors/>

You should also have a very good understanding of soldering techniques and be able to neatly wire up the preamp chassis to ensure a noise free tube preamp.

As with all tube circuits, the PAS-NG works with **VERY high DC voltages, up to about 280VDC!**

These can be lethal to you, so you must take EXTREME care when you power up this preamp for the initial testing and when taking measurements with your meter.

The kit pretty much comes with all parts necessary to build it, including a set of tubes if you've ordered them with the kit.

You will need to provide the following tools. A good quality soldering iron, good quality solder with flux, small pair of small nose pliers, wire cutters, screw drivers and a multi meter, preferably a digital meter, as they are far more accurate than analog meters.

Take your time assembling the individual pcb's, check three times...solder once! Also take careful note of the orientation of diodes, semi conductors and electrolytic capacitors. Installing these components the wrong way and powering up will in most cases damage those and possibly other components as well, resulting in costly replacement of parts.

When assembling pcb's, always start with the lowest profile components first such as resistors and diodes, then work your way up in component size. Install at most half a dozen components at a time, check their values and orientation again before soldering them in, trim the excess leads off, then move on to the next lot of components. Once you've completed one pcb, check it over, then check it over again! Make sure all solder joints are clean, have a nice silvery shine to them and never use too much solder. It is better you start with a small amount of solder, check the joint and add more if necessary.

There are very good instructional videos on YouTube on soldering techniques.

If you're not sure, do some practice soldering before starting on the pcb's.

There is no set way as to which pcb to start with, pick one and get started. Once completed, as mentioned above, check all components and solder joints, then start on the next pcb.

Once you have completed the assembly of all pcb's, then move on to installing the other components such as volume, balance, tone controls (only if the tone control option is ordered) and switches.

A note on the tone controls (only if the tone control option is ordered). DO NOT solder the tone potentiometers to the tone pcb yet, instead, install each tone control potentiometer it is place on the front of the chassis with each potentiometer's pcb tags facing each other, see photo's. Line each potentiometer up as 'squarely' as possible and do not fully tighten its mounting nut yet. Then, carefully push each tone potentiometers mounting tabs through each appropriate hole on the tone pcb, making sure the pcb sits nice and even, then solder each potentiometer's mounting tab on the tone pcb, trim off the excess, and only then fully tighten each potentiometer's mounting nut. This way you will ensure that all the potentiometers are nicely and squarely lined up.

Now install each pcb.

Take note with the power supply pcb. Refer to its instructions and you will notice that extra mounting holes will need to be drilled. We are giving you two options. Drill the additional holes and use the aluminum spacers and screws to mount the power supply pcb, or do not drill any additional holes and use the self adhesive pcb stand offs instead. Either will work just fine.

Once all that is done, start with the wiring.

Use the supplied 24gauge twisted red/white, for right channel, and green/white, for left channel, audio wiring, such as to the selector switch, Tape/Source switch, in and outputs and tone control wiring.

For pcb B+ and ground use the 18 gauge red & black wires respectively, for filament F+/H+ & F-/H- use the 18 gauge yellow & brown, for the PCB ground connection to star chassis star ground use the 18 gauge green wire and for mains wiring use the 18 gauge white wire, TWIST the white wires. It is really important that all AC wiring is twisted, see photo's. It is easier if you pre twist a length of a pair of the white hookup wire, then just cut to required length and install.

Use the Mogami black shielded audio wire for the phono inputs ONLY, ie from the RCA PHONO sockets to the Z-PH10 inputs.

Try and keep AC wires away from DC and signal wires to minimize possible noise pick up into the low voltage signal wiring.

Follow the wiring diagrams in the respective preamp pcb assembly manuals for all audio connections..

For the selector switch to RCA socket wiring, please refer to the **Selector Switch and Audio Signal Wiring** sheet.

Use the provided zip ties to keep each bundle of wires neat, see photo's. Also use the provided self adhesive zip tie mounting tabs to hold the wiring neatly in place, see photo's.

Although not really necessary, even twist all DC power supply wires, such as filament and B+, it makes the whole installation look neater and it is in fact easier to keep the wires neatly placed inside the chassis when they are twisted.

Once all the wiring is complete, just as you did with the pcb's, check it all, then check it again, and THEN check it again! ☺

Makes sure all solder joints are clean and NOT dry, check for any possible shorts to chassis as well, except of course for the ground connections, which are connected to the chassis.

IMPORTANT NOTE ABOUT SAFETY:

We cannot stress enough that you are dealing with high voltages on this preamp, up to 280VDC and 230VAC. These voltages are lethal and can and do kill! Be extremely careful when taking the following measurements!

Once all is good, do not install any tubes yet, but power up. Set your volt meter to DC volts, we will be reading close to 300VDC.

Switch the unit on, and check for any unusual noise or even smoke! If something does not look right, immediately power down and check all connection etc. again.

Once all seems good, put the black negative meter lead to a GND tag on the power supply pcb, and the red positive lead of the meter to one of the B+ tags at the bottom left of the power supply pcb. You should get a B+ reading of anywhere between 260 to about 280VDC. You will get a higher than normal B+, since there really is no load on the power supply yet. If all is good, now check the 24VDC filament supply.

Put the black meter lead one of the H- tags on the power supply pcb and the red lead on the H+ tag of the power supply pcb. You should get a reading of 24VDC, +/- 1V or so.

If all is good, power down and allow the capacitors to discharge for a minute or so.

Now plug all the tubes into their respective pcb's. Make sure they are seated correctly and no pins of any of the tubes are bent out of shape.

Power up, wait about 10s and take another B+ reading at the power supply pcb. You should get about 265VDC at B+L and about 255VDC at B+P with reference to ground. This can vary a little depending on your household mains.

Now check across AIK H- and AIK H+, you should still get a reading of 24VDC or so.

If all is good, power down and connect a peripheral audio device, such as your phono player, CD or tuner, select the appropriate input, and connect the output of the preamp to the input of your power amp.

Make sure the volume on the preamp is set to zero and balance is centered.

Power up the preamp, wait a few seconds, power up your power amp and with a music source playing, slowly turn up the volume on the preamp.

If all is well, you should start hearing music. Check to see the balance control is working correctly.

Let the preamp run for a while with the cover off, keeping an eye on it, and making sure there are no unwanted smells or smoke signals!

If you hear or smell something that you should not, power down immediately, disconnect the power plug from the wall outlet and do a full visual check, making sure all the wiring is still good and nothing is shorted.

If all is good, power down and disconnect the power plug from the wall outlet.

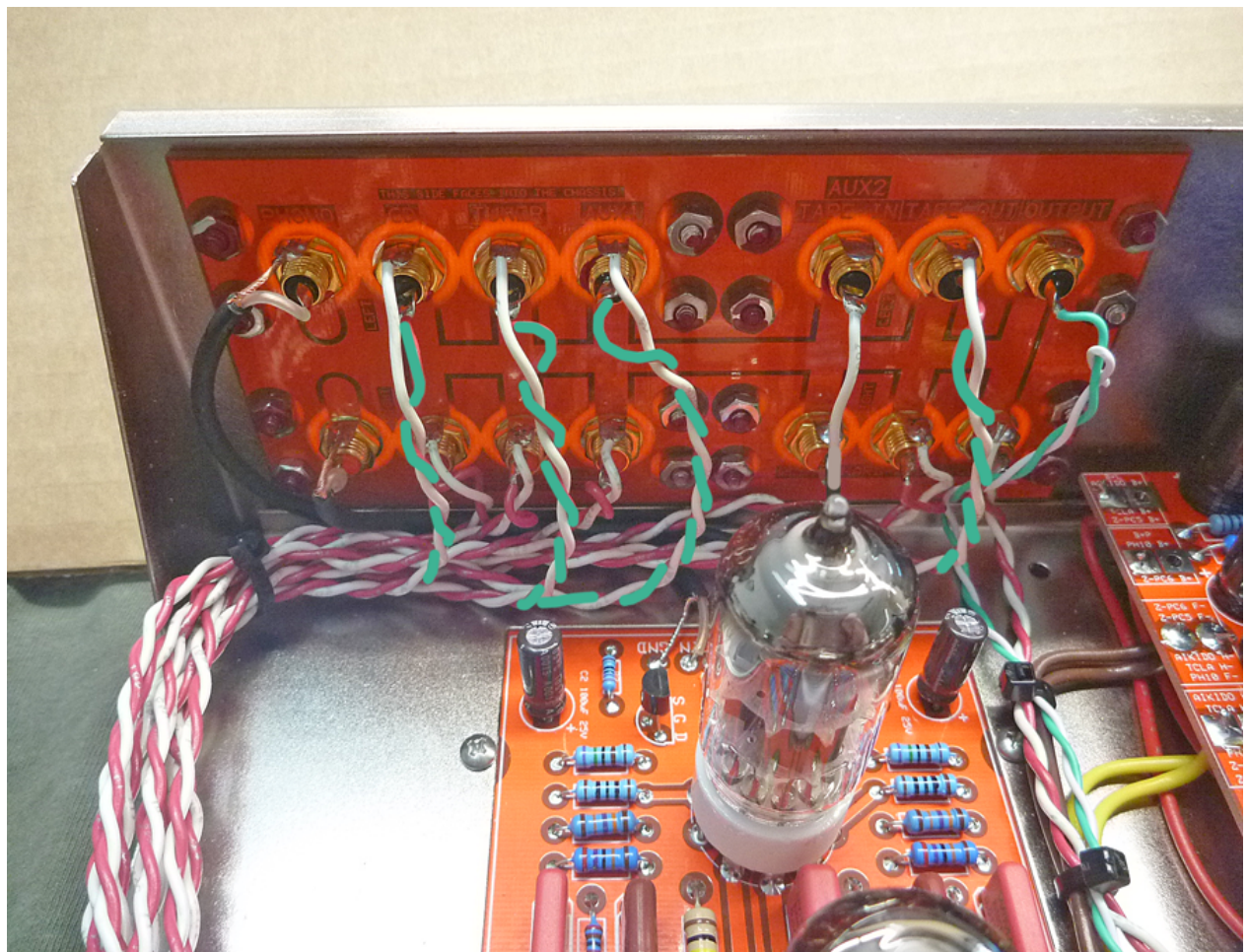
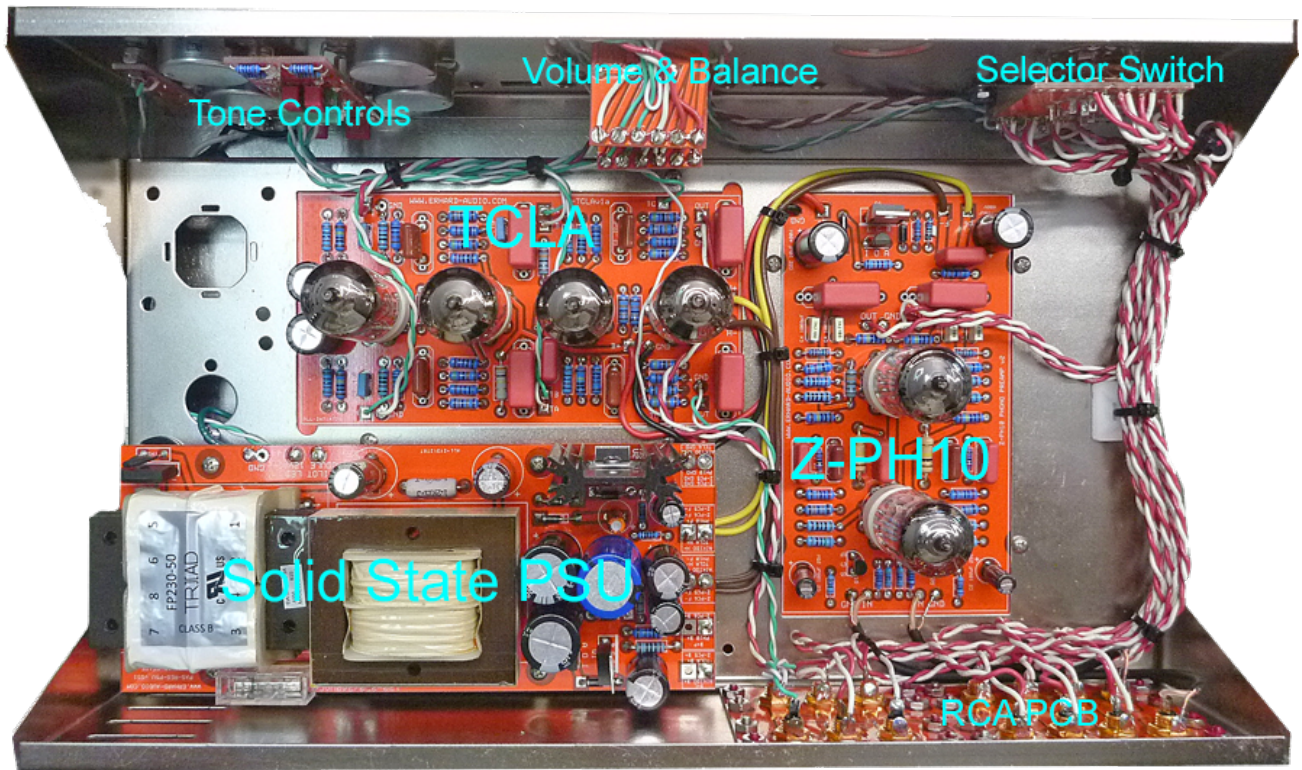
Do one final check of all your wiring, making sure no wires are pinched and nothing is close to being shorted to chassis ground and that all tubes are seated straight.

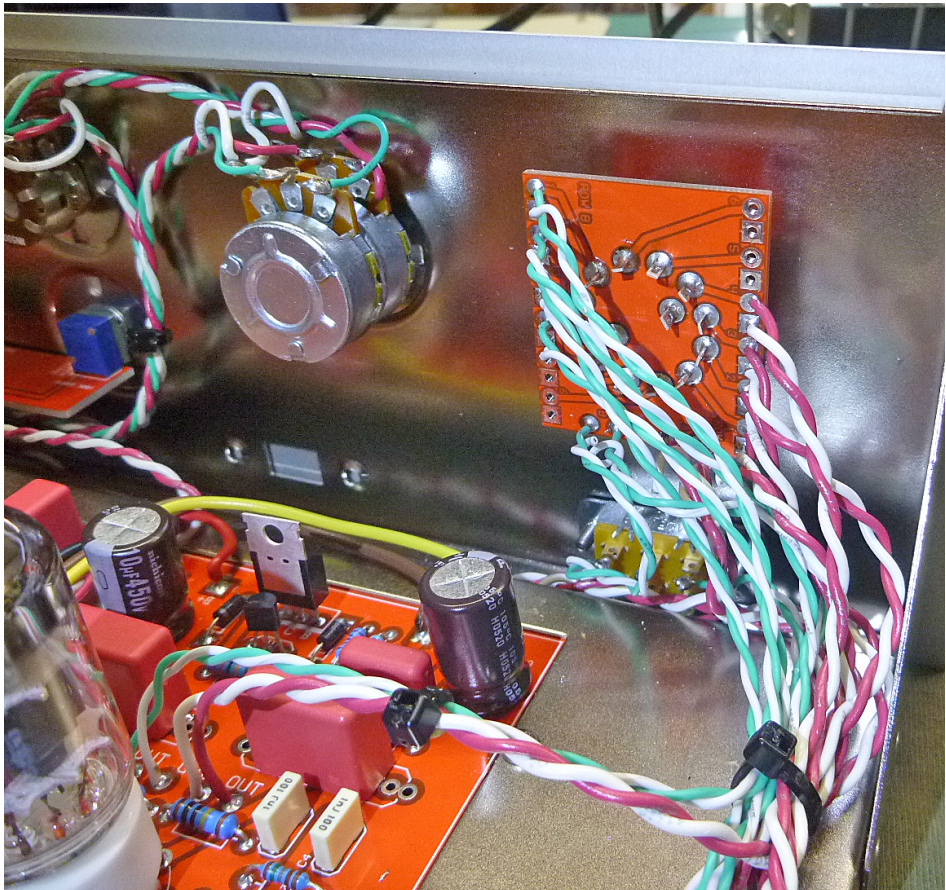
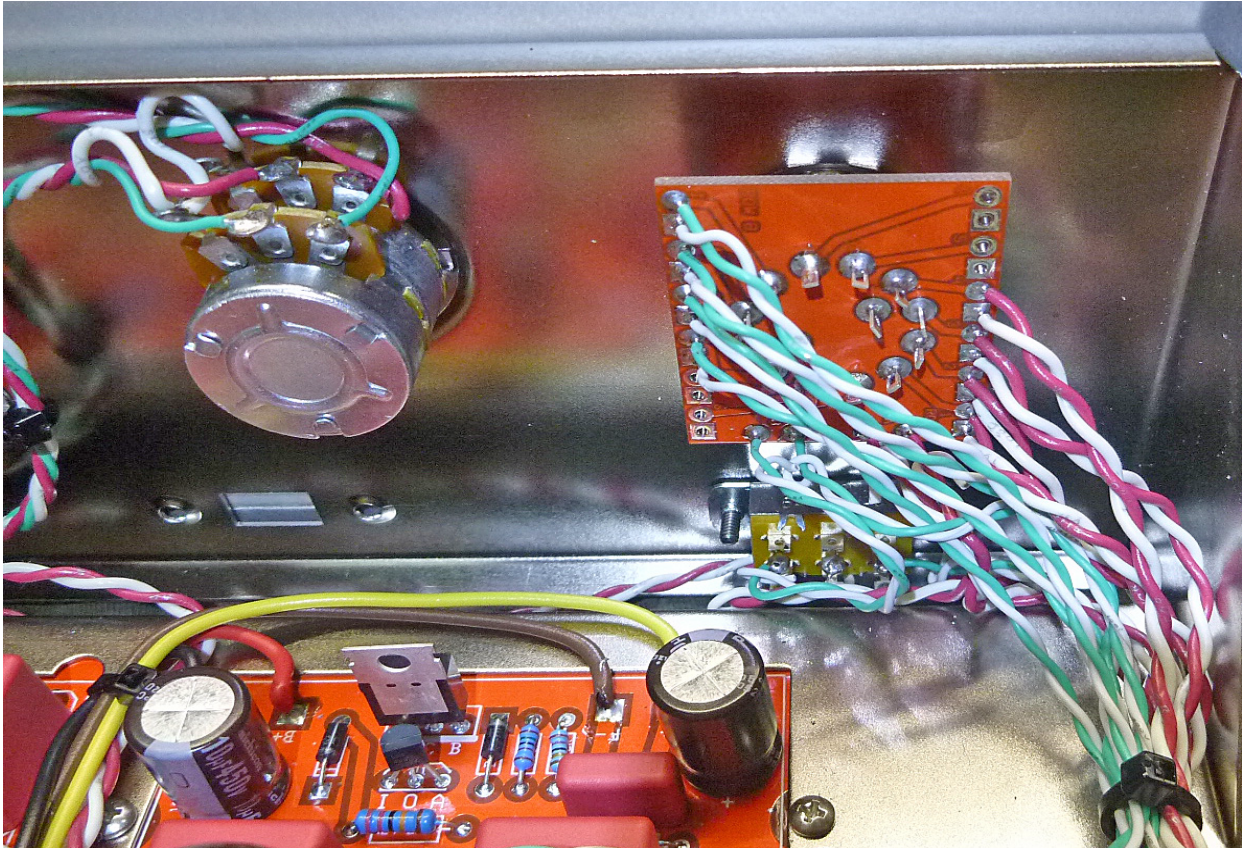
Install the chassis cover and place your preamp in its spot!

You now ready to enjoy tube music!

The following photo's just give you an idea on how a finished upgraded PAS3 looks like. Even though this is an old chassis, your new kit should look very similar.

Also note the wiring of the selector switch, and note how the ground wire, at the selector switch end, is curled back, yet the RCA I-O pcb end MUST be connected, so each ground wire is grounded. This will still give each signal wire an excellent shield!





Abbreviations used on the pcb's

B+P = Z-PH10 phono preamp B+

B+L = TCLA or Aikido tone control/line preamp B+

F+, F- = Filament plus and minus

H+, H- = Filament plus and minus

GND = ground

TA, TB & TC = tone control wiring between the tone control pcb, where the potentiometers are mounted and the main TCAL pcb

Supplied wires and their uses

The pre twisted 24gauge wires, typically red/white (used for right channel wiring) and green/white (used for left channel wiring), should be used for all signal wiring, such as from the RCA pcb to the selector switch, volume and balance controls and the taper/source switch.

The colored 18gauge wires are used for all power supply wiring.

Yellow for F+/H+

Brown for F-/H-

Red for B+

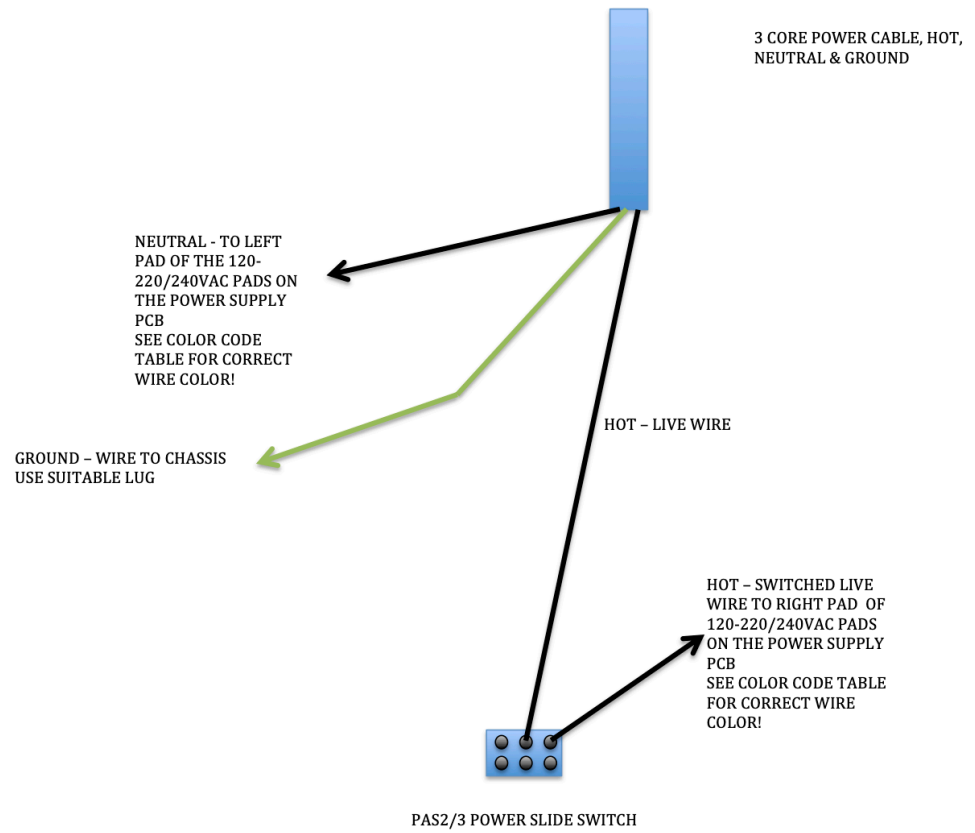
Green for ground

Black for AC HOT wiring

White for AC NEUTRAL wiring

The Mogami shielded cable for Phono input only, that is, phono RCA in sockets to phono pcb inputs only

Power cable wiring



Make sure that the HOT wire is the one that gets connected to the power switch, NOT the neutral wire!

COLOR CODE TABLE FOR POWER CABLE CONDUCTORS

| Conductor Color Coding | | | |
|-------------------------------|----------------------|-----------------------|---------------------|
| Conductors | International | North American | Japanese |
| | 2 Conductors | 2 Conductors | 2 Conductors |
| Line | Brown | Black or Brown | Black |
| Neutral | Blue | White or Blue | White |
| | 3 Conductors | 3 Conductors | 3 Conductors |
| Line | Brown | Black or Brown | Black |
| Neutral | Blue | White or Blue | White |
| Ground | Green/Yellow | Green or Green/Yellow | Green |
| | 4 Conductors | 4 Conductors | 4 Conductors |
| Line | Brown | Black or Brown | Black |
| Line | Black | Red or Black | Red |
| Line/Neutral | Gray | White or Gray | White |
| Ground | Green/Yellow | Green or Green/Yellow | Green |
| | 5 Conductors | 5 Conductors | |
| Line | Brown | Black or Brown | |
| Line | Black | Orange or Black | |
| Line | Gray | Red or Gray | |
| Neutral | Blue | White or Blue | |
| Ground | Green/Yellow | Green or Green/Yellow | |

International conductor color coding per IEC 60445 Section 6 and IEC 60227-1 Section 4.1.2
 North American conductor color coding per UL 82 and CSA C22.2 No. 49
 Japanese conductor color coding per JIS C 3306

Note on Flexible Cable: Color codes listed on this chart are typical for what is seen in flexible cable. Other colors may be used for certain conductors according to the application.

We cannot take ANY responsibility for mains, and for that matter, ALL high voltage AC and DC wiring you carry out. We have described in this, and all of our other manuals, as best as we can, on how to wire up these high voltage connections.

You MUST take EXTREME care, that no wires are shorted together, or to the chassis, or any other part of the assembly and pcb's.

All these high voltages can be life threatening, and can hurt you or others if carried out incorrectly.

Use your meter in the continuity setting to make sure no high voltage wires are shorted together or to chassis ground.

Apart from bodily harm, incorrect high voltage wiring can and will damage components!

You are totally and solely responsible for all high voltage wiring and the general assembly of this kit!

We have wired our prototype amp exactly as described in this and all of our other manuals, so we know that the amp will work as designed and intended!

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