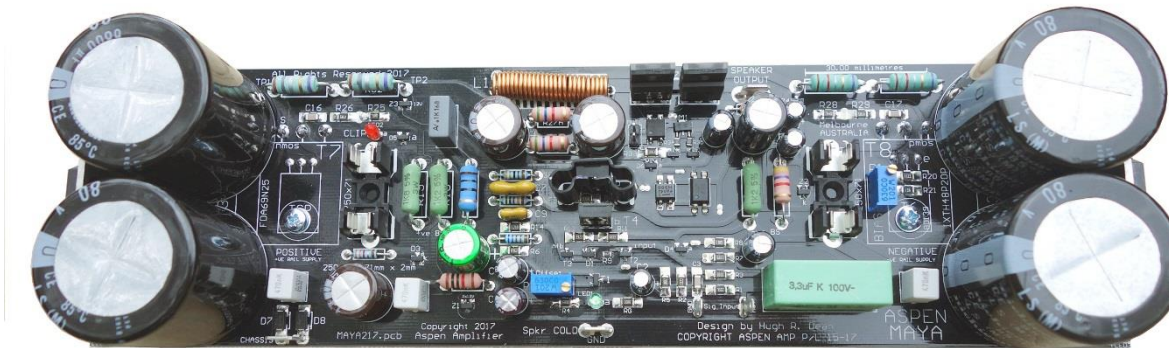


MAYA 200 MANUAL

September 20th 2017



Description

The MAYA 200 is a stereo solid state Class AB power amplifier of unconventional design delivering 203 watts RMS into an 8 ohm load using two 45-0-45 V power transformers. The Maya 200 was engineered after 25 years of careful study of human hearing and is designed specifically for the music lover and discerning audiophile. It is the flagship of the Aspen range and offers compact design, superb sound quality and artisan build standards at moderate cost. It suppresses odd order harmonics whilst enhancing second and fourth harmonic, giving a rich, textured sound to recorded music fulfilling the demand of music lovers worldwide; the sound quality of a tube amp and power and impact of solid state. The MAYA 200 recreates a spatial, realistic natural sound, delivering a palpable engagement for listeners of recorded music. The listener is enveloped with the musical performance. The designer, Hugh R. Dean, has more than 25 years of experience in designing, building and selling high end audio amplifiers.

The MAYA Stereo amplifier uses two independent modules, each 250L x 70W, each mounted onto 350Lx100H heatsink. Each module requires a 300VA high quality toroid to generate sufficient power and to avoid issues with transformer hum and interaction. Each MAYA 200 module is built onto a single high quality 2mm thick double sided circuit board and includes all power supply circuitry which integrates both independent power supplies and is fitted to a wide cast Aluminium heatsink which is 350mm long by 100mm with 5mm air space between each fin. The Maya is sold as two modules (with heatsinks) at lower cost, a kit: AND as fully built plug 'n play, with a two year warranty.

The MAYA 200 Sound

The MAYA 200 delivers low frequency grip, startling dynamics, strong clarity and astonishing depth of image. Discerning audiophiles try to 'see into the music' in their systems, seeking beyond the electronics in the experience. The warm, large scale sound and image depth of the MAYA 200 is a revelation for a solid-state amplifier, reflecting unique first and second stages which use single-ended topology, unusual feedback regimes and unique mosfet drive. The power supply is also pivotal to the sound of in the MAYA 200 with independent, integrated supplies for each rail delivering zero hum and clean energy in all musical situations.

The MAYA 200 features a benign harmonic profile with a second harmonic dominant artefact and a linear, monotonic reduction of higher harmonics. The odd, higher harmonics are very low, typically -100dB and lower which confers a natural presentation for the human ear thus a warm and musical engagement with fine resolution. The MAYA 200 circuit topology also offers extraordinary reliability with low stress component use.

Philosophy & Design

The MAYA 200 is designed to a philosophy and built to high standards. The philosophy follows a unique Class AB solid state mosfet topology with low global feedback and careful operating points to yield a musical harmonic profile with unusual stability into any reactive load. Each MAYA 200 module uses two independent power supplies, one giving +65V rail, and the other -65V. The common ground is at DC only; there is no connection to a center tap on the transformers. The output devices incorporate a temperature sensor and are mounted beneath the circuit board directly onto a large heatsink. The module is assembled with

premium quality components and is tested for high quality performance, efficient durability, and cool running for the domestic environment. Use of surface mount components permits a compact, reliable and elegant layout. The output devices are a pair of high duty, complementary mosfets per channel. Other features are rail indicator LEDs, a bipolar power output connector for powering accessories, a chassis earth lift, and high quality, insulated rail fuseholders. The MAYA 200 circuit board is supplied directly mounted on drilled, tapped cast Al heatsink, and requires you to supply a 300VA toroidal transformer with two, independent 45Vac secondary windings (NO CENTER TAP). The MAYA 200 runs in Class AB at low dissipation delivering dynamic, large sound scale, with power, slam and clarity to rival the best Class A designs with none of the troublesome thermal problems. Power consumption of both channels at idle is 20 watts. Key aspects of the MAYA 200 design are:

- Single module with one power amplifier and two integrated power supplies, one for each rail, including a carefully design earthing systems for low noise.
- Very large mosfet single pair output stage, each rated each to short term 480W dissipation.
- Surface mount resistors with large pads, conferring high packaging density, high dissipation and reliability. In critical sonic areas, high quality thin film resistors are used. Larger, axial leaded resistors confer high thermal loading and low noise.
- Low impedance output bias circuit offering high efficiency, high current and high linearity of the output mosfet transistors.
- Unique voltage amplification stage fully isolated from the output stage with a constant power buffer, further improving linearity at all frequencies and output levels into any load reactance.
- Nested and minimal global feedback regime (<30dB) which enhances image spatiality and musicality at all output levels.
- Two bipolar power supplies which use discrete fast, soft recovery rectifier bridges, one for each rail. This topology simplifies the transformer connection whilst improving noise performance by reducing transformer parasitics from the DC circuits.
- The power supply filter capacitors are substantial. A dual CRC filter cap on each rail significantly reduces intermodulation effects of high speaker currents, reduces high order artefacts from ripple and delivers a quieter amplifier.
- Speaker protection using optocoupling including slow turn on circuit. This completely eliminates switching noise and thumps during switch-on. The protection circuit disconnects the speaker within milliseconds if DC more than 2V appears on the speaker output for any reason. The system is completely transparent to music signals.
- A connector is fitted for a front panel LED, offering very easy connection of a power LED of any colour.
- Connectors are fitted to provide auxiliary power for a preamp, balanced input stage or additional accessories if required.
- A mains safety earth and chassis network is adopted on the amplifier module.
- Fast fuses protect the rails. Since all circuitry is ultra-conservative and reliable, and intrusive protection circuits utterly avoid damaging sound quality.

MAYA 200 Specifications

- 203 watts maximum output into 8 ohms, 350 watts into 4 ohms, 65V rail.
- THD at 1 watt (1KHz, 8ohms): 0.031% predominantly second harmonic (H2) and H3.
- THD at 12 watts (+20dBu, 1KHz, 8ohms): 0.035% predominantly H2
- Frequency Response (at 1 watts into 8 ohms):
1dB corners at 15 Hz, 125KHz. (Low Pass filter is in circuit to remove RFI)
- Input impedance: 28 Kohms (18K with 25K stepped attenuator in place)
- Gain into 8R: 28.2 (29dB) Clip 114Vpp into 8R corresponding to 203 watts
- Input sensitivity: 1.51 RMS (2.14Vp) for 203 watts into 8 ohms.
- Output stage bias: Pre-set to 125mA per output device (42mV across 2 x 0.18R source resistors).
- Output Offset: Adjusted at manufacture to less than +/-30mV when warm.
- Circuit Board dimensions: 250x70 mm, 2mm FR4, two layers, 70um Cu clad.
- Heatsinks: pressure cast Conrad MF35-100, 0.28C/watt, 350x100 mm.
- Rail fuses: 15 amp, M203 type, fast blow, fitted to Schurter OGN holders.
- Transformers: 300VA toroid with two 45 Vac secondary windings, no less than 7% voltage at full loaded output.
- Amplifier rail voltage: Not to exceed 65 volts.
- Fuses: 15 amp M205 mains fuses AND rail fuses are ALL recommended for 230/120 Volt AC and rail fuses.

Warranty

When you purchase a MAYA 200 you have peace of mind knowing that it is covered by a two year warranty when used in a domestic situation. This warranty covers failure of the amplifier modules due to materials or manufacturing defects but does not cover improper use or misuse, abuse, being incorrectly wired, shorting of the speaker outputs, overheating such as outdoor operation in hot weather at high levels or with multiple or low impedance speakers. This guarantee will be void if the module has in any way been tampered, including removal of the module from the supplied heatsink. Should a module require return to the factory we may apply shipping charges.

Building a MAYA 200 Amplifier

What Aspen supplies:

When you purchase a MAYA 200 amplifier the following components will be shipped to you:

- Two (2) fully built, tested modules.
- Two (2) Conrad MF35-100 aluminium heatsink flat machined and M3 tapped.
- Six (6) M3 screws.
- Two (2) RCA input connectors.
- Coaxial internal signal cable.
- Speaker 'hot' lead for connection to output binding posts (not supplied).
- Speaker 'cold' leads for connection to output binding posts (not supplied).
- Front panel power indicator Green LED.
- Chassis ground wire.
- Eight crimp 6.3mm (1/4") spade connectors for the transformer output wires.
- 30cm heat shrink tubing.
- Detailed build instructions with photographs and prompt email support in English language.

What you will need to supply:

- Suitable chassis to accommodate the two modules with their respective heatsinks and the two transformers.
- Two (2) (Note: one for EACH module) 300VA transformers with two, separate secondaries of 45 volts RMS AC to power two amplifier modules. Use good quality toroids, NOT cheap toroids which often tend to saturate and can cause hum intrusion during listening levels. (Refer to Appendix 1 for Recommendations in US market).
- One (1) IEC power entry socket, with integral mains fuse.
- A suitable mains power switch rated to 15A surge 230Vac.

- Speaker binding posts.

NB: A suitable custom designed chassis is available at an additional cost.

Tools required:

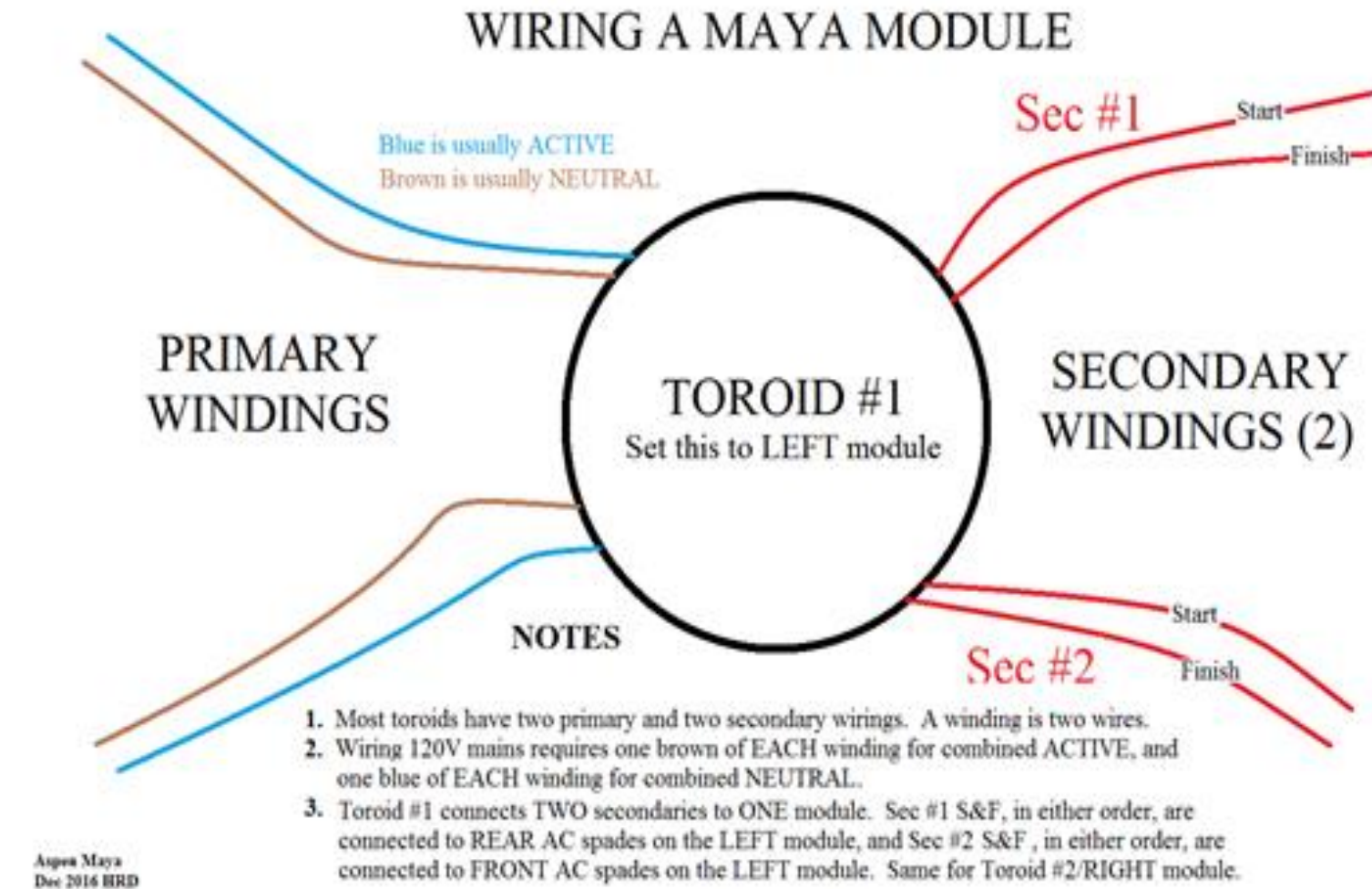
- Soldering iron, solder etc.
- Multimeter for setting offset and bias level.
- Screw drivers, needle nose pliers, fine wire cutters.

What you will need to do:

- Mount the two transformers, the two MAYA 200 modules, IEC mains socket, mains switch, indicator LED, speaker and input connectors in the chassis (Refer to diagram below).
- Use a 10A mains fuse for 230 volts AC, or a 15A fuse for 115 volts AC mains.
- Connect mains earth to chassis earth (**very important**).
- Chassis earth to MAYA 200 module(s).
- Input mains to the mains power switch.
- Power switch to the transformer primaries (see note following).
- Connect transformer secondaries to the MAYA 200 module(s) (see note following).
- Input RCA connectors to the MAYA 200 module(s)
- Speaker wires from the MAYA 200 module(s) to the speaker connectors.
- Power indicator LED to the MAYA 200 module(s).

How to Connect Transformer Wiring to one module

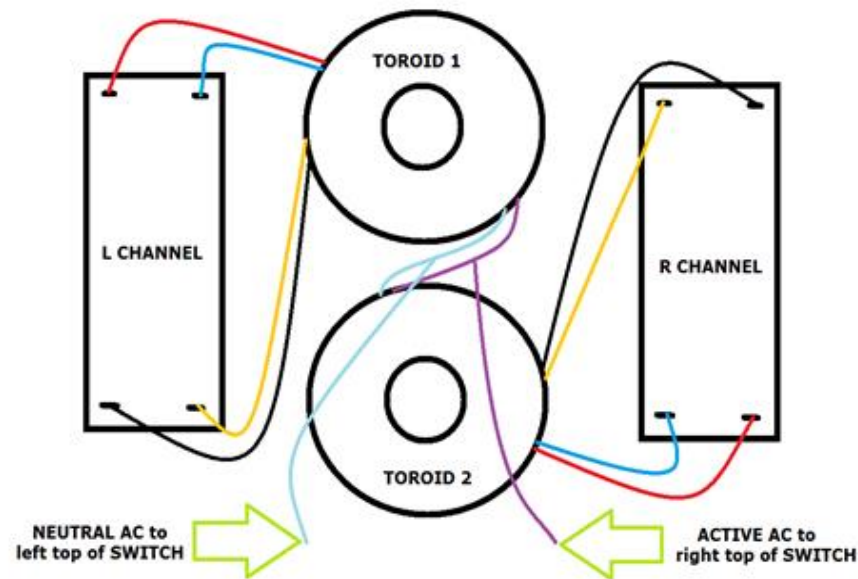
Below is a diagram of a typical 300VA toroid with primary and secondaries windings shown:



Begin by identifying the two primary and the two secondary windings, note that each winding has two wires. Most manufacturers of toroidal transformers do NOT conform to the same colour code so it is critical that you CHECK COLOURS on your toroid connections – this is extremely important, particularly with mains connection. Each module is powered from TWO INDEPENDENT SECONDARIES wired from ONE TRANSFORMER. You need to tag the two primary winding wires so that they are readily identifiable. Also tag one pair of Secondary wires as #1, and tag the other Secondary winding pair #2. Secondary #1 and Secondary #2 are equivalent, so Secondary#1 could be attached to one side of the module and the Secondary 2 to the other side or vice versa i.e. each secondary winding is identical, so there is no order for connection to the module.

TAKE CARE NOT TO INTERCONNECT THE TWO SEPARATE SECONDARY WINDINGS.

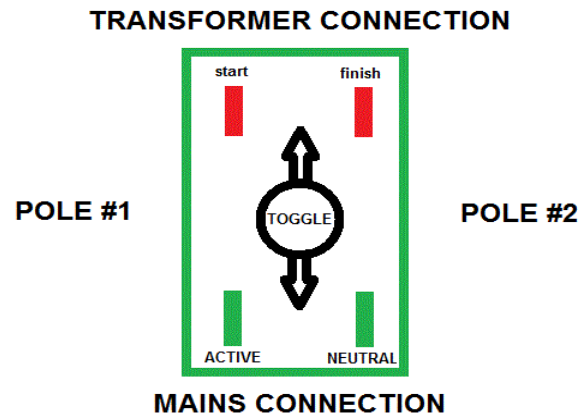
The pictures show the connections of the left supply and right supply at the ends of the module to their respective toroids. After connecting the primary AC mains on each toroid in parallel, you should have the interconnections below:



Wiring the TWO PRIMARIES and AC Switch to the MAINS

The IEC power entry module situated at the back panel transfers the mains voltage to a mains switch on the front panel of the amplifier. The IEC takes the mains connection from the power socket, and it combines a 15A fuse. Take note of the following:

MAINS SWITCH & TRANSFORMER CONNECTIONS



NOTES

1. Mains wiring has two wires; active (blue) and neutral (brown). In some cases the sense of these wires is important; not with transformers. There is no distinction between active, neutral, start and finish of the wiring.
2. The toggle (switch lever) would be **BEHIND** the graphic, we are looking at the rear at the terminal connections. **BOTTOM** is to mains, and **UPPER** is to the transformer primary.
3. Knowing start and finish of the windings on the transformer are not important to connect the mains switch and the secondaries to the Maya modules.
4. Connections should be made with insulated 6.3mm spade connectors (female).

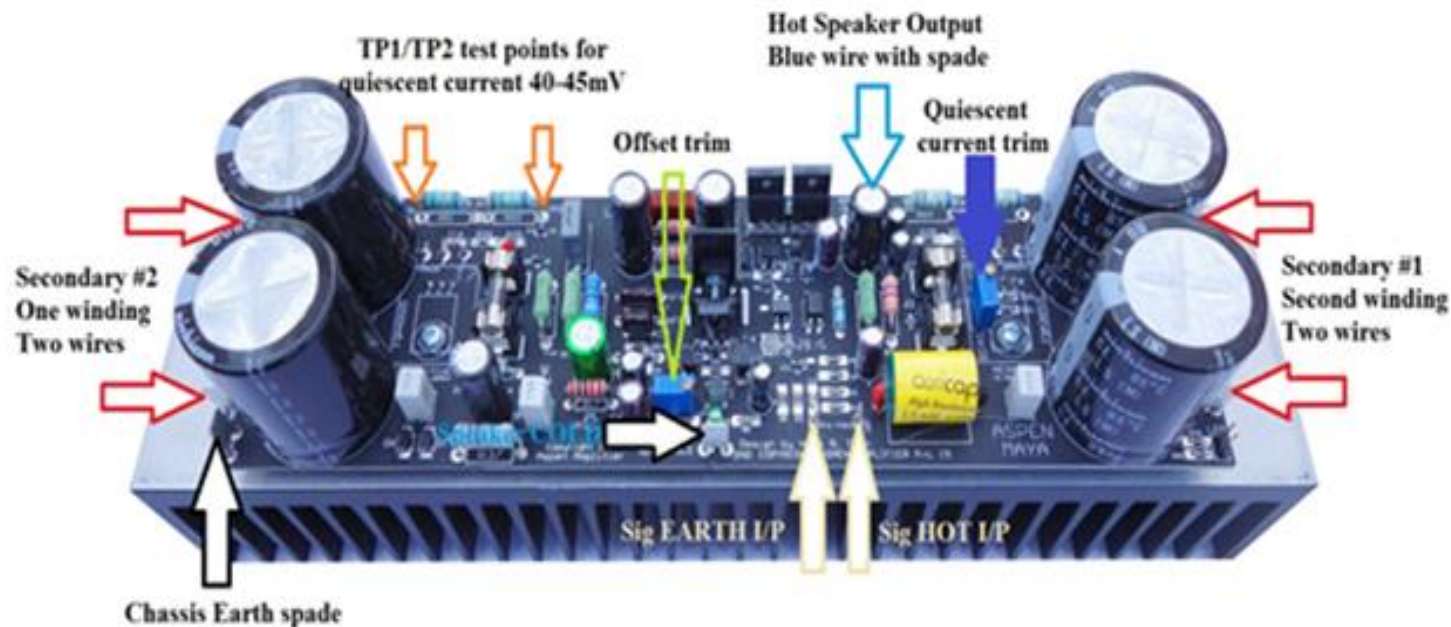
Aspen Amplifiers P/L 2016

Connect suitable mains wires from the mains connection to the switch and then connect the mains power from the switch to the primary wires of the transformers. You will note from the two pictures immediately above, that only two wires are being used to connect to the switch and only two wires from the switch that go to the two transformers. This requires that you connect one primary from each transformer together. Ensure a 15A mains M205 fuse is fitted in the IEC socket.

AC connections should be completely insulated by two thicknesses of either heat shrink (supplied) or tightly wound tape.

Double check your wiring connections as you cannot afford to make wiring errors because a destroyed transformer is expensive and dangerous. Check the IEC 15A fuse is fitted.

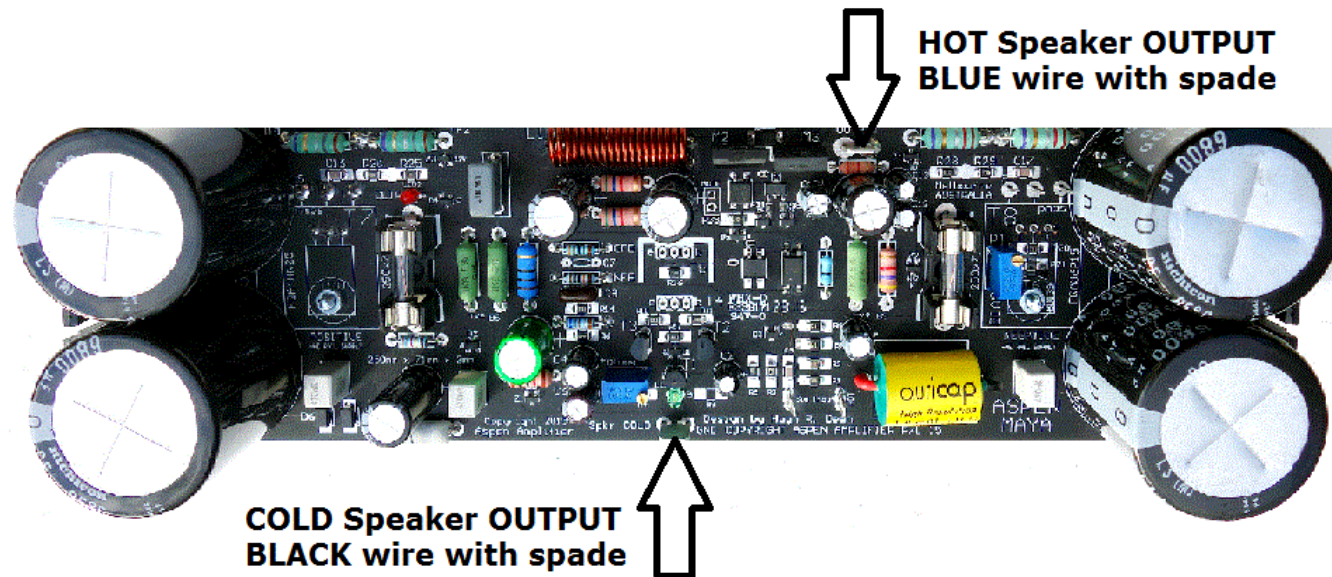
WIRING UP THE MAYA POWER AMPLIFIER TO A TRANSFORMER



Connection of the Speaker binding posts

Each module has two outputs for the two binding posts, left channel HOT (red) and COLD (black), and right channel HOT (red) and COLD (black). At the module end of these wires are 6.3mm spade connectors which plug into designated spades. HOT wires are BLUE, and COLD wires are BLACK.

CONNECTION OF THE SPEAKER WIRES TO THE MAYA 200 MODULE



The Maya 200 is not fitted with short circuit protection but it is fitted with mains and rail fuses (all 15A) and speaker DC protection using ultra-fast solid state relays. If the amplifier output is accidentally shorted to ground, then one of the fuses will swiftly fuse, and the protection circuit will immediately disconnect the speaker to prevent damage. Nevertheless, speaker leads should NEVER be shorted at any time, so when connecting speaker the amplifier MUST be turned OFF.

With high reliability assembly, minimal protection never causes any operational issues, and in fact the MAYA 200 protection system was deliberately designed to avoid interfering with the sound quality.

Indicator LED Connection Detail

A two pin connector designated LED is provided on the module (bottom right corner) to which a power indicator LED can be connected with a small 2 pin computer plug. The outer pin, closest to the pcb edge, is POSITIVE for ANODE on the LED.

Auxiliary Power Connection Detail

Each May 200 module contains two connectors that if required allow the module to power auxiliary devices such as a preamplifier. The two connectors at each end of the module provide access to the amplifier rail voltages (typically 55v to 64v), and would typically be connected to a remote power supply to regulate the voltages down to +/-15v. Note that the auxiliary power is NOT fused, but does contain small, smd (10ohm) resistors in series with the + and – voltages. Current supply should not exceed 50mA from each node to prevent these resistors failing. Hereby the amplifier module power supply is protected.

About Aspen Amplifiers

Aspen Amplifier commenced in 1995, and sold amplifier modules under the name ‘Aspen Kit Set Amplifiers’, known as the AKSA brand. The first AKSA’s were the Glass Harmony, the GK1 preamp, then the AKSA55, AKSA100, Lifeforce55 and Lifeforce100 models, all bipolar, solid stage power amplifiers. The former flagship Soraya 205 was released in 2007 as a plug ‘n play product, and finally a new series of AKSA amplifiers, the NAKSA brand, in 2010. The first NAKSA was a fully built module of 70 watt amplifier (the NAKSA 70) and then a 100 watt version (the Naksa100) in 2011. The current amplifier models are the NAKSA 80

(replacing the NAKSA 70 in early 2013), and the NAKSA 125 (replacing the NAKSA 100 in 2014). The Maya 200, the flagship of the company, was released in January 2016 and in May 2016 the Super AKSA, the SAKSA, was released. All these amplifiers over a long period represent steady evolution dominated by critical listening and musicality, and while the original AKSA was a marvellous amplifier, the later versions constantly improved on this to the point where Aspen is known for outstanding sound quality, with a focus on musical presentation featuring broad and deep sound field and musical engagement.

Contact

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