5 + 5 Watt Stereo Amplifier

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NOTE: CAREFULLY READ ALL INSTRUCTIONS BEFORE STARTING TO BUILD AND OPERATE THE AMPLIFIER KIT.

INTRODUCTION

The 5+5 Watt Stereo Amplifer kit # SA5W is two mono amplifer circuits placed in duplicate on one Printed Circuit Board PCB. The SA5W PCB may be cut down the middle to create two individual mono 5 Watt Amplifiers.
The amplifier circuit consists of a TDA1905 monolithic integrated circuit in POWERDIP package, intended for use as a low frequency power amplifier in a wide range of applications in radio and iPods etc.

Specifications

Supply Voltage:	4 to 24Vdc (Note: below 10Vdc R4 must be fitted.)
Power output:	5 Watts per channel
Speaker Output:	6 Watt 4Ω with 12Vdc Supply (4.5W rms) Supplied with Kit.
	6 Watt 8Ω with 16Vdc Supply (4.5W rms)
	6 Watt 16Ω with 22Vdc Supply (4.5W rms)
Input Impeadance:	20k Ohms

For further details refer to www.datasheetcatalog.com and download data sheet TDA1905.
The kit is supplied with all components to build the SA5W Stereo Amplifier circuit board, including two 125mm 6W 4Ω speakers, DC 2.5mm pin panel mount power socket and 3.5mm panel mount stereo socket.
In addition you will require a wall mount Power Plug Pack Regulated to 12Vdc 1A.

Fig 1 - PCB SA5W

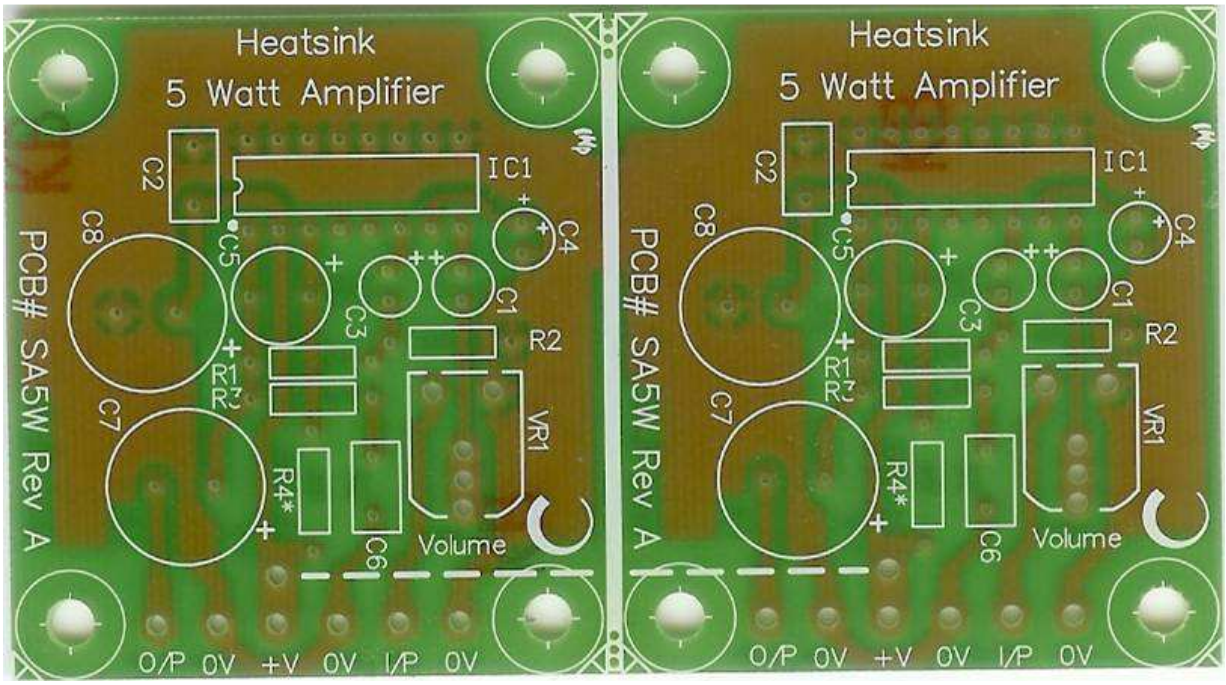

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Fig 2 - Assembled PCB

CHANNEL A

Speaker Output + to (+V) Red
Speaker Output – to (0V) Black

Signal Input + to (I/P) White
Signal Ground to (0V) Screen

CHANNEL B

Speaker Output + to (+V) Red
Speaker Output – to (0V) Black

12Vdc 1A Supply + to (+v) Red
Supply ground to (0V) Black

Signal Input + to (I/P) Red
Signal Ground to (0V) Screen

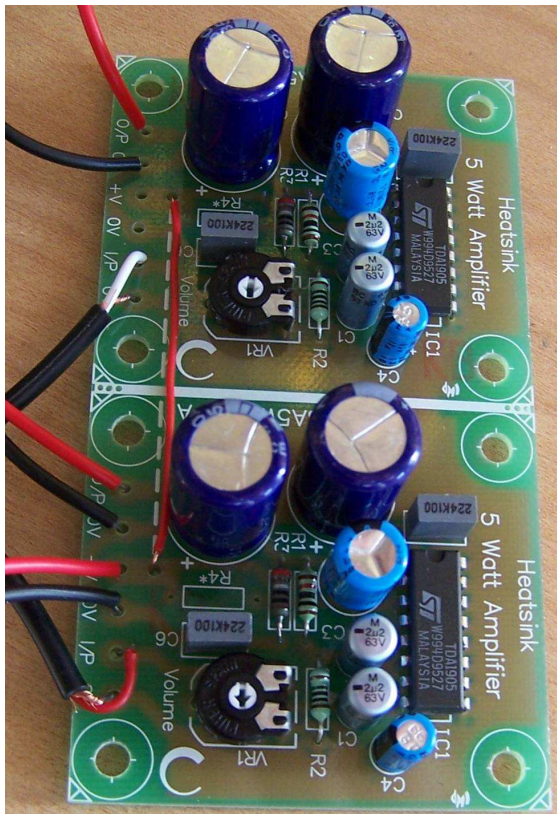

Fig 3 - Complete Assembled Kit

2x 125mm Speakers
6 Watt 4 Ohm

1.5 Stereo Lead with 3.5mm plug jack

2.5mm pin DC Power socket

12 DC 1 Amp Power Plug Pack

Assembled Amplifier PCB far right

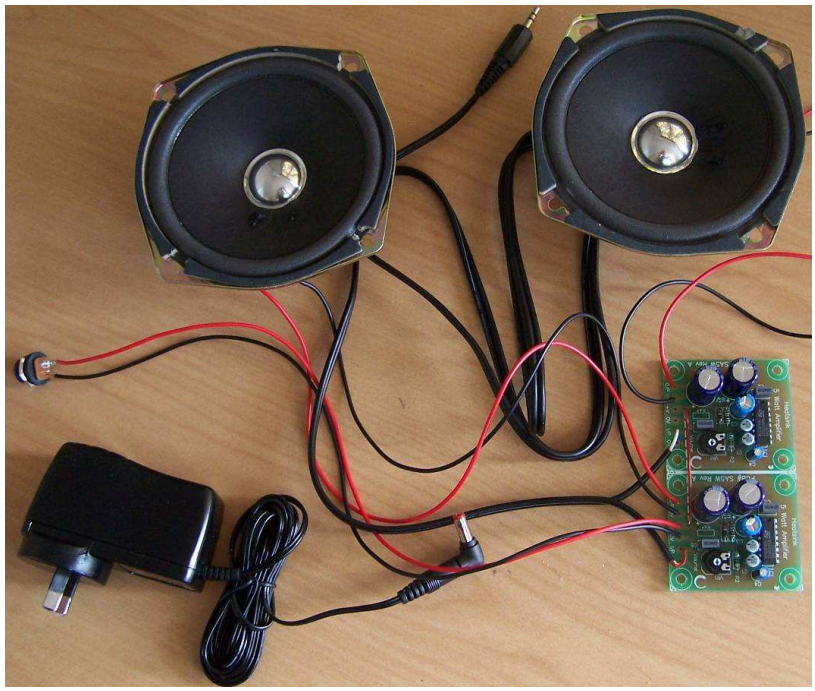

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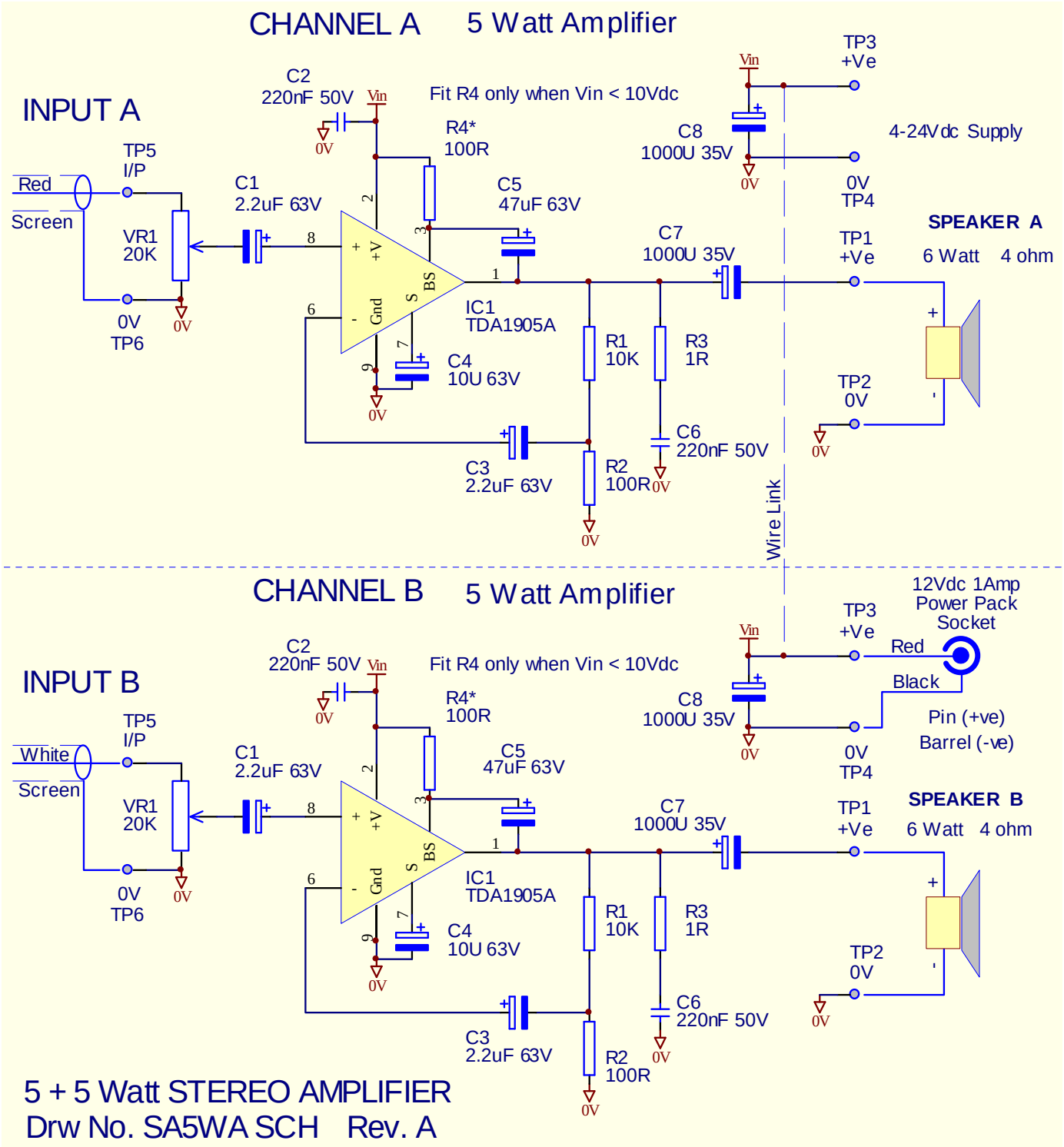
Fig 4 – 5+5 Watt Stereo Amplifier Circuit Diagram



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Bill of Materials - Per Channel

RESISTORS	Designator	Value	Size	
1x	R3	1R	0.6W	
2x	R2 R4*	100R	0.6W	Note* Fit R4 only when supply is less than 10Vdc
1x	R1	10K	0.6W	
1 x	VR1	22K	Trimpot	

CAPACITORS

2 x	C2 C6	220nF 50V	5 x 3.2mm
2x	C1 C3	2.2uF 50V	∅ 5x11mm 2.0 p-p
1x	C4	10U 63V	∅ 11mm 2.5 p-p
1x	C5	47uF 63V	∅ 8 x12mm 5.0 p-p
2 x	C7 C8	1000U 35V	∅ 13 x20mm 5.0 p-p

AMPLIFIER Chip

1x	IC1	TDA1905A	DIP16

Hardware per Kit

1x	PCB - SA5W	5+5 Watt	101 x 56mm O/All	91 x 46mm c-c mounting holes
2x	Speaker	6Watt 4Ω	125mm (5”) with 4x 120mm mounting holes	
1x	DC Socket	2.5mm pin	Chassis Mount Power Socket	
1x	Stereo Cable	1.5m	2.5mm jack plug each end	

ACCESSORIES

1	Wall Power Pack	12Vdc	1Amp
1m	Red connecting wire	22AWG	
1m	Black connecting wire	22AWG	
60mm	single core Link wire		

Assembly instructions

Before proceeding please take necessary antistatic precautions when inserting the amplifier IC1.
Insert and solder in all resistors, capacitors and the amplifier IC. Take care to follow good soldering practices.
Make sure all electrolytic capacitors are inserted correctly with the correct pin polarity. Refer to Figure 1 & 2.
Ensure adequate solder is applied to IC1 Pins 9 to 16 to ensure good heat conduction to the 0V copper plane.
Finally connect an insulated link wire for the (+V) supply rail between Channel A and B as indicated by the dotted line on the PCB.

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Fig 5 – Wiring Diagram

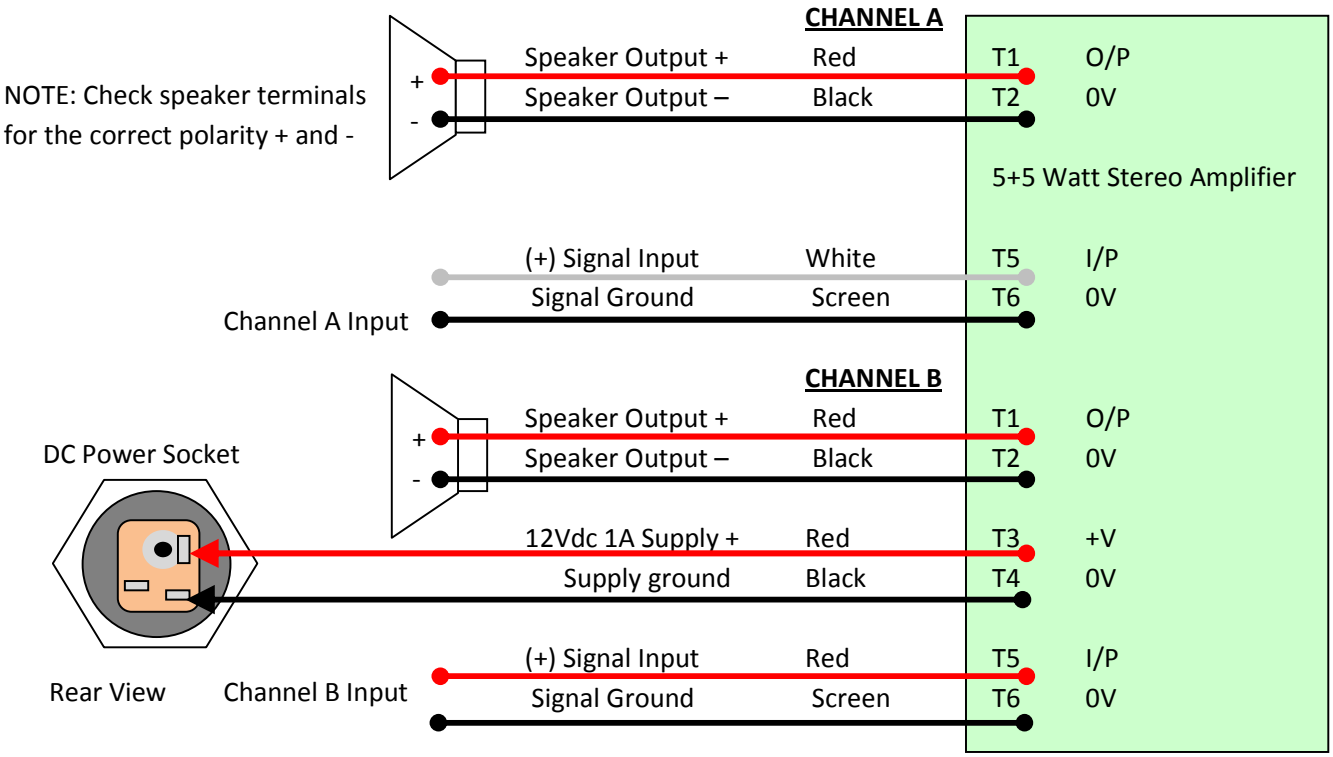


Fig 6 – Stereo Input Cable Diagram (Signal Input Option 1)

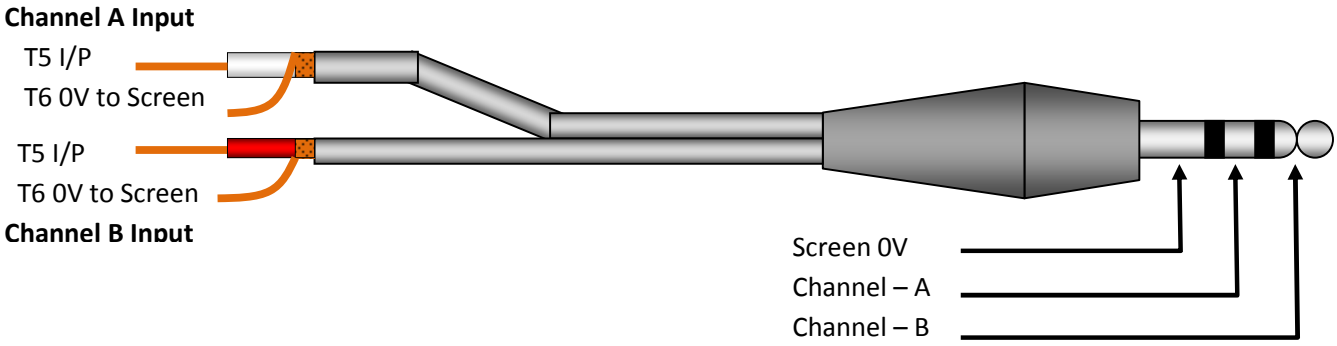
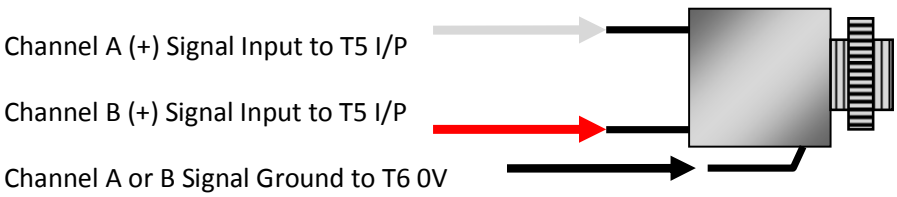


Fig 7 – Stereo Input Socket Diagram (Signal Input Option 2)



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Wiring Instructions

When the PCB is completely assembled check that the polarity of the Electrolytic Capacitors are fitted the correct way. Refer to Fig 1 and Fig 2. Incorrect fitted capacitors will permanently damage if power is applied.

The wiring diagram Figure 5 shows the connections for the speakers, power supply and input signals.

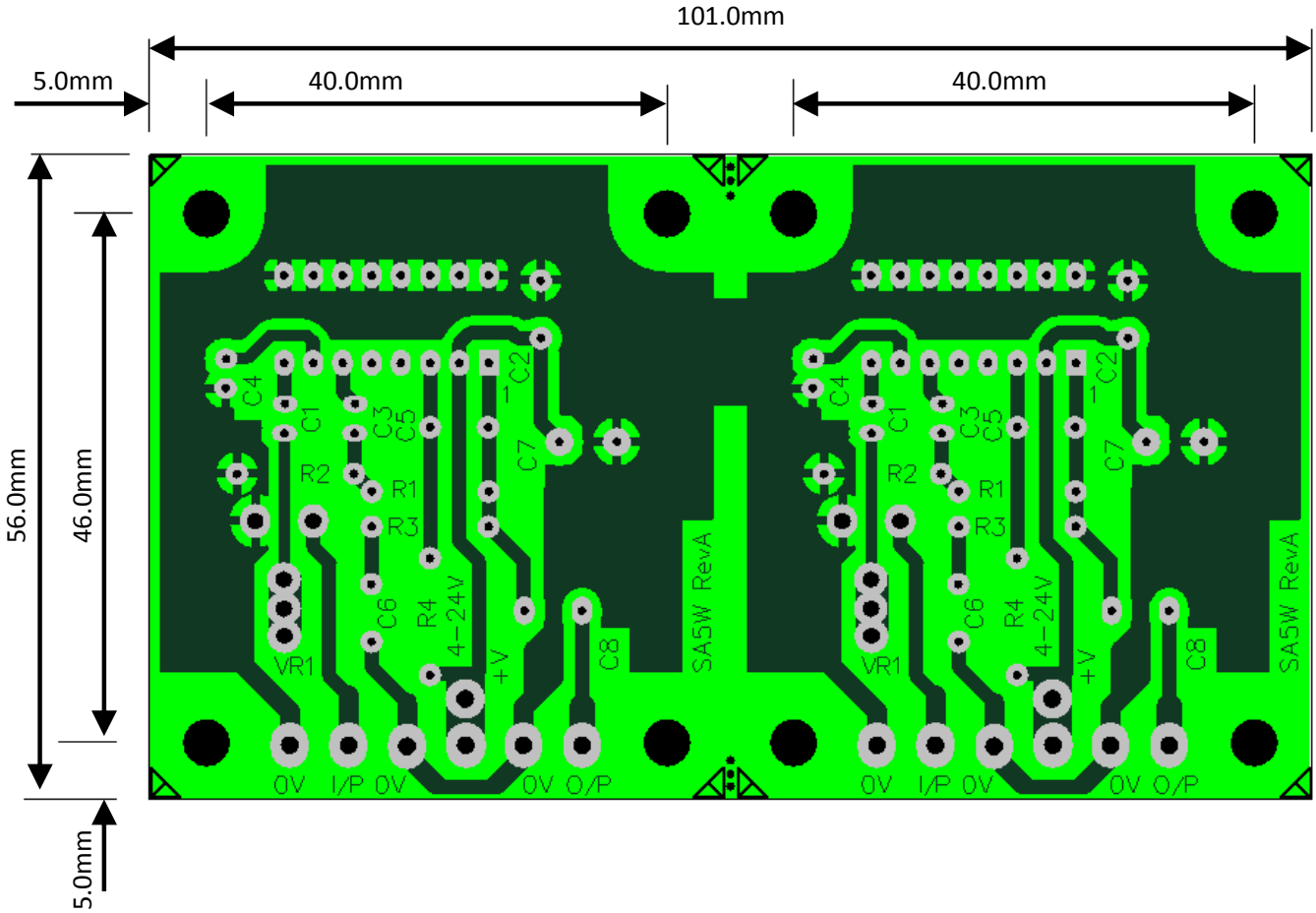
1. First connect the signal inputs for Channel A and Channel B using one of two options.
   Option 1; With the Stereo cable connected directly to the PCB refer to figure 6
   Option 2; With the Stereo socket refer to Figure 7.
   Terminals T5 the (+) Signal Inputs and terminals T6 the Signal Ground 0V, which is the Screen connection.
   For Option 2 only one 0V signal ground is needed to be connected.
   For Option 2 keep the wires short as possible.
2. Connect the supply socket as shown in figure 5, the centre pin positive (+V) and the outside barrel negative. Check the power pack DC plug is connected accordingly.
3. Connect the Speaker wires, check the polarity of the speaker terminals, (+) connects to T 1 O/P and (-) connects to T2 (0V).
4. Check all wiring is correct to the diagram Figure 5. Use a Multimeter to check the connections are correct.

Operation Instructions

1. Using a small screw driver set both VR1 Trimpots fully anti-clockwise for zero volume.
2. Plug in the Power to the mains supply and check the 12Vdc 1 Amp supply is providing +12V to the centre pin and negative to the outside barrel.
   Connect the Power pack DC plug into the Amplifier power socket.
   Using a Multimeter check the supply to the amplifier is at 12Vdc across T3 (+) and T4 (-).
3. Using the stereo audio cable connect the amplifier input to the stereo output of the iPod or radio with music playing at full volume. First ensure first both VR1 Trimpots would to minimum fully anticlockwise.
4. Very slowly wind Channel A Trimpot VR1 a minute amount clockwise to increase the output volume of the music to the Channel A Speaker. Continue increasing the volume until the music is almost sounding distorted.
   Place a mark on the PCB where the Trimpot arrow is pointing for maximum setting of the Trimpot.
   Next wind Channel B to the same level of volume without distortion occurring.

   NOTE: Do not wind the volume too high causing distortion.
   Excessive distortion will cause permanent damage to the speaker.
5. The Amplifier is now fully operational. Control the volume using the iPod or radio volume control.

Fig 8 – Rear view of PCB with Dimensions



Installation Instructions

1. Do not mount the stereo input socket directly onto a metal enclosure. The socket ring mount is also the signal ground (0V). Mount the socket to a plastic enclosure or use separate non conductive material.
2. Use mounting posts to provide clearance between the component pins to the mounting plate.
3. Do not restrict air flow around the Heatsink area of the PCB. Keep 30mm clearance above the PCB.
4. Do not install the wall mount power pack in with the same enclosure for the amplifier.
5. Restrain cables so that movement does not cause damage to the insulation.
   Use additional protective insulted sleeving to protect cables passing through the enclosure wall.
6. Ensure the speaker enclosure is rigid and the speakers are firmly mounted. Loose fitting and screws will vibrate causing distortion to sound quality.

Fig 9 – Speaker Dimensions