# 5687 Tube Pre-Amplifier

# User Manual

## Analog Metric

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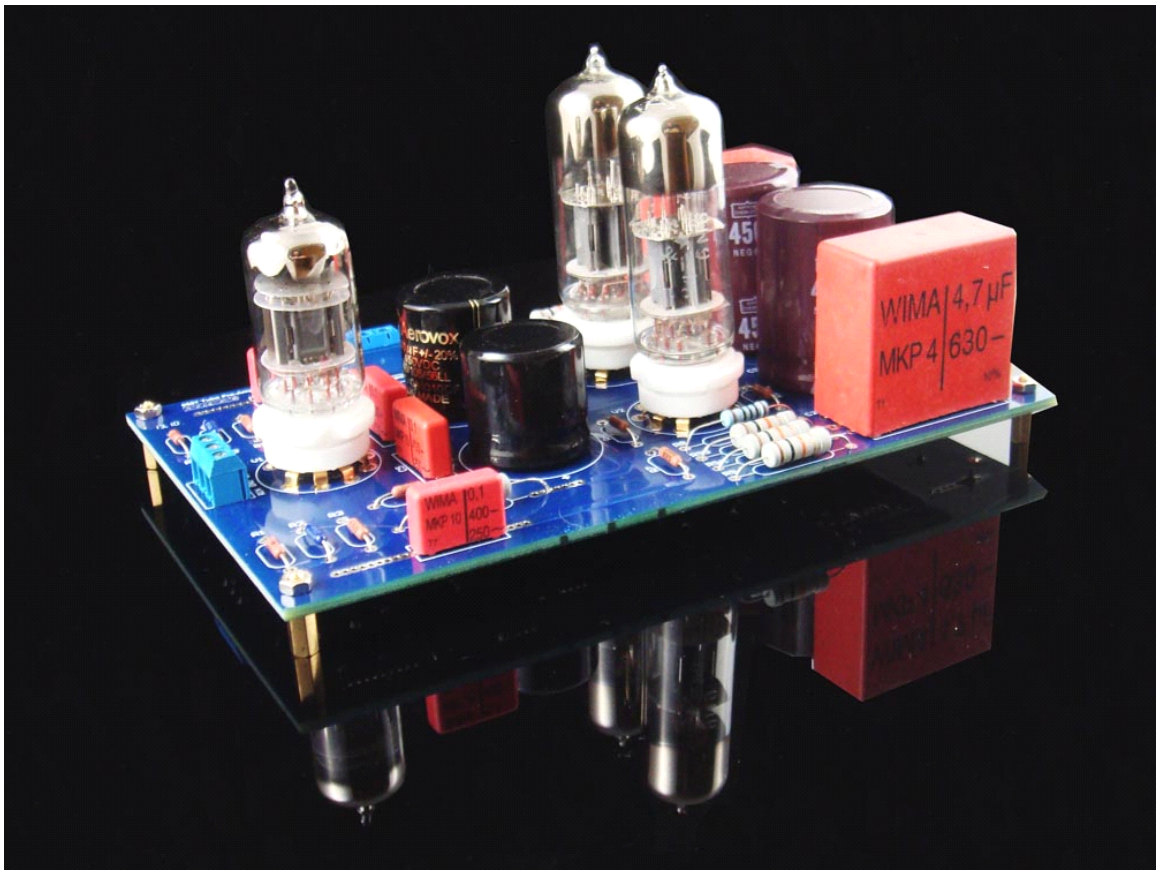



## INTRODUCTION

The circuit design comprises of two stages: the first stage uses 12AU7 vacuum tube in common-cathode configuration which provides moderate gain, minimum noise and high linearity to the amplified signal; The output stage uses 5687 or its equivalent 6N6-T as buffer to deliver sufficient power to the load. In additional to pre-amplifing input signal, this amplifier is capable to drive headphone directly whose impedance is often very low. The signal paths of this PCB layout is designed in symmetry for both channels. Dedicated power rails, ground, and signal paths, althogether are taken into considerations so that all are to minimize the parasitics, cross interference, and influence of RFI.

## FEATURES

- One 12AU7 and two 5687 (6N6-T) vacuum tubes.
- Circuit design comprising two stages: common-cathode stage and followed by a buffer stage.
- Voltage Gain: 22dB
- Bandwidth: 850KHz
- Input Sensitivity: 1Vrms
- Input impedance: 100kΩ
- Ouput impedance: 75Ω
- Two single-ended inputs and two single-ended outputs.
- Symmetric layout design and signal paths with minimum parasitic.
- Dedicated ground and power rails layout design.
- Two large reservoir decoupling capacitors for power rails.
- Power requirements: one 260V(100mA) DC and one 12.6V(2A) DC.
- PCB dimension: 18mm (W) x 11.5mm (L)
- PCB thickness: 2.4mm, double layer, 2oz copper.

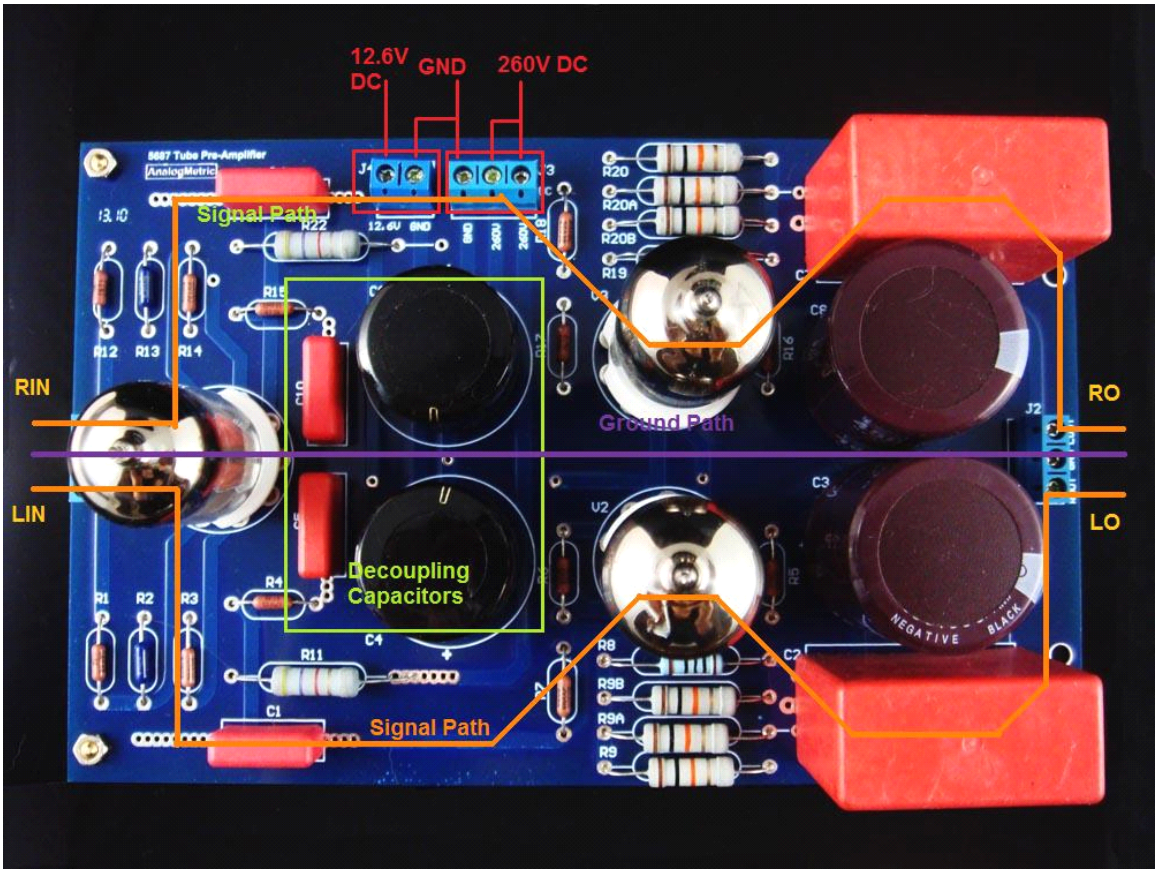
## PRECAUTIONS

- Do not use any body parts to touch the metal parts of the kit after power up or power off, since the high voltage capacitors may not fully discharge. It may cause serious electric shock.
- Use a power transformer with fuse (1-3A) socket to limit the supply current in case of short circuit or incorrect assembly.
- Double check the assembled components with the schematics.
- Do not attempt the measure the voltage by multimeter with hand after power up. The probes of the multimeter should be mounted by some stands to the points of the measurement before switching on the power supply.

- Turn off the power supply if you observe any smokes or hear strange sound coming out from the transformer or board. If there is short circuit, the transformer will be getting very hot shortly.

## PROCEDURES

1. Hook up all the components according to the schematic, part list, and photos. Notice to the polarity of the high voltage electrolytic capacitors (C1, C4, C6, C9). There are no polarities of the thin film capacitors.
2. Apply either one or two 260V DC to J3 and 12.6V DC to J4. Connect the GND of these two connector. If you only have one 260V DC, connect the two '260V DC' pins together.
3. If everything work fine, the tubes will be led up gradually. Then, apply signals to connectors J1 and obtain corresponding output signal at J2.
4. Enjoy it.



**CHECKLIST**

1. The polarity of the high voltage capacitorsC1, C4, C6 and C9.
2. The supply voltages at connectors (J3 and J4). Check the two DC pins of J3 whether connected to power supply.
3. Short the GND of J1, J2, J3 and J4 together.

If you have any problem in assembly, please contact us by email to tech@analogmetric.com