

Yamaha AG06 - DIY conversion manual phantom power 48V for input 2

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Foreword

The Yamaha AG06 is a nice little and universally applicable mixer. Insignificantly larger than a classic 2-channel audio interface, it offers significant added value through its diverse inputs and outputs and its controls. Particularly noteworthy are the software configurable limiters / compressors. Input 1 is equipped with 48 volt phantom power, but input 2 unfortunately is not, so that only externally powered condenser microphones or dynamic microphones can be connected here. This limitation is actually completely unnecessary, since a second phantom power supply would cost next to nothing and would have no disadvantage. The advantage is obvious: You could connect two condenser microphones.

Since this restriction bothered me, I rebuilt my mixer and documented the conversion so that others can replicate it. Of course, such a modification voids the warranty. But since liquid had unfortunately leaked into the mixer, I had to open and clean it anyway. Since the additional conversion was then no problem.

Description Phantom power

Input 1 differs from input 2 in terms of phantom power only by two additional capacitors (C108 and C109). They have a value of $47\ \mu\text{F}$ / 50 Volt each and block the 48 Volt phantom power in the direction of the preamplifier, which would not tolerate DC voltage. These two capacitors are missing at input 2. The 48 volt phantom power is fed symmetrically at input 1 by two resistors (R103 and R105) with $6.8\ \text{k}\Omega$ each (see figure 1).

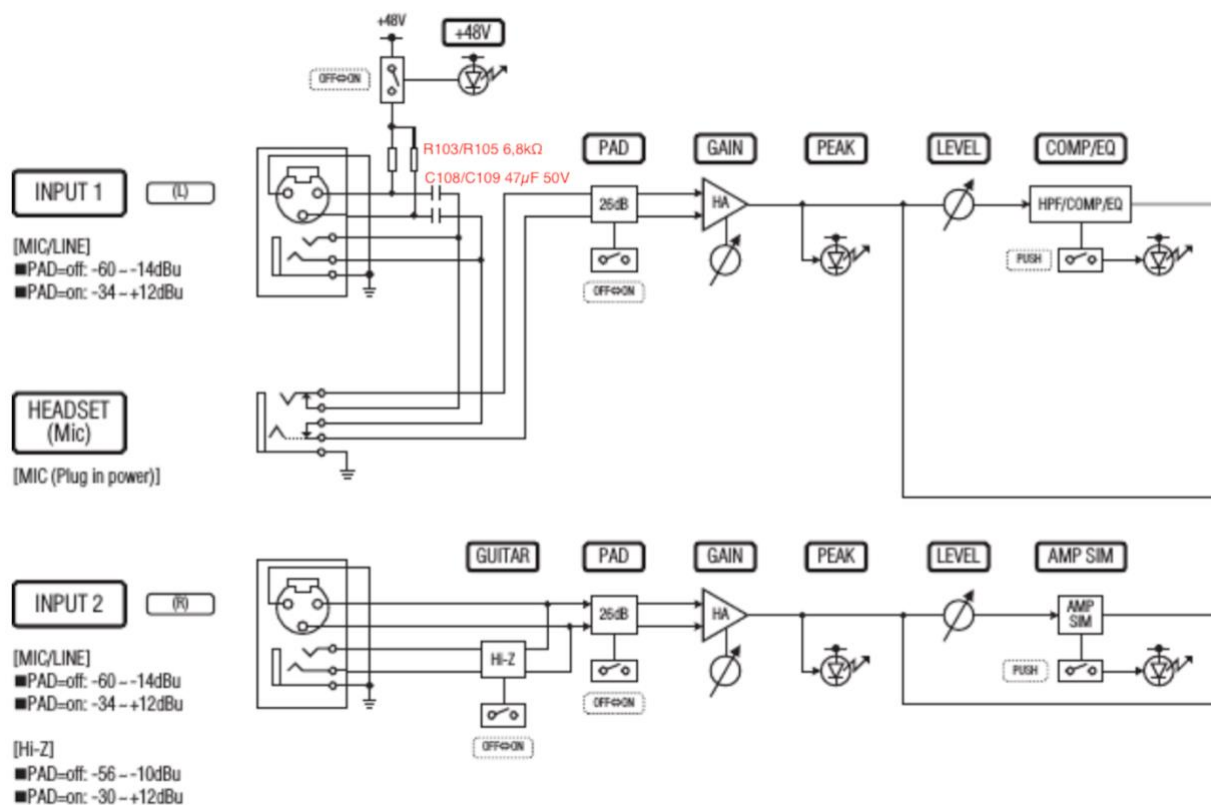


Figure 1 - Circuit diagram inputs original state

Rebuild

In order to provide input 2 with 48 volt phantom power as well, four things have to be changed:

- the resistors R201 and R205 must be removed
- the lines must be interrupted
- the interruption must be bridged with 47 μF / 50 Volt capacitors
- both lines must be connected to the 48 volts at the XLR input with a 6.8 k Ω resistor each.

The circuit looks like this after the rebuild:

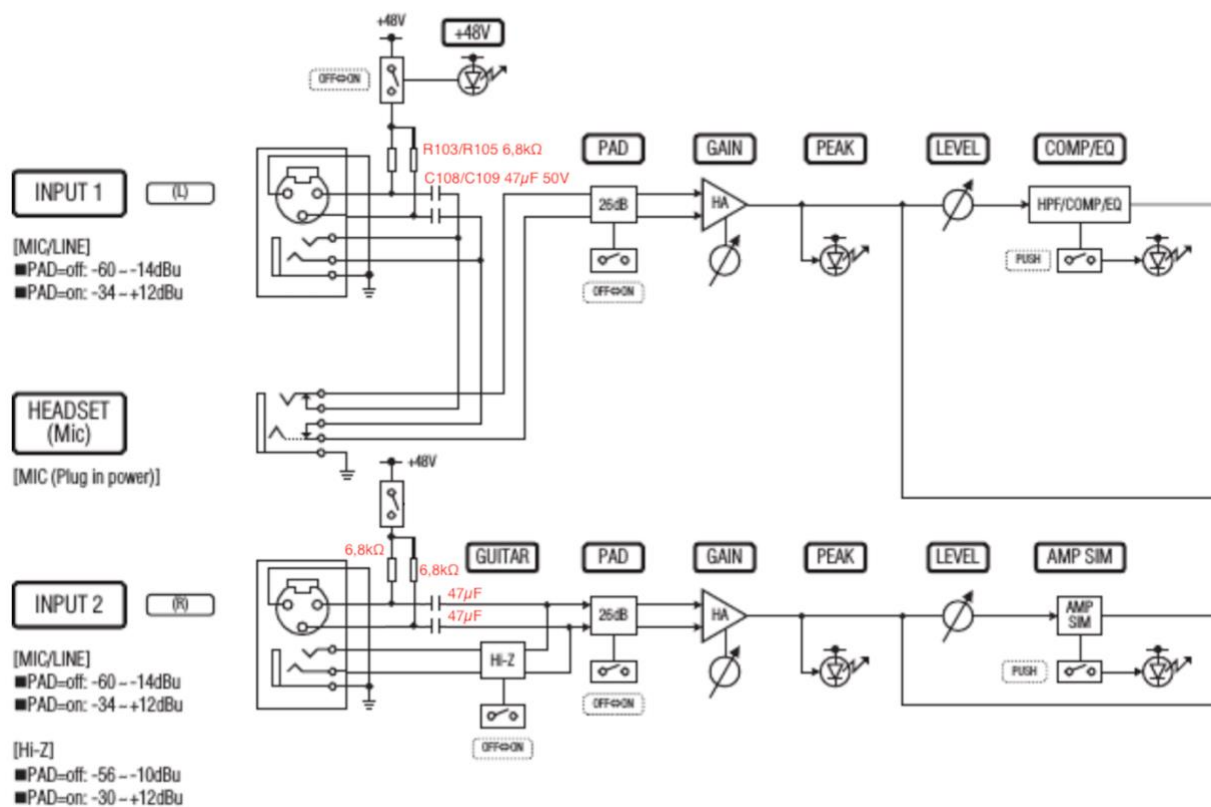


Figure 3 - Circuit diagram inputs after conversion

Re a)

The resistors (R201 and R205) actually have the correct value 6.8 k Ω and could theoretically be used. But since they have a lower load capacity than the resistors at input 2 (they are smaller) and SMD resistors are difficult to solder, I removed them. More precisely, I soldered them on edge on one side so that they could be reused for a rebuild later if necessary (see Figures 4 and 5). Instead, I soldered in two new resistors and looked for stable soldering points for them, since the interrupted traces are not stable enough for this (see Figure 8). It is important that both new 6.8 k Ω resistors have exactly the same resistance value. Please do not trust the manufacturer's specifications, the tolerances are usually much too large. Please measure and take two exactly equal resistors. The value of both resistors does not have to be exactly 6.8 k Ω , it just has to be exactly the same for both.

Re b)

The traces are best separated with a small pointed knife above R205 (see Figure 4). Please work carefully and do not damage anything else. Afterwards check with a multimeter (measuring range Ohm) whether the conductors were really separated. This is important, otherwise the 48 volts will destroy the preamplifier.



Abbildung 1



Abbildung 2

Re c)

The electrolytic capacitors cannot be positioned directly above the soldering points, because the sub-board is so close above the main board that there is not enough space there. They must therefore be positioned a little closer to the edge of the board (see figures 8, 9 and 10). Please pay attention to the polarity. The positive pole of the electrolytic capacitors must point towards the XLR connector, the negative pole marked by a line on the capacitor must point towards the preamplifier. The electrolytic capacitors have a value of 47 μF with a dielectric strength of at least 50 volts (see electrolytic capacitors for input 1: Figures 6 and 7).



Figure 3



Figure 4

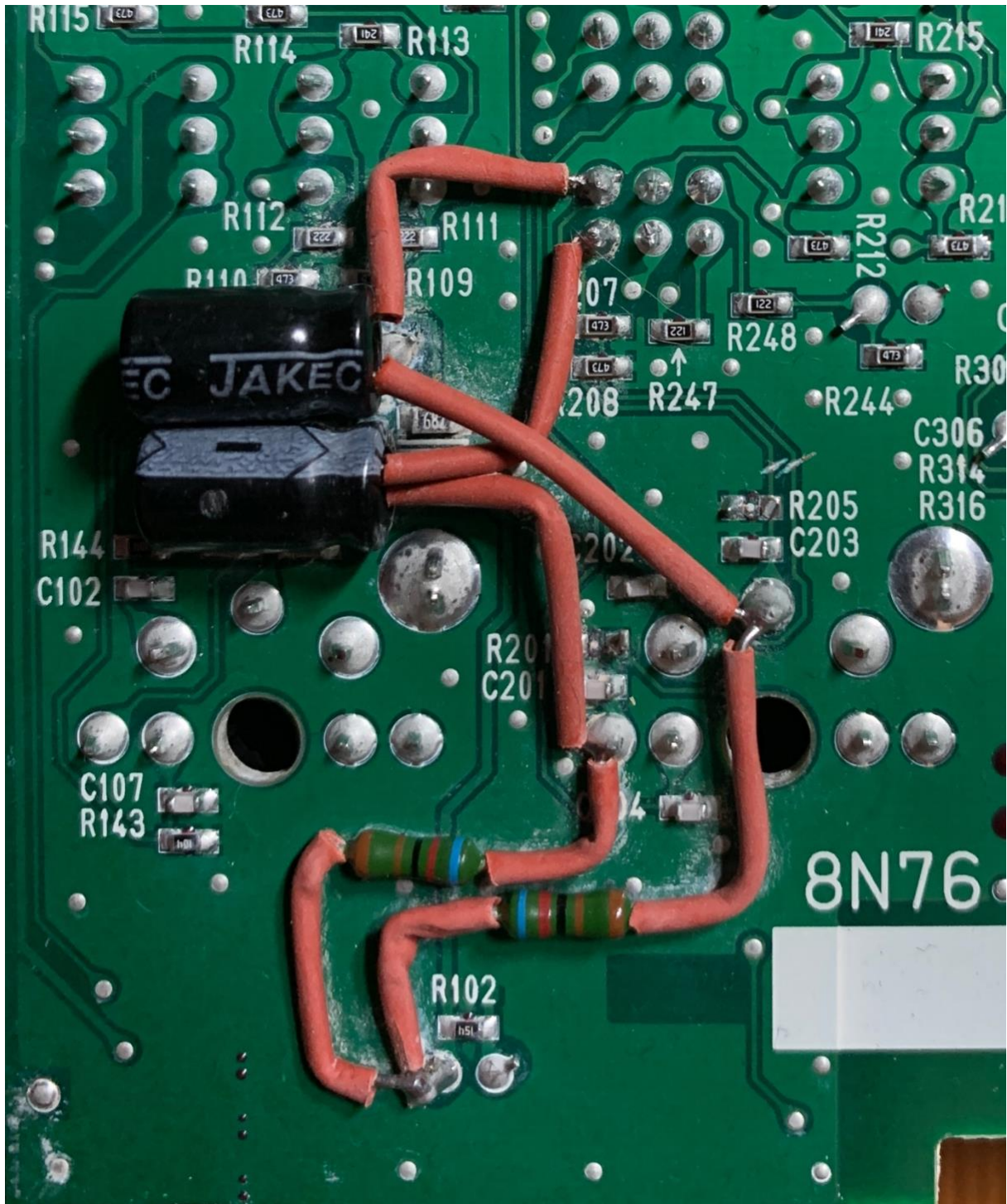


Figure 8 - Finished conversion

Annotation:

Be sure to insulate the component wires with insulating or heat-shrink tubing so that they do not have any electrical connection with underlying solder points.

