

# Power Supply for Preamplifiers

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## Introduction

Preamps may in some cases use a simple regulator, with the supplies taken from the main amp power supply. This can be a problem if the main amp is of very high power, as the supply voltage will be too high for 3-terminal regulator ICs. This will also be a problem if the main amp is under warranty or you just don't want to fiddle with it.

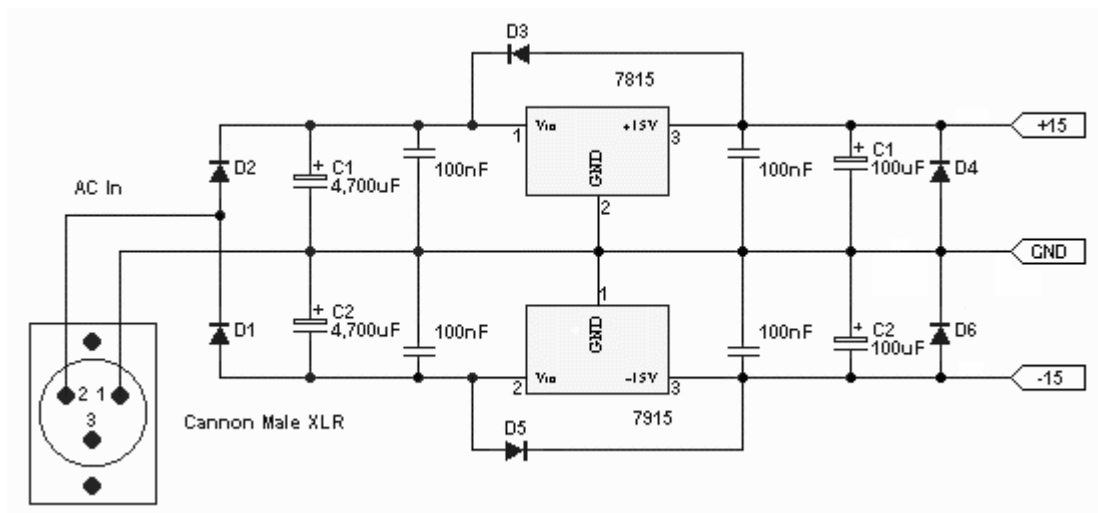
For these occasions, a simple, high performance supply can be built using an external AC power pack (no mains to worry about, and you don't even need a power lead). Power packs (wall warts, wall transformers) are available in a variety of voltages, and if you can find a 16V AC version, this is ideal. With 16V, you can easily get +/-15V DC regulated, using the circuit shown below. If you cannot find a 16V unit, you can use a 12V version instead, but the regulators will have to be changed to 7812 and 7912 (12V) types.

Another alternative is to mount a suitable transformer in a plastic or metal box, and just bring the secondary out on a pair of leads with a female line XLR on the end. The mains input can be a fixed lead or an IEC power connector. Remember to ground the chassis of the transformer (if a conventional type) and any metal on the box used. The disadvantage of this is that you will not have the safety factor afforded by the Double Insulation rating on external power packs.

Inclusion of a fuse suitable for the transformer used is highly recommended, and a thermal fuse is a good idea too, since the power transformer will be left on permanently in most installations. If a "Power" switch is incorporated in the preamp, this can be a simple low voltage type since no mains voltages are present, and can be in either AC input lead - there is no need to break both leads with the switch.

## NOTES

- This circuit will not work with external DC power supplies - it **must** use AC.
- The GND (0 Volt) line **must** be connected to the ground of the equipment being powered. Serious malfunctions can be caused by leaving off this connection.



**Figure 1 - +/-15V Preamplifier Power Supply**

The rectifier is a "full-wave voltage doubler" type, and with an input of 16VAC will provide about +/-20V DC at a current of 100mA - this should be enough for the most power-hungry preamp. All diodes are 1N4001 or similar (100V / 1A minimum rating for all).

The 3-terminal regulators should be the TO-220 types, and unless your preamp requires lots of current, they will not require a heatsink.

The diodes around the 3-terminal regulators prevent reverse voltages being applied to the regulator chips under any condition. They are not strictly necessary, but are considered a good idea. Keep the 100nF caps close to the IC power leads to prevent oscillation.

Use of the XLR connector is suggested, because these devices are extremely rugged, provide very low contact resistance and cannot fall out. They are rather large however, and may be difficult to mount if space is a problem. Right angle plugs are available which can reduce the depth behind the preamp somewhat.



**Photo of Completed Unit**

The photo shows the completed PCB, and has small clip-on heatsinks for the regulators. These will not be needed in many cases, but will do no harm, either.

Make sure that they are well insulated from each other! In the photo, you will see that the diodes (left hand side) are not used - this unit was powered from a DC supply in the same case, so they weren't needed.

The PCB can be wired to use a single 16V AC supply, or a 15-0-15 AC supply from a conventional power transformer (or as shown, of course - make sure that the input voltage is below +/-30V under all operating conditions - this is important). Another feature of the board is much better filtering than the schematic shown above. High frequency noise in particular is attenuated massively, and the output DC is very quiet indeed.