



Elliott Sound Products

The Audio Pages

Project 122

Ultra-Simple Microphone Preamplifier

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PCBs are available for this project

Introduction

This little project came about as a result of a design job for a client. One of the items needed was a mic preamp, and the project didn't warrant a design such as the P66 preamp, since it is intended for basic PA only. Since mic preamps are needed by people for all manner of projects, this little board may be just what's needed for interfacing a balanced microphone with PC sound cards or other gear. There is a PCB available, and this has been given the ok by my client because it is a non-critical part of a much larger project. Unlike most of my boards, this one is double-sided. I normally avoid double-sided PCBs for projects because rework by those inexperienced in working with them will almost certainly damage the board beyond repair. I consider this not to be an issue with this preamp, because it is so simple. It is extremely difficult to make a mistake because of the simplicity.

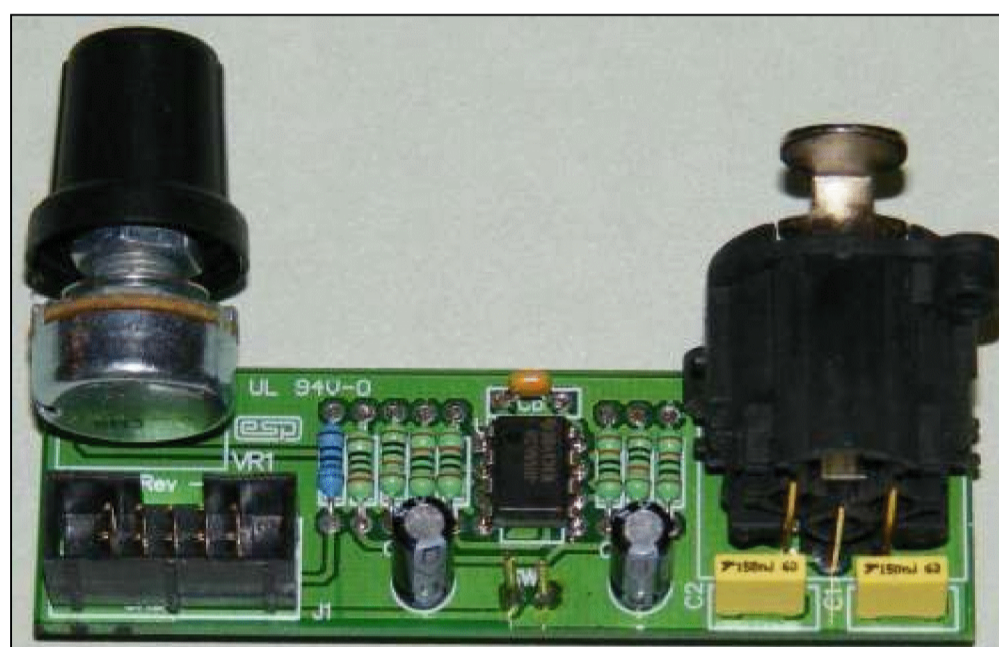


Photo of Completed Board

As you can see, the board uses a PCB mounted XLR connector and pot, so is a complete mic preamp, ready to go. Feel free to ignore the terminals marked SW1 (centred between the two electrolytic supply caps), as they are specific to my client's needs and are not useful for most applications. The original use was to use them for a push-button switch that activated an audio switch via a PIC micro-controller. They are not shown on the schematic.

The DC, GND and output terminals may be hard wired to the board, you may use PCB pins or a 10-way IDC (Insulation Displacement Connector) and ribbon cable. Power can be anything between +/-9V and +/-18V with an NE5532 opamp. The mic input is electronically balanced, and noise is quite low if you use the suggested opamp. Gain range is from about 12dB to 37dB as shown. It can be increased by reducing the value of R6, but this should not be necessary. Because anti-log pots are not available, the gain control is not especially linear, but unfortunately in this respect there is almost no alternative and the same problem occurs with all mic preamps using a similar variable gain control system.

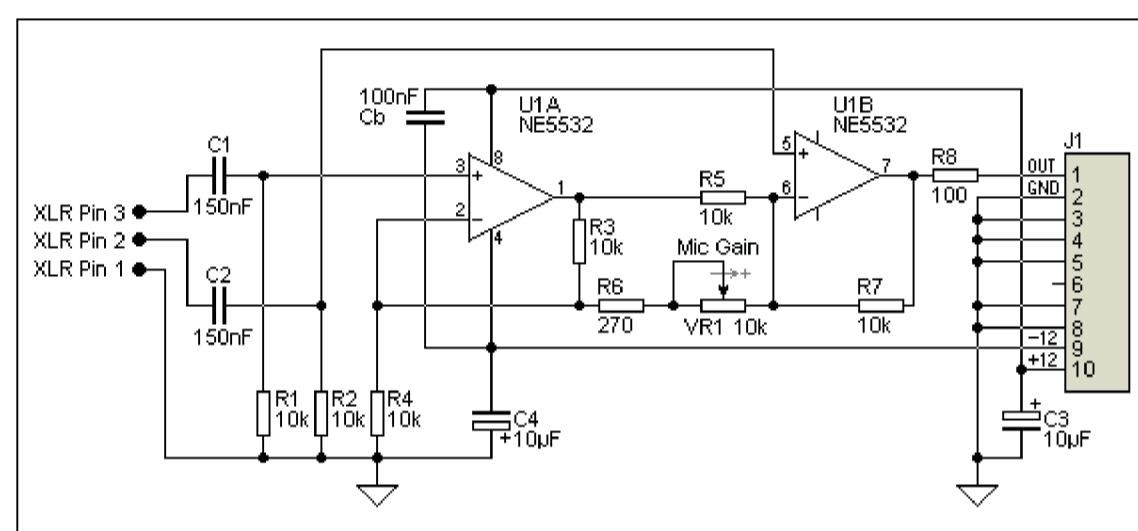


Figure 1 - Preamp Schematic

The circuit is quite conventional, and if 1% metal film resistors are used throughout it will have at least 40dB of common mode rejection with worst-case values. The input capacitors give a low frequency rolloff of -3dB at about 104Hz. If better low frequency response is required, these caps may be increased to 4.7uF or 10uF bipolar electrolytics. These will give response to well below 10Hz if you think you'll ever need to go that low.

The project PCB measures 77 x 24mm, and the mounting centres for the pot and XLR connector are spaced at 57mm. If preferred, a traditional chassis mounted female XLR can be used, and wired to the board with heavy tinned copper wire. The PCB pads for the connector are in the correct order for a female chassis mount socket mounted with the "Push" tab at the top.

[Project Index](#)

[Main Index](#)

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