DIY MM Phono Preamplifier Kit (Moving Magnet)

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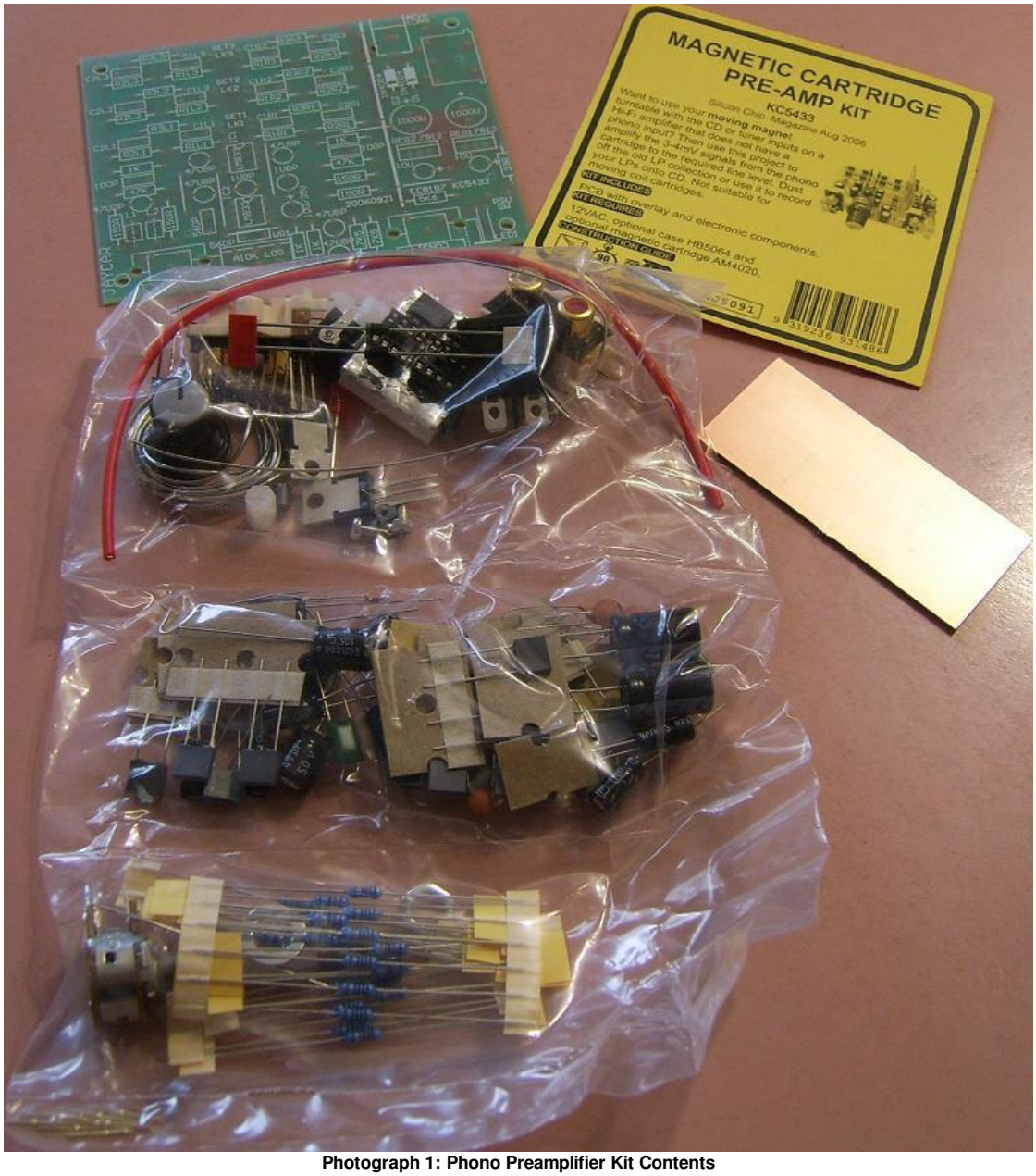
Vinyl Resurgence

I bought a Pro-Ject Phono Box SE to complete the revamp of the analogue section of my audio system which consists of a Rega Planar 3 (P3) Turntable, Rega RB300 Tonearm (bought some twenty years ago) and new Grado Sonata wood body cartridge. The Pro-Ject Phono Box SE preamp cost about $AU400 (~$200US) and appeared to be good value for the money. My resurgence to vinyl listening has certainly been enjoyable and now I'm purchasing Classical and Jazz on vinyl which I would never have done in my "old" vinyl playing days. In the old days I had a Harmon Kardon integrated amp with a integrated phono stage. This produced a very flat and "hissy" sound from LPs which I would not tolerate today. So things have got better.

DIY Phono Preamp Kit

While looking through the local (Jaycar) electronics store catalogue I came across a Magnetic Cartridge Preamp Kit (Cat. No. KC5433). It uses two LM833 Operational Amplifiers (op-amps) and cost $AU39.95. Naturally, the op-amps can be upgraded with higher performance versions. While I was satisfied with the Pro-Ject Phono Box SE I wanted to build my own phono preamp. I guess being an avid DIYer draws one to anything you can build yourself even if you already have a commercial unit.



Photograph 1: Phono Preamplifier Kit Contents

The kit consists of a printed circuit board (PCB) and all of the components which mount on the PCB. You will need a suitable case, a power supply (15VAC walwart) and some optional components if you want add additional compensations. The PCB has provision to allow three different compensations which are jumper selectable. But note that only enough components are provided in the kit to install one complete and two partial compensations. To have three complete selectable compensations you will need to buy the balance of the components (which cost me about $20). If you are only interested in RIAA compensation, additional parts are not required.

Compensations listed are: RIAA, DECCA, EMI LP, NARTB and Columbia. There are also a number of 78 compensations. There is a lot of flexibility with this kit. For myself, I included RIAA and DECCA compensation.

The schematic of the preamplifier section is shown in Figure 1. Please note that this circuit is © Silicon Chip Online and permission to host the schematic on this site has been provided by Silicon Chip Online. Here is the link to the article which appeared in Issue 215 - Build this magnetic cartridge preamplifier by John Clarke.

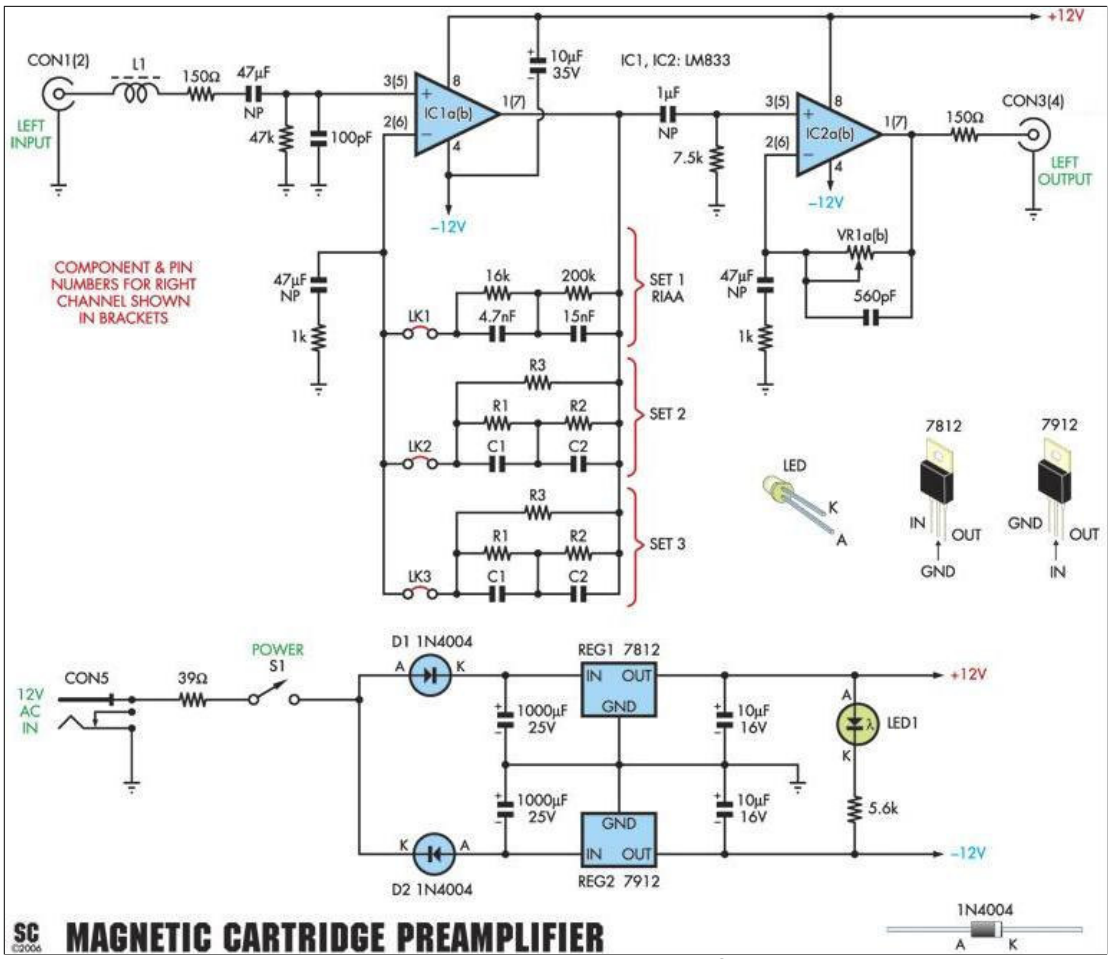
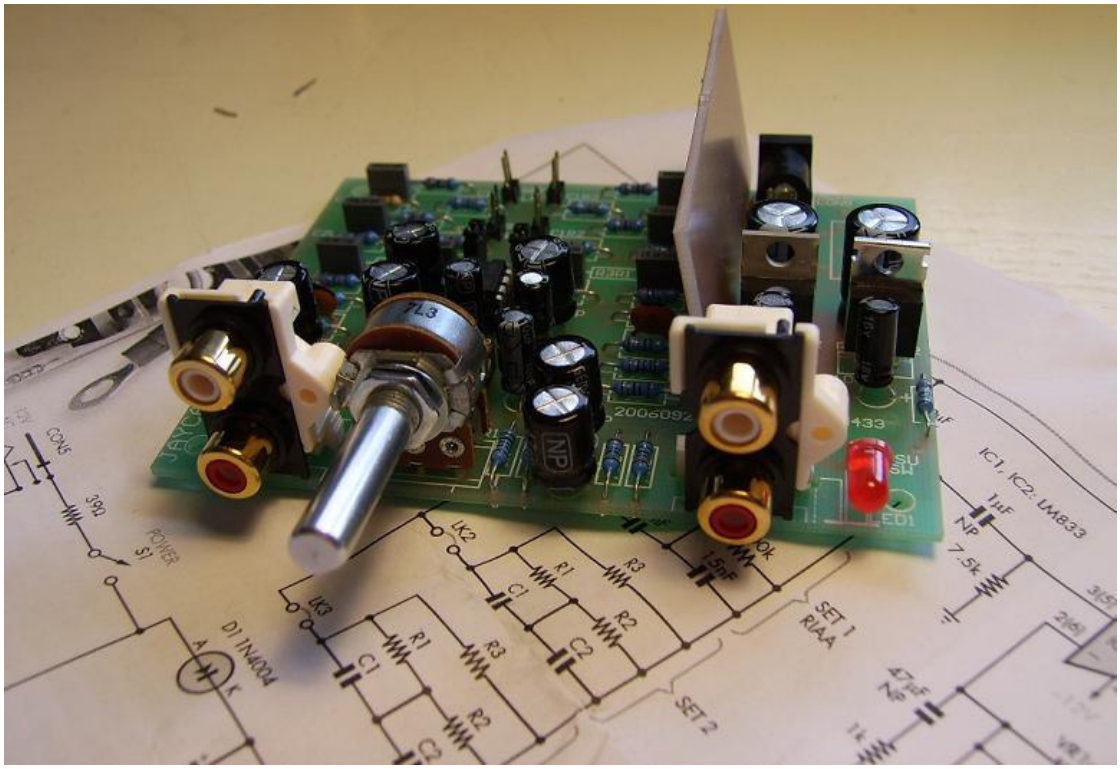


Figure 1 - Moving Magnet Phono Preamplifier Schematic
(Schematic © Silicon Chip Online)

Phono Preamp Kit Construction

I started by installing the small parts, resistors and small capacitors. The kit comes with rectifiers (1N4004 diodes) 12V regulators (7812/7912) and a PCB shield. I inserted the two op-amp chips last. I also added snubbing 0.1 uF polypropylene caps to the final filter capacitors to reduce diode and regulator noise and any induced RF. Also, I added a clip on ferrite bar to the end of the 15VAC walwart. The board can be fully populated in one or two hours. Be careful when installing the compensations components. You must align two charts in the instructions to select the correct components from many for the compensation networks.



Photograph 2: Assembled Phono Preamplifier Kit

The case I chose is of ABS plastic. The plastic is tough to drill but does not shatter or splinter. I lined the case with sticky tar and heavy Aluminum foil tape on the base, lid and sides. I did not earth the foil. The PCB stands on sticky computer stand-offs. The foil and stand-offs provide dampening and RF shielding. For further dampening I added large soft silicon feet.

Photograph 3: Phono Preamplifier Enclosure

The gain control pokes through the front with the inputs/outputs (gold plated RCA jacks) and power socket on the rear. A LED was

used for the power indicator.

Photograph 4: Finished Phono Preamplifier Kit - Rear

Phono Preamplifier Kit Sound

The big advantage that this kit has over the Pro-Ject Phono Box SE is the ability to adjust the gain. What it does not provide is support for moving coil (MC) cartridges.

After many hours of listening I am extremely pleased with the sound. It is hiss and hum free, appears to produce a natural and uncolored sound from all the classic, rock and jazz albums I have played (some are 180g re-releases of 1958 classical recordings, others modern day direct metal cut master pressings and digital recordings). I cannot fault the preamp kit at all. Even when set to full gain it produces no unwanted noise.

Subjectively, the kit compares sonically very well with the Pro-Ject Phono Box SE Preamp. It may even be better sounding. It is definitely far more flexible and can be built for a 1/4 of the price (plus you get the DIY satisfaction).

Photograph 4: Finished Phono Preamplifier Kit - Front