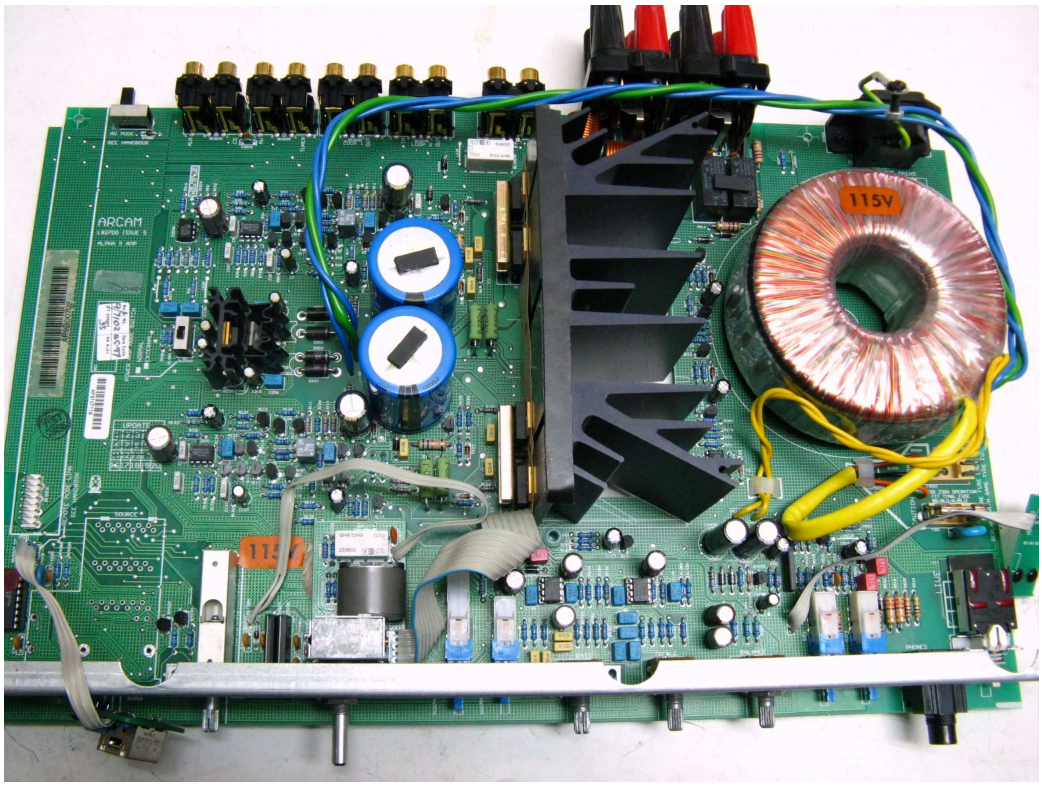
Audio Restoration Project: Repair Source Selector Switch and Upgrade Arcam Alpha 9 Integrated Power Amplifier.

This classic was available in 2 forms – the Integrated Amplifier, and the Power Amplifier. Although compact, they were highly over-engineered; testimony to this is proof of their longevity today.

They both share the identical main PCB and components. The only difference is that the Power Amplifier PCB has a large area of unpopulated empty space, as it does NOT include the PreAmp and Tone-control components, which are present on the PCB of the Integrated Amplifier.

The objective here was to upgrade all components which would contribute firstly to increased reliability and longevity, and secondly to improved sound quality, and then to replace the troublesome motorized Source Input Selector Switch.

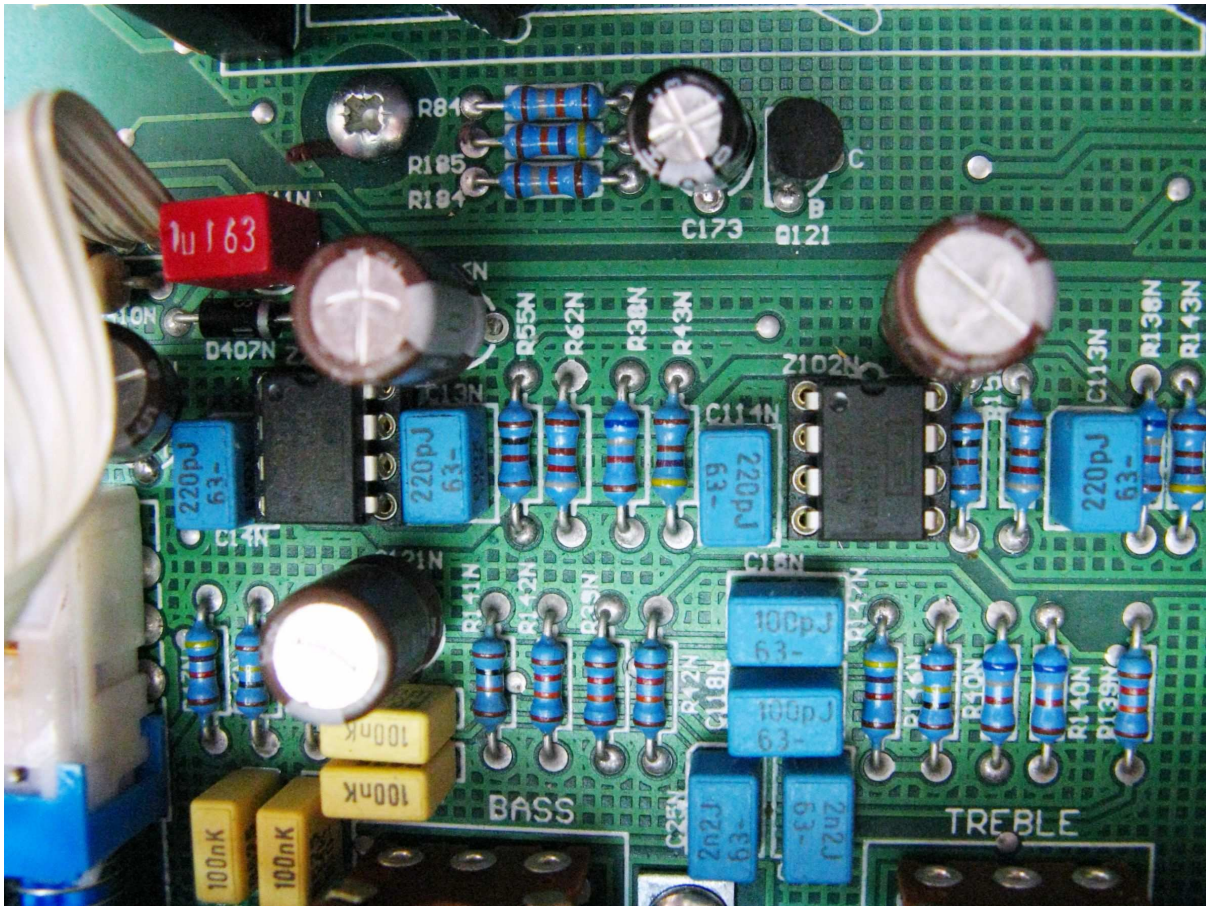
1. Upgrade the PreAmp and Power Amp capacitors



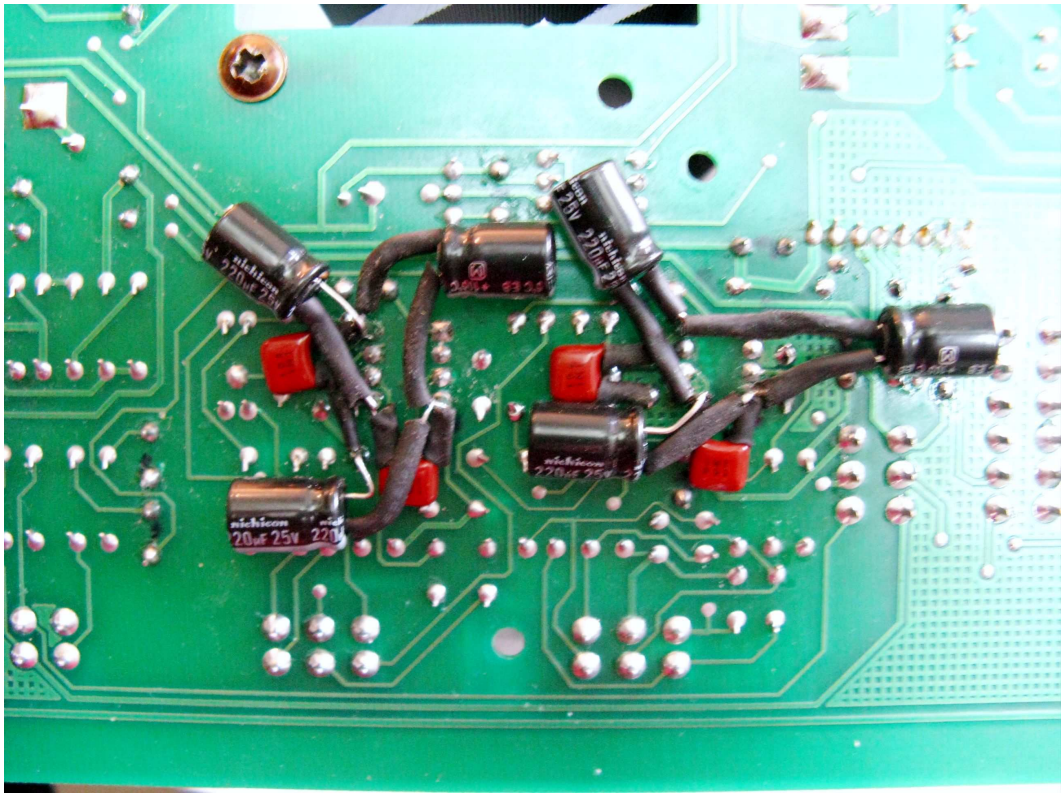
I selected Panasonic FC and Nichicon HE for the Bypass capacitors, and Elna Silmic II and Wima MKS2 film caps for the Signal Path. The main Decoupling capacitors are 10,000uF 63V CD 381LX.

The picture shows the Source Input Selector Switch already removed from the PCB.

2. Upgrade the Op-amps in the Preamplifier



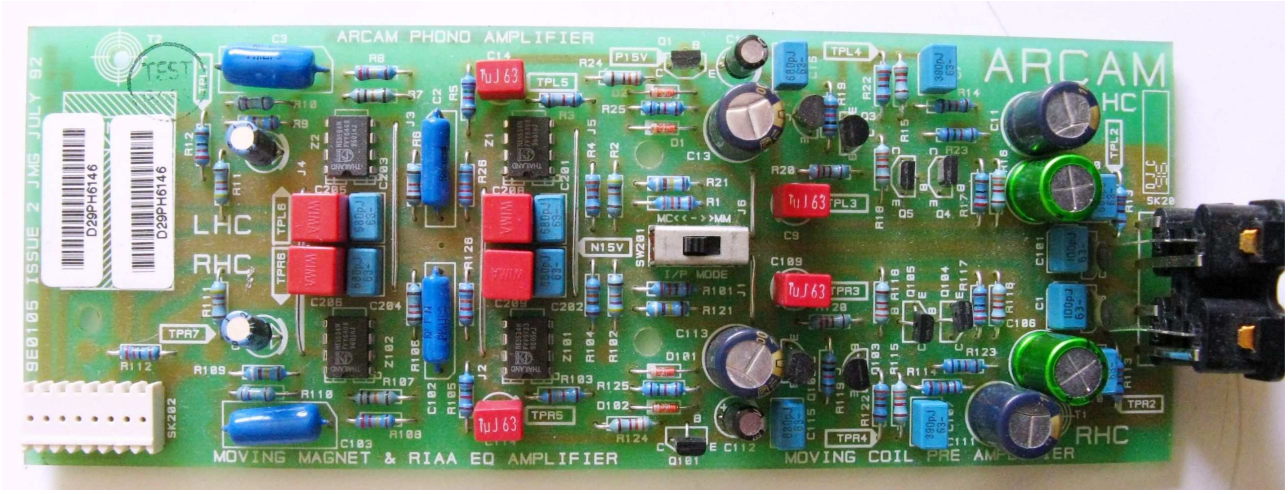
The original 4560 op-amps were replaced with OPA2134's, after installing gold-plated sockets, to allow for future upgrading.



Under the PCB, Bypass caps on and between the rails, were added. I used 220uF Nichicon HE, and Panasonic EB and 100nF film capacitors. In addition to improving the oscillation stability now (which is not really critical with the OPA2134's), it will enable painless future upgrades, for those op-amps which are really oscillation-sensitive.

In the RIAA and Power Amplifier, the NE5534 op-amp is used. It has a non-standard pinout, so upgrades here are not practical.

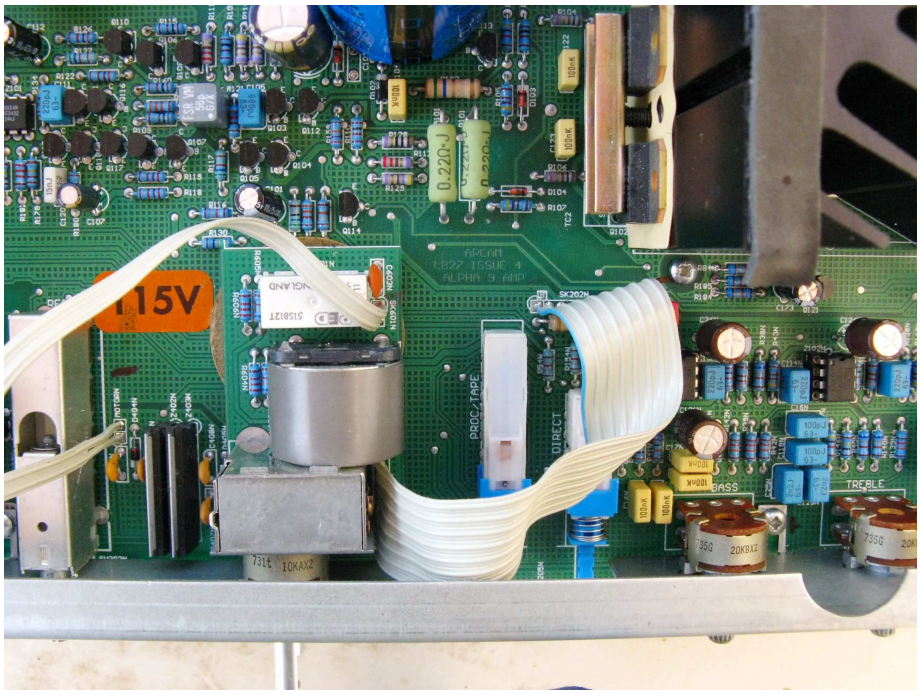
3. Upgrade the RIAA MC/MM PreAmp daughterboard



This daughterboard was an optional extra, and not installed on all Alpha 9's. It has an excellent design, and is well-worth upgrading. It is selectable between MC and MM stages.

The bypass capacitors are Panasonic FC, and the signal path caps are Nichicon Muse Bipolar and Wima MKS2.

4. Trouble Point – Ribbon cables



These ribbon cables tore at the solder points, and required complete removal, restripping and resoldering.

5. Replace the Source Selector Switch

The Source Selector switch has a long history of failure. It was made by ALPS, and is mediocre quality, having thin tin contacts, which are not resistant at all to oxidation.

Disassembly and cleaning with DeOxit is at best, only a temporary fix – the oxidation returns, and with a vengeance. And desoldering 40 pins, each time the contacts need to be cleaned, weakens the inter-PCB VIA's to the point that a bricked machine is a potentially realistic outcome.

In the past, I used a similar ALPS switch from Onkyo (now NLA), which required major modification to suit the Alpha 9, but this was a matter of only prolonging the inevitable, and not solving the problem once and for all.

It was understood that the motorized function would be discarded – I mean, who really needs to use a Remote-Control on a selector switch? Nice toy, but totally unnecessary.

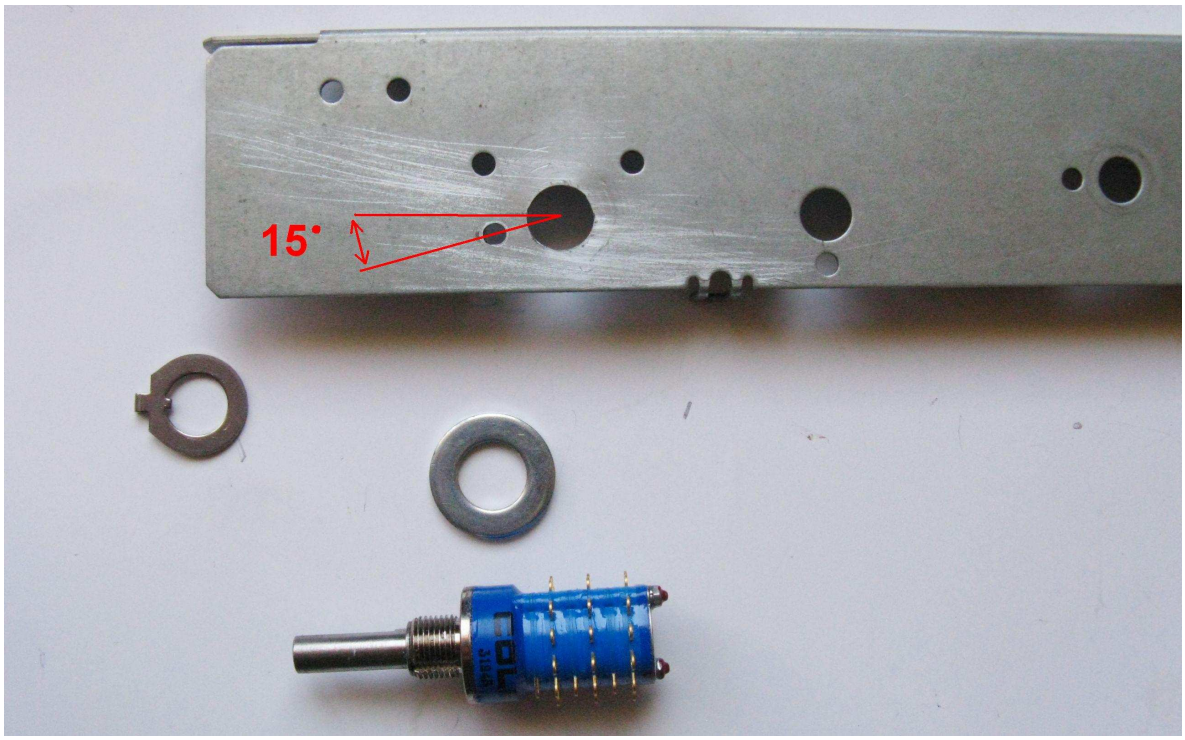
The major obstacle to obtaining a suitable switch, was physical size limitations. There is no shortage of cheap SP6T, 3-gang switches available, especially from China (not even discussing quality). The problem is that the panel hole for the Alpha 9 selector is very close to and low down to the PCB, so that no switch with a diameter of more than 18mm will clear the PCB.

That immediately limited the potential sources to miniature Military-Spec switches. The upside is high-quality base materials, gold-plating, reliability, and sound clarity, and the downside is cost.

This required a special order because all stock Mil-Spec switches are built with 1/4" round shafts, and all the Arcam switches and knobs have a European 6mm D-Flat form. The objective was to make this a transparent replacement, so I did not want to use a non-original knob for the sake of saving a few $'s.

After receiving quotes from a number of Mil-Spec switch manufacturers, I selected the Cole S3900 series, requiring a custom production run with a minimum order.

5a. Prepare the Panel

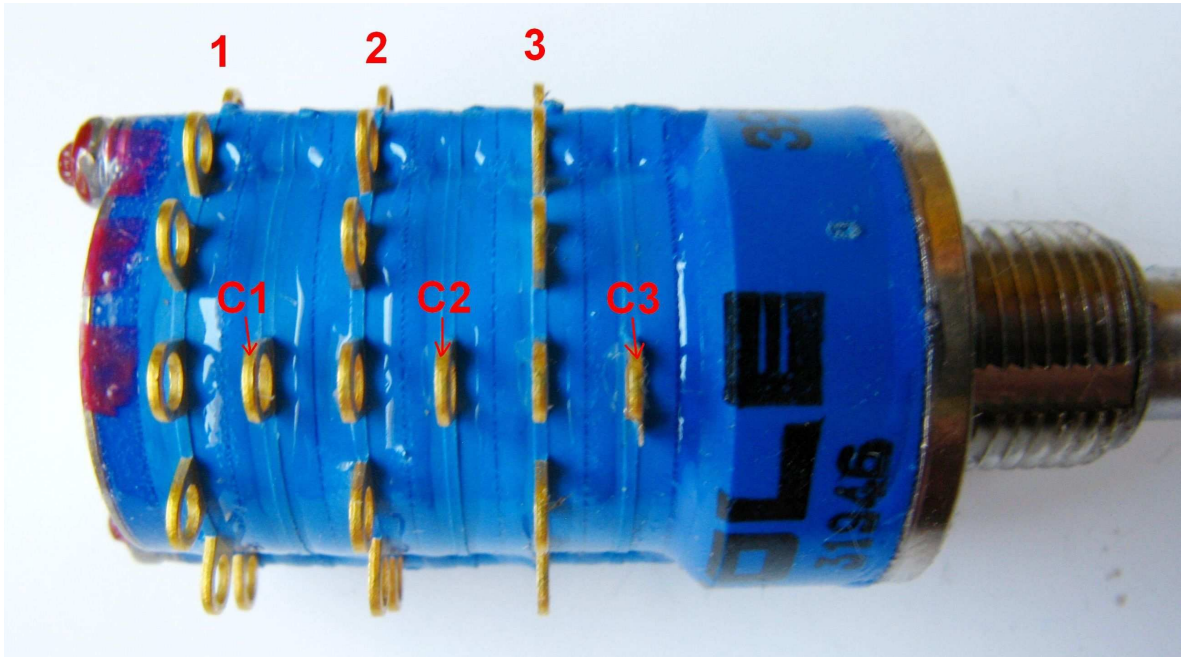


The original hole must be widened to accommodate the 3/8" bushing – I used a 9.5mm ream.

A 3mm hole for the lock-nut must be drilled 15° below horizontal on the left, at a radius of 9.6mm, so that when fully CCW, the flat edge of the D-shaft is aligned vertically at the 0° position.

A 2.5mm thick washer with I.D. of 10mm is inserted on the bushing BEHIND the panel.

5b. Prepare the Switch

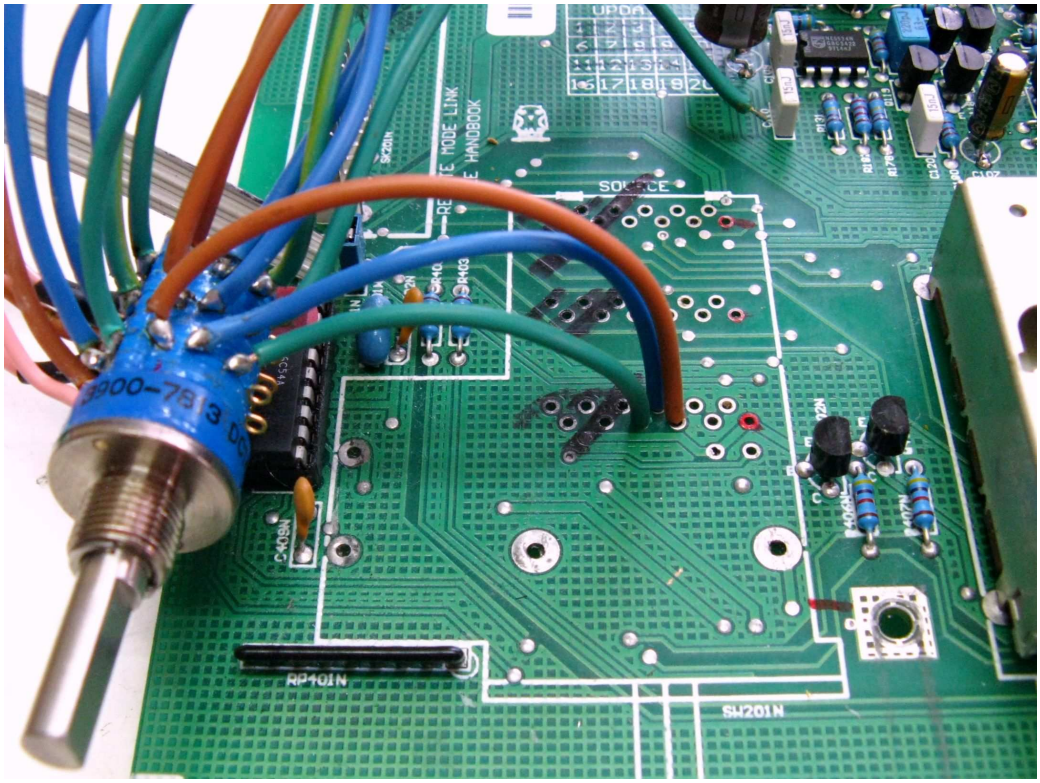


Even though all 12 contacts on each of the 3-gangs are present, only 6 are actually active. The non-active contacts are mechanically blocked and cannot be selected. I have marked the active positions with red paint.

The ideal soldering sequence is Row 1, and then C1 (the common selector for Row 1), Row 2, and then C2, Row 3, and then C3. The "C" positions have the pink wires.

Use 20-22 guage copper cable, with a length of 100mm, each of which will then be trimmed appropriately when ready to solder into the PCB holes.

5c. Prepare the PCB and trim the cables

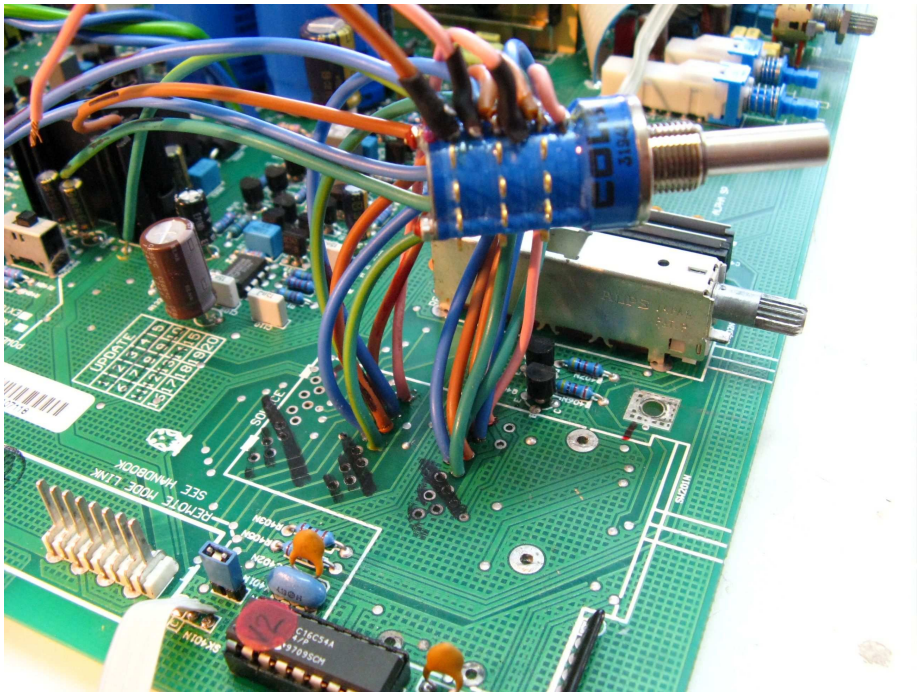


To avoid mistakes, coloured cables are used in a specific order, and trimmed appropriately, as shown.

Notice that on the PCB, the COMMON holes are marked in RED. The Pink wires will be soldered into these holes.

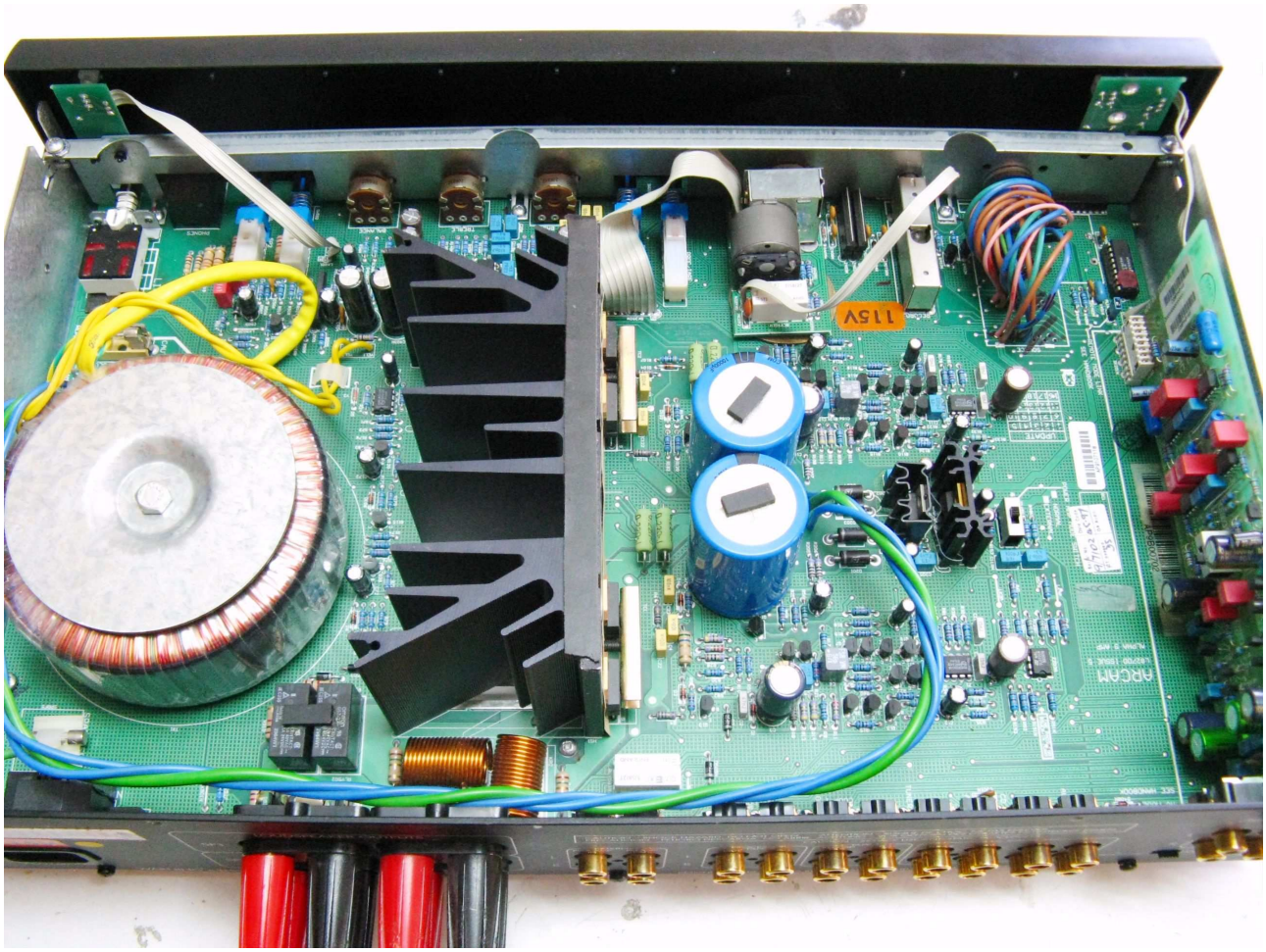
Then, moving to the left, are the 6 active position holes. The remaining 5 holes are blacked out, and are not used.

5d. Solder all the cables



Here 2 of the 3 rows are complete. On the common connectors, it's a good idea to use shrink-wrap tubing, as the connectors are very close to one another.

The two front PCB holes, which previously supplied power to the motor, are now unused.



Here is the completed machine.

The amplifier performs flawlessly, and the switch problem is solved permanently.

5e. Gold plating of the contacts on the Original ALPS switch is NOT a long-term solution

Gold plating of the contacts of the original ALPS switch is, at best, a temporary stop-gap measure. The damage on the contacts, in the form of ridges and gouges, is not filled-in or removed by gold-plating, and the original tin material is too soft and too thin to survive long-term. It is NOT a permanent solution.

Parts for this restoration

Parts and advice are available for owners who wish to tackle this project by themselves.

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