

## LA100 Application Note 23 – Fitting the Lithium-Ion Battery Upgrade (Linear PSU)

**Note.** Only fit this modification to LA101 or LA102 with a transformer (NOT a black switch-mode power supply). These instructions apply to issue 4 and 5 LA100 top boards.

**This kit is to be fitted by competent engineering personnel. If you have any queries, contact Lindos for advice.**

**All memory contents of LA102 will be lost. It is best to print out any relevant information before starting this upgrade.**

**While fitting the kit, static electricity precautions should be observed.**

### **Check kit contents:-**

- 1 x Lithium-Ion battery pack assembly
- 1 x Charger circuit board assembly (surface mount)
- 1 x FQP706 transistor
- 1 x LM2940-5.0 I.C.
- 1 x 470K $\Omega$  resistor
- 1 x 11DQ03 diode
- 1 x Test load.

### **Fitting the upgrade:-**

- Disconnect the instrument (LA101 or LA102) from the mains supply and remove the top cover.
- Unplug and remove the Ni-Cad battery pack. Dispose of this in an environmentally responsible manner or return it to Lindos for disposal.
- The upgrade is fitted to the processor/power supply (top) board. Carefully remove this board from the chassis by disconnecting the ribbon cables, remove the self-tapping screws, remove the mains shield and unsolder the mains wires to the transformer.
- Remove the resistor or link in position R3 (LK2 on issue 5 top boards) by cutting its leads and unsoldering the two remaining wire ends in turn. Carefully clean out the holes with a solder sucker.
- Fit the Charger circuit board in position R3 (LK2 on Iss 5) on the component (top) side, aligned so the components face the transformer. IN and OUT legs go in the holes for R3 (LK2 on issue 5 top boards). The 'Gnd' leg connects to the PC track directly beneath that leg (the track from Pin 5 of IC19 to Pin 5 RN6). Scrape away the solder resist from the track, and ensure that the leg lays flat on the track. Solder all three wires.
- Remove the TIP115 from position Q1 and fit the supplied FQP706.

- Remove the LM340-5.0 or 7805 from position IC18 and fit the supplied LM2940-5.0, retaining the existing heatsink.
- Identify resistor network RN6 and carefully fit the supplied 470K $\Omega$  resistor between pads 1 & 2 on the non-component side of the PCB. Pin 1 is identified by a dot on the screen-printed legend on the component side of the board.
- Check the number on the diode in position D10. If it is anything other than an 11DQ03, fit the diode supplied in this kit (it will already be a 11DQ03 on an issue 5 top board). Use the same removal method as used for R3 (LK2 on issue 5 top boards).
- Refit the processor board back in the unit. Be careful that the mains voltage wiring is not trapped when refitting the board. Check very carefully that all cables/wires are fitted to their original locations and that there are no loose wires.
- Apply mains power. The unit should work normally.
- Take the test load in the kit (8K2 resistor on a 3-way header) and plug it on to the battery connector on the processor board. Using a Digital Voltmeter, check the voltage on the outer pins of the battery connector. This voltage must be 8.35V  $\pm$ 0.05V. If the voltage is above 8.40V, do not connect the battery pack and contact Lindos for advice.
- If within these limits, fit and connect the new battery pack, noting that the battery connector will only fit one way round. Check battery operation. Batteries are normally supplied about 75% charged.
- Leave unit powered from the mains at least overnight to charge the new battery.
- Re-fit the top cover.