

Electronic Load

...keeps your battery pack switched on!

USB power packs are readily available and seem just perfect for powering your low-power USB devices. Unfortunately, many such packs will switch off if the current being drawn is too low. Our electronic load allows you to adjust the current draw to just beyond the point where the load keeps switched on. It's an efficient and simple way of using your power pack!

Building the **Electronic Load** is easy and fun. It will take about 20 minutes to build and is suitable for a beginner.



Revision History

23-Jan-17 First issued

Electronic Load Packing List

It's a good idea to check that you have all the parts before you get started:

Designator	VALUE	NOTES
D1	Not used	Not marked on PCB
D2	LED	Red
Q1, Q2	Transistor	BC337-40
R1	Trimmer potentiometer (pot)	100k
R2, R3	Resistor 47R	yellow-purple-black-gold-brown
R4, R5	Resistor 33k	orange-orange-black-red-brown
J1	USB A female	shorter connector
J2	USB A male	longer connector
	Heatshrink sleeving - clear	looks like a rectangle of clear plastic
	PCB	

If anything is missing, just get in touch for help.

Richard@sotabeams.co.uk

Errata

None

Electronic Load Instructions

The Electronic Load kit is easy to make and you will end up with really useful addition to your portable station.

Step by step instructions together with photographs will make it easy to build your Power Conditioner. It will take around 30 minutes of work.

Spotted a mistake or need help?

Please let me know!

Email Richard@sotabeams.co.uk, telephone +44 (0) 7976 688359

Building tips

Use a soldering iron with a fine tip (e.g. 1.2mm) and a fine solder (e.g. 0.7mm).

All the components are installed on the top side of the board labelled "SOTAbEams".

Use the list above to identify the components.

Only solder a component when you are sure that you have inserted the correct one.

Assembly

1. Install and solder R1 (blue pot)
2. Install and solder R2, R3 (47R=47 Ohms)
3. Install and solder R4, R5 (33k)
4. Install and solder Q1 and Q2 – note these must be installed the correct way round as indicated on the pcb.
5. Insert D2 (LED) into the PCB with the shorter leg in the square pad. Make sure that the LED is flush to the board before soldering.
6. Install and solder J1 – USB socket (the shorter connector).



J1

J2

7. Install and solder J2 – USB plug (the longer connector) – make sure that it is straight before soldering (tack-solder and adjust if necessary)

Testing

Turn R1 (pot) fully anticlockwise.

Plug the load (J2) into a USB power pack socket. The LED should light.

Plug your intended target device (e.g. WSPRlite) into the USB socket (J1).

If the USB power pack powers down after a few minutes (LED on Electronic load goes off), turn R1 slightly clockwise to increase the current being drawn. Note that some USB power packs take a few minutes to power down.

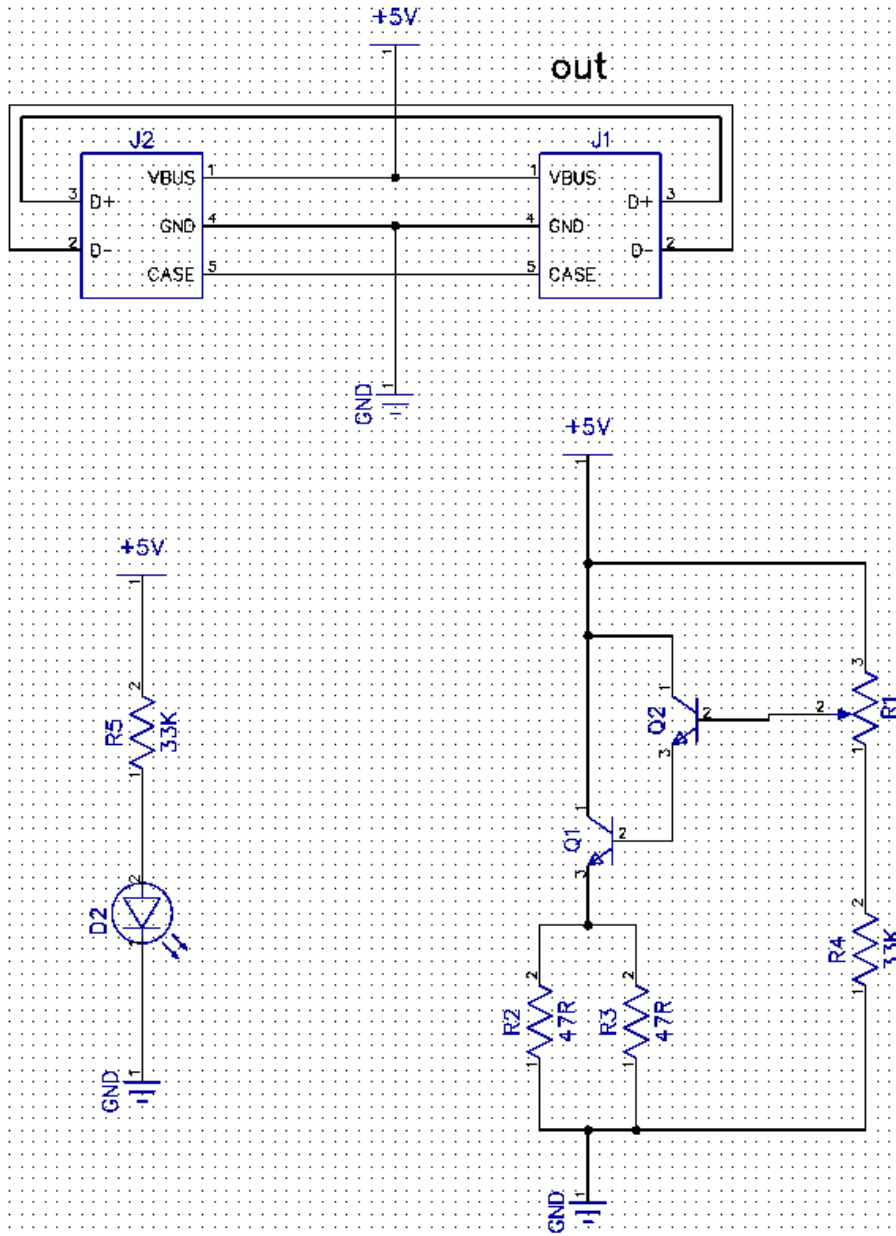
Repeat the previous step until the battery pack remains on reliably with the electronic load **and** your target device connected. This will ensure that you have the minimum additional current for best battery life.

Encapsulation

Before putting on the heat-shrink sleeving, ensure that you remove any sharp wire ends on the underside of the board. Clip with wire cutters.

Cut the sleeving to 5cm length and slide over the board from the J2 end. Push up and over J1 until the J2 end of the sleeving sits about 3mm beyond the board edge (over J2). Heat evenly on both sides with a hot air gun or hair dryer.

If you want to adjust the load again, using a sharp knife, cut a small window in the heatshrink over the pot.





Fault finding

The most likely problem on this board is a poor solder joint, Inspect your soldering carefully.

If you get stuck, send me an e-mail for help! Richard@sotabeams.co.uk

