

Battery Trickle Charger

Description

The design provides a constant ‘topping up’ of a stored battery while preventing the stored battery discharging back into the source (which may be another battery in parallel). In a sense this can be represented by a diode but a single diode cannot be used because of the diode forward voltage drop; the stored battery would never reach full voltage unless the power source was at a sufficiently high voltage to overcome the diode drop and still reach the charging voltage of the battery in store.

The circuit relies on two resistances. One provides the main source of charging current and is in series with a diode. This is a power resistor and must be mounted such as to dump the heat generated. When the difference between the battery and source is insufficient to overcome the diode drop the second resistance continues to trickle charge the stored battery until full charge is reached. The relay then disconnects the circuit to prevent current flow back to source should the source be lower than the stored battery (which it will when a load draws on the prime battery). A CB is added for safety.

This is a straightforward project built on a tag strip. Care needs to be taken, however, to ensure the heat generated by the significant currents can be dumped safely, and to use components and wiring that can handle currents up to 5Amp. We recommend the finished unit be housed in a metal case and located clear of heat sensitive materiel.

Components

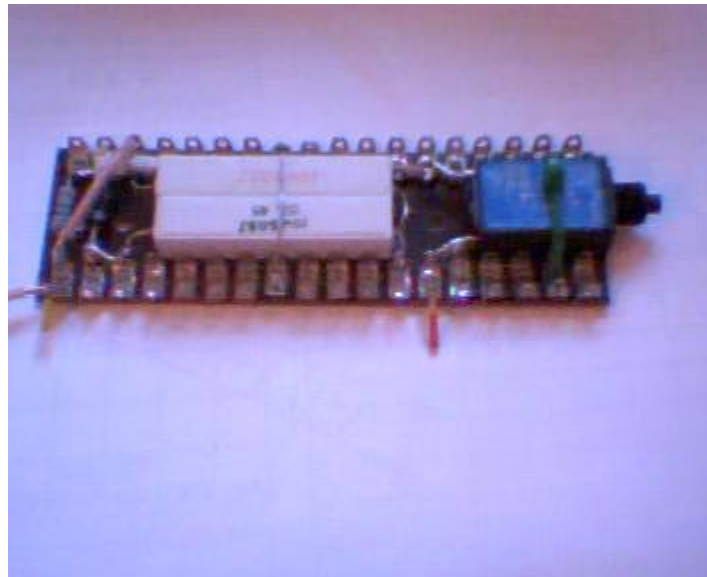
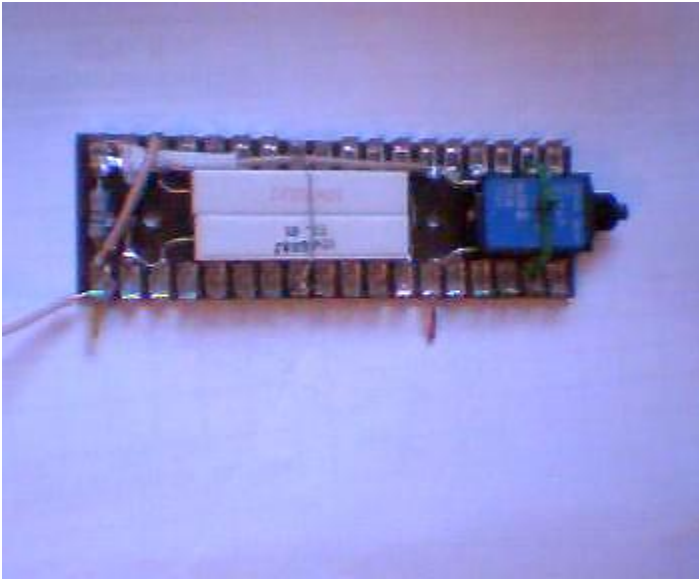
| Description | Part number | Source |
|---|--------------|----------------|
| Circuit breaker 3A | | RS, Maplin etc |
| 10v Zener | | RS, Maplin etc |
| LED | | RS, Maplin etc |
| Diode 3A | (eg) 1N5400 | RS, Maplin etc |
| Diode signal | 1N4148 | RS, Maplin etc |
| Transistor NP GP | (eg) BC109 | RS, Maplin etc |
| Power Resistor 12W min, 15R (see note 1) | | See note 1 |
| Resistor 150R 1.5W | Maplin D150R | Maplin etc |
| Resistor 390R 0.6W | Maplin M390R | Maplin etc |
| Resistor 1k5 0.6W | Maplin M1k5 | Maplin etc |
| Relay SPST 154R coil 12V | Maplin N26AW | Maplin |

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Note 1. Unable to source 12W, 15R we used 2 x 8R2, 7W w3ire wound in series, Maplin L8R2.

Construction

The photographs show the arrangement of the larger components on a tag strip. The relay and the tag strip are mounted in an aluminium case.



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Disclaimer

This article describes the Trickle Charger made by us during 2006. However, since we have no control over changes to specification of the parts used it is up to you to ensure the parts are still suitable for use in this application.

We must also point out that if your charger fails to work there can be no claim against us whether the failure is due to errors in our data or not. If you are unable to accept this caveat then you must not use the data in this article.

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