

Battery Backup PSU

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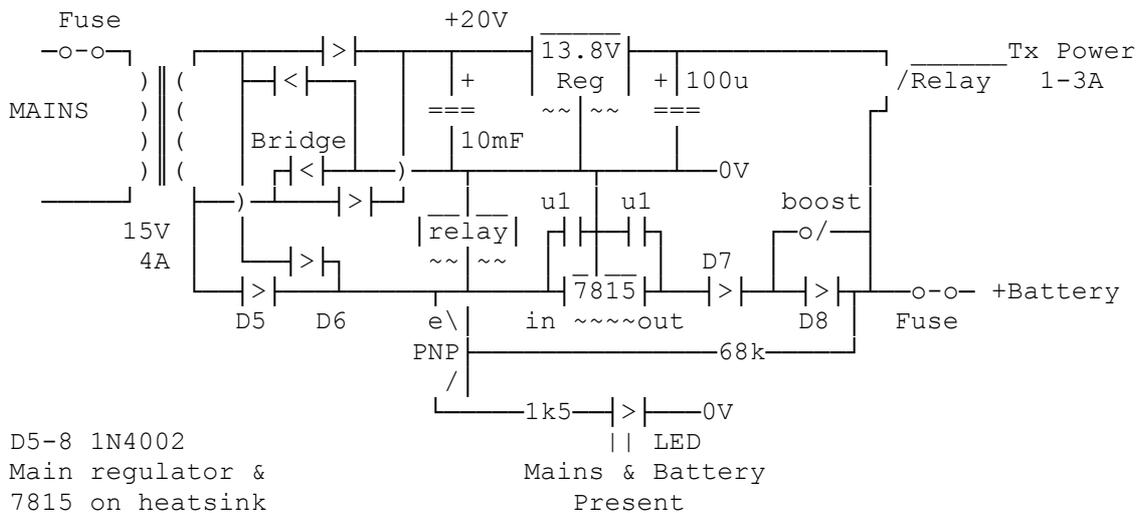
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Here is my design for a backup PSU suitable for a repeater etc. It offers a different approach to just paralleling up a battery with a PSU.

FEATURES

- Trickle charges battery @ 14.2V boost or 13.5V normal @ up to 1A peak.
- A flat battery does not hold repeater off air/blow up PSU.
- LED indicator shows "battery present" when mains is on.

CIRCUIT



OPERATION

The +13.8V PSU is quite conventional as needed, but with the addition of D5 & D6 supplies raw DC power to the mains fail relay, which connects the battery instead of the PSU when it is released. Extra "no drop out diodes" could be placed across the relay contacts if absolutely no power break is required e.g. to feed a uProcessor PCB.

This raw DC is also used to charge & maintain the lead acid battery. The charge voltage is either 1 or 2 diode drops less than the 15V regulator output as needed.

On the battery going flat after a long mains failure for example, the 15V regulator limits the battery recovery current to 1 amp (why it needs to be heatsinked), which stops the battery from taking down the PSU, so the repeater will come back on as soon as mains is restored even on a shorted battery.

N.B. This is the opposite to some strategies (UPS) that wack in full current into the battery in case of another power failure.

The LED battery indicator shows the presence of the battery when the battery voltage is less than the raw DC rail voltage by turning on the PNP transistor.

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