



FIG 2a - ADDITIONAL +5 VOLT POWER SUPPLY

2. Using an extra mains supply unit

The full circuit is shown in fig 2e and will provide up to 1 Amp at +5 volts. Instead of connecting pin 1 of the regulator to the Spectrum +9v supply, as in the previous example, it should be connected to the new +9 volt supply. This extra +9 volt supply consists of a 240v to 9 volt at 1 amp mains transformer, a 1 amp bridge rectifier (BR1) and a large 1000µF +25 volt smoothing capacitor C1. You must ensure that the mains transformer is safely wired up. Build it into an earthed metal case. The 7805 can then be bolted to the case, which will act as the heatsink. Accessible mains connections must be avoided to eliminate the possibility of an electric shock. Apart from the differences mentioned above, the circuit is identical to that described in section 1.

You should ensure that the mains supply is connected to your extra power supply at the same time as the Spectrum. If power is not applied simultaneously some chips could be damaged, because they don't like to have voltages applied to any of their pins without power being applied to them.

DECOUPLING CAPACITORS

The power supplies are distributed all over the main Spectrum board. Therefore if a chip on the far side of the board from the power supply suddenly requires extra current, a localised drop in voltage could occur. If the voltage drops too low (even for a microsecond), it could be enough to destroy essential data and program stored in memory. Supply 'decoupling capacitors' are therefore placed at strategic positions around the board. They are able to smooth out the supply by providing large currents for short periods of time. The voltage is therefore held approximately constant. C1—C8 around the memory chips are there for this reason, as are the other capacitors around the board connected across the supply rails. You should put some around any external circuits which you build as well. One 0.1µF capacitor for every two chips should be enough.