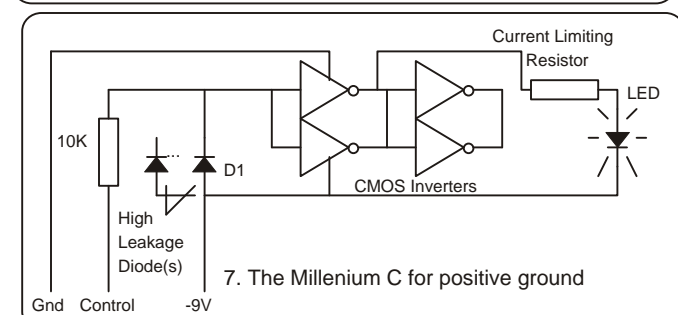
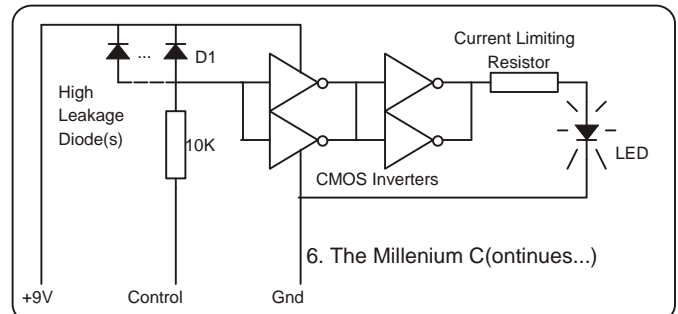
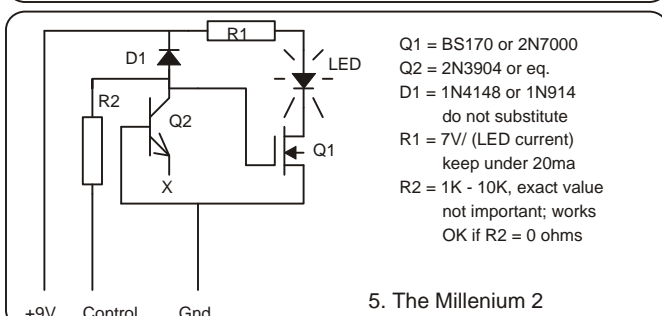
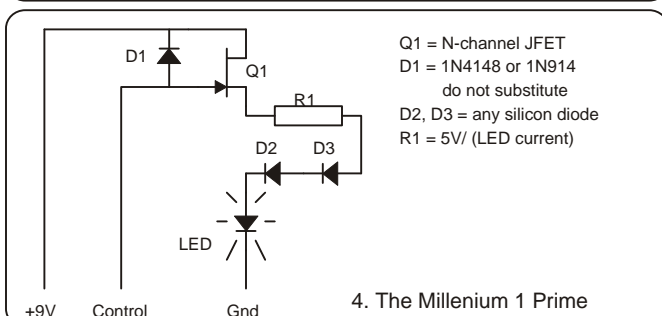
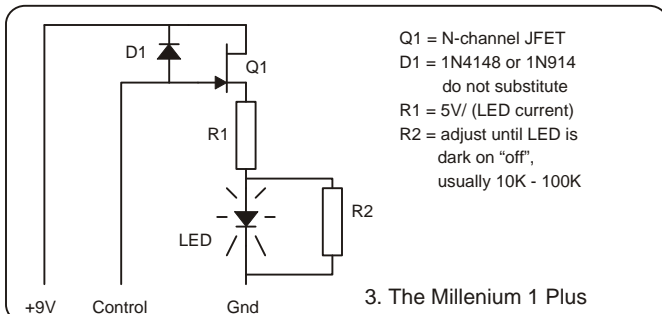
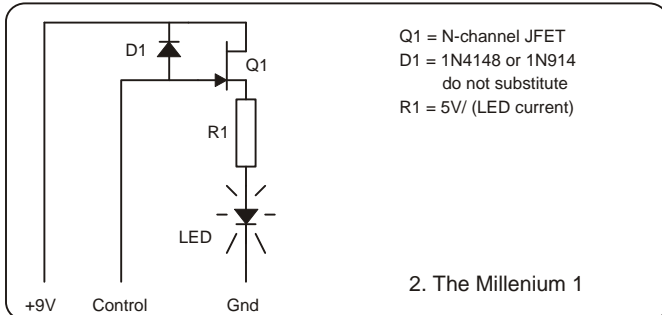
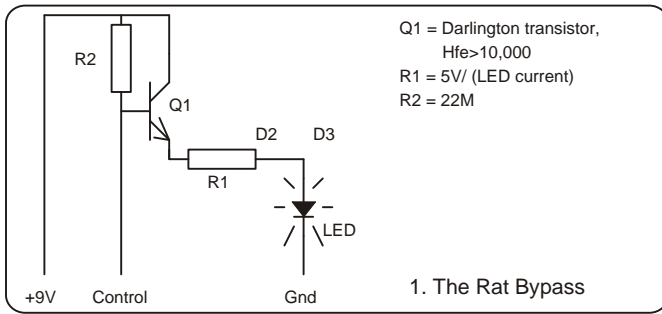


The Millenium C(ontinues)



Good, cheap bypassing started out with the Rat bypass. The Rat's designers noted that they could get true bypass plus an LED status indicator in a DPDT switch without the expense of a 3PDT switch (which were *very* expensive at the time) by using the DC resistance of the output of the effect to change the state of a darlington transistor. This is explained in some detail in the article on the Millenium Bypass at GEO.

Everything has problems, and so did the Rat. The DC resistance couldn't be large or you got pops when switching. The Millenium 1 (Fig 2) changed this by using the constant leakage of a silicon diode instead of a resistor to bias a JFET, not a darlington. This was cheap, and works well.

Again, nothing is perfect. The Millenium 1 suffered from the JFET's notorious variation in characteristics. A dim glow when supposedly off was surmounted by a parallel resistor (Fig 3) or a series diode or two (Fig 4), which very late Rats used, likely from seeing the Millenium 1 on the web.

To get around this, the Millenium 2 uses a MOSFET as an inverting switch. (Fig 5).

But there were still problems. People complain about not being able to find MOSFETs. So the Millenium C keeps the moves on. Using a common CMOS logic chip (Fig 6) instead of a MOSFET is cheap, very available, and has a bonus. If you reconnect the leakage diode and the LED, as in Fig 7, the same circuit works for positive ground effects as worked for negative ground effects.

The Millenium Continues! ... more to come...