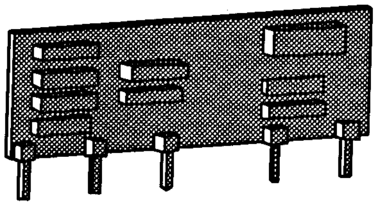
NEWS RELEASE: The MacNauchtan Laboratory.
DATE: 05/24/92
NOTE: As of August 1995 this has never happened. If anyone is interested in making a product out of this, please let me know. DPM.

Low voltage DC from the AC mains



Fabricators of line-powered equipment who need a small amount of low voltage DC to power a microprocessor or other circuitry usually have a choice of an over-sized and expensive transformer or a high power dropping resistor. We present a new low-power technique which can provide low voltage at tens of milliamperes with very low dissipation. The first in a series of "Living Power" modules has been prepared with these specifications:

- Line voltage: 90 - 440 V rms, 50 or 60 Hz.
- Output voltage 8 ± 0.4 volts. An external resistor allows adjustment to higher voltages.
- Current rating: 30mA. An external resistor allows for higher current. Power rating of the resistor depends on actual current drawn.
- Dimensions: 1 inch long X 1/2 inch high X 3/16 inch thick. Single inline printed circuit pins on .200 inch centers.
- Dissipation: 1/4 watt (Full load, no external resistors.)
- Additional components required: One low voltage, polarized capacitor. Specification depends on load, output voltage, and allowable ripple: about 500µF. Many applications will require an additional 3 terminal regulator.
- Ripple: Can be calculated from capacitor and load. Frequency is the same as the line. Waveform is sawtooth.
- Regulation: About 5% line and load.
- Line isolation: None. Output is positive relative to one of the line conductors.

For further information contact Doug McNutt at:

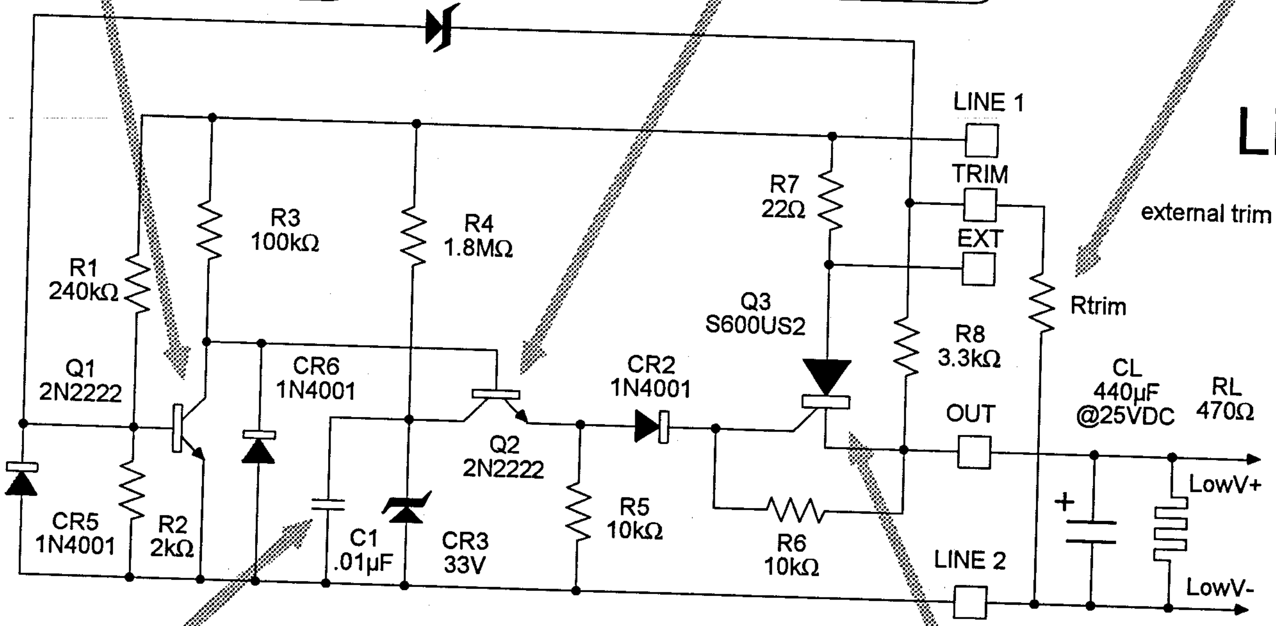
The MacNauchtan Laboratory
7255 Suntide Place
Colorado Springs, CO, 80919-1060
719 593 8192
FAX 719 594 6643
dmcnutt@macnauchtan.com

LivingDropPower

Q1 is held in a conducting state from the time when the line goes positive until its base voltage, determined by R1 and R2 reaches approximately 0.6 volts on the downward swing of the line. The exact time is further modified by feedback through R8 and CR4.

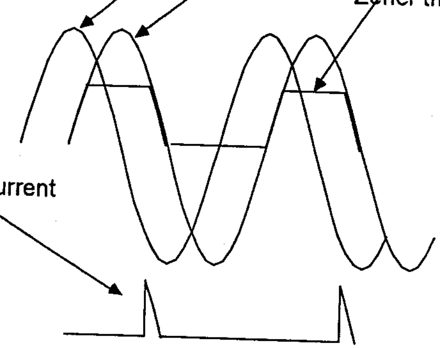
Near the end of the positive power cycle, when Q1 stops conducting, Q2 is turned on by current through R3. This dumps the charge on C1 through CR2 into the gate of Q3 turning it on. CR2 protects Q2 from the DC voltage at the cathode of Q3.

CR4 determines the regulated output voltage, but the value can be trimmed upward with the addition of an external resistor.



C1 is discharged during the negative half of the power cycle and then recharged thru R4 reaching 33 volts about 1/4 cycle after the line starts positive. A possible trigger of Q3 at the beginning of a cycle is prevented because of the delay in charging of C1.

SCR Q3 is turned on only late in the cycle and conducts current thru R7 into external capacitor C1. C1 is large enough so that the voltage across it is nearly constant. R7 limits the charging current.



Doug McNutt
The MacNauchtan Laboratory
7255 Suntide Place
Colorado Springs, CO, 80919-1060
voice - 719 593 8192
dmcnutt@macnauchtan.com

4:46:18 PM 12/28/92

Potentially new contributions to the art:

- Suppression of a possible trigger pulse at the start of the positive arch of the line by delayed charging of C1 thru R4.
- Use of feedback thru CR4 to stabilize the voltage.
- Other phase control devices use timing alone. This one uses voltage sensing to determine the trigger time.
- All components are physically small and suited for integration into a small module.