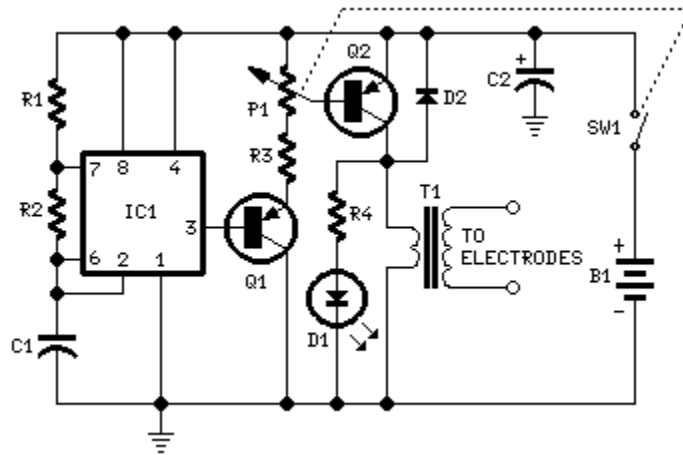


# Muscular Bio-Stimulator

Particularly suitable for cellulitis treatment  
3V battery supply, portable set

## Circuit diagram:



## Parts:

- P1\_\_\_\_\_4K7    Linear Potentiometer
- R1\_\_\_\_\_180K    1/4W Resistor
- R2\_\_\_\_\_1K8    1/4W Resistor (see Notes)
- R3\_\_\_\_\_2K2    1/4W Resistor
- R4\_\_\_\_\_100R    1/4W Resistor
- C1\_\_\_\_\_100nF    63V Polyester Capacitor
- C2\_\_\_\_\_100µF    25V Electrolytic Capacitor
- D1\_\_\_\_\_LED    Red 5mm.
- D2\_\_\_\_\_1N4007    1000V 1A Diode
- Q1,Q2\_\_\_\_\_BC327    45V 800mA PNP Transistors
- IC1\_\_\_\_\_7555 or TS555CN    CMOS Timer IC
- T1\_\_\_\_\_220V Primary, 12V Secondary 1.2VA Mains transformer (see Notes)
- SW1\_\_\_\_\_SPST Switch (Ganged with P1)
- B1\_\_\_\_\_3V Battery (two 1.5V AA or AAA cells in series etc.)

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## Device purpose:

This is a small, portable set, designed for those aiming at look improvement. The Bio-Stimulator provides muscles' stimulation and invigoration but, mainly, it's an aid in removing cellulitis.

Tape the electrodes to the skin at both ends of the chosen muscle and rotate P1 knob slowly until a light itch sensation is perceived. Each session should last about 30 - 40 minutes.

## Warning:

**The use of this device is forbidden to Pace-Maker bearers and pregnant women.**

**Don't place the electrodes on cuts, wounds, injuries or varices.**

**Obviously we can't claim or prove any therapeutic effectiveness for this device.**

## Circuit operation:

IC1 generates 150 $\mu$ Sec. pulses at about 80Hz frequency. Q1 acts as a buffer and Q2 inverts the pulses' polarity and drives the Transformer. Output pulses' amplitude is set by P1 and approximately displayed by LED D1 brightness. D2 protects Q2 against high voltage peaks generated by T1 inductance during switching.

## Notes:

- | T1 is a small mains transformer 220 to 12V @ 100 or 150mA. It must be reverse connected i.e.: the 12V secondary winding to Q2 Collector and ground, and the 220V primary winding to output electrodes.
- | Output voltage is about 60V positive and 150V negative but output current is so small that there is no electric-shock danger.
- | In any case P1 should be operated by the "patient", starting with the knob fully counter-clockwise, then rotating it **slowly** clockwise until the LED starts to illuminate. Stop rotating the knob when a light itch sensation is perceived.
- | Best knob position is usually near the center of its range.
- | In some cases a greater pulse duration can be more effective in cellulitis treatment. Try changing R2 to 5K6 or 10K maximum: stronger pulses will be easily perceived and the LED will shine more brightly.
- | Electrodes can be obtained by small metal plates connected to the circuit's output via usual electric wire and can be taped to the skin. In some cases, moistening them with little water has proven useful.
- | SW1 should be ganged to P1 to avoid abrupt voltage peaks on the "patient's" body at switch-on, but a stand alone SPST switch works quite well, provided you remember to set P1 knob fully counter-clockwise at switch-on.
- | Current drawing of this circuit is about 1mA @ 3V DC.
- | Some commercial sets have four, six or eight output electrodes. To obtain this you can retain the part of the circuit comprising IC1, R1, R2, C1, C2, SW1 and B1. Other parts in the diagram (i.e. P1, R3, R4, D1, D2, Q2 & T1) can be doubled, trebled or quadrupled. Added potentiometers and R3 series resistors must be wired in parallel and all connected from Emitter of Q1 to positive supply.

- | Commercial sets have frequently a built-in 30 minutes timer. For this purpose you can use the [Timed Beeper](#) the [Bedside Lamp Timer](#) or the [Jogging Timer](#) circuits available in this Website, adjusting the timing components to suit your needs.

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