Project name : Therapeutic Neuromuscular Stimulator

Overview:

This circuit stimulates nerves of that part of your body where electrodes are attached. It is useful to relieve headache and muscular pain and revive frozen muscles that impair movement. Though it provides muscle stimulation and invigoration, it's mainly an aid in removing cellulitis.

1. At 1st we are making the muscular stimulator circuit using IC 7555.
2. Then the timer ckt using IC NE555 will be used as a indicator notifying that stimulation time is over
3. Electrodes made of metallic plates are connected to the output and other end is attached with Rubber Pads.

Components:

1. IC 7555
2. IC NE555
3. Resistors 180k,1.8k,2.2k,100ohm, 5.6k,10k(2),33k
4. 5k, 1M potentiometer
5. Transistor(2)- BC327
6. Capacitors 100nF,0.01microF (2), 220microF, 0.47microF
7. Diode 1N4007
8. LED (2)
9. Piezo buzzer
10. Transformer- 12V to 220V, 100mA to 150mA max
11. Battery 3V,9V
12. On/off switch (2)
13. Connecting wires
14. Bread board
15. Thin Metallic Jacks
15. Rubber Pads (2.5×2.5 sq.cm)

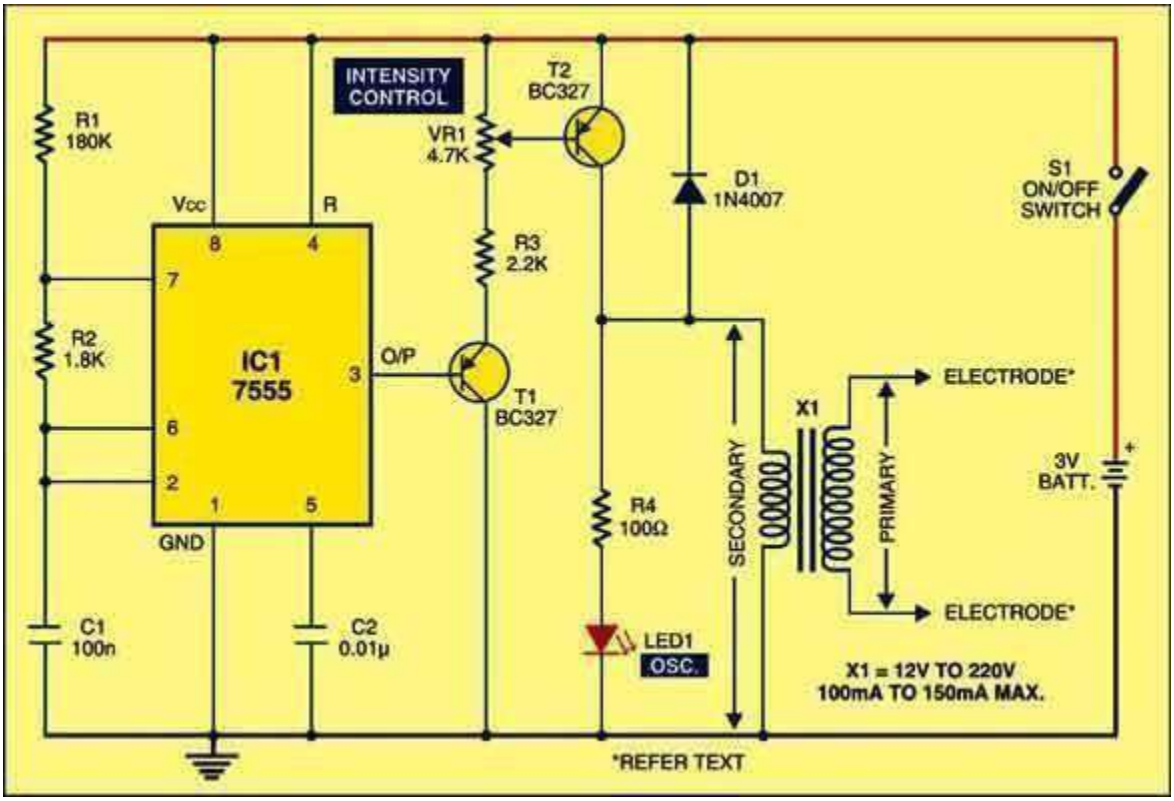
Circuit diagram:

Muscle Stimulator Circuit:

IC 7555 is wired as an astable multivibrator to generate about 80Hz pulses.

Using potentiometer VR1 you can control the intensity of current sensing at the electrodes.

The brightness level of LED1 indicates the amplitude of the pulses.

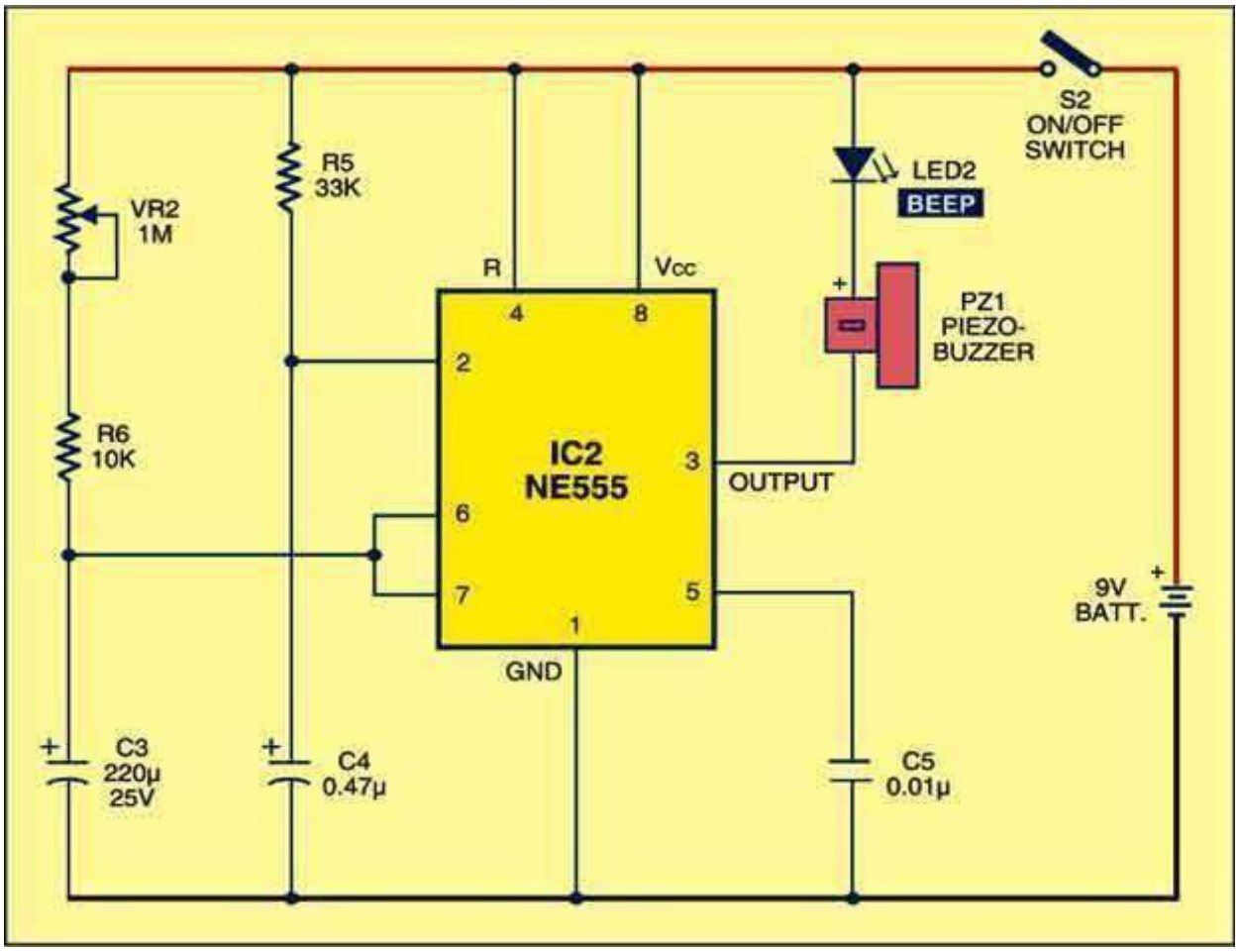


If you want to increase the intensity level, replace the 1.8kΩ resistor with 5.6kΩ or higher value up to 10kΩ.

X1 is a small mains transformer with 220V primary to 12V, 100/150mA secondary. It must be reverse connected, i.e., connect the secondary winding to the collector of T2 and ground, and primary winding to the output electrodes. The output voltage is about 60V but the output current is so small that there is no threat of electric shock.

Electrodes are made of small, thin metallic jacks insulated with Rubber pads measuring about 2.5×2.5 cm2 in size. Use flexible wires to solder electrodes and connect to the output of the device. Before attaching metal electrodes to the body, wipe them with a damp cloth. After attaching the electrodes to the body (with the help of Rubber pads), flip switch S1 to activate the circuit and rotate the knob of intensity-control preset VR1 very slowly until you feel a slight tingling sensation.

Timer circuit:



It uses IC NE555 wired in monostable mode. Initially, when you press switch S2, the monostable triggers and its output goes high for 10 minutes. Thereafter, its output goes low to give a beep sound from the piezobuzzer and lights up the red LED (LED2) indicating that muscle stimulation time is over.

Construction and Testing:

Assemble the timer with a separate switch and a 9V DC battery in the same cabinet as the stimulator. Tape the electrodes to the skin at opposite ends of the chosen muscle and rotate VR1 knob slowly until you sense light itching when the muscular stimulation circuit is powered on. At the same time, flip switch S2 to start the timer for counting the time. At the end of the timing cycle, the Piezobuzzer beeps. Each session should last about 10 minutes.

Caution:

Heart patients and pregnant women should not use this device. Also, do not attach electrodes to burns, cuts, wounds or any injury. Consult your physician before using this circuit.