Cell phone detecting system/Part I: Simulation

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Introduction

The transmission frequency of cellphones ranges from 0.9 to 3GHz with a wavelength of 3.3 to 10 cm. A circuit is needed to detect those gigahertz signals. Tuning circuit can work in selecting certain frequencies while rejecting others, but doesn't work for these gigahertz signals.

Stages of implementation:

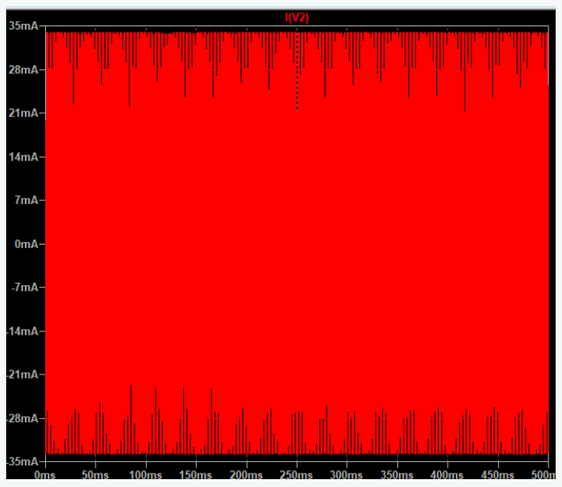
- Designing circuit able to detect 2G, 3Gand 4G networks and analyze its success in the electronics simulators.
- Correction of errors and proving its efficiency in case Bluetooth is on, data connection on, making/receiving a call and sending text messages.

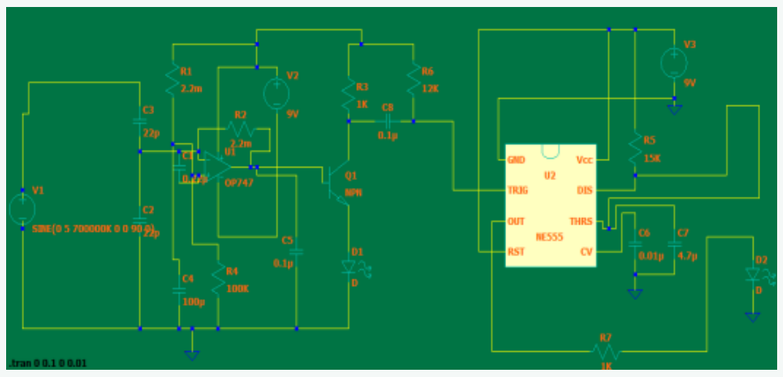
The simulation

The circuit is made of three parts: The operational amplifier, the monostable multivibrator and the buzzer.

b. At high frequency

The input to the op amp and the circuit simulated for 3G, 4G networks under LT spice.





Observation and next steps

- At low frequency, the simulation was quick and the results were easily noticed.
- At high frequency, the sine waves are very close indicating the gigahertz signals plus the LED blinking slowly.
- The next steps include implementing the circuit on the breadboard and the soldering.
- Reference to be made after implementation.

Acknowledgment

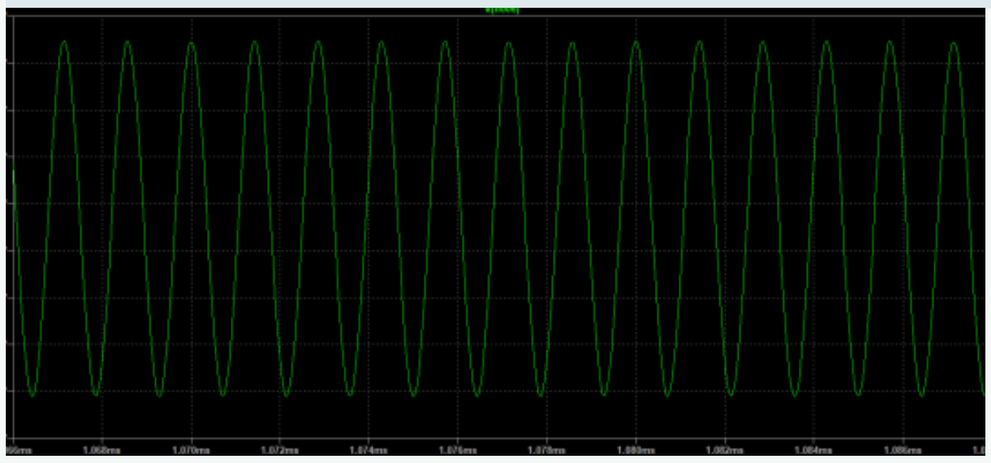
Thanks a lot to my supervisor, Lecturer Hitiyise Emmanuel for the continuous support.

Methodology

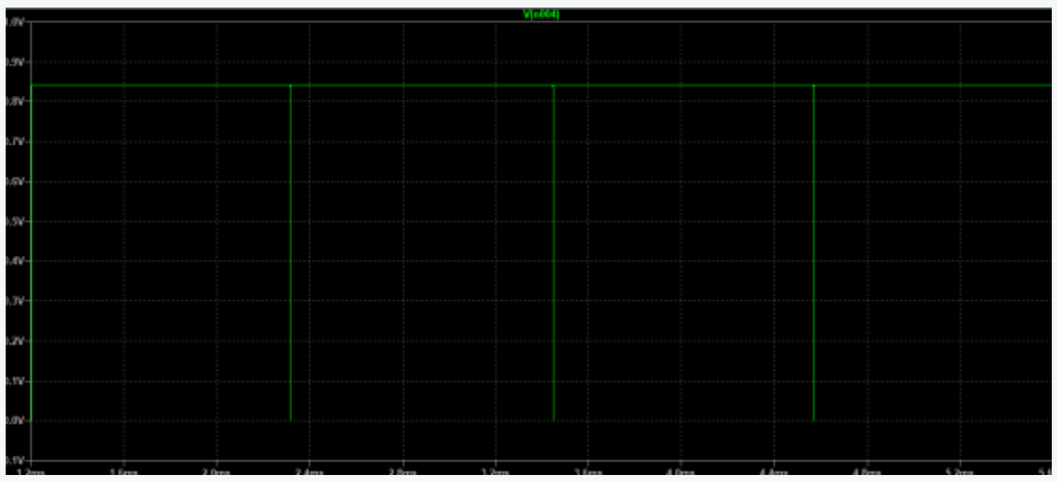
Part I: Simulation under Multisim and LT spice (electronics softwares)
Part II: Hardware implementation (on breadboard and on the PCB)

a. At low frequency

The input at low frequency to the circuit (to the op amp). The simulation done under LT spice showed the sine waves which are apart for low frequencies and the continuous blinking of LED.



The output of the monostable multivibrator shown below indicates that LED blinks at a certain period and stops at another period (short period) following the formula: **T=1.1RC** where T indicates the period when LED was blinking and R, C are resistors and capacitors respectifully.



The circuit below was simulated for 2Gnetworks under the multisim software for the 2G networks and had shown the results as expected. When a person makes a call or receives one, the LED (Light Emitting Diode) starts to blink and it stops when a person ends a call. This happens during text messaging too.: