ARMSTRONG OSCILLATOR

1. THEORY

Oscillator converts the DC signal to AC signal. There are many types of oscillators; out of that the LC oscillator works on the principle of positive feedback. Armstrong oscillator is a basic feedback LC circuit. In the proposed circuit, we are introducing the tank circuit between the base and ground. The tuned circuit is actually made of an inductor and a capacitor in parallel. In the proposed circuit, transformer and capacitor is used. The transistor starts its operation when the power is supplied to the base of the transistor. The collector current which flows through the secondary coil of the transformer induces a voltage in the primary coil of the transformer. The capacitor stores the charges produced by mutual induction. The capacitor starts discharging and the tank circuit functions.

When the capacitor is totally discharged the primary coil now induces voltage by self-induction and this results in storage of charges in the capacitor which in turn charges the tank circuit to produce oscillations. The part of the oscillation is now fed to the base of the transistor which is amplified.The oscillations sustain longer when the feedback is high. The oscillations become distorted when the feedback is too high and they die out very soon if the feedback is too low. The oscillations are sustained because of positive feedback. Thus the Armstrong (tuned base) oscillator is successful in producing the required output.

2. SCHEMATIC DIAGRAM:

The schematic diagram of Armstrong circuit in eSim is as follows

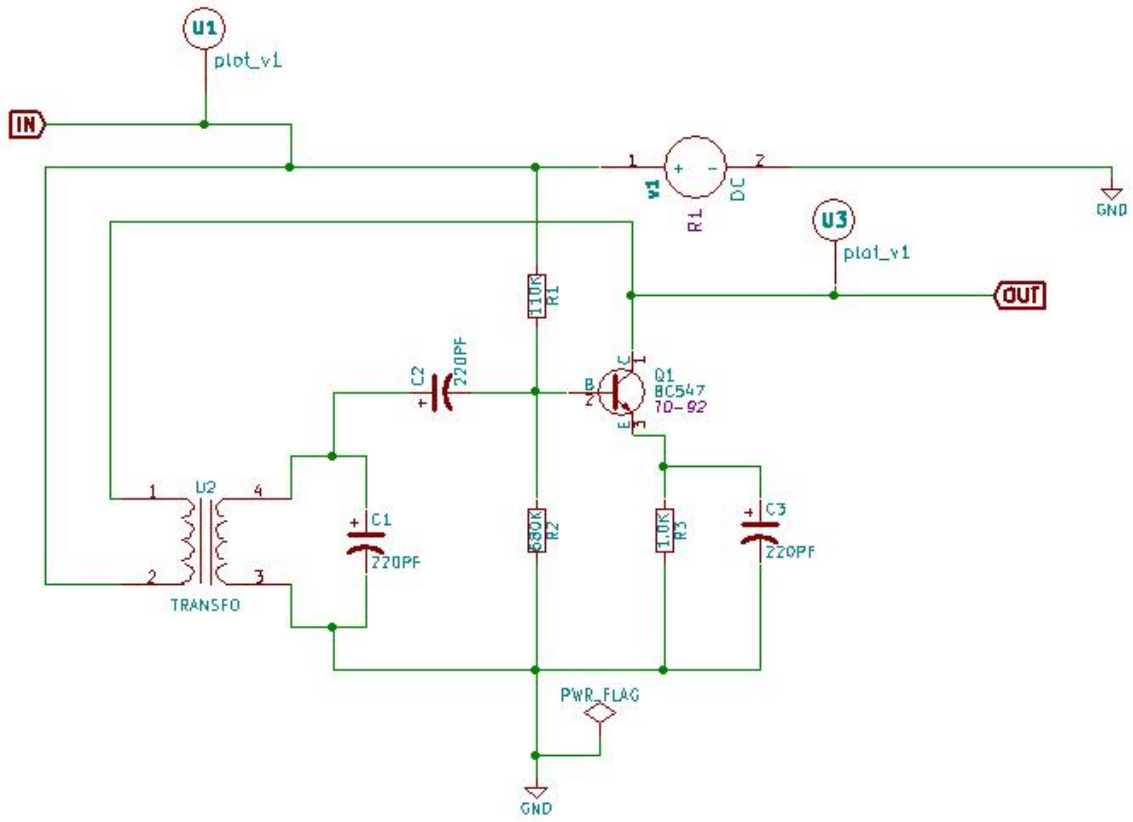

Figure 1: Schematic Diagram of Armstrong Circuit

3. SIMULATION RESULTS:

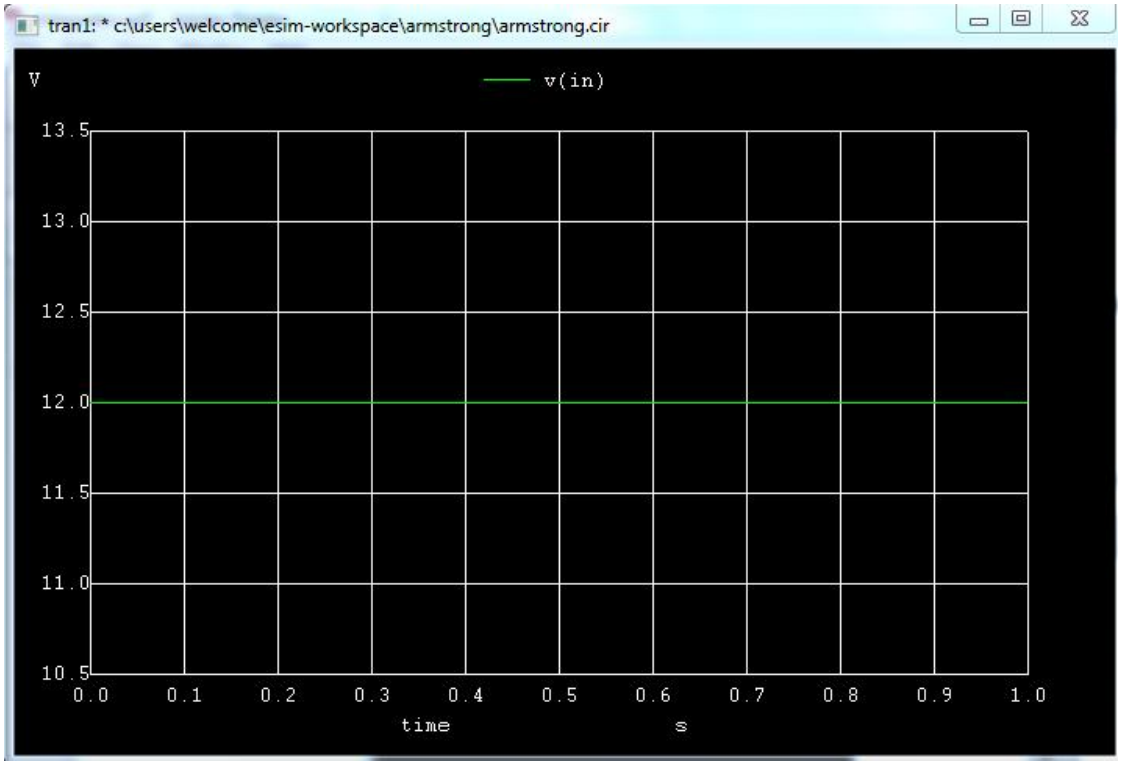

Figure 2: Ngspice Input Plot

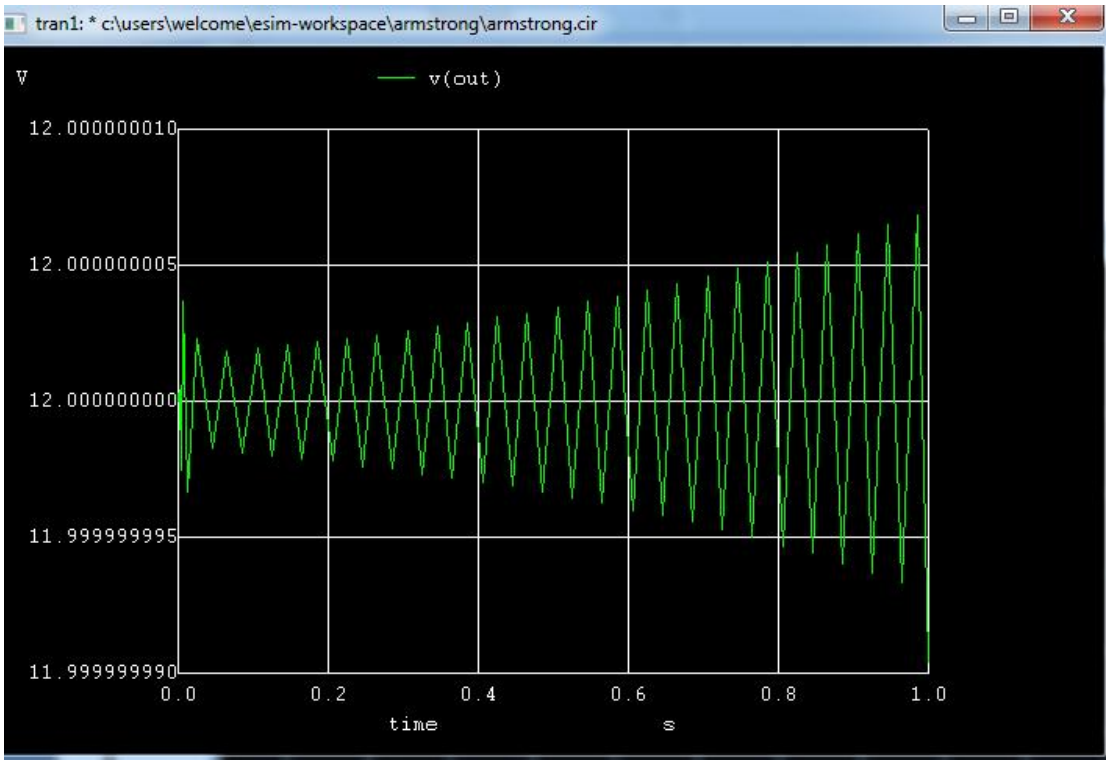

Figure 3: Ngspice Output Plot

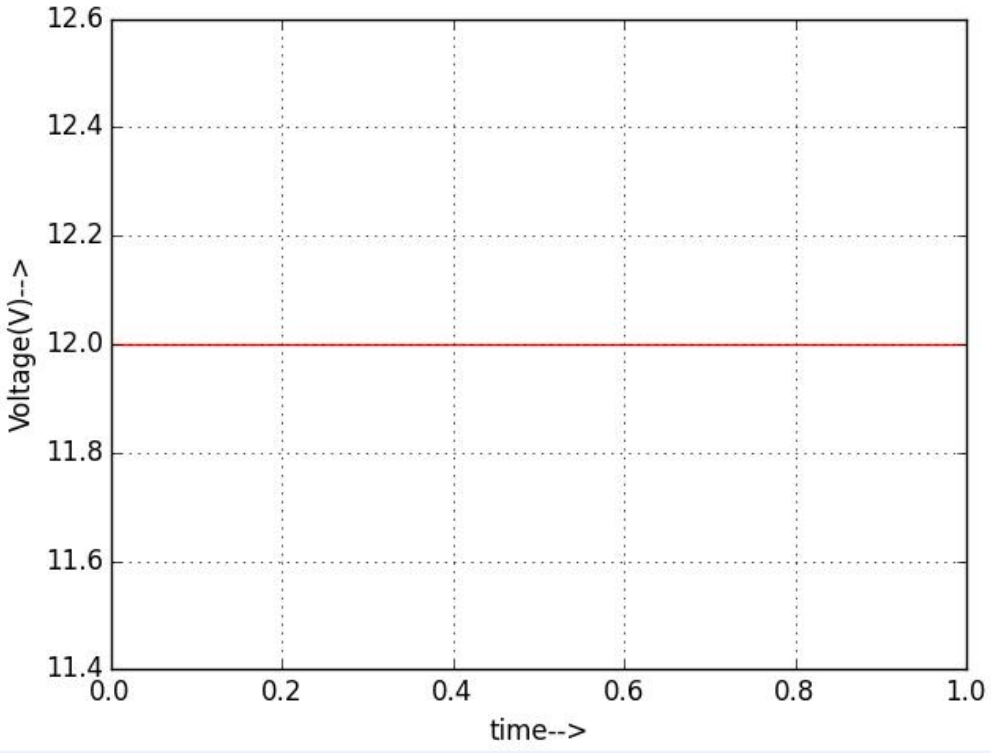

Figure 3: Python Input Plot

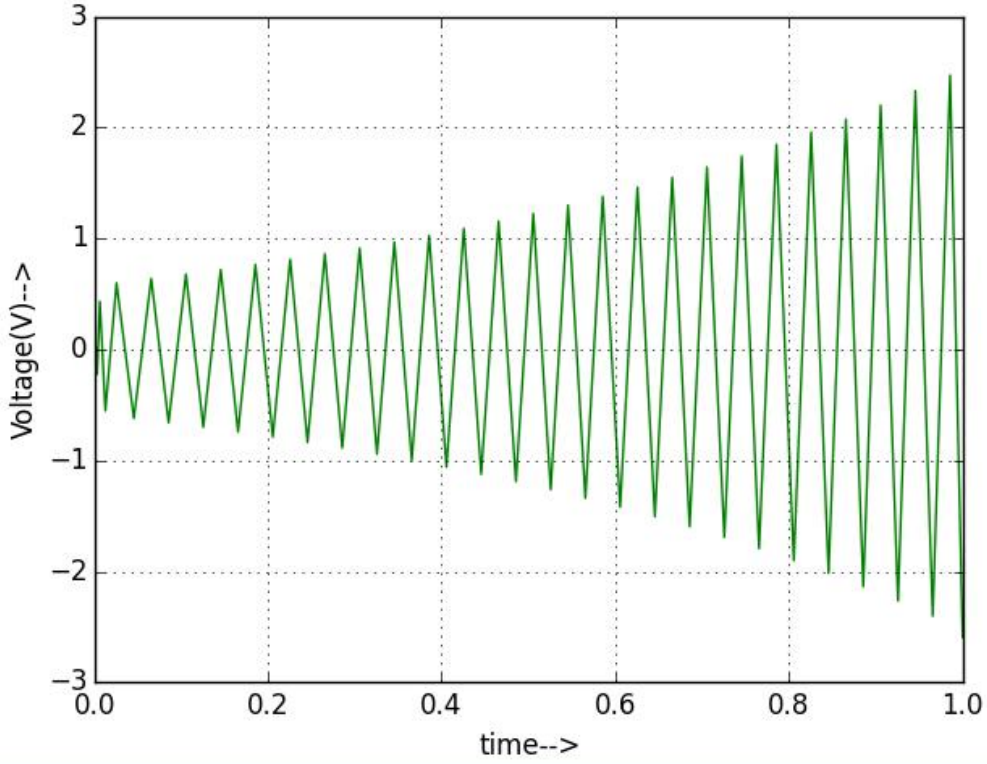

Figure 3: Python Output Plot

4. CONCLUSION:

Thus we have studied Armstrong Oscillator using eSim and got the appropriate wave forms.

5. REFERENCE:

http://www.circuitstoday.com/tuned-base-oscillator

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