

When the circuit is switched on current flows through R1 and turns on the npn transistor q1(not completely). Since the transistor is switched current flows the coil of 500 loops. This creates a magnetic field around the coil which slowly increases and reaches the coil of 10 loops. This induces a current in the second coil. This current will add up with the current from the 220k resistor. This will activate the q1 transistor more increasing the current through the 500 loops coil as well which in turn increases the current through the 10 loops coil as well. This process will go on till the transistor is fully on. When it is fully on the magnetic flux is no longer rising and becomes a static magnetic flux. So current will no longer be induced in the second coil. This will reduce current through the transistor, at the same time current through the main coil starts decreasing. This will again induce a current in the secondary coil but this time the current is reversed. So this current will be subtracted from the current from the 220k resistor and the transistor will be switched off. The magnetic flux is generated again in the main coil. This process goes on again and again creating a high frequency ac current. This oscillating current will switch the Q2 transistor on and off. When q2 is on along with vcc it maintains a value of vcc at the base of Q3. Since Q3 is a pnp transistor it is switched off. So no current will flow

towards the buzzer and no sound is emitted. When metal is brought near the coils part of the magnetic flux passes through the metal and gets lost and the amplitude of the ac current becomes smaller near the base of q1. The amplitude will become so small that the transistor won't be able to amplify the signal enough and the oscillations will die out. Without any current q2 will always be off. Hence vcc is no longer maintained at the base of q3 and ground will be maintained instead allow current to flow through q3 switching on the buzzer producing sound.