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Faculty of Engineering and Technology

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Electronic Circuit Design II Report

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Introduction:

This is a simple Electronics Project named **Power Amplifier.** It is voltage divider biased circuit. In this circuit Transistor, Capacitors, Resistors and Diodes are involved. It is a multistage common emitter and power amplifier.

Following components are used in circuit.

Name	Quantity
Transistor 2N3904	3
Transistor 2N3906	2
Transistor BD135	2
Diodes	3
Capacitors	5
Potentiometer	1
DC Battery	2
Resistors	14

Proposed Methodology:

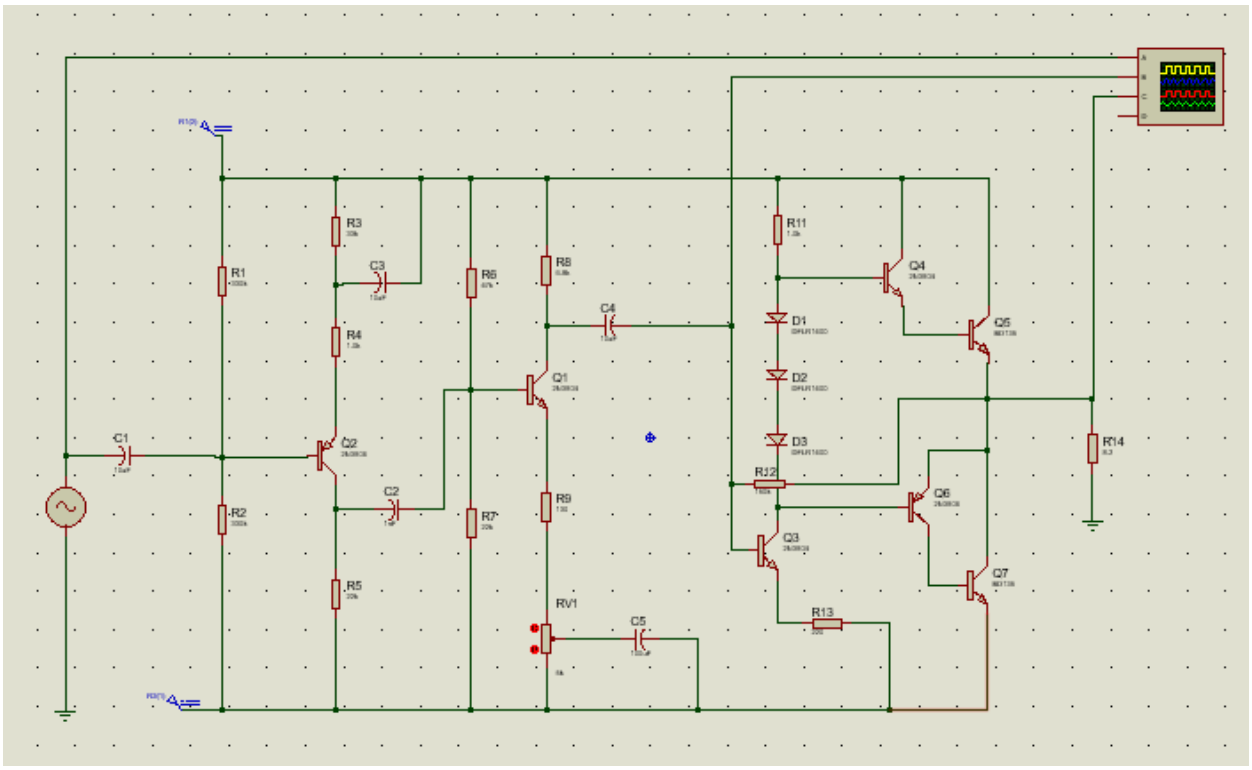
The First 2N3906 transistor is voltage divider biased and its collector terminal is connected to the base of next 2N3904 which is also a configured as common emitter Voltage divider biased. At Emitter terminal of 2N3904 transistor a Potentiometer is connected in series with Resistor RE. Now the collector terminal of 2N3904 transistor is connected to base of next 2N3906 transistor via a capacitor. The Collector terminal of 2nd 2N3904 transistor is connected to dc battery i.e. +15V battery via 3 diodes and a resistor which are connected in series combination. The Next 2N3904 and 2N3906 transistors base terminals are connected to collector terminal of previous 2N3904 transistor's collector i.e. 2N3904 is connected to collector after Resistor and 2N3906's base terminal is connected after Resistor and 3 diodes at collector of previous 2N3904 transistor.

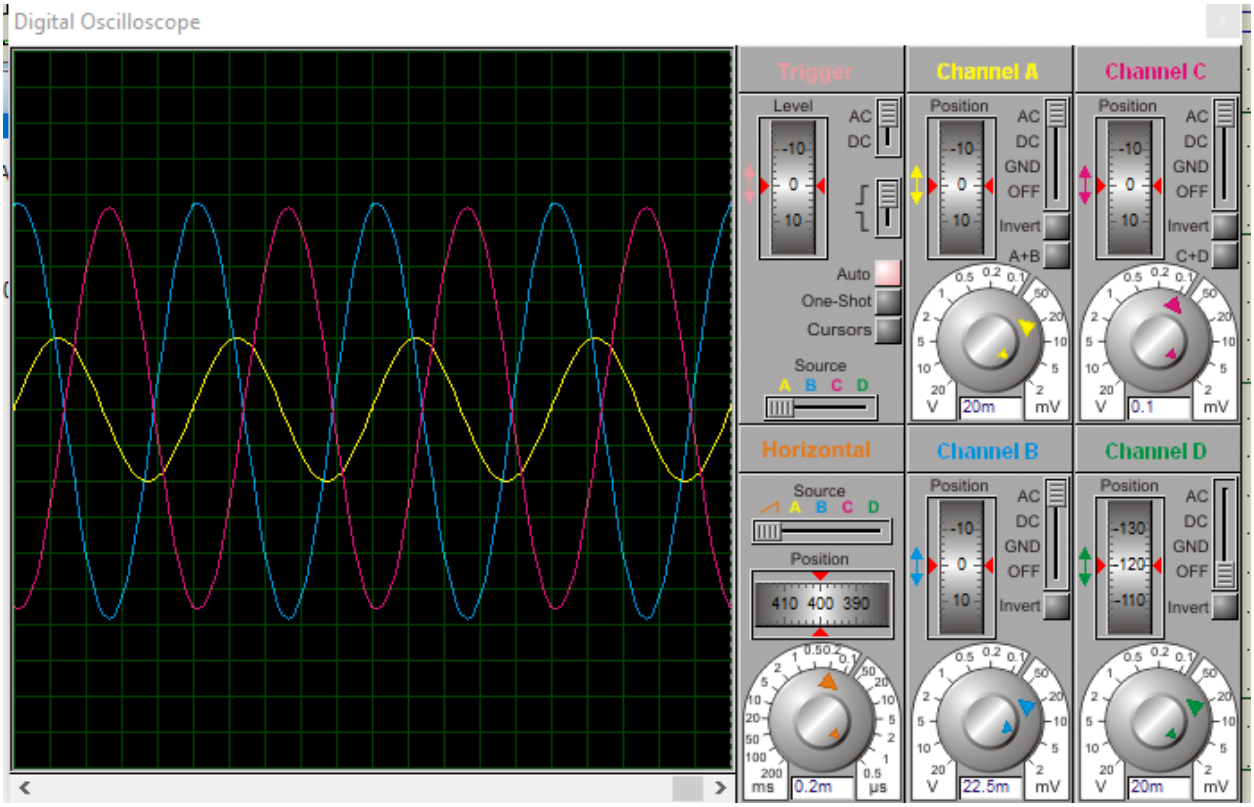
Now 2N3904's emitter terminal is connected to base of 1st BD135 transistor and 2N3906's collector terminal is connected to base of other BD135. Both BD135 are connected to each other via Emitter to Collector Connection. Also at that terminal the output of Amplifier is taken. At output 8.2 ohm Load resistor is also connected.

Working Operation:

In start a common emitter circuit is connected, it inverts the input of the signal. This inverting output is connected to the base of Next Common Emitter transistor. The Output of this transistor is given to next 2N304 transistor. The output of this transistor is connected in parallel to the base terminals of next 2N3904 and 2N3906 transistors. This output is further connected to the power transistors BD135. BD135 amplify the given signal to its maximum reach. It also inverts 180 degree the input which is connected to 2^{nd} 2N3904. At output Load resistor is connected, if we increase the Resistance of Load resistance the Amplifier will amplify the signal more.

Snapshots of INPUT & OUTPUT:





Applications:

- The common emitter amplifiers are used in the low-frequency voltage amplifiers.
- These amplifiers are used typically in the RF circuits.
- In general, the amplifiers are used in the Low noise amplifiers
- The common emitter circuit is popular because it's well-suited for voltage amplification, especially at low frequencies.
- Common-emitter amplifiers are also used in radio frequency transceiver circuits.
- Common emitter configuration commonly used in low-noise amplifiers.
- Consumer Electronics: Audio power amplifiers are used in almost all consumer electronic devices ranging from microwave ovens, headphone drivers, televisions, mobile phones and Home theatre systems to theatrical and concert reinforcement systems.
- Industrial: Switching type power amplifiers are used for controlling most of the industrial actuator systems like servos and DC motors.
- Wireless Communication: High power amplifiers are important in transmission of cellular or FM broadcasting signals to users. Higher power levels made possible because of power amplifiers increases data transfer rates and usability. They are also used in satellite communication equipment.