# A.C. Amplifier

This circuit produces an inverted, amplified copy of the AC input voltage. However, if the designer needs the ac response characteristics of op-amp, low and high frequency limits, or if ac input voltage riding on some DC level, it is necessary to use an AC amplifier with a coupling capacitor. For ex. In an audio receiver system, that consists of no. of stages, because of thermal drift, component tolerances, and variances, the DC level is produced. To prevent amplification of such a DC level , the coupling capacitors must be used between the stages.

The active component of this circuit is an operational amplifier, which is configured as an inverting amplifier. To ensure that the output can swing in the positive and negative directions equally, a DC voltage equal to Vcc/2 is inserted at the non-inverting input through the voltage divider formed by the 100K resistors.

When Vin is an AC signal within the circuit's bandwidth, the gain G of the amplifier is given by G = -(RF/R1). The op amp output Vo' is the sum of the DC (Vcc/2) and AC output voltages. Output capacitor Co removes the DC component of Vo', causing the final output Vo of the circuit to be a purely AC amplified copy of the input waveform, or Vo = (-RF/R1) Vin.

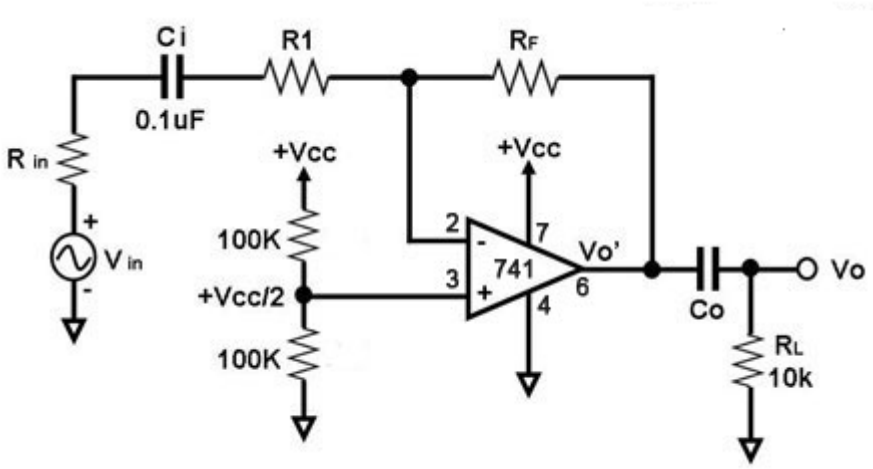


Figure 2.2

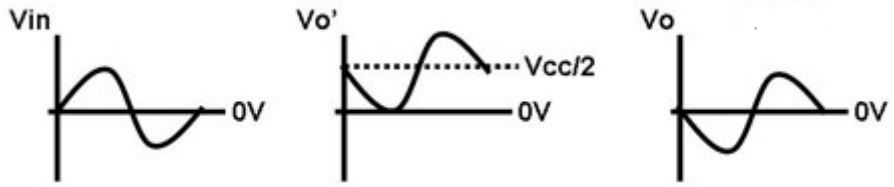


Figure 2.3

Figure  graphically shows an example of how an AC input voltage is inverted and amplified by the AC amplifier shown in Figure 1. The op amp's output, Vo', is an inverted, amplified copy of the input voltage, shifted upwards by a DC component equal to Vcc/2. The final output Vo of the circuit is just an inverted and amplified copy of the input waveform, since the DC component has already been removed by Co.