Amplitude Demodulation

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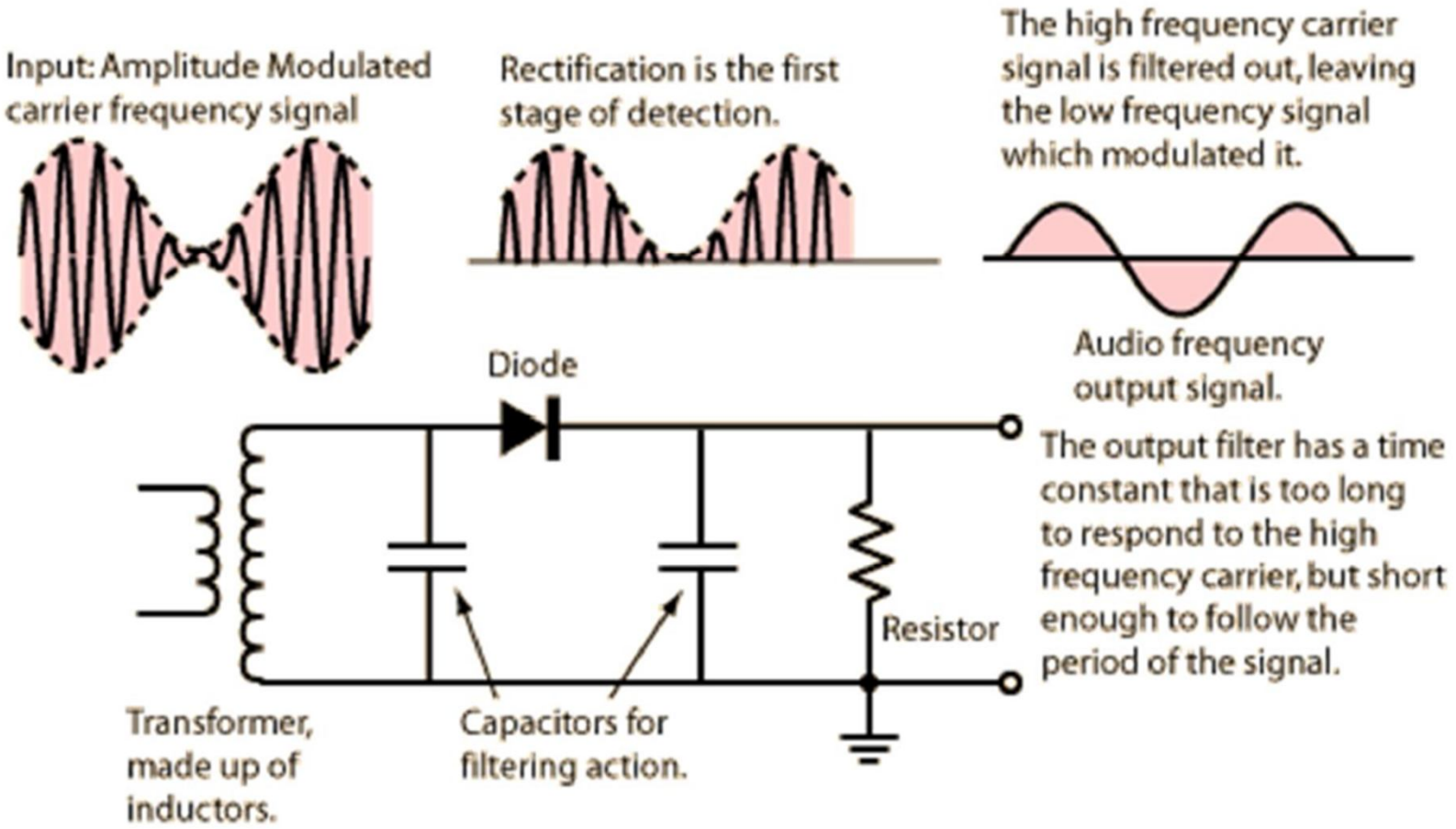
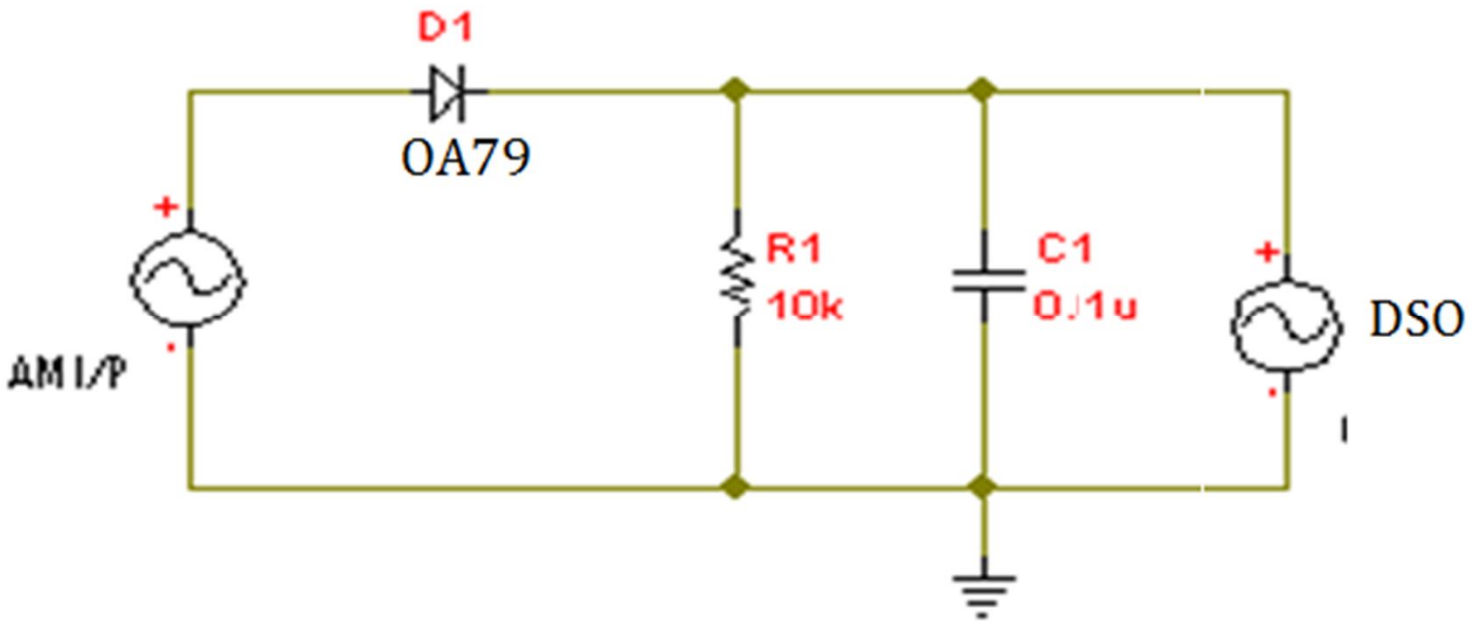


Tasks

- Design a low pass filter for a modulating frequency of 100 Hz and f_c = 19 kHz
- Design a low pass filter for a modulating frequency of 10 kHz and f_c = 455 kHz
- Design a Π filter for a modulating frequency of 10 kHz and f_c = 455 kHz

Amplitude Demodulation- Task 1



Task - Detector circuit with Simple AGC

Let the carrier frequency be $f_c = 455\ kHz$ and maximum modulating signal frequency be $f_m = 10\ kHz$
Inorder to design a lowpass filter with upper cutoff frequency 10 kHz,

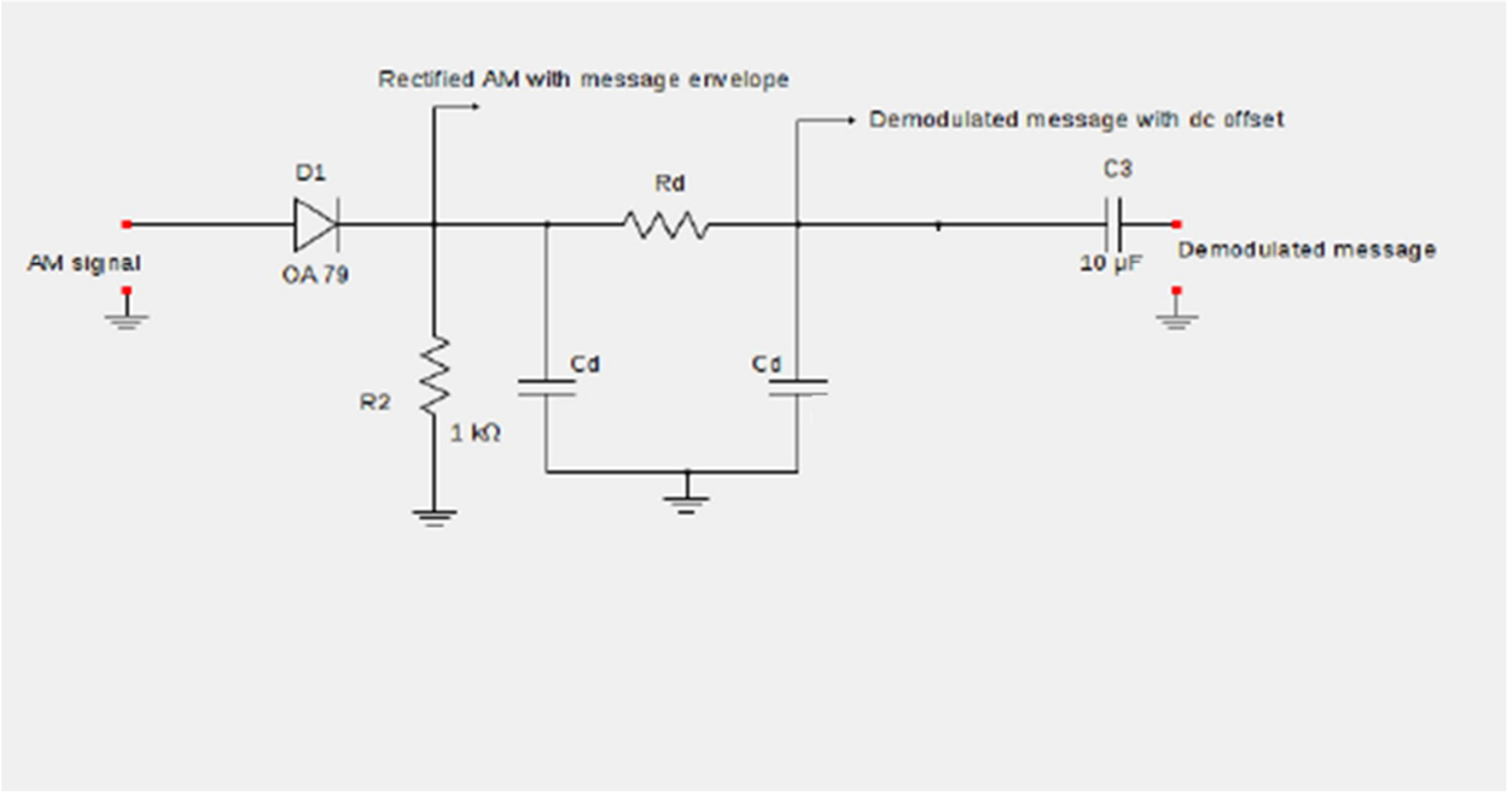
$$f_H = \frac{1}{2\pi R_d C_d}$$

$$10\ kHz = \frac{1}{2\pi R_d C_d}$$

Select $C_d = 0.001\mu F$. Then $R_d = 16.1k\Omega$. Choose $R_d = 15k\Omega$ *or* $22k\Omega$ standard resistor values.

Make a π filter (for better performance) using these R_d and C_d values.

Task 2


Rectified AM with message envelope
Demodulated message with dc offset
D1
Rd
C3
AM signal
OA 79
10 µF
Demodulated message
R2
1 kΩ
Cd
Cd

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Procedure

1. Connect the diode to the output of AM signal(See Figure.) as in the circuit diagram .

2. Connect load resistance R_L and observe the outputwaveform on a CRO and plot it.

3. Connect the π filter circuit of R_d and C_d and observe the output waveform on a CRO and plot it.

4. Obtain the demodulated output without dc offset by connecting capacitor C_3. Observe it on a CRO and plot it.

5. Connect the lowpass filter using C_a and R_a for obtaining AGC voltage level. Observe it on a CRO and plot it.

6. Vary the modulation index by changing carrier or modulating signal levels. Plot the simple AGC charateristics with modulation index on x-axis and AGC voltage level on y-axis.

7. Eliminte the dc offset and observe the modulating signal from the $10\mu F$ capacitor as shown in the circuit diagram.