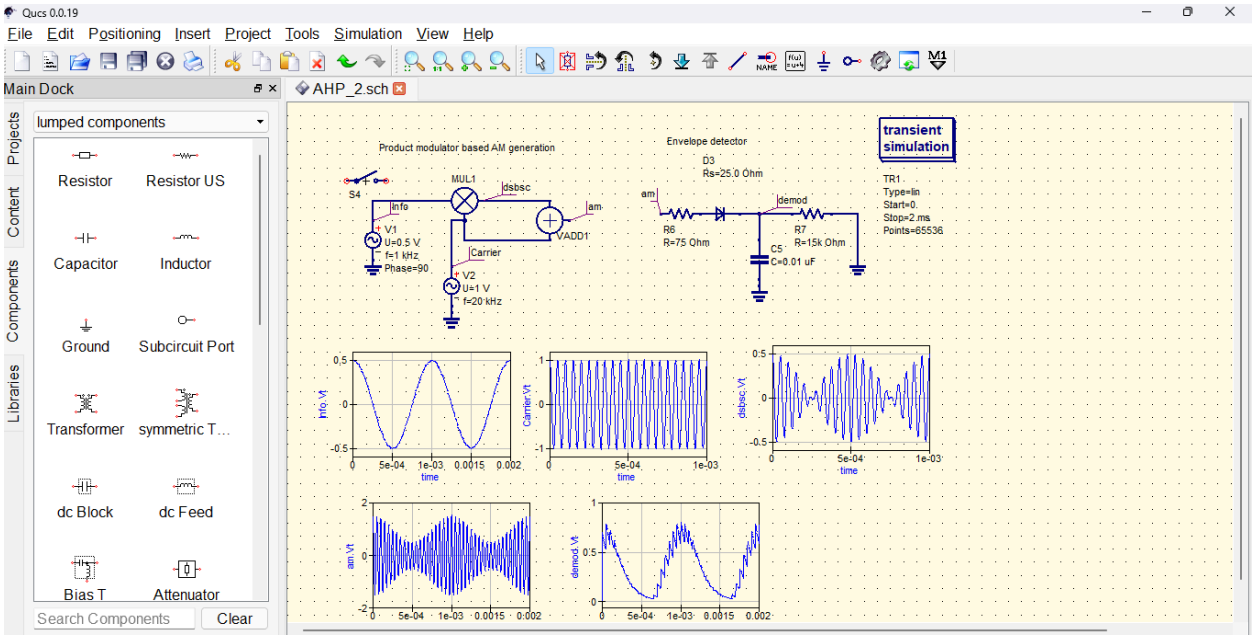
AHP – 2

A) Product Modulator



On changing the above parameters we observe the following the changes:

1) fc:
   Effect on the Spectrum: As the carrier frequency the bandwidth of the modulated signal increases in the spectrum.
   Effect on the Graphs: In the time domain , higher the carrier frequency faster is the rate of frequency variations according to the modulated signal.
2) fm:
   Effect on Spectrum: As the fm increases the bandwidth of the modulated signal increases.
   Effect on Graph: The waveform exhibits more oscillations in a given interval of time.
3) Ac:
   Effect on Spectrum: As the Ac increases, this results in a more powerful or strongly
   modulated signal.
   Effect on Graph: A larger Ac generally results in a higher amplitude of modulated signal.
4) Am:

B)Envelope Detector:

Effect on Spectrum: As the Ac increases, this results in a more powerful or strongly
modulated signal.
Effect on Graph: A larger Ac generally results in a higher amplitude of modulated signal. When the Am is too high , it can lead to overmodulation and causes distortions in the graphs.

The output obtained from the envelope detector must be similar to the input signal since it is demodulating the initially modulated signal. However there certain parameters that affect the speed of the response.

1) Rs (Series Resistor):
A larger resistance value provides a smoother output similar to the initial signal, however the time required to produce the response increases. Hence a larger the resistance guarantees a more efficient output but increases the response time.

2)C (Capacitor):
A larger capacitor value provides a more smooth output similar to the initial signal, however the time required to produce the response increases. Hence a larger the capacitance guarantees a more efficient output but increases the response time.

Conclusion: Hence there is a **Trade-Off** between smoothness of the signal and the response time of the demodulated signal.