Undergraduate Program
Computer Engineering Department
Communications Engineering (ELC 325A)
Fall 2016
Report - Due Date: December 22, 2015, 2:00 PM

Part 1: Using Matlab

1) Generate the message signal $x(t)$, shown in Fig. 1, and plot it.
   Note that the amplitude of the signal is 1 Volts and its period is 1 ms. You need to generate only 2 cycles of the signal.
2) Generate the phase deviation signal, $\theta(t) = 2\pi K_f \int_0^t x(\tau)d\tau$, for $K_f = 1000$, and plot it.
3) Generate an FM signal of the phase deviation signal using a carrier wave of 1 Volt amplitude and 10 KHz frequency. Plot this signal and comment on it.
4) Repeat the last step for $K_f = 3000$ and $K_f = 5000$. Comment on the plots you obtain.

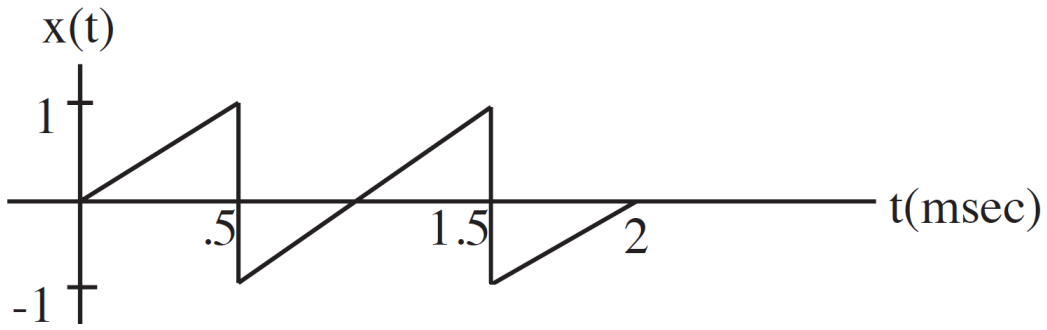

Fig. 1

Deliverables 1:

1) Matlab code to generate the required signals.
2) Figure plots of the required signals.
3) Your comments.

Part 2: Using Simulink

1) Repeat Part 1 using Simulink.
   Hints:
   - Use "simin" block to use the message signal defined in your workspace.

   Use a multi-input scope to show the message signal, the phase deviation signal and the modulated signal on the same graph.
2) Repeat step 1 for a sinusoidal message signal with an amplitude of 1.5 volts and a frequency of 2 KHz.

Deliverables 2:

1) Block diagram of your system in Simulink.
2) Parameters of each block used in the system.
3) Scope outputs for triangular and sinusoidal message signals.
4) Your comments.

Undergraduate Program
Computer Engineering Department
Communications Engineering (ELC 325A)
Fall 2016
Report - Due Date: December 22, 2015, 2:00 PM

Part 3: Using Simulink Toolboxes

Using the ”FM Modulator” block from ”Communications” toolbox, verify your findings from Part 2.

Deliverables 3:

1) Block diagram of your system in Simulink.
2) Parameters of each block used in the system.
3) Scope outputs for triangular and sinusoidal message signals.
4) Your comments.

Instructions

- You can work this reports in teams up to 5 members per team.
- Write a full report including all the deliverables.
- A printed copy of the report should be handed by the due date.
- Late submissions are not allowed.
- All team members should expect to be asked about all the report parts.