

# Project 3

## Waveform Generator

For this project, you will implement a low-distortion multifunction waveform generator. The generator is capable of displaying 4 different waveforms: a square wave, a triangle wave, a sinusoidal wave, and an exponential wave. A user selects the waveform via a keypad interface. A user may specify the period of the waveform via the keypad. A user may also adjust the amplitude of the outputted signal to several fixed levels.

### 1. Output:

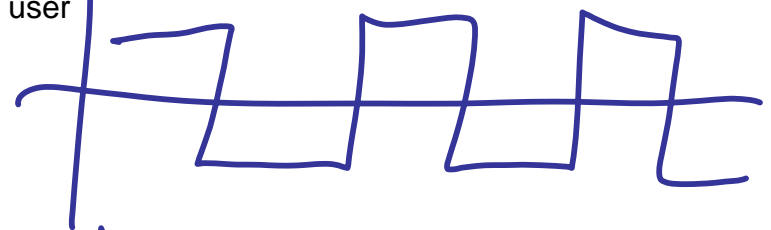
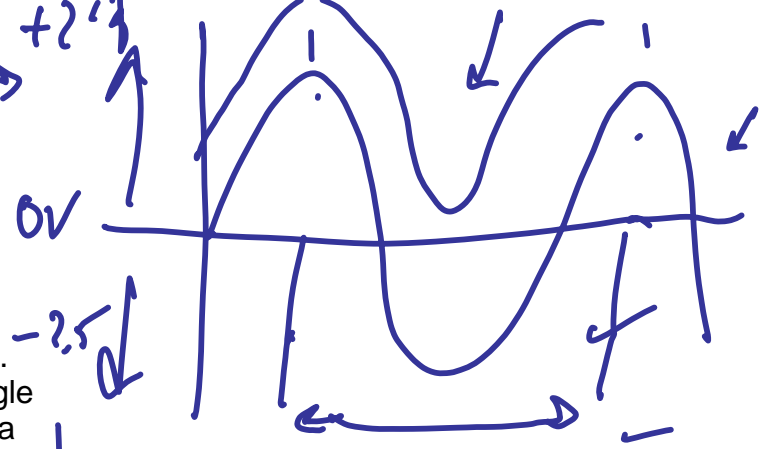
- Continuous through each period (i.e., no glitches)
- Low Noise
- No DC offset
- Smooth Signal (no jagged lines/curves)

### 2. Waveform:

- Square Wave
- Triangle Wave
- Sinusoidal Wave
- Exponential Wave

### 3. Operation:

- Accurate waveform period - entered via the keypad by the user.
  - MAX: 100ms
  - MIN: 1ms
- Amplitude of waveform is adjustable via the keypad. You must be able to produce the following percentages of the maximum amplitude of your signal:
  - 0%, 10%, 20%, ..., 100%
- A user can easily switch between the waveforms via the keypad.



10 → 11

# Understand Problem?

- User selects one of 4 possible waveforms
  - - Keypad is the UI for changing period & waveform
    - Define Keys? ✓
    - Simplify problem? ✓
  - Define Hardware needed and what HCOB can do
  - Feedback to user ... ✓
- Amp ~10
- Wave 4
- period ~99

# ANTICIPATING HARDWARE NEEDS

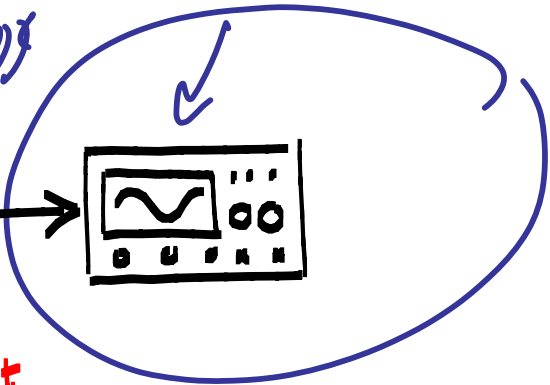
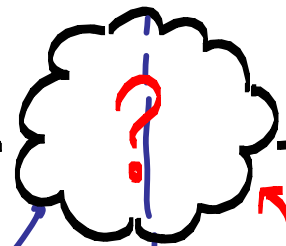
Entry keypad

0	1	2	3
4	5	6	7
8	9	.	.
.	.	.	.



Dig

Analogy



"Something" that helps us with producing the waveform



Visualizing the period +

Period  
Amp  
WF

We have at least two questions:

What is that "something"?  
How does the period get modified?



Project 2 ?

Due next week.

