



# Electronic Organ

黃元豪

Yuan-Hao Huang

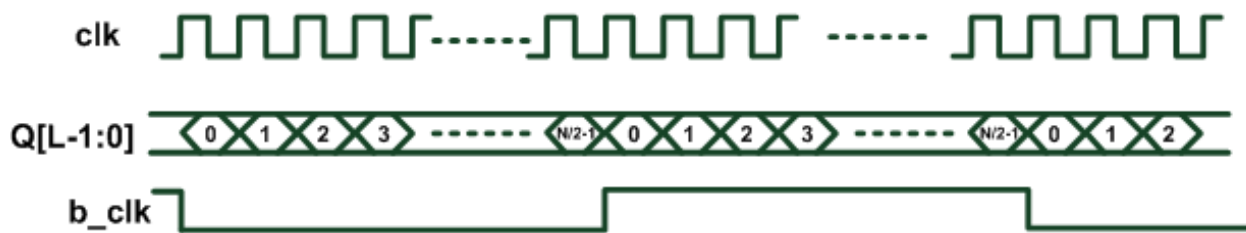
國立清華大學電機工程學系

Department of Electrical Engineering  
National Tsing-Hua University

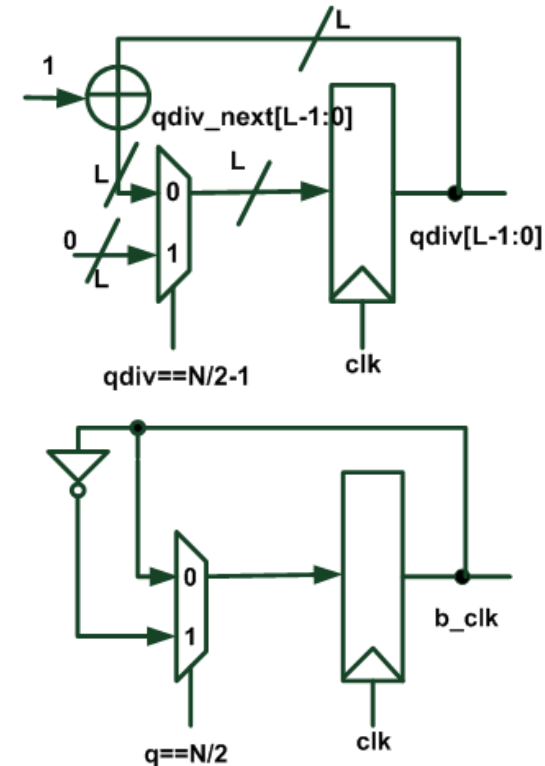
# Tone Generation using Clock Frequency divider



- The buzzer frequency is obtained by dividing crystal 40MHz by N.
- The buzzer clock (b\_clk) is periodically inverted for every N/2 clock cycles.
  - clk frequency = 40 (MHz)  $\rightarrow$  clk period = 25 (ns)
  - Buzzer period =  $25 \times N$  (ns)  $\rightarrow$  Buzzer period =  $40/N$  (MHz)
    - “mid Do” sound frequency = 261 Hz
    - “mid Re” sound frequency = 293 Hz
    - “mid Mi” sound frequency = 330 Hz



$$2^L > N$$





# Sound Tone Table

- Table of 16 tone frequencies can be used to compute the periodic of the sound counter

Tone	Do	Re	Me	Fa	So	La	Si
Low (Hz)						220	245
Mid (Hz)	261	293	330	349	392	440	494
High (Hz)	524	588	660	698	784	880	988

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