UC Berkeley

EE 105
Microelectronic Devices & Circuits
Fall 2019

Prof. Clark T.-C. Nguyen

Dept. of Electrical Engineering & Computer Sciences
University of California at Berkeley
Berkeley, CA 94720

Lecture 2 Supplement

Digital Communications

UC Berkeley

Sound Energy   "e e e e o o o h"

$N_S(t)$

② analog voltage/power amplification

$$N_{SA}(t) = A \sim N_S(t)$$
gain

$N_{SA}(t)$

③a $N_{SH}(t)$

④ As long as
$N_{SH}(t) > N_{Ramp} \rightarrow$ Comparator output '0'
$N_{SH}(t) < N_{Ramp} \rightarrow$ " " '1'

high voltage e.g., 1V

low voltage, e.g., 0V

$N_{SH}(t)$

Comparator output '0'   Comparator output '1'

Analog Amplifier

Sample & Hold

Comparator

① Microphone: (transducer)
⇒ converts energy from one form to another: sound → electrical

Encode

Center start of a T cycle

Ramp Voltage Generator

③b $N_{Ramp}(t)$

stops the binary counter

Binary Counter

1 0 0 1

Clock Frequency Oscillator
(much faster period than T)

T

Read Command

Parallel-to-Serial Converter

1 0 0 1

2