Physically Immersive Video Gaming

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Ceryen Tan
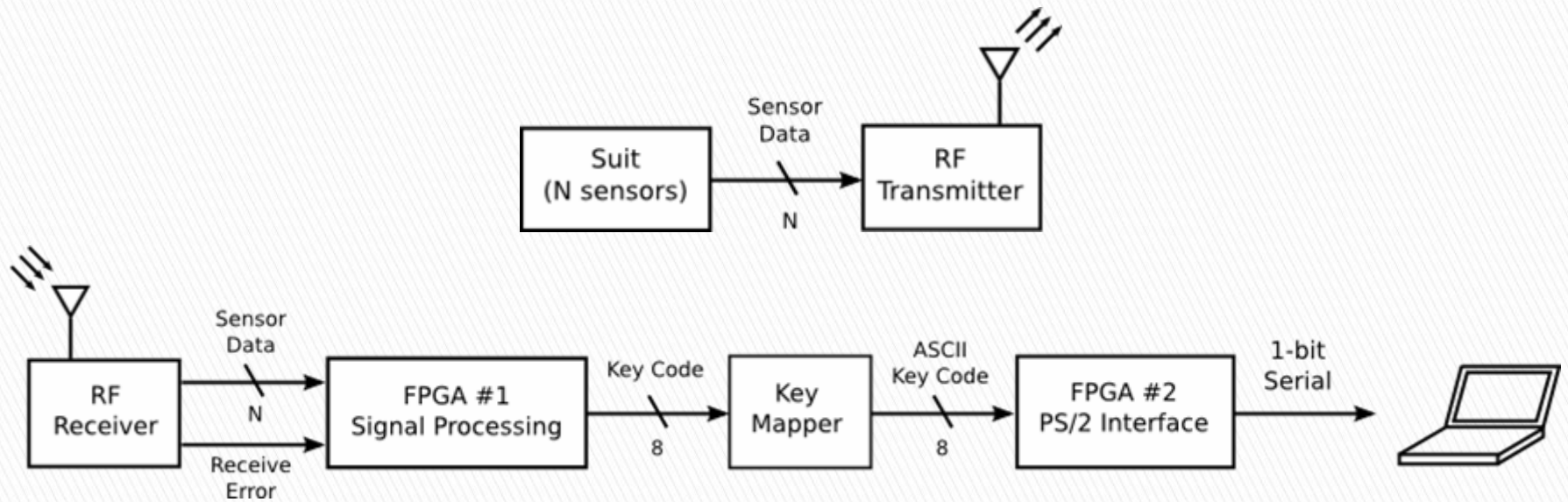Paul Steiner

 ❤ = ???

Can you be Mario?

System Overview

Wireless Module

- Transmits measurements from accelerometers and gyroscope to FPGAs
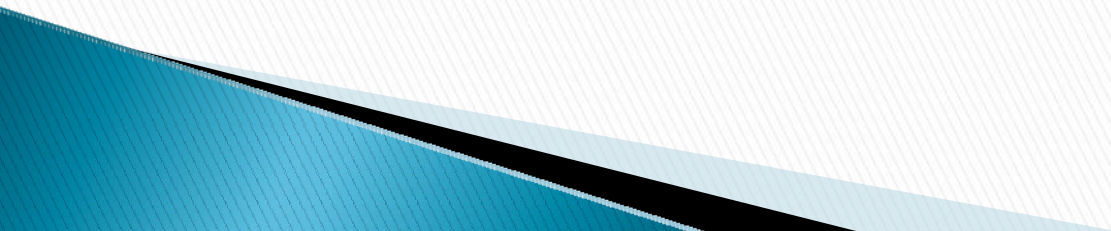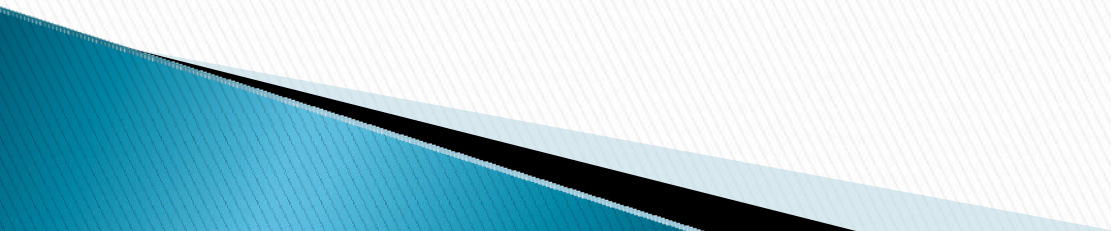
CC1010

- 900 MHz, up to 76.8 kb/s

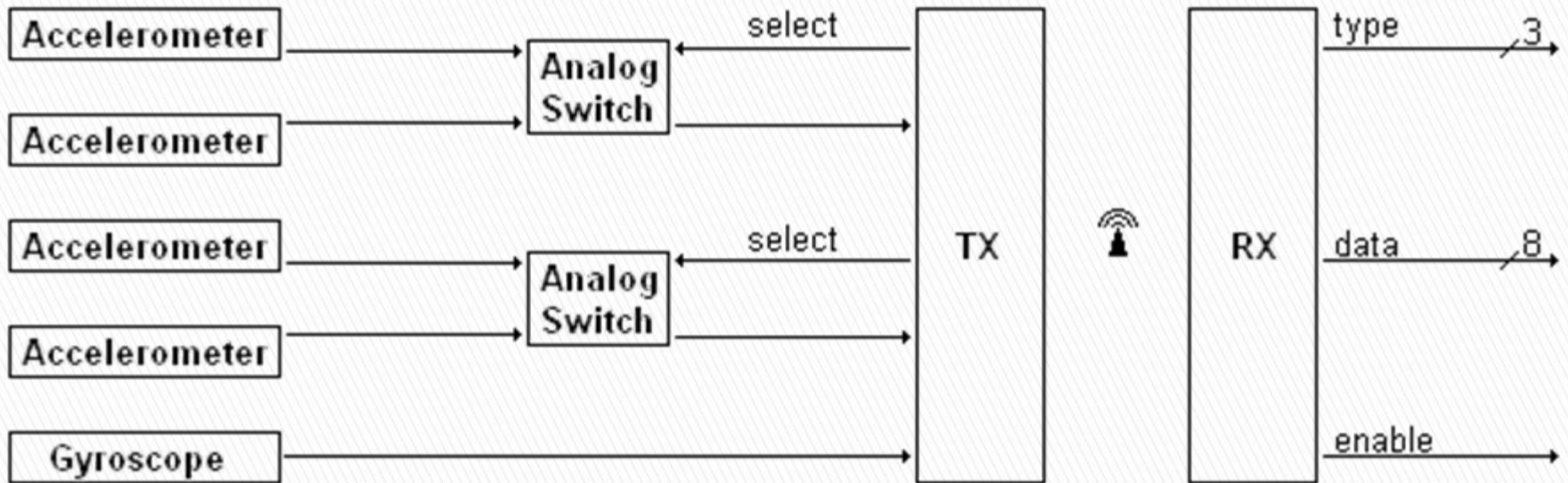# CC1010

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- 1 kb/s minus overhead

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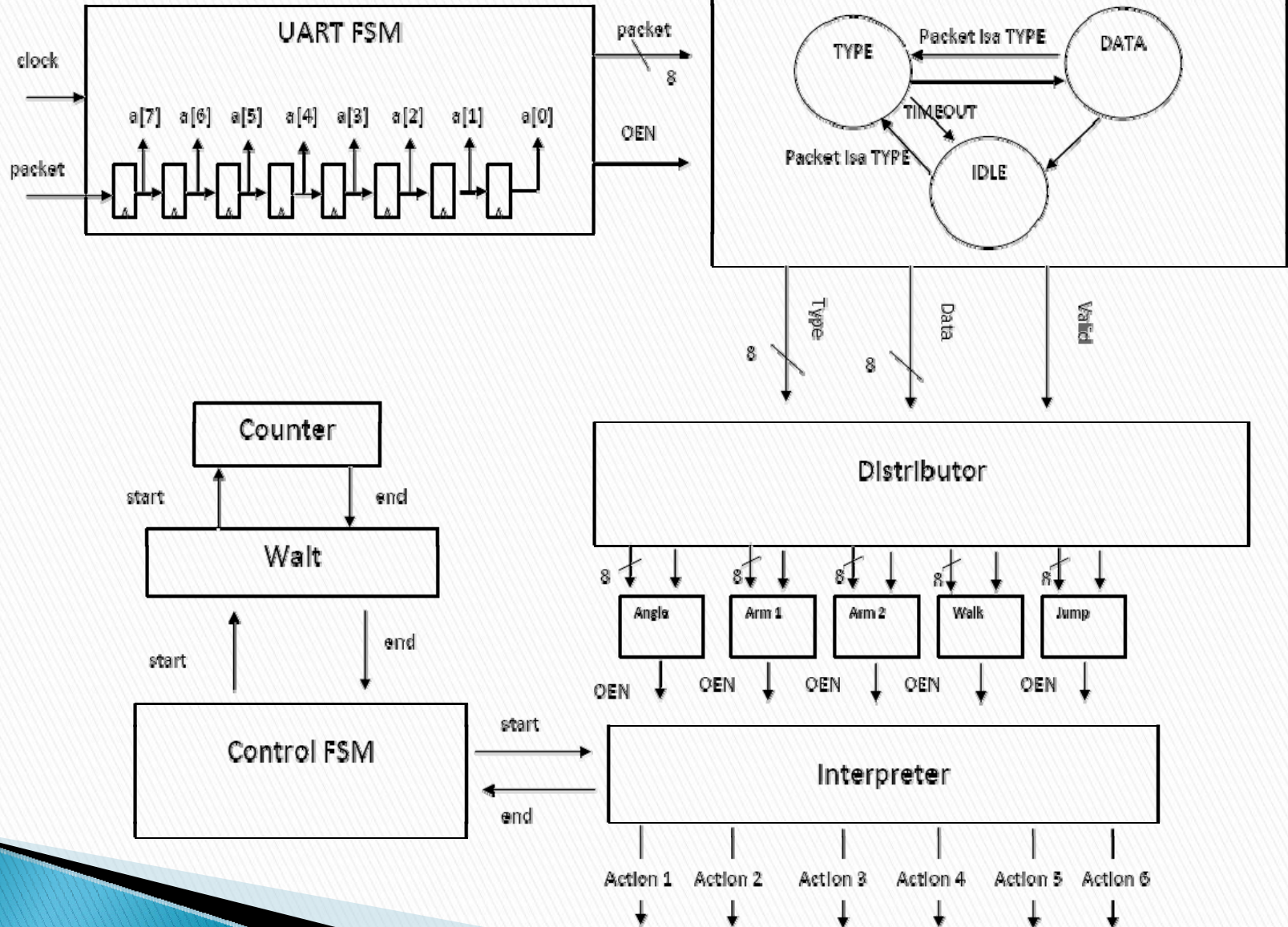- Embedded 8051 microcontroller
- 3 channel 8-bit ADC

Block Diagram

Signal Processing

Three Tasks

- ‣ Distribute Data to proper places
- ‣ Detect motions
- ‣ Infer Actions

Signal Processing

Signal Processing

- Based on Changes
- Subject to RF constraints

Keyboard Interface

- Convert actions into keyboard strokes

Keyboard Interface

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- Use keyboard strokes to play computer games

Keyboard Interface

- Convert actions into keyboard strokes
- Use keyboard strokes to play computer games
- Two modules
    - KeyMapper – Maps actions into scancodes
    - PS/2 interface – Sends scancodes to computer
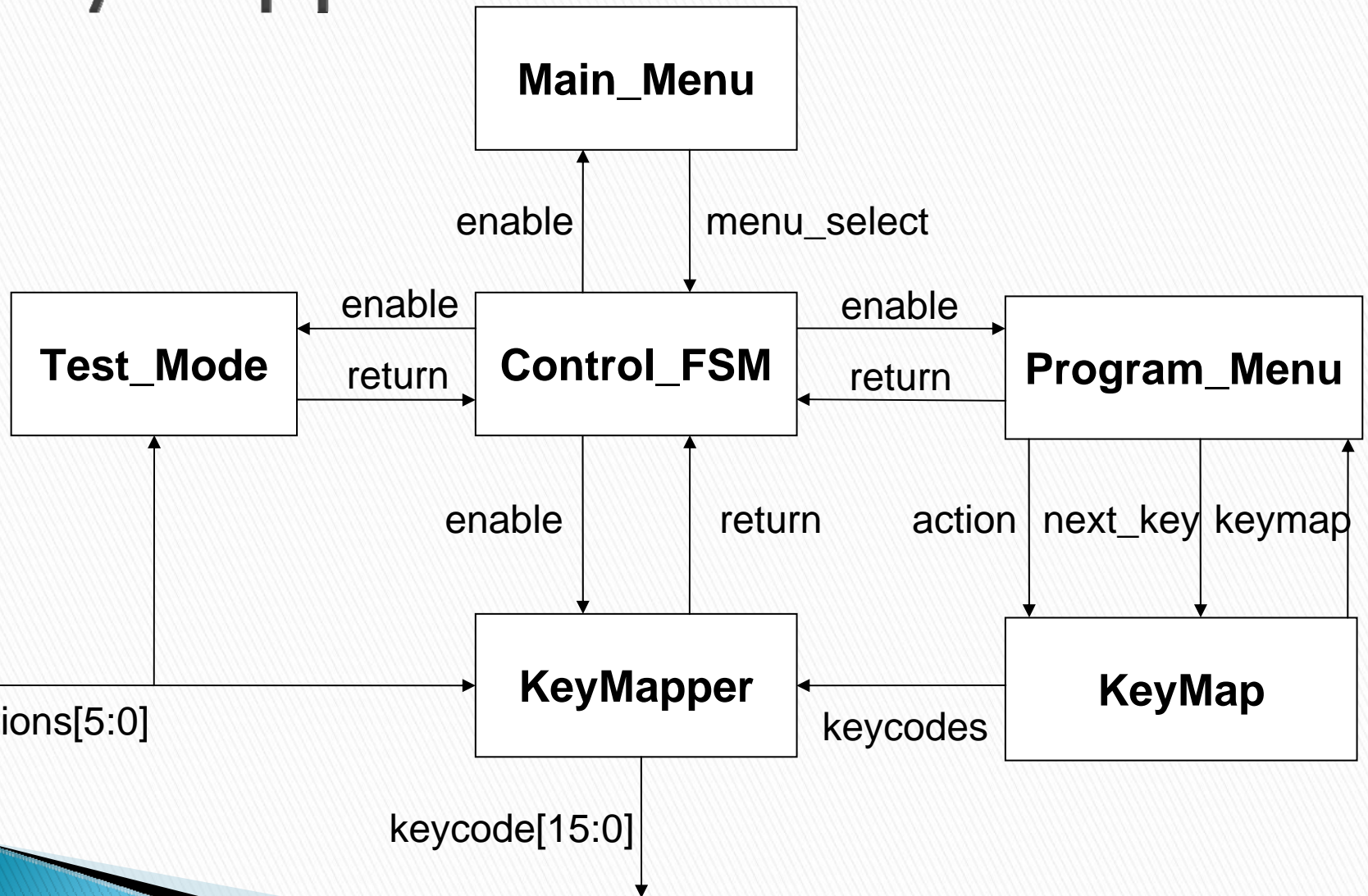
KeyMapper

- Maps actions into scancodes

KeyMapper

- Maps actions into scancodes
- Programmable

KeyMapper

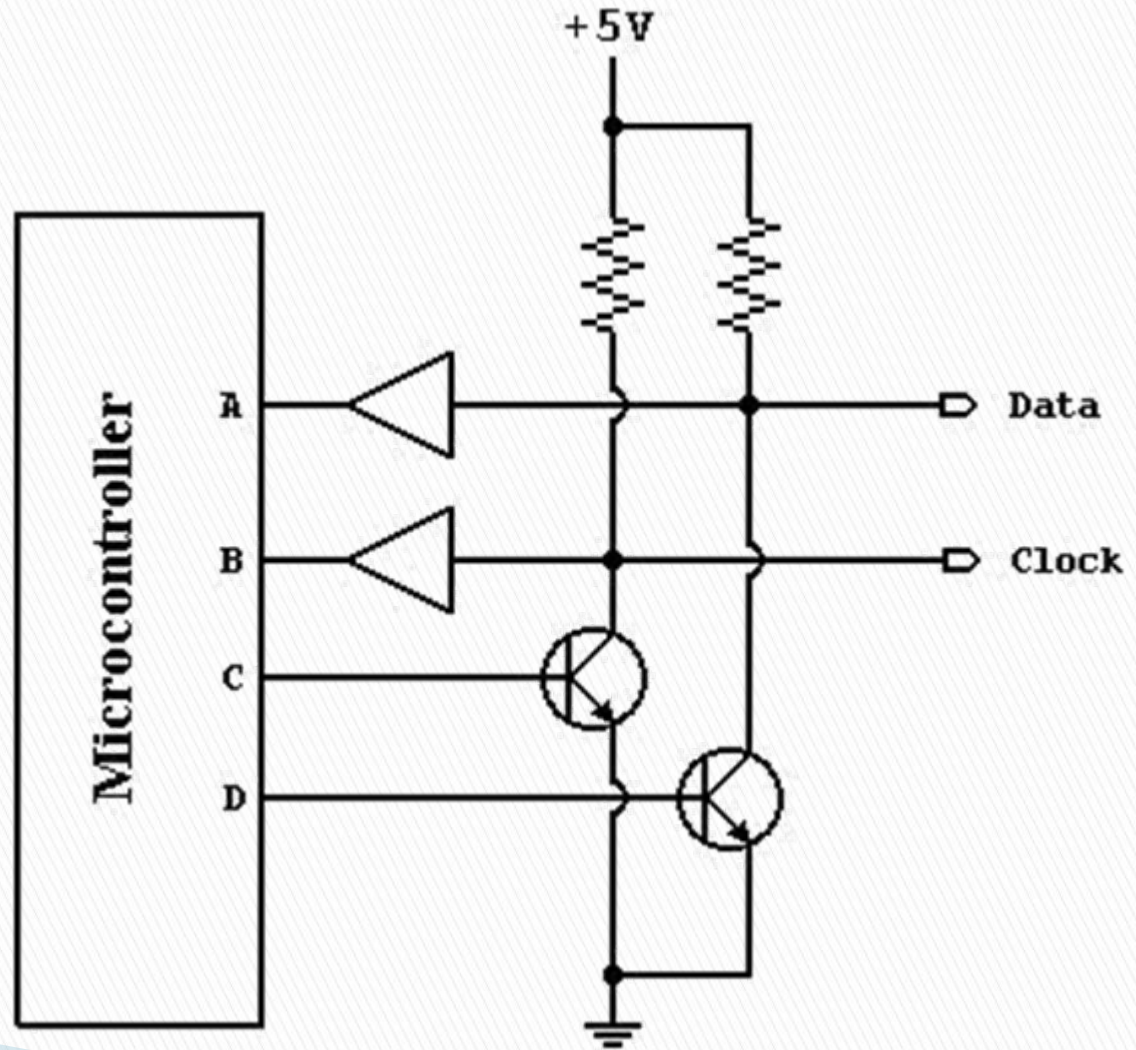- Maps actions into scancodes
- Programmable
- Test mode

KeyMapper

PS/2 Keyboard Interface

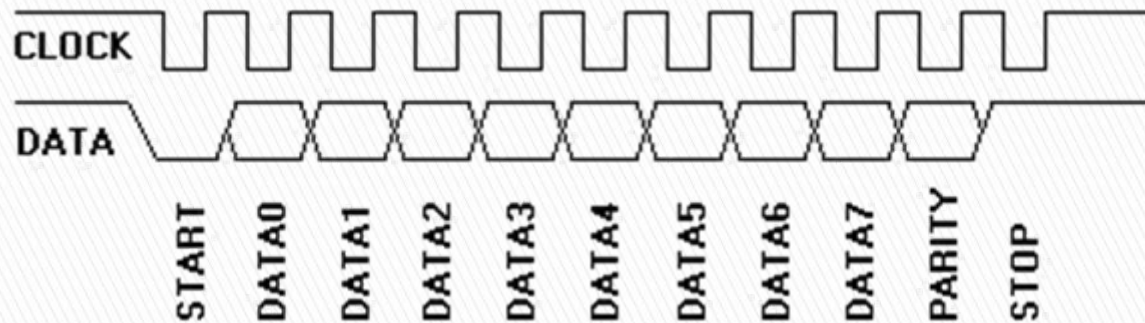- Take mapped scancodes and send them to the computer
- Packets of 11-12 bits
  - 1 start bit
  - 8 data bits (scancode)
  - 1 parity bit
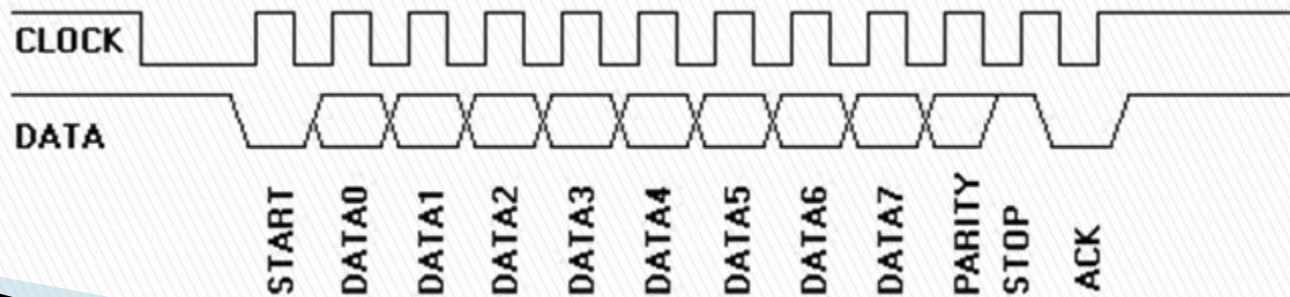 - 1 stop bit
  - 1 acknowledge bit
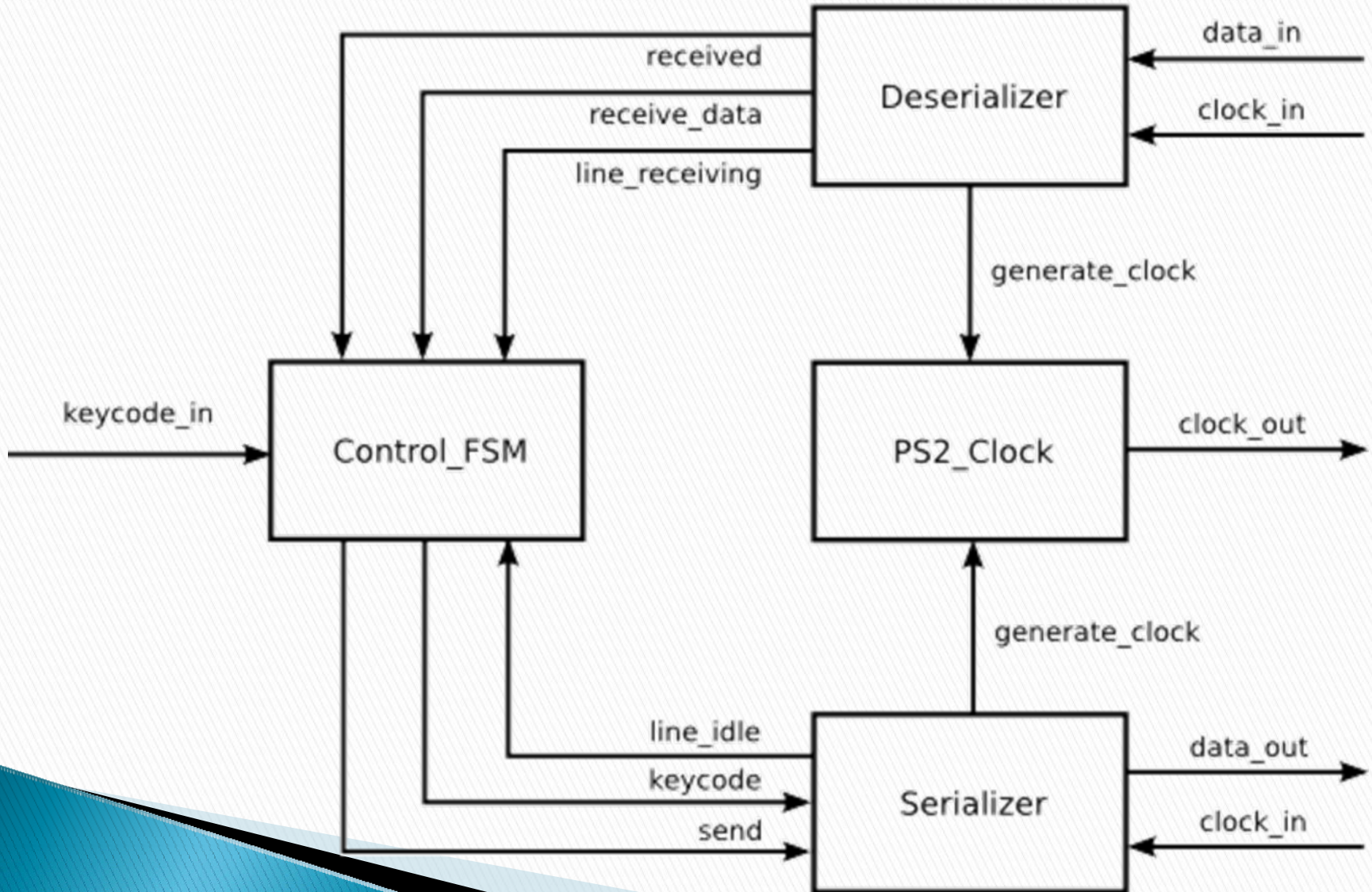
PS/2 Keyboard Interface

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Device to Host communication

Host to Device communication

PS/2 Keyboard Interface

Questions?