**ABSTRACT**

- Clamping system - self-closing, accommodates wide variety of neck sizes
- Intuitive 2-button system allows for easy operation:
  - Reset Button
  - Multipurpose Button:
    - Hold: On/Off
    - Press: Record/Stop
- Indicator LEDs for user interfacing and feedback
- Integrated camera system captures HFR video
- System stores the videos to a microSD card
- When connected to Linux OS computer, latest video begins playing immediately in slow motion
- All recorded videos (up to 250 hours) are easily accessed and played
- Go through files and play different records

**MOTIVATION/APPLICATION**

- Video capture and slow-motion review is a proven effective skill development tool
- Existing technology to utilizing this method for speed-picking is effective but with drawbacks
- PickIt! provides low-cost, single-purpose, self-contained, prefabricated alternative
- Additional application with most other stringed instruments

**HARDWARE**

- MCU: Pearl Gecko efm32pg12
- Camera Module: Raspberry Pi Zero W
  - (capture 180FPS in 640*480 pixels)
  - Wirelessly access the storage from computer
  - Non-volatile storage and can be access by ssh protocol over wifi
  - 3.5-4.2V DC 14500 Lipo battery power source regulated by boost converter and LDO.
  - 3.3V regulated for MCU
  - 5V regulated for Camera
  - 2 frosted illumination LEDs
  - 1 RGB indicator LED
  - 2 buttons: multifunction/reset
  - 128 G8 MicroSD Card

**SOFTWARE**

- Ultra low power hibernation
- Wakeup upon button press
- Automatic file transfer and playback
- Designed for ease of use
- One button operation
- Utilizes Linux OS and VLC
- 10ms internal scheduler
- Transfers data via wifi
- Python3 for Linux/PI
- C for embedded software

**MECHANICAL**

- FDM Additive manufacturing (3D printing)
- ABS, cooling slats for heat dissipation
- Electronics full, securely enclosed
- Self-Closing Spring-Force Clamping System
- Modular for various neck sizes
- Secure, non-destructive attachment pads

**FLOW DIAGRAM**

- Power Management
  - Main Processor
    - Camera Module
      - Camera Module Power Center
      - Camera Module Operation Control and Signal Generation
      - Camera Interface Signal Processing and Signal Generation
      - Camera Image Transmission & Signal Processing
  - Battery Test (MCC)
  - LED Illumination
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**PCB DESIGN**

- MAP: components/ highlights