UMassAmherst

F.I.R.E (Ferguson Intervention Recording Equipment)

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Current status

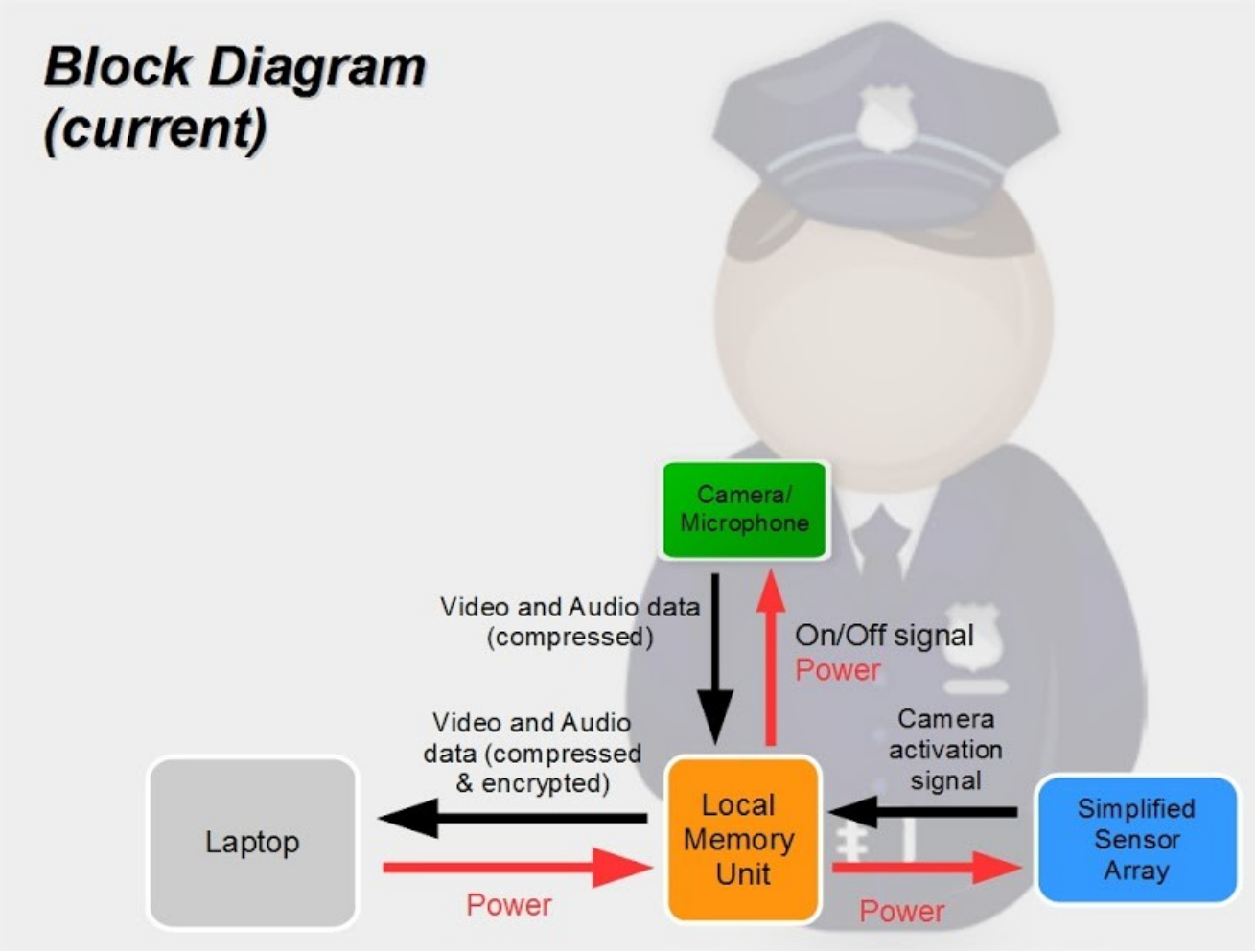
What is functioning:

- **Video/audio compressed to record 2.2GB/Hour**
- **Real Time Clock**
- **Push-button Camera activation**
- **AES encryption implemented**

What is NOT functioning:

- **NFC reader**
- **Independent activation of camera and mic**
- **Pre-Record of two minutes**
- **GPS**
- **Time-stamp**
- **MicroSD card mount for additional 16 GB**

Current status Block Diagram



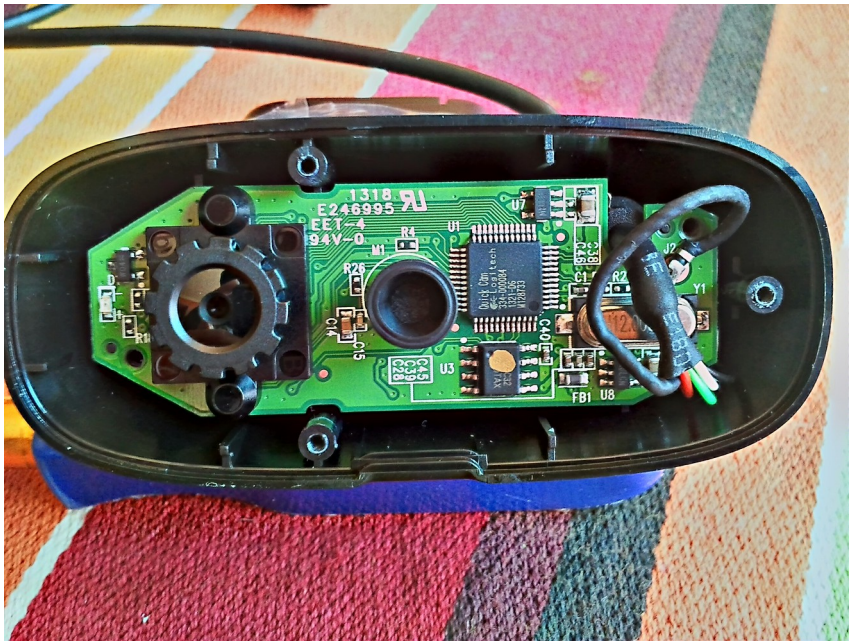
Overview – Camera/Mic Unit

Parts:

- **Logitech C270 webcam w/mic**
- **USB connection instead of ribbon cable with BBB Camera Cape**
- **Auto-light correction, noise-cancellation and improved gain**

Function/Connections:

- **Both power and data flow are controlled via USB connection to BBB**
- **Current software version activates both video and audio upon device trigger**



Logitech C270 webcam

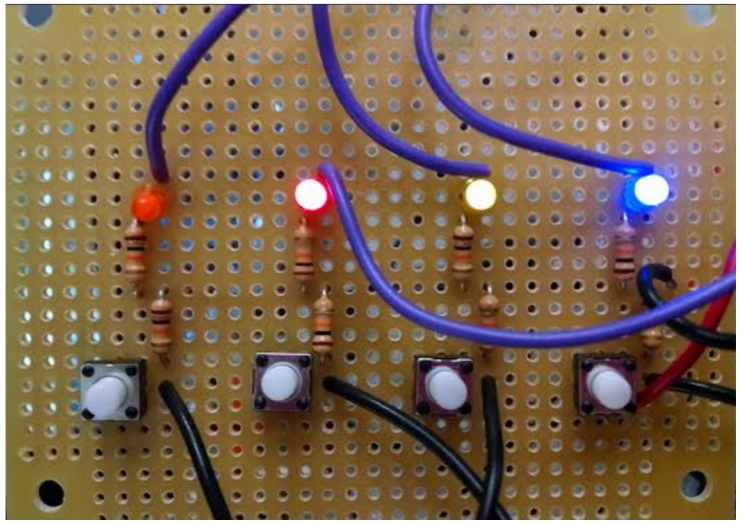
Overview – Sensor Array

Design:

- **4-button system with indicator LEDs**

Function:

- **Button push mimics removal of device from duty belt**
- **Connection goes high and is sent to GPIO pin on Proto-cape**
- **Corresponding LED lights up to indicate weapon pull**
- **Only one device can be triggered at a time**



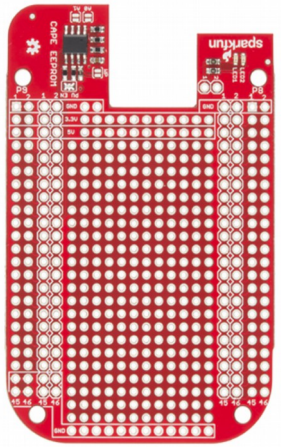
Overview – Local Memory Unit (LMU)

Parts:

- **Proto-cape with EEPROM**
- **Dead-On Real Time Clock Breakout (DS3234)**
- **GPS Receiver (5Hz, 66 Channel)**
- **Polymer Lithium battery (3.7V at 2000mAh)**

Function/Connections:

- **LMU receives weapon pull signal via GPIO pins in proto-cape**
- **Activates recording via USB connection to camera/mic**
- **Compresses and stores data into EEPROM with timestamp and GPS information**

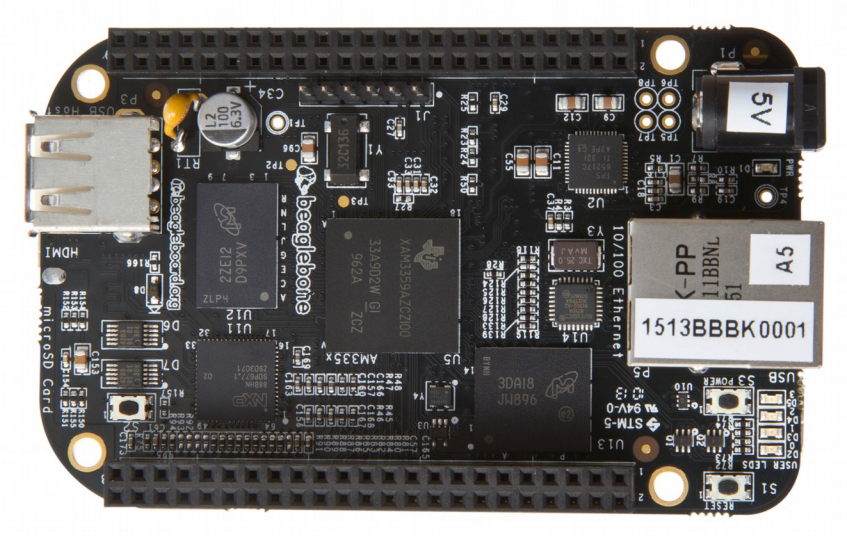


Overview – Software Component

Parts/Design:

- **BeagleBone Black**
- **(1 GHz, 512 MB DDR3L & 4GB eMMC Flash)**

Functionality	Implementation
OS	Angstrom
Video	MJPEG
Audio	AC3_Fixed
Encryption	AES



Goals for FPR

- NFC reader calibrated for single device
- 3 push-button sensors for other devices
- 3D-printed enclosures for LMU, camera unit and docking station
- Independent activation of audio and video
- Pre-record option implemented
- GPS- and time-stamped video