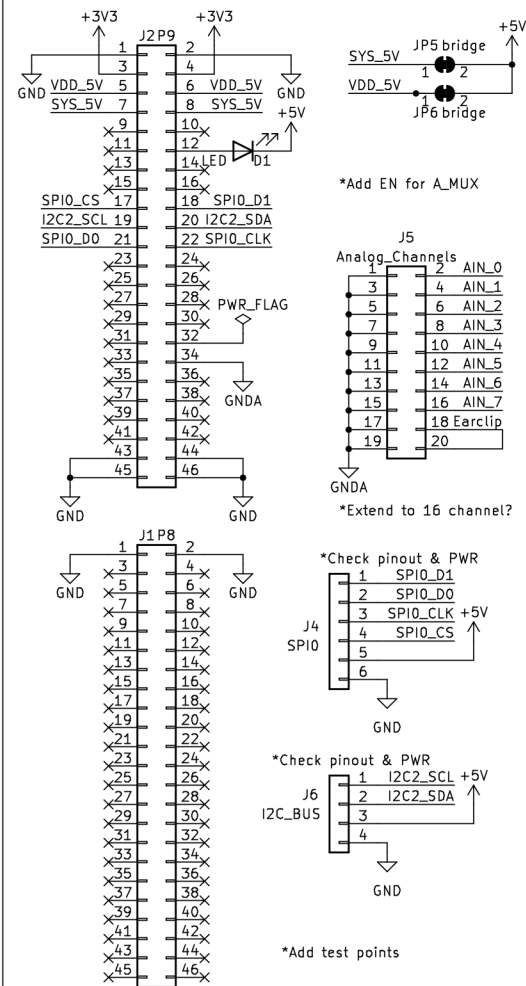


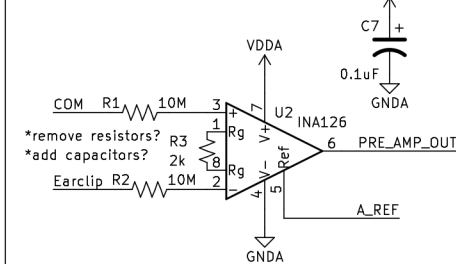
## Connectors – BeagleBone Black [BBB]

Connections to BBB pins



## Pre-Amplifier (45x Gain)

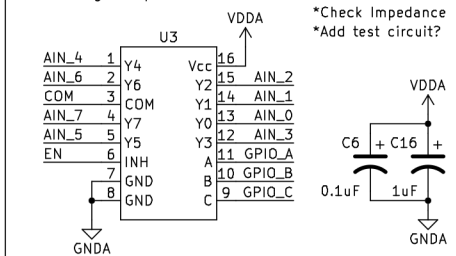
Amplifies the signal before filtering



$$G = 5 + (80k\Omega / R3) = 45$$
$$V_{out} = (IN+ - IN-)*G ??$$

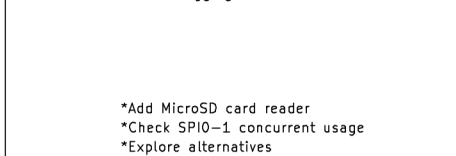
## Analog Multiplexer [A\_MUX]

16:1 Analog Multiplexer ???



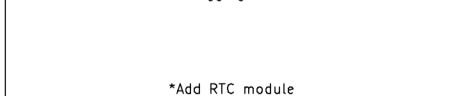
## MicroSD Card Reader (v0.2)

MicroSD slot for data logging



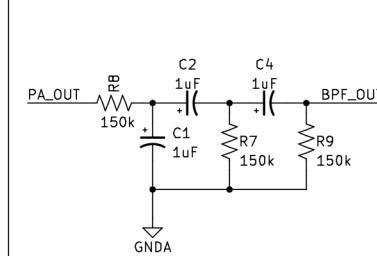
## Real-Time Clock [RTC] (v0.2)

Used for accurate data logging



## Band-Pass Filter [BPF]

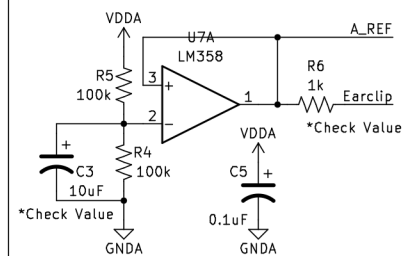
Filters frequencies between 1–106Hz



$$F_c(\text{HPF}) = 1/(2\pi * R8 * C1) = 1.1\text{Hz}$$
$$F_c(\text{LPF}) = 1/(2\pi * R7 * C2) = 106.5\text{Hz}$$

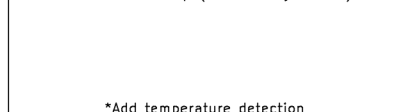
## Driven Right Leg [DRL]

Sets the bias to 0.9V



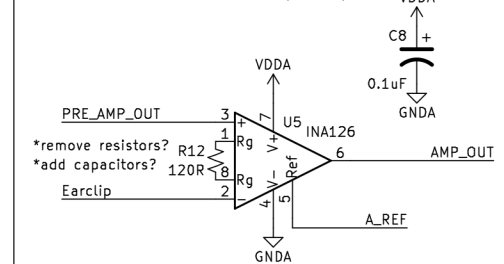
## Temperature Sensor (v0.3)

Measures ambient temp (used to adjust ADC)



## Amplifier (~670x Gain)

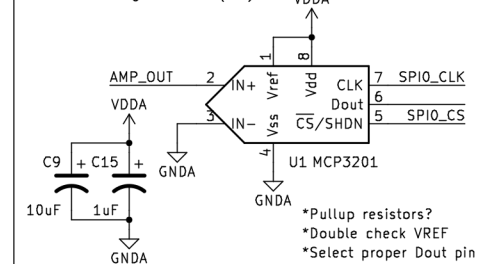
Amplifies further to fill ADC range (0–3.3V)



$$G = 5 + (80k\Omega / R12) = 671.66$$
$$V_{out} = (IN+ - IN-)*G ??$$

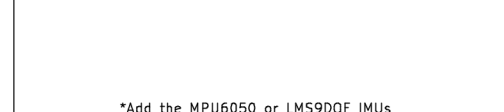
## 12-bit Analog->Digital Converter [ADC]

Converts Analog to Serial (SPI)



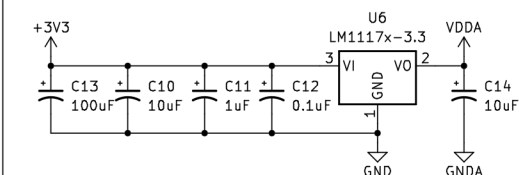
## Accelerometer (v0.3)

TBD



## VDD->VDDA Filtering

Filters VDD to be used as VDDA



Martin McCorkle

Sheet:

File: Quron\_Cape.kicad\_sch

Title: Quron Cape

Size: A4 Date: 2024-11-20

KiCad E.D.A. eeschema 7.0.1-3b83917a11-172-ubuntu22.04.1

Rev: 0.1.1

Id: 1/1