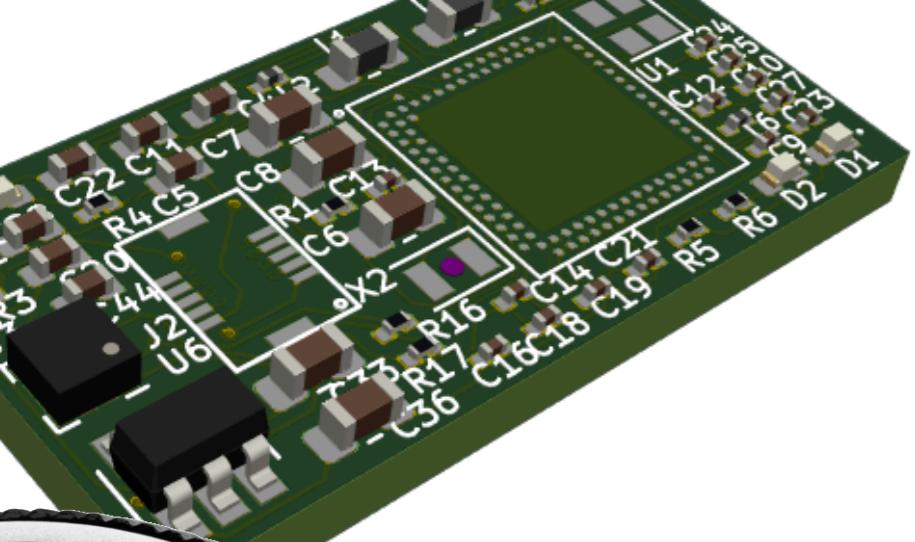
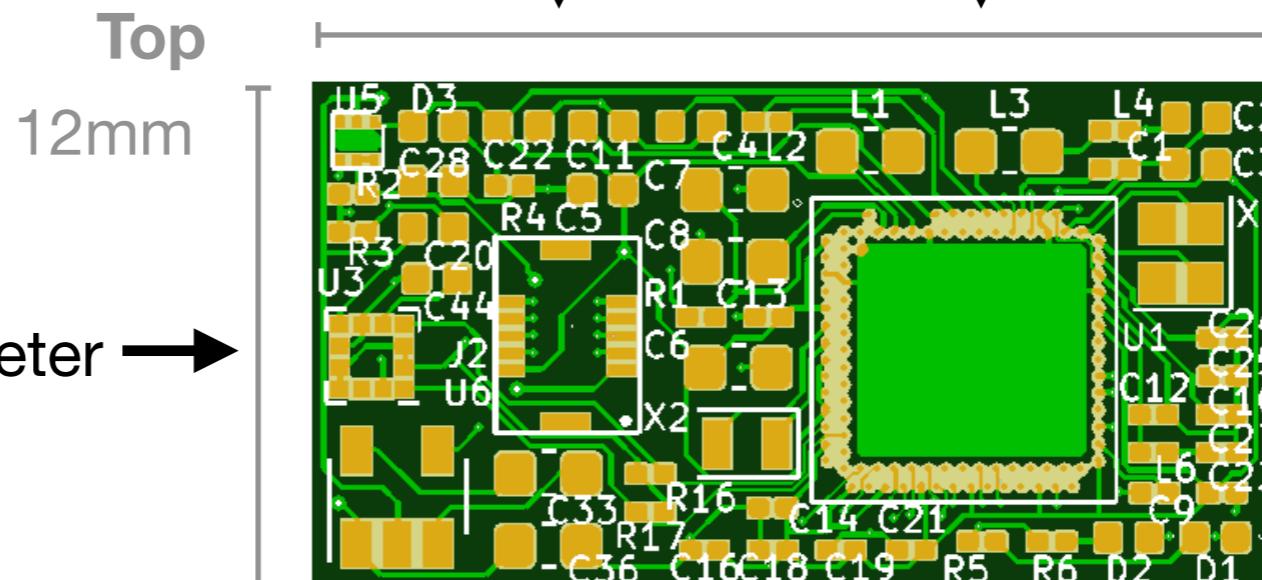


ARBO Bluetooth (BT) Proposal

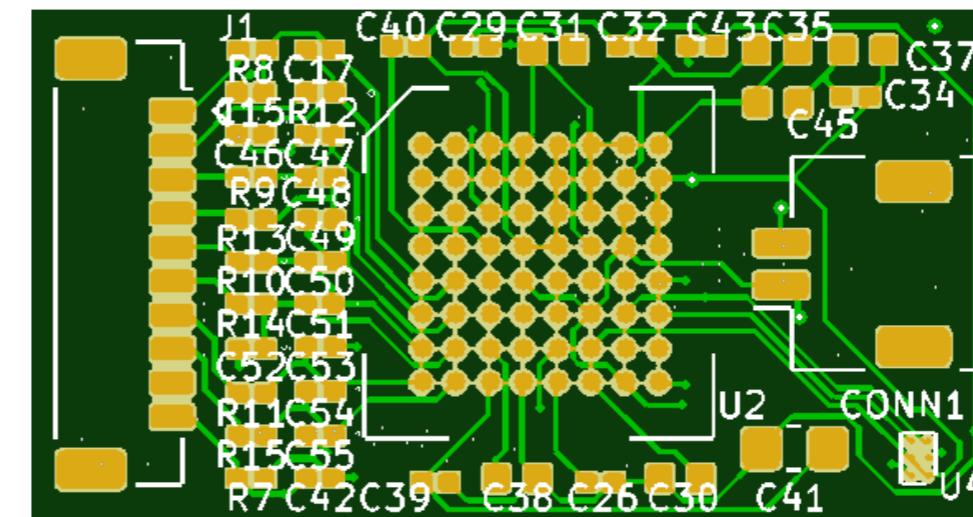
Winter–Summer Development Plan



actual scale

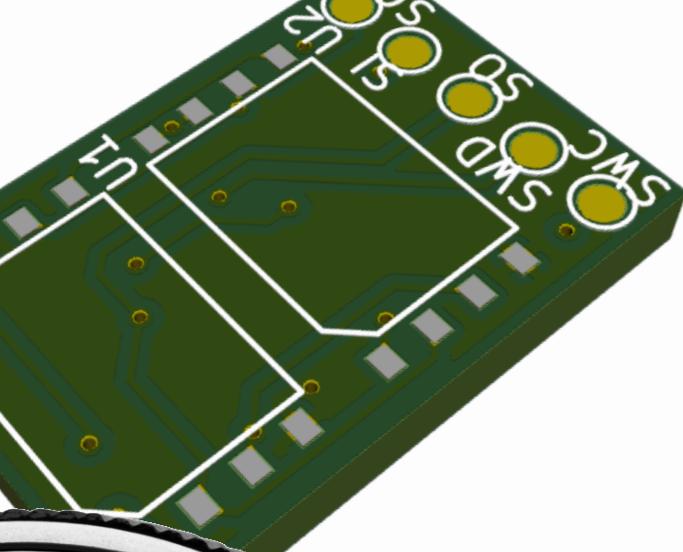


Bottom



4ch Bio-amp Connecto

ADS1294 Bio-amp (64-pin)



actual scale

Memory “Backpack”
1Gb NAND Flash (x2)

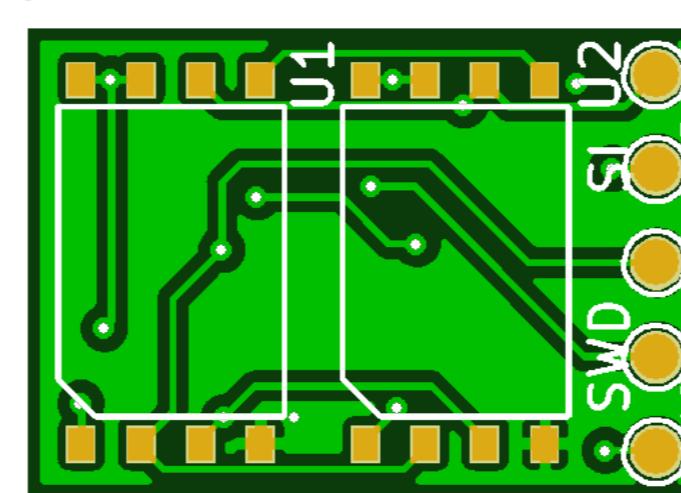


15mm

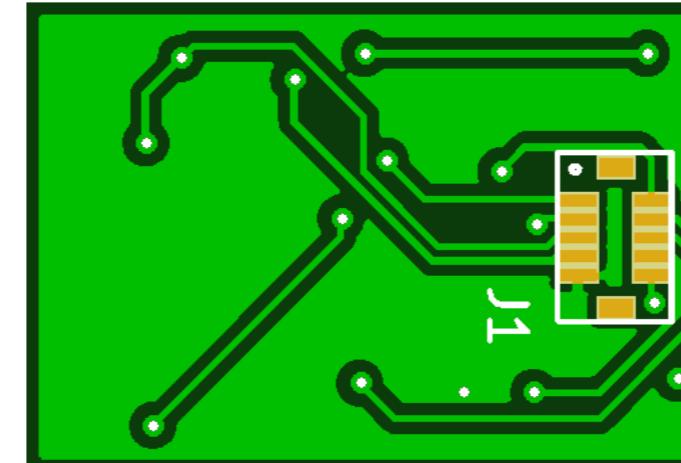
Top

12mm

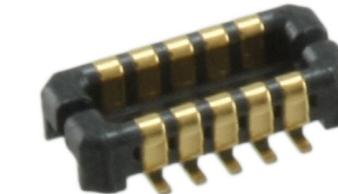
Bottom



Programming Port/
Debug pins



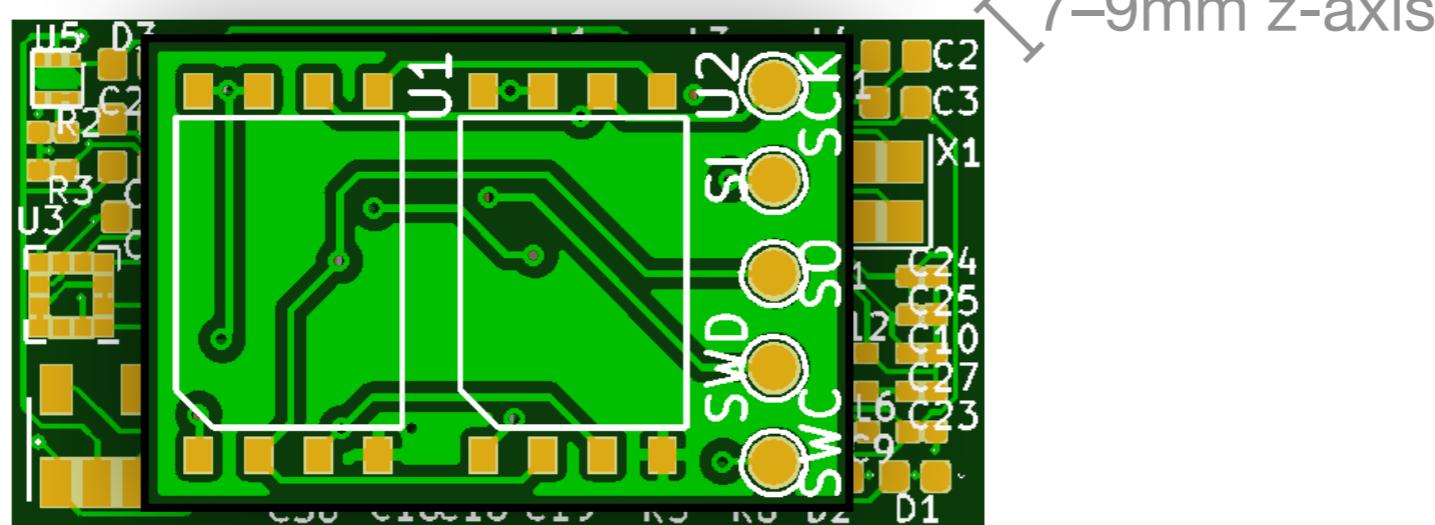
Conn. to Main Board



actual scale



Memory backpack can accommodate up to 3 high-speed peripherals (which could be a micro-SD card).



Stacked Boards
("snaps" together)

ARBO BT

Main Board

- Nordic BT low-energy microcontroller unit (MCU)
 - Sleeps @ 1.8uA
 - Processor powered @ 2.4mA
 - High-speed BT Transmit/Receive @ 8.8mA
 - 1MB on-board flash for data buffering to memory chips (minimizes memory chip up-time)
- Accelerometer
 - Sleep mode @ 7.7uA (operates at 12.5Hz until motion is detected)
 - Magnetometer + Accelerometer @ 200uA
 - Programmable magnetometer and motion interrupts to wake MCU
 - FIFO storage: 256-sample buffer reduces the need to constantly sample
- ADS1294 Bio-amp
 - Easily powered down for low-power sleep mode
 - Individual channel enable @ ~1.5mA per active channel

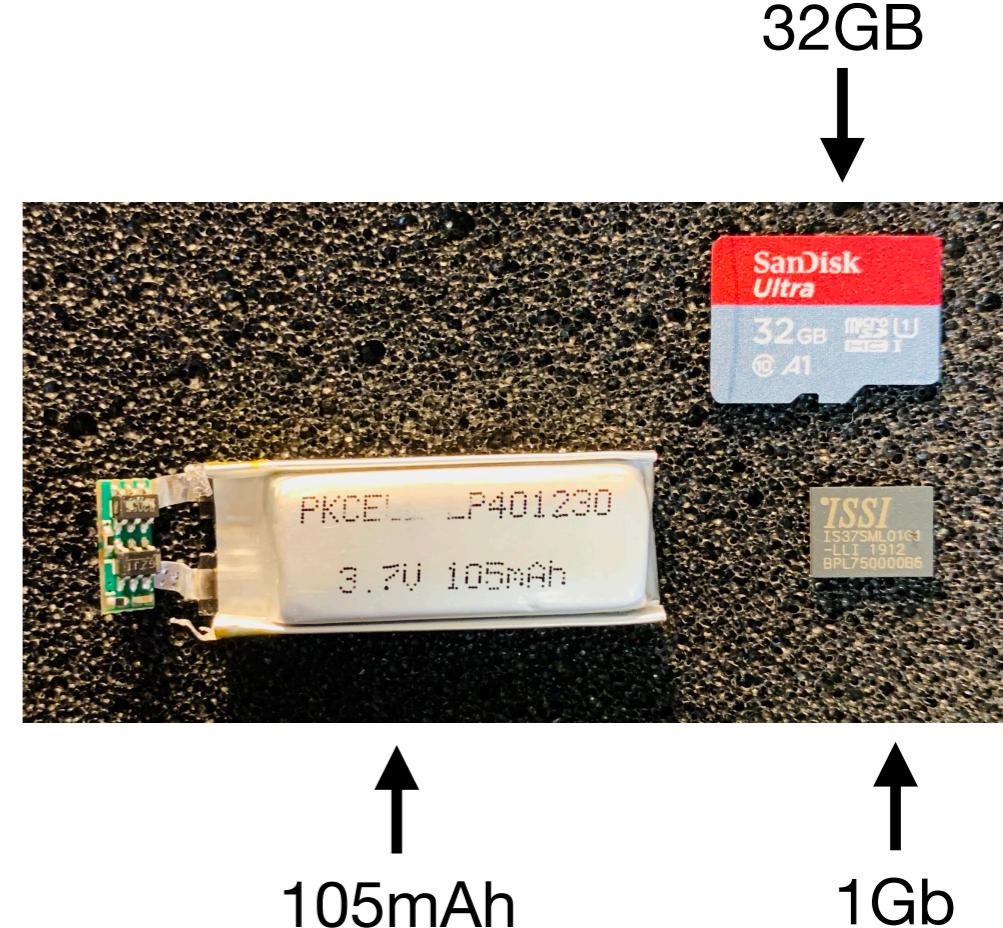
ARBO BT

Memory Backpack

- **1Gb** (giga-bit, or 256MB) NAND Flash
 - 10uA standby current, 20mA read/write
- Memory port can also be used for a micro-SD card (or any other high-speed peripherals) and is the main interface for two-wire programming/debugging
- Micro-SD card sleeps @ ~100uA, writes ~10mA

Envelope Calculations

- **1Gb** stores **~12hrs** of data @ 200Hz sampling rate
 - **100mAh** battery powers a device @ 8.5mA for **~12hrs**
- ∴ for every **~100mAh** battery we need **~1Gb** of memory



ARBO BT

Main Board is high cost because of high-density interconnect (HDI) fabrication (i.e. “advanced” PCB service).

- Unfortunate for prototyping @ ~\$400 base cost
- But scales well: 10-200 boards are roughly the same cost
- Good candidate for an assembly service for final builds (~\$400 for all parts, ~\$800 total for 30+ boards)
- Parts cost ~\$50 per-board

Memory Backpack is low cost because it uses basic, 2-layer fabrication techniques (i.e. “standard” PCB service).

- Shipping likely costs more than the boards (~\$1 per-board, but also scales)

HARDWARE

SOFTWARE

MAR **APR** **MAY** **JUN** **JUL** **AUG**

Order Prototypes
(~3wk lead)

\$500

Order Production
(+Assembly?)

\$1,000

Test at Scale/
Cohort (Yukon?)

Development/Testing

