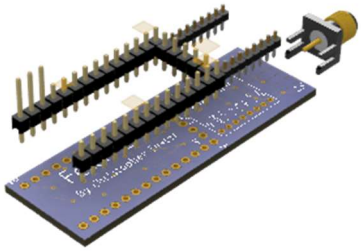
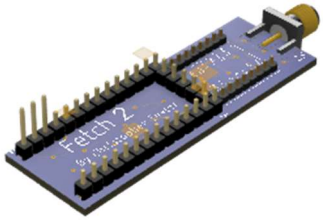
By Christopher Texler

Fetch Assembly guide Ver 1.0

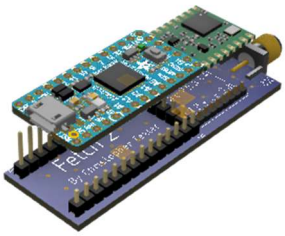
Hardware Assembly

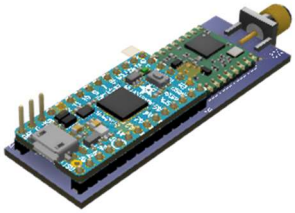




Step 1:

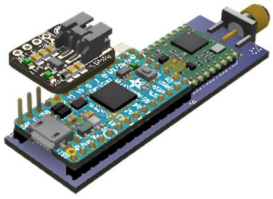
Insert and solder the pin headers and SMD board connector onto the main board as shown in the pictures to the left of this caption.





Step 2:

Insert the Itsy bitsy M0 and RFM 95W boards onto the pins and solder them in place as shown in the pictures to the left of this caption.

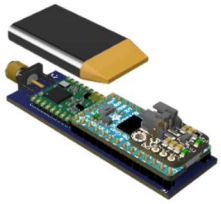


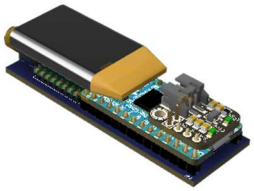
Step 3:

Insert the Adafruit battery charging backpack board onto the 3 tall pins sticking through the itsy-bitsy board and solder it in place as shown in the pictures to the left of this caption.

Step 4:

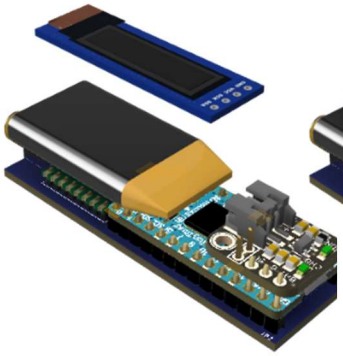
Insert two pins cut from a pin header into the battery output pin holes after carefully cutting the trace between them and solder them in place as shown in the pictures to the left of this caption.

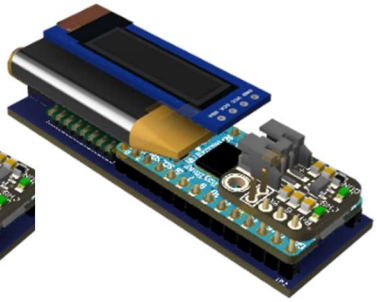




Step 5:

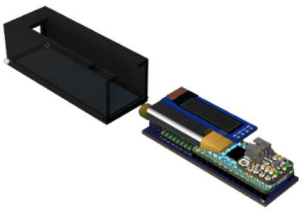
Put some masking tape on the side of the battery that will be facing the board and set it on top of the assembly while connecting it to the battery charging backpack as shown in the pictures to the left of this caption.

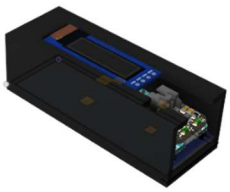




Step 6:

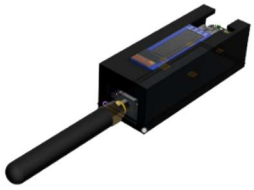
Place the OLED screen on top of the battery and connect it to the corresponding pins on the Itsy bitsy via jumper wires and solder joints as shown in the pictures to the left of this caption. (Note, make sure to route everything to be as compact as possible, this may mean custom cutting and stripping jumper wires)





Step 7:

Slip the 3d printed case over the entire assembly, making sure to align the OLED to the large channel and line up the ON/Off jumper pins to the smaller channel as shown in the pictures to the left of this caption.



Step 8:

Insert the corresponding antenna onto the SMA connector as shown in the pictures to the left of this caption.

Congratulations! You've completed one Fetch Box! Now you get to make another! The Hardware for Fetch is identical for the transmitter as it is for the Fetch Ground Station, with the exception of the antenna. This means that to make the hardware for a full Fetch system, you just need to make 2 Fetch boxes and equip one with an omni directional antenna and one with a directional antenna.

Software Integration

Thankfully, when hardware assembly is done correctly, software integration is easy to do. First, put the itsy bitsy into Arduino programing mode via the tutorial available at Adafruit. Then, upload the proper sketch to each box based on its purpose, ie the GS script should be uploaded to the box that will serve as the ground station and the payload script to the box that will serve as that transmitter. Some warnings before doing any of this, though, never power the system without the antenna or else it might damage the RFM module. Also, when putting the itsy bitsy into programing mode, use a plastic instrument, not a metal one.