

Week 5 LoRa Exploration Lab Task 2

There's no easy way to start off a report, so let's go with this: this lab was certainly much harder than the rest we've covered in class. During our move to get things working, we ran into so many issues and problems, we barely even knew where to begin. However, we did it, and we're proud of what we did, so let's do a quick overview of it!

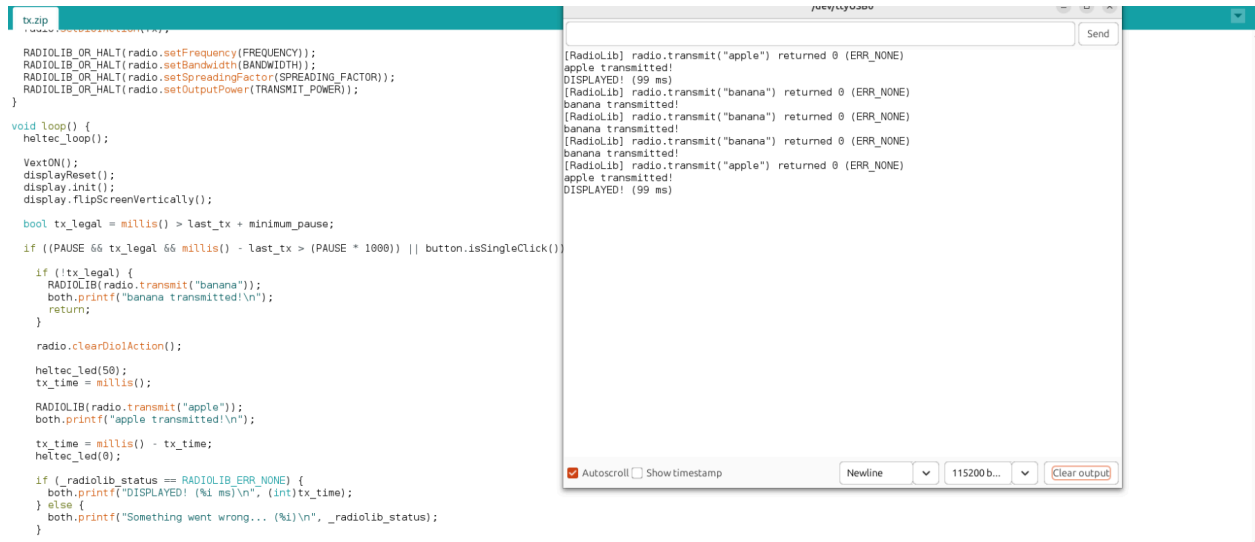
For task 2, we really wanted to make something special. This was our first time doing anything like this, so after a few hurdles that the first task gave us, we wanted to really test our newfound knowledge. We used the `LoRa_rx_tx.ino` file from the given repository (https://github.com/ropg/heltec_esp32_lora_v3/blob/main/examples/...) as a base and modified it, as we thought the transmission was both the most versatile thing in the examples, as well as the easiest to modify and make into something truly impressive.

We had many ideas, from using it as a way to ping for WiFi to sending files over, but we went with one that we thought was far more challenging and, in our opinions, infinitely cooler. We decided to try to display things on the screen after being sent a transmission! The code is not like the one in the display demos, but rather it used byte arrays to show it (like actual image formats do!)

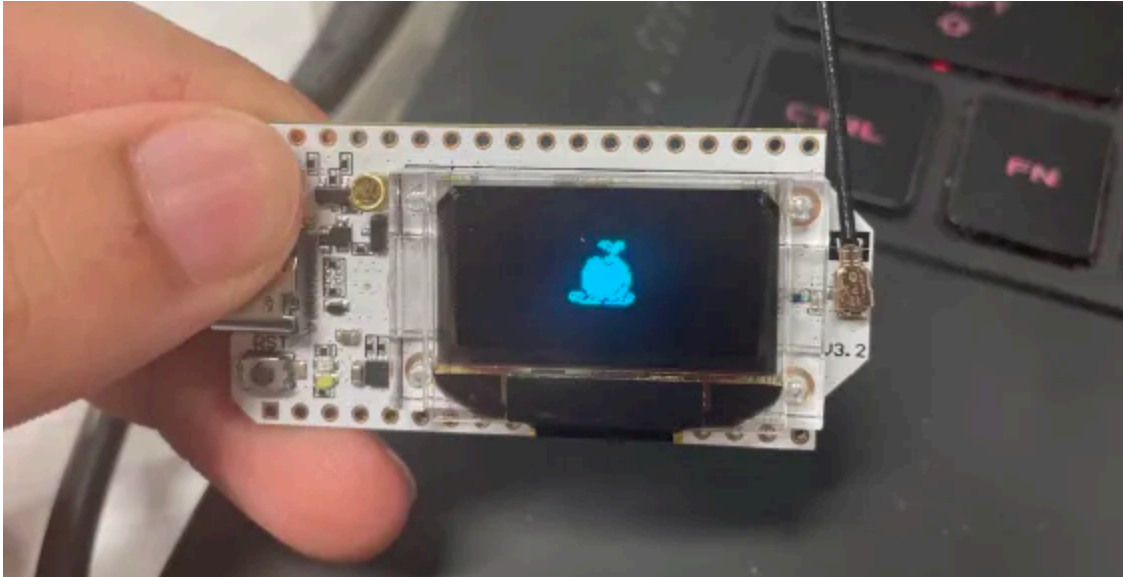
Here's the step-by-step process:

1. We separated the RX and the TX into two files.
2. We edited out the comments after we understood the code, and cleaned up the things we wouldn't need (ie: `HELTEC_POWER_BUTTON`, `printf()` statements, counters.)
3. `HELTEC_POWER_BUTTON` kept turning off the OLED indefinitely, so we had to fix it with `VextON/OFF`, `displayReset`, etc.
4. We got the functionality for the buttons up and running, so that they'd send out the adjusted values we wanted.
5. Xavier made the pixel art for the screen, Ashe made them into image byte arrays to be displayed.
6. We got the images to display when being sent specific values over transmission! We also added the ability to interact with them.

Images



(The TX loop() code and Serial Monitor)



(The RX OLED screen)

We also got a video of it working in action! It will be posted in the Blackboard submission. We hope you enjoy it!