Long-Range Wireless Data Transfer for a Microwave Radiometer

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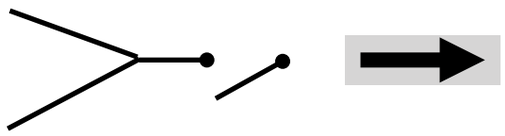
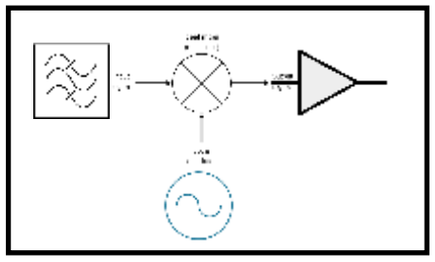
This year's goal is to fly the radiometer on a UAV, which would require wireless data transfer capability. This can be done by implementing a LoRa module into the radiometer and setting up a ground control device with another LoRa.

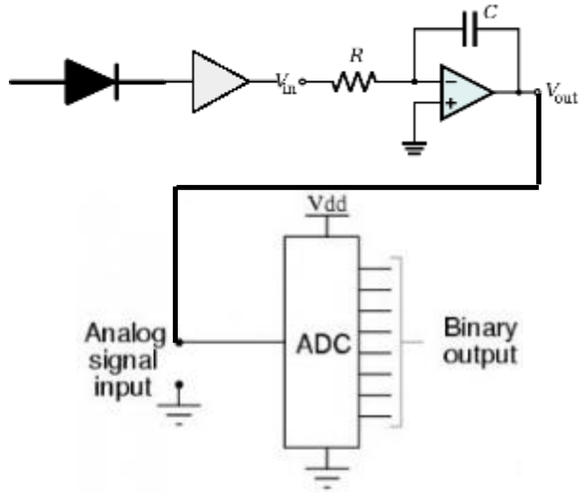
Radio Frequency(RF) Front End



Intermediate Frequency(IF) Down Converter



Power detector/back-end circuit



Data Collection and Transmission Unit

-Arduino nano i2c communication

-transmit wirelessly via LoRa

-same setup for sender and receiver

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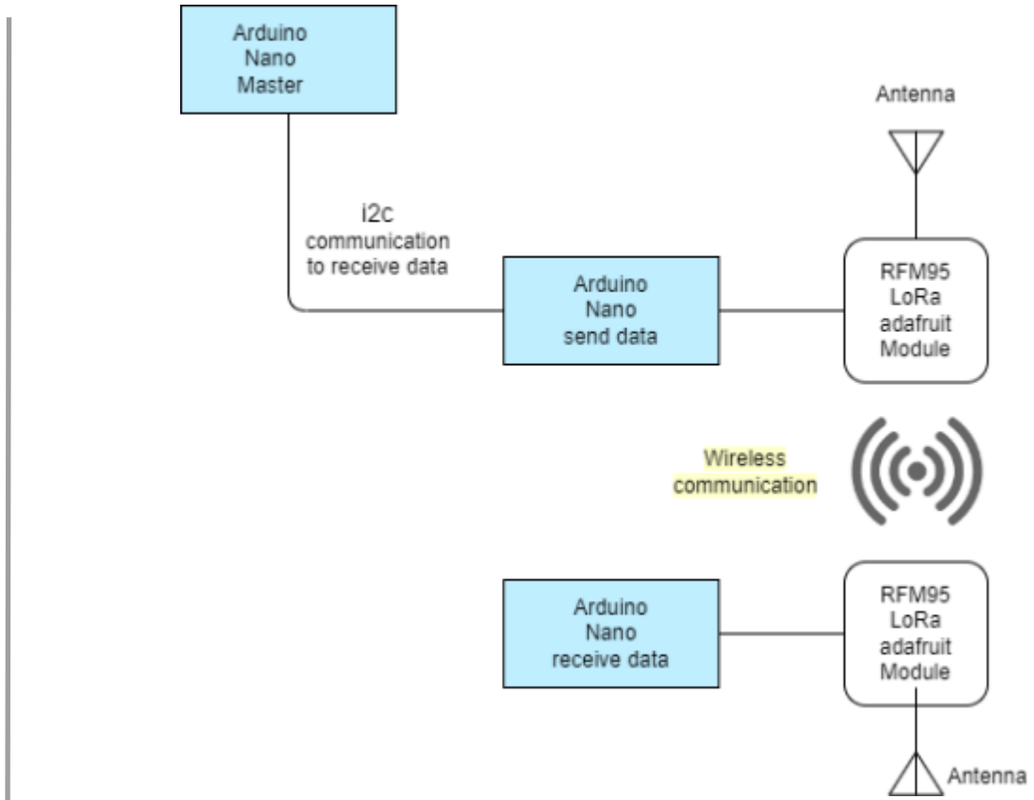
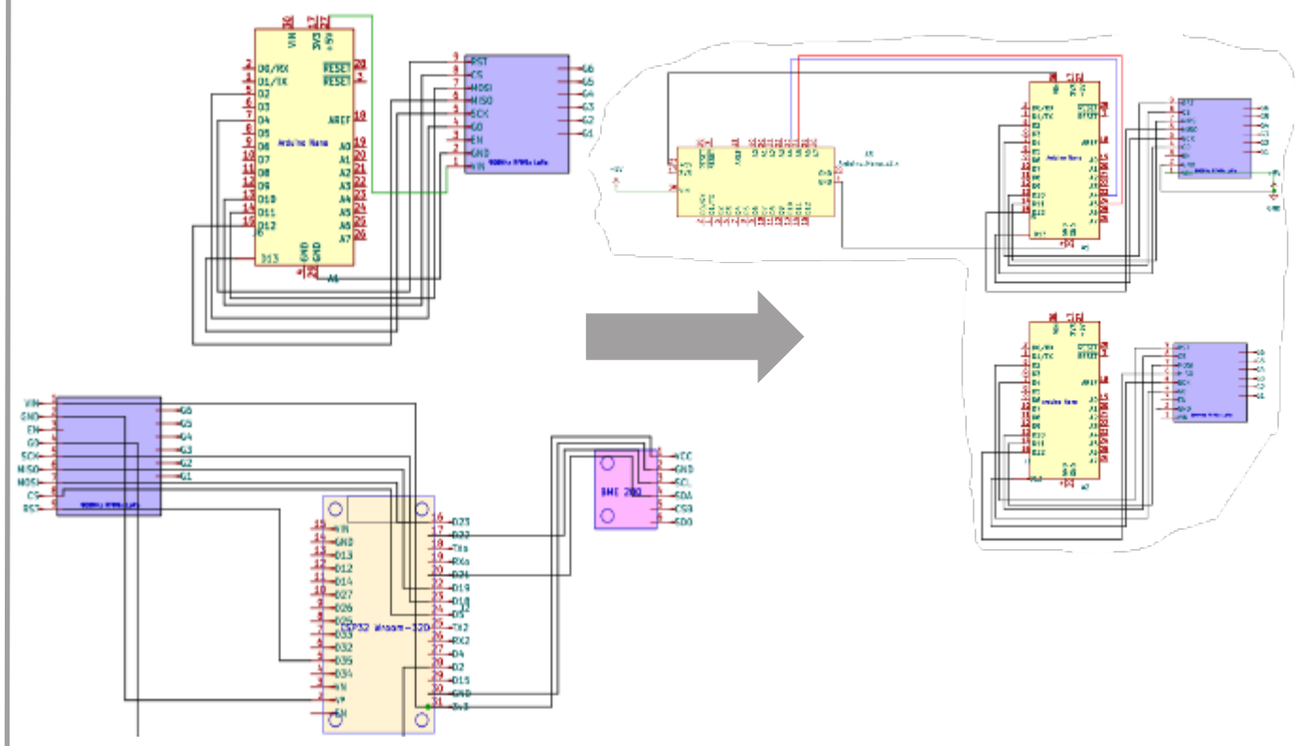
Introduction:

- LoRa modules are wired to microcontroller and send “chirp” signal to communicate with each other
- LoRa module hooked up to microcontroller via SPI communication
- Original testing design was between sensor data transmitter and receiver using an ESP32





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Implementation/Results: