

Memo for mobile system
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Objective of the project

The purpose of the project is to develop a mobile system and characterize the wide range radio frequency in different location. The first step is to design and build a mobile system to collect RF data across a wide range of frequencies including hardware design for the system, packaging and writing software for the analysis. Second step is to find a location. We'll look for places that fit our needs based on geography, infrastructure, accessibility, and, most crucially, the RF environment. The final step is to visit candidate locations with the RF system to collect data and analyze for RF suitability.

System Summary

In our mobile system we have 4 main subsystems to collect radio frequencies. Those are an LWA FEE, [RTL SDR](#), raspberry Pi 4B and a power supply. LWA FEE is the electronics that collects radio frequencies. RTL SDR is the component that has usb port to plug in to the raspberry pi to convert RF data into computer. Raspberry pi is the small computer that can be connected to the monitor and keyboard.

For the power supply we need 15V and 250mA to power up LWA FEE. We designed a small circuit using a voltage regulator, two 9V batteries and a [Bias-T](#) to get 15V. The Bias-T is used to supply DC currents or voltages to bias RF circuits. Since we need 15V to power up LWA FEE, we

connected 2 batteries in series to get 18V and using voltage regulator we stabilize the output voltage to 15 and output voltage is connected to the Bias-T which is connected to the LWA FEE.

The LWA FEE and power supply are placed in a box to protect from environment.

LWA FEE is connected to the power supply with a 2m SMA cable. The Power supply is connected to the RTL SDR with a short black SMA cable and RTL SDR is plugged in to the raspberry pi.

Lastly, to power up the raspberry pi and monitor we used a 10 Ah [power bank](#).