**Description:**

The Foghorn should be a handheld electronic device that receives a user’s voice using a microphone and broadcasts it on an FM band. It should be tunable so that the user can choose the frequency of broadcast.

The user should see the current frequency displayed on the device and be able to adjust it with physical controls. The users voice should only be broadcast when the user applies a physical control (e.g. button, trigger).

The device should be able to broadcast a signal such that a nearby FM radio can receive that signal. The FM radio user should be able to discern what the Foghorn user is saying.

The device should be battery powered and rechargeable. It should be able to be switched off when not in use. The entire package should fit within a microwave.

**Use:**

The user turns on the device using a switch. After a short boot time, the device is ready for use. The user can adjust buttons to adjust the frequency, which is displayed on a small screen on the side of the device. Next, the user can depress a trigger or button and begin speaking. When the button is released, live transmission stops. The user can switch off the device using the power switch.

**Requirements:**

* Users voice must be comprehensible on an FM radio up to 10 meters.
  + Device will be used 10 meters from a radio. FM radio input will be recorded.
* Output frequency must be able to consistently target a single FM frequency within 0.2MHz.
  + 5 different frequencies will be checked on the FM band. Device should transmit at the target frequency but be inaudible at adjacent (+/- 0.2MHz) frequencies.
* Battery should last for up to 30 minutes of continuous use.
  + Device will be powered on and set to broadcast at medium power for 30 minutes.
* User must be able to tune frequency across the FM band.
  + Check minimum and maximum FM frequencies using an FM radio.

**Constraints:**

* Must fit within a handheld (toaster or smaller) package.
* Must transmit quietly enough to avoid annoying or alerting the public in a radius larger than 100 meters.
* Total parts cost must not exceed $300.

**Goals:**

* Allow audio input to be played from device using a wireless connection with a phone.
* Allow for tunable power for longer or shorter ranges.