

Requirements for Radio Tiny (RAT)

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Signal Receiving

1. RAT shall be able to receive FM and AM radio signal bands.
2. RAT shall have two separate antenna for FM and AM radio capture.
3. RAT's AM antenna shall capture radio signals on the 88 – 108 MHz spectrum.
4. RAT's FM antenna shall capture radio signals on the 540 – 1700 kHz spectrum.

Communication

1. RAT shall have two communication modalities.
2. RAT shall have a USB-C style physical connector as one communication modality.
3. RAT shall be able to function as a WiFi client as its second communication modality.
4. RAT's USB-C port shall be capable of data transfer, communication, control, and firmware programming capability.
5. RAT's ability as a WiFi client shall be capable of data transfer.

Playing Sound

1. RAT shall be able to play signal locally.
2. RAT's shall have a local speaker.
3. RAT's local speaker shall be large enough for human audibility: 0dB – 80dB.
4. RAT shall be able to play signal externally.
5. RAT shall have an AUX port for external speaker use.

User Interface

1. RAT shall have an adjustable volume.
2. RAT's volume adjustment system shall operate over the working range of the local speaker.
3. RAT shall have an adjustable frequency tuning system.
4. RAT's frequency tuning system shall be adjustable over the entire frequency spectrum of the AM and FM radio frequency range.
5. RAT shall have a display.
6. RAT's display shall display information regarding the operating frequency, volume, and battery life.
7. RAT shall be mutable.
8. RAT shall indicate charging status.

Power

1. RAT shall be able to be powered by an AC power adapter.
2. The AC power adapter shall be capable of providing power using mains voltages from 100 VAC to 240 VAC \pm 10% with line frequencies of 50 to 60 Hz.
3. RAT shall have a built in rechargeable Li-Ion battery.
4. RAT's rechargeable battery shall be chargeable via the USB-C port.
5. RAT's rechargeable battery shall be chargeable via the AC power adapter supply.
6. RAT shall be able to compute the charge in the built in battery.
7. RAT shall operate over the temperature range 0°C to 40°C with the rechargeable battery installed.
8. RAT shall be able to play sound on built in speaker for 4 hours on a full battery charge.
9. RAT shall be able to power off.

Data Logging

1. RAT shall have a built in micro-SD slot.
2. RAT shall be able to log data from antenna to micro-SD.
3. RAT shall be able to log data from battery sensor to micro-SD
4. RAT shall be able to transfer sensor data outward via communication modalities.