#### **🖥️ HackRF CLI Quick Reference**

##### **🔍 Device Check & Status**

hackrf\_info

Check if HackRF is connected and identify serial number, board ID, and supported features.

##### **📥 Receiving (Recording) IQ Data**

hackrf\_transfer -r capture.iq -f 433000000 -s 8000000 -a 1 -g 40 -n 10000000

* -r capture.iq: save IQ data to file
* -f 433000000: center frequency in Hz (433 MHz here)
* -s 8000000: sample rate (8 Msps recommended)
* -a 1: enable antenna power
* -g 40: RX gain (up to 40 dB)
* -n 10000000: capture 10 million samples (1.25s at 8Msps)

##### **📤 Transmitting IQ Data (Playback)**

hackrf\_transfer -t capture.iq -f 433000000 -s 8000000 -a 1 -x 40

* -t capture.iq: transmit this IQ file
* -f 433000000: center frequency to TX at
* -s 8000000: match the sample rate of original recording
* -x 40: TX gain (max = 47)

⚠️ Use only in ISM bands and test environments. Add attenuation or shielding.

##### **🌐 Sweeping the Spectrum**

hackrf\_sweep -f 70:6000 -w 10000000 -l 40 -g 20 -n 1000 -o sweep.csv

* -f 70:6000: sweep from 70 MHz to 6 GHz
* -w 10000000: bin width (in Hz) per scan step
* -l 40: low gain setting (LNA gain)
* -g 20: VGA gain
* -n 1000: number of samples
* -o sweep.csv: output to CSV for plotting

##### **🎧 Example: Record FM Broadcast (e.g. 100.3 MHz)**

hackrf\_transfer -r fm.iq -f 100300000 -s 2000000 -n 40000000

* Records 5s of FM broadcast (200 kHz BW) for demodulation later in GNU Radio

##### **🔁 Example: Replay with Caution**

hackrf\_transfer -t fm.iq -f 100300000 -s 2000000 -x 30

* Replays captured FM data—test only in shielded or legal lab conditions