



Thomas Watson

@wa7son

github.com/watson

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apt-get install node
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apt-get install node



apt-get install nodejs

Build your own

JavaScript Powered Radio



Who is this guy anyway?

- Thomas Watson
- Open Source developer at github.com/watson
- Node.js Lead at Opbeat
- Member of the Diagnostics Working Group under the Node.js Foundation
- Tweets as @wa7son



Build your own

JavaScript Powered Radio



An introduction to

Software Defined Radio

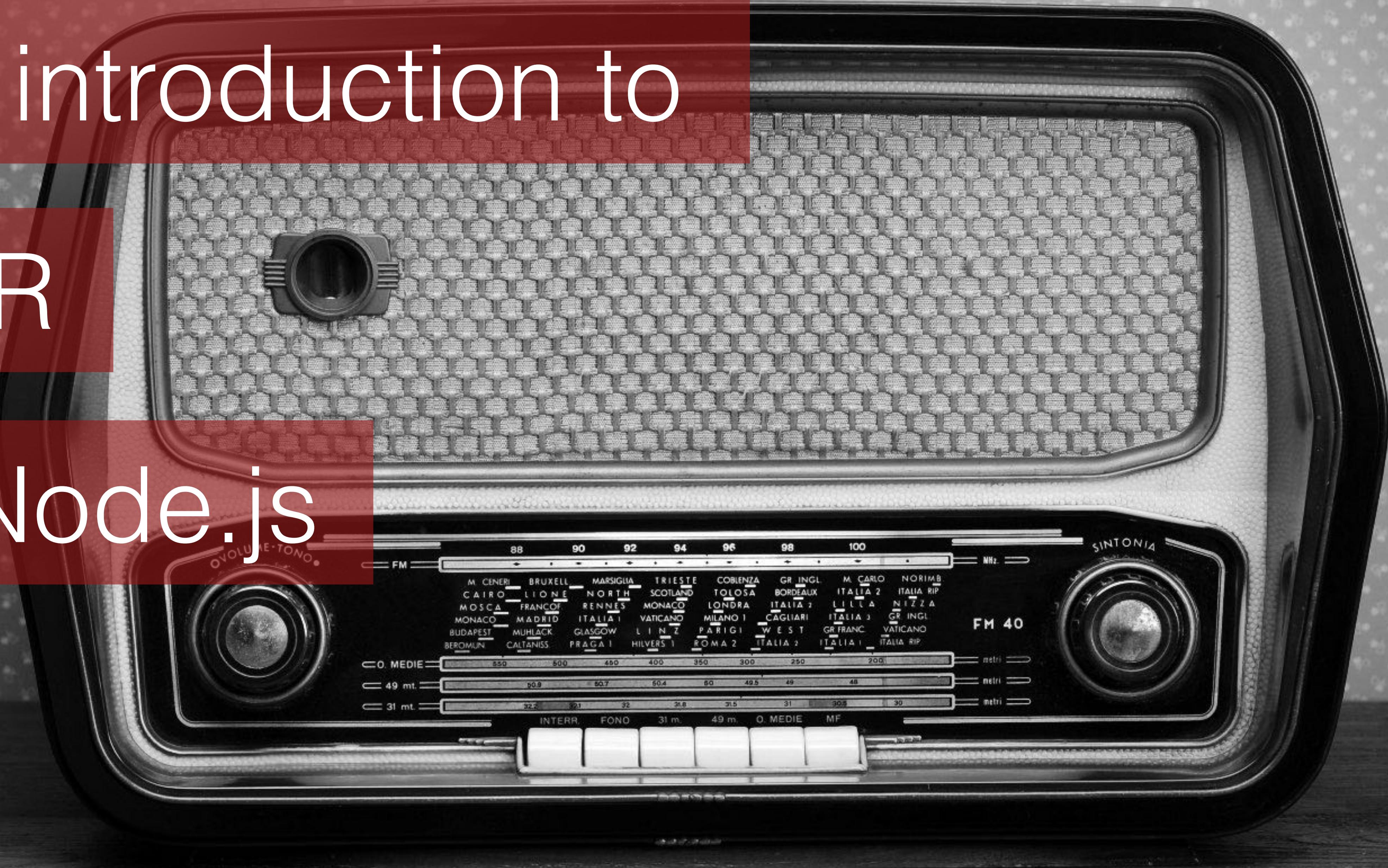
in Node.js



An introduction to

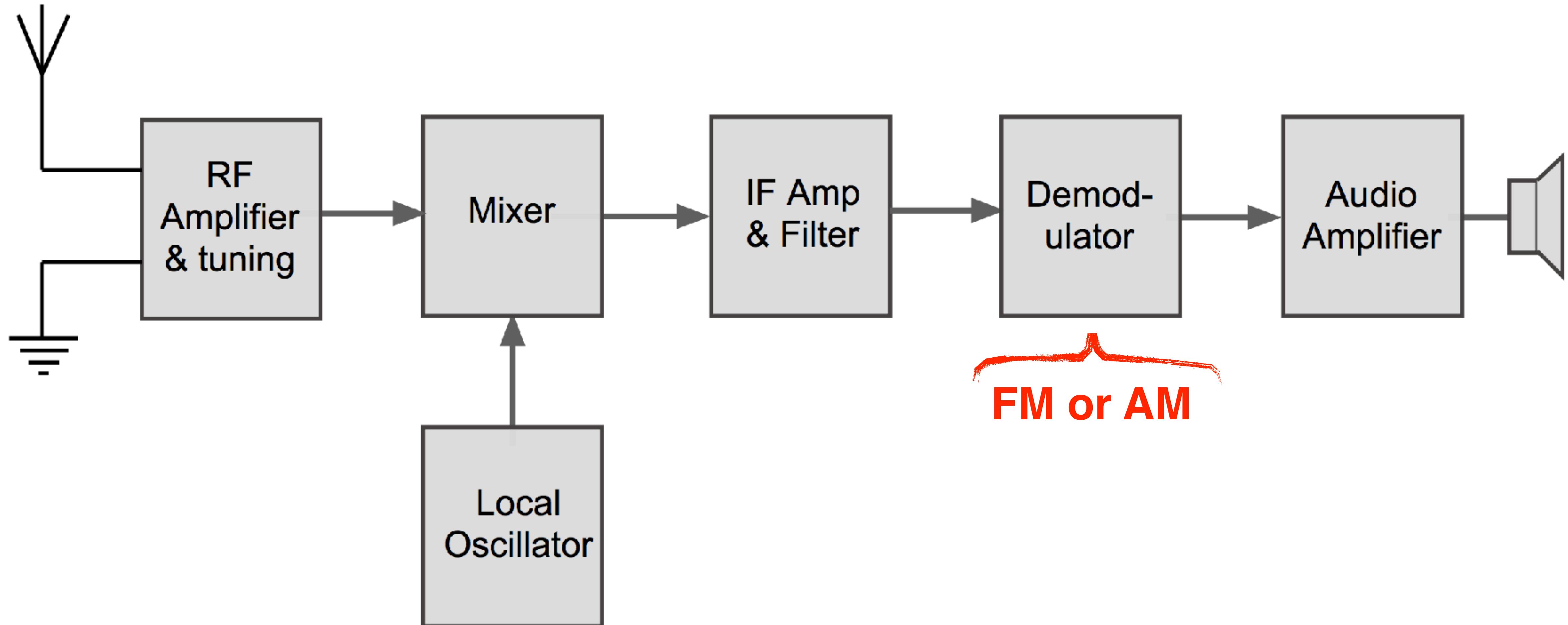
SDR

in Node.js

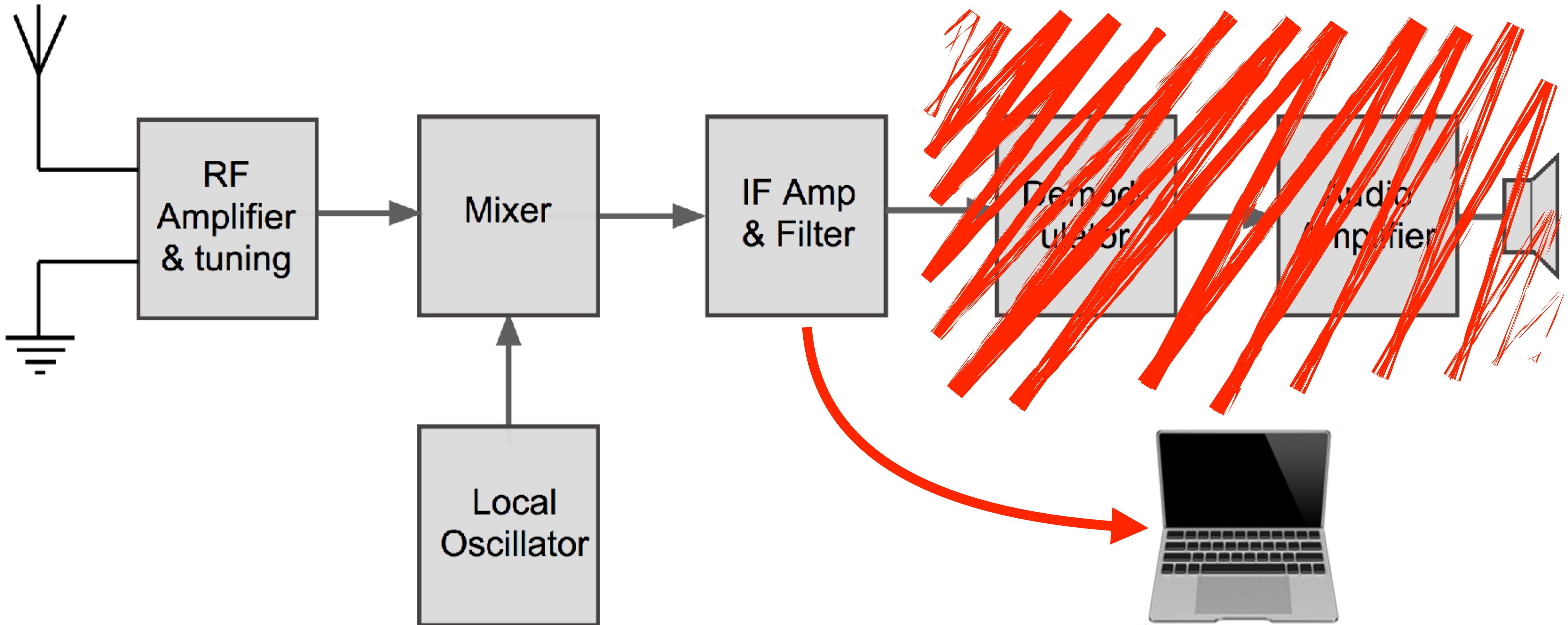


Radio 101

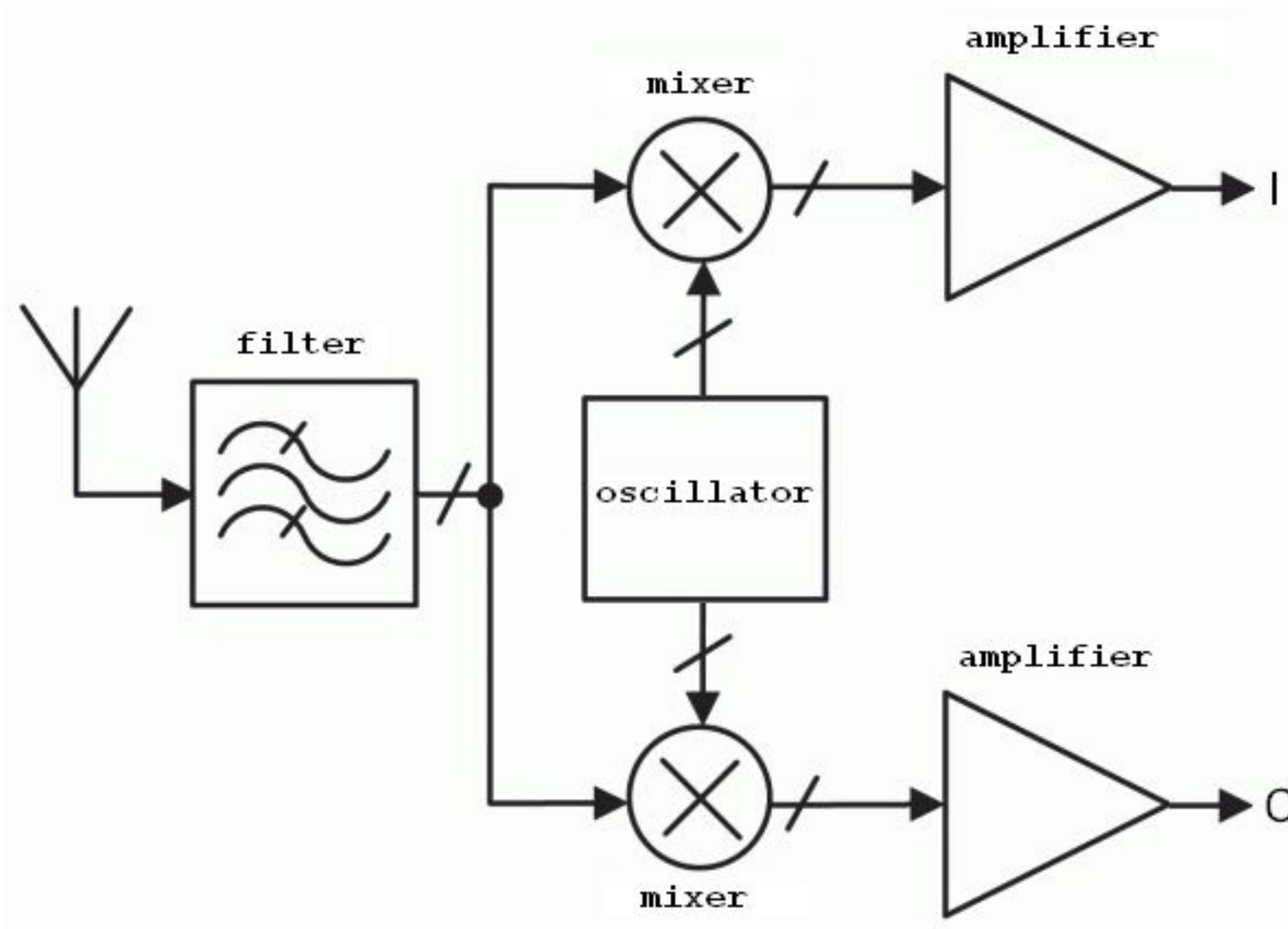
Normal Radio



~~Normal Radio~~

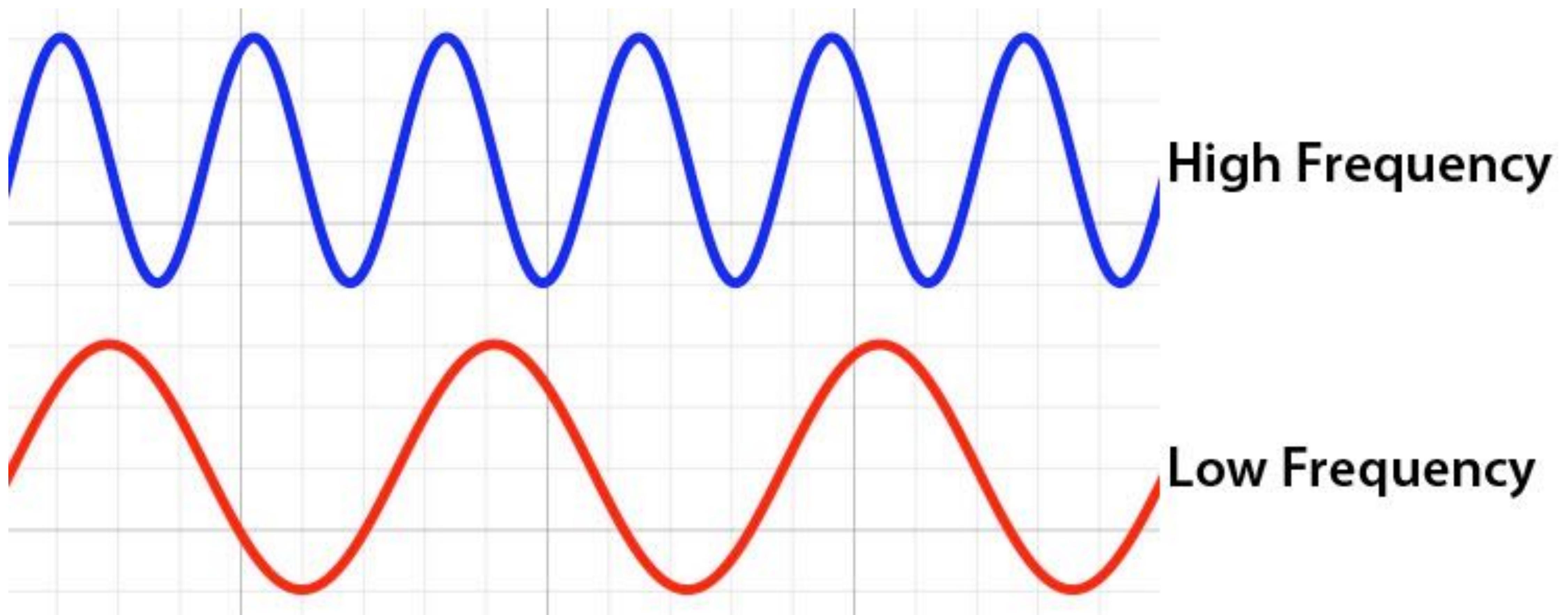


SDR (quadrature)





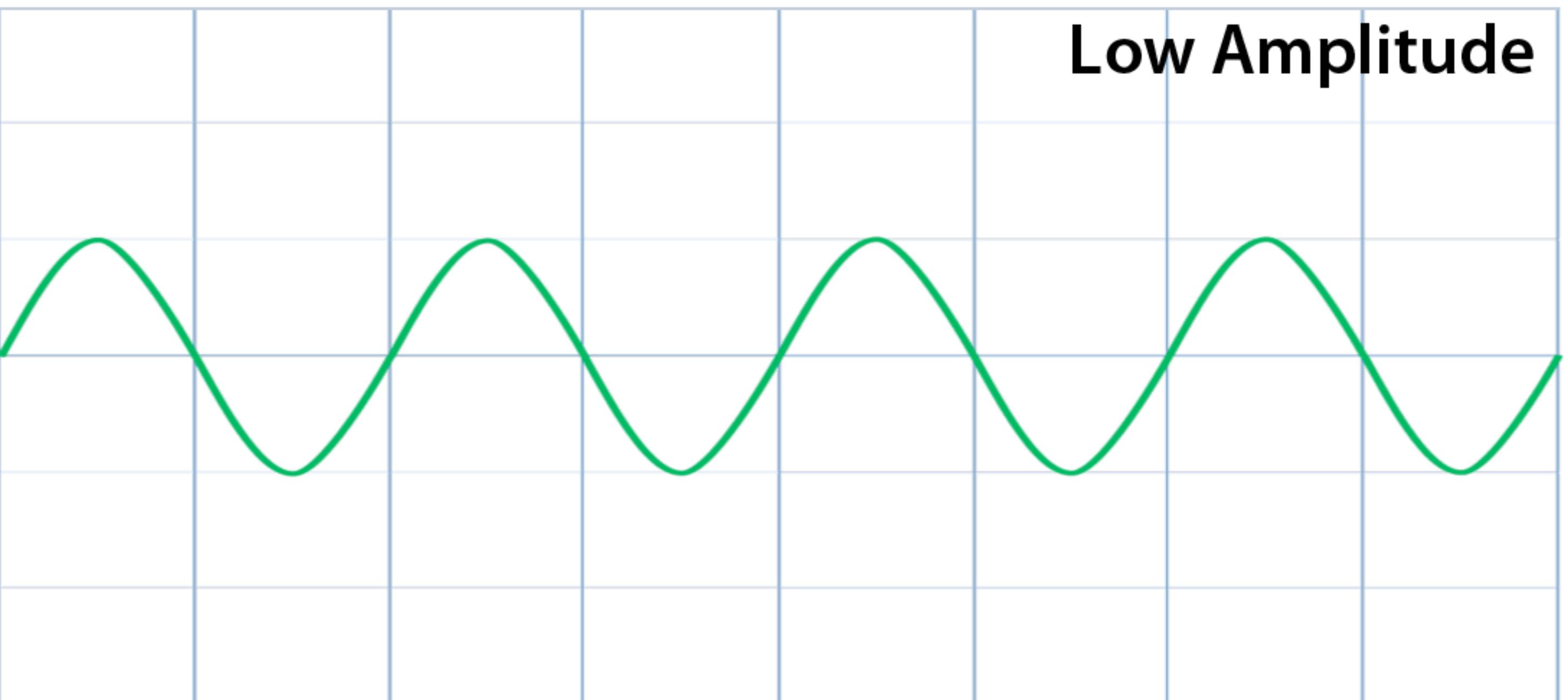
@wa7son

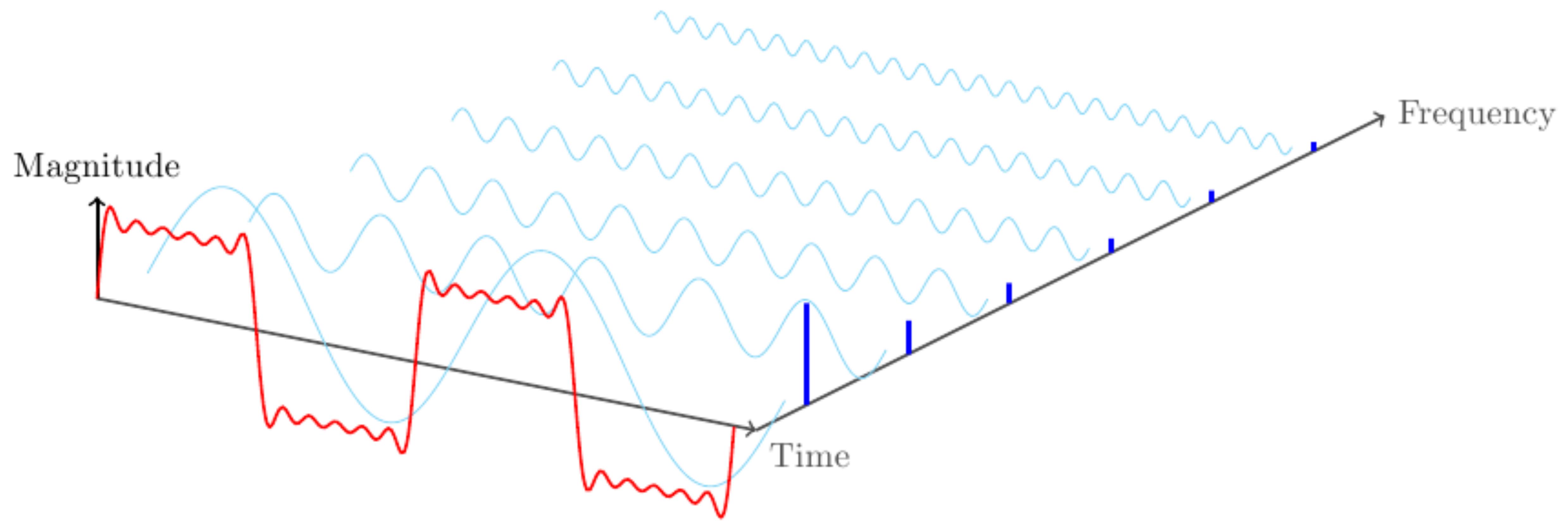


High Amplitude

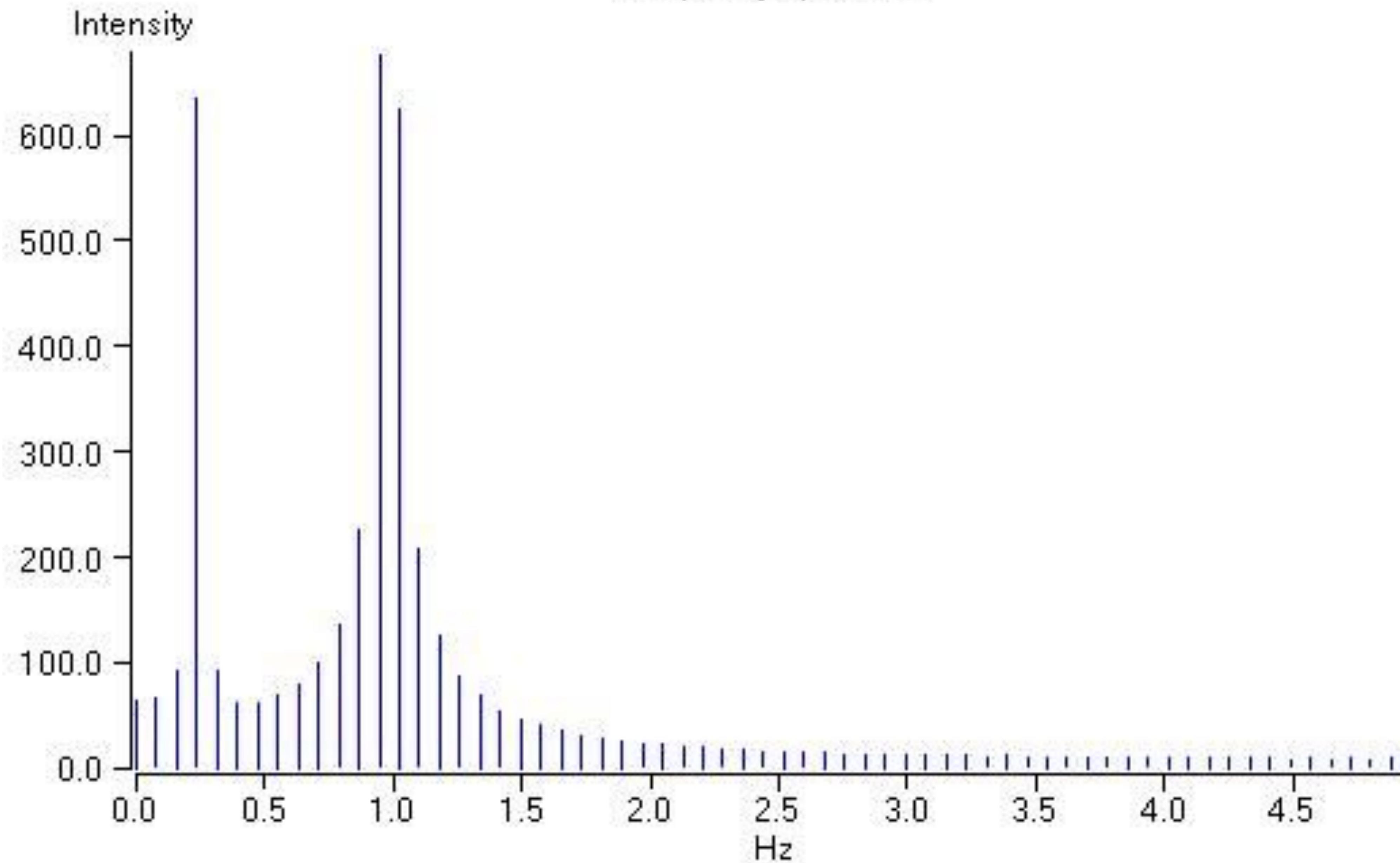


Low Amplitude

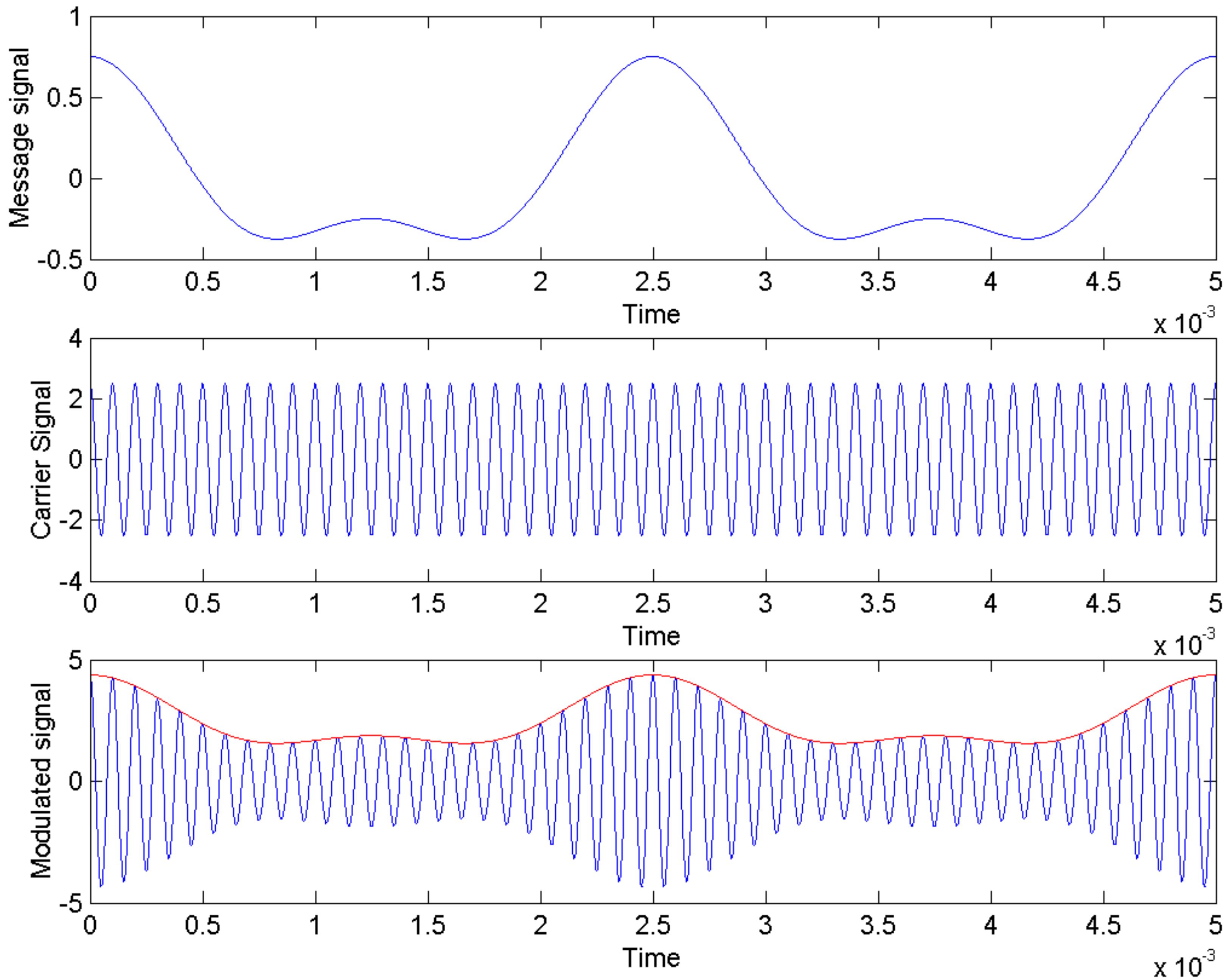


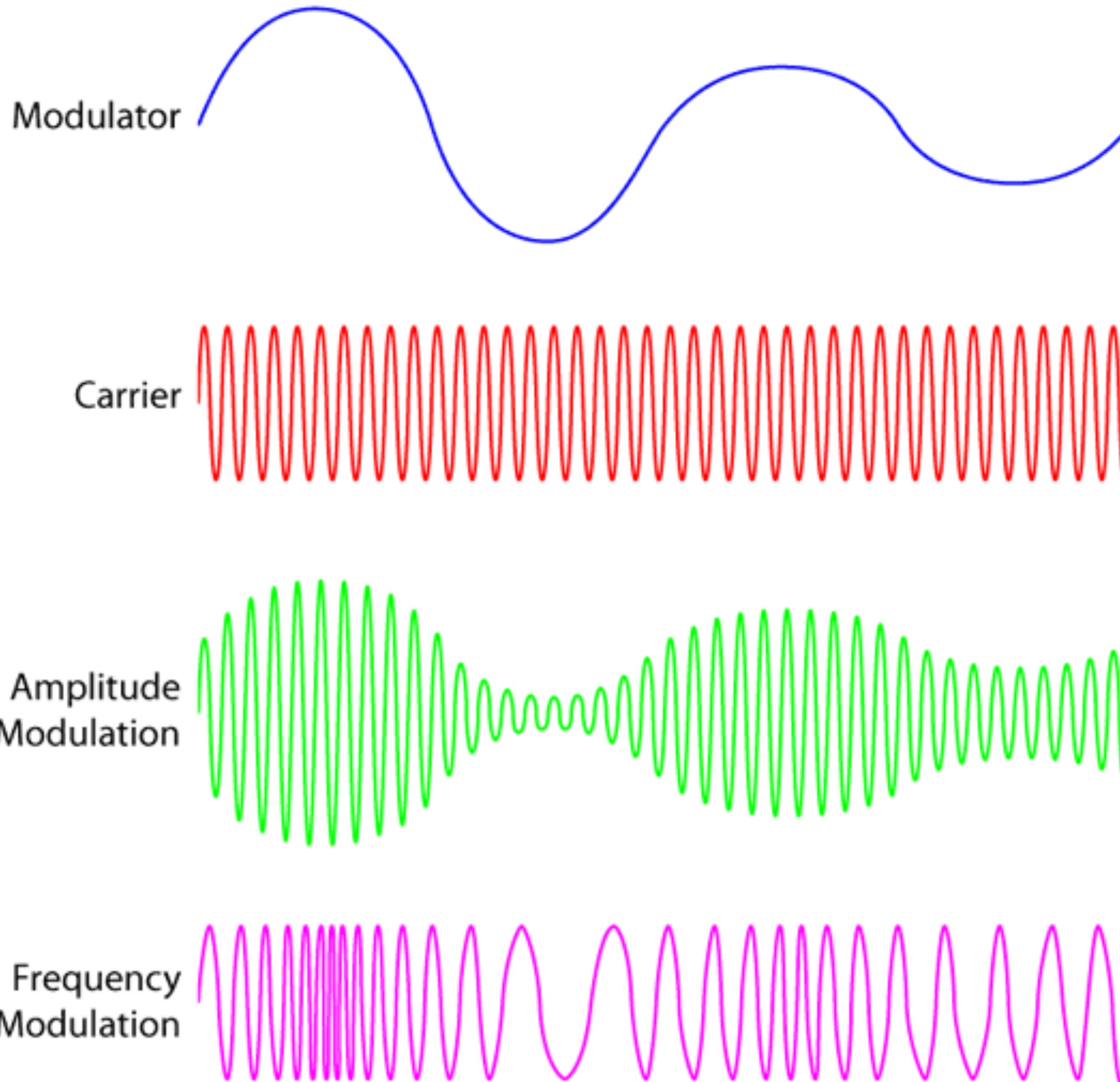


Frequency spectrum



Modulation





Commercial SDR

Ettus
Research™
A National Instruments Company

Expensive: €5,350

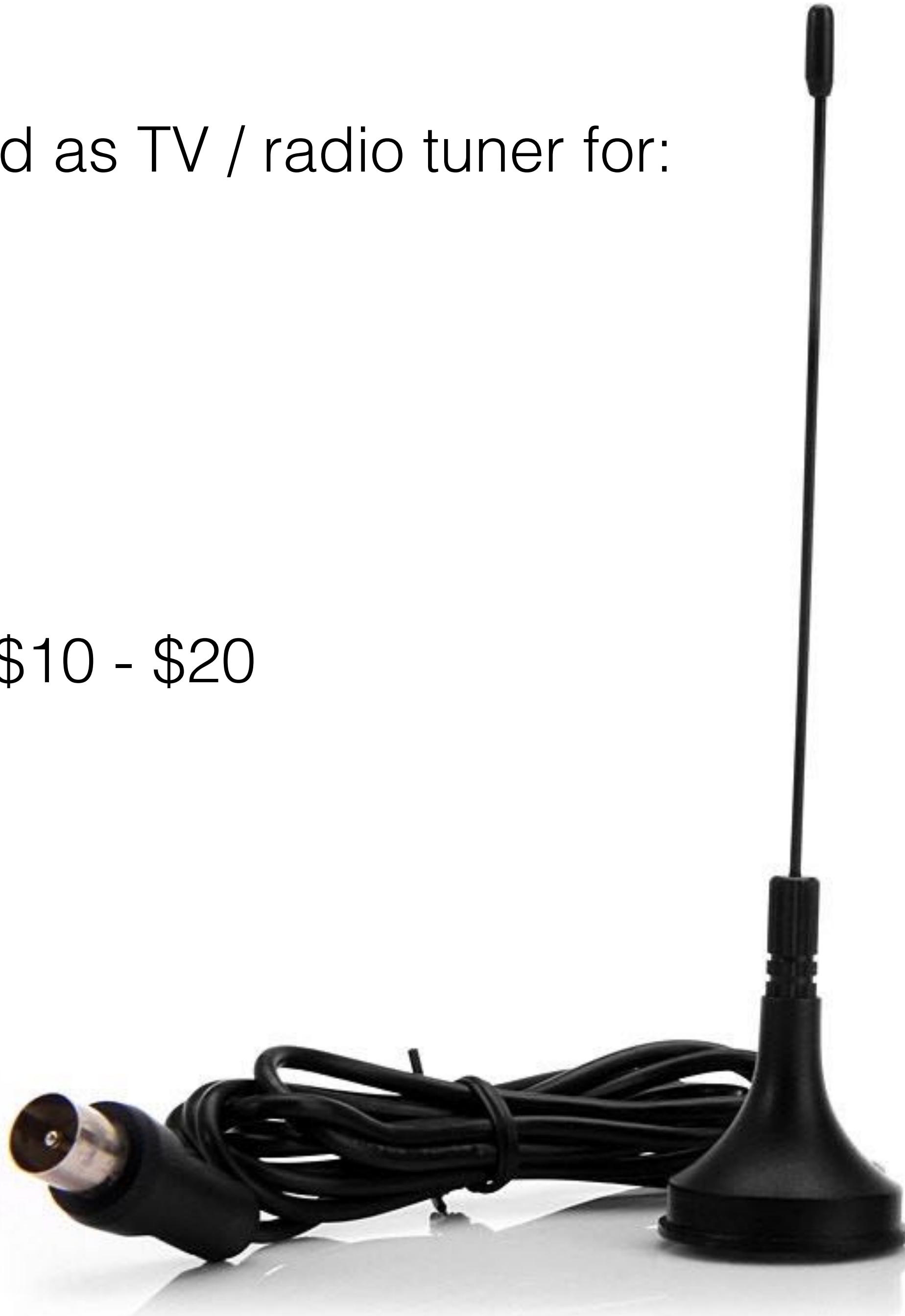


RTL SDR

Marketed as TV / radio tuner for:

- DVB-T
- DAB
- FM

Cheap: \$10 - \$20



Contains a Realtek RTL2832U chip

💻 Hackable! 💻

Supports approx. 24 MHz – 1766 MHz



Cue for Demo

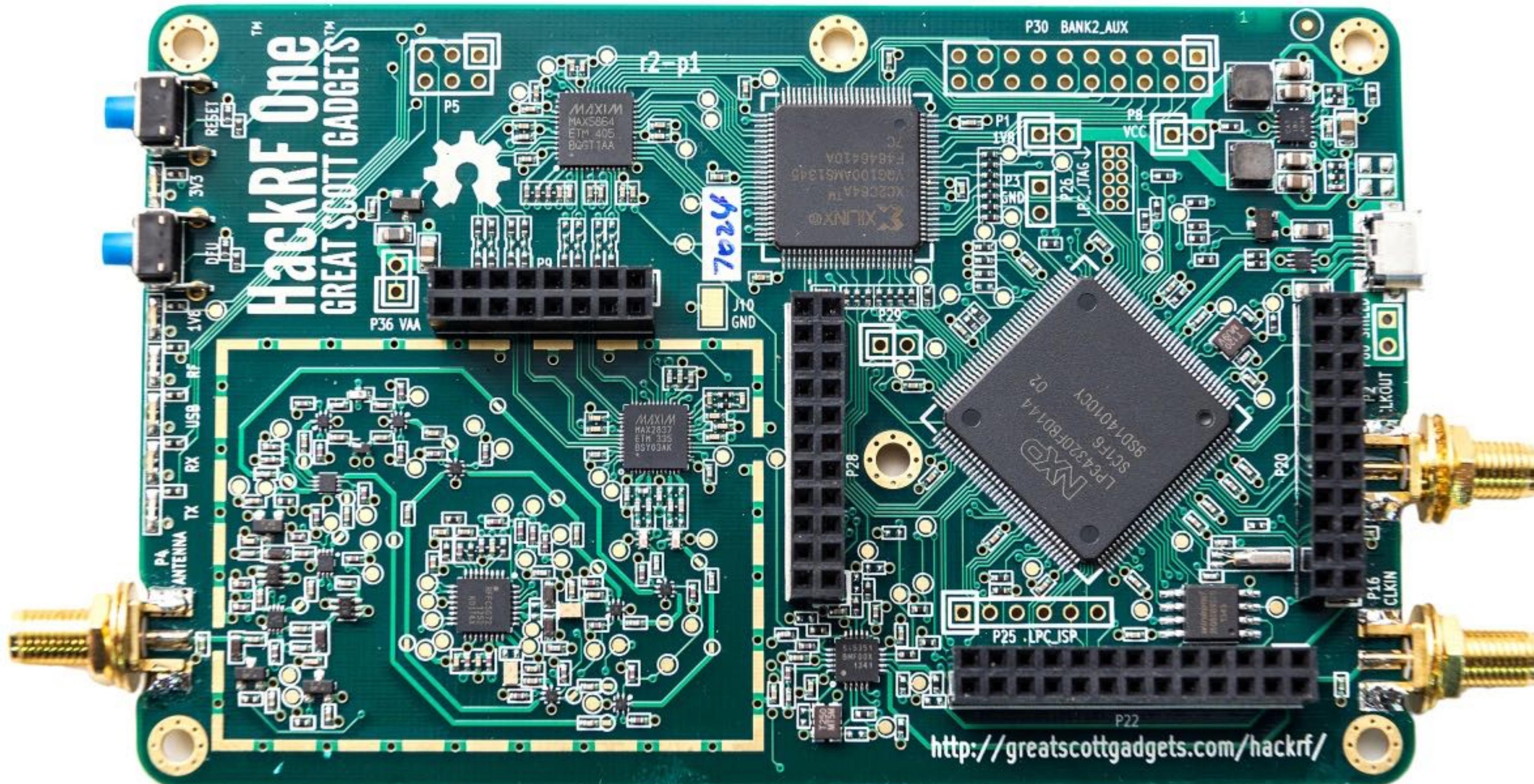
HackRF One

Funded by:



Affordable: \$299



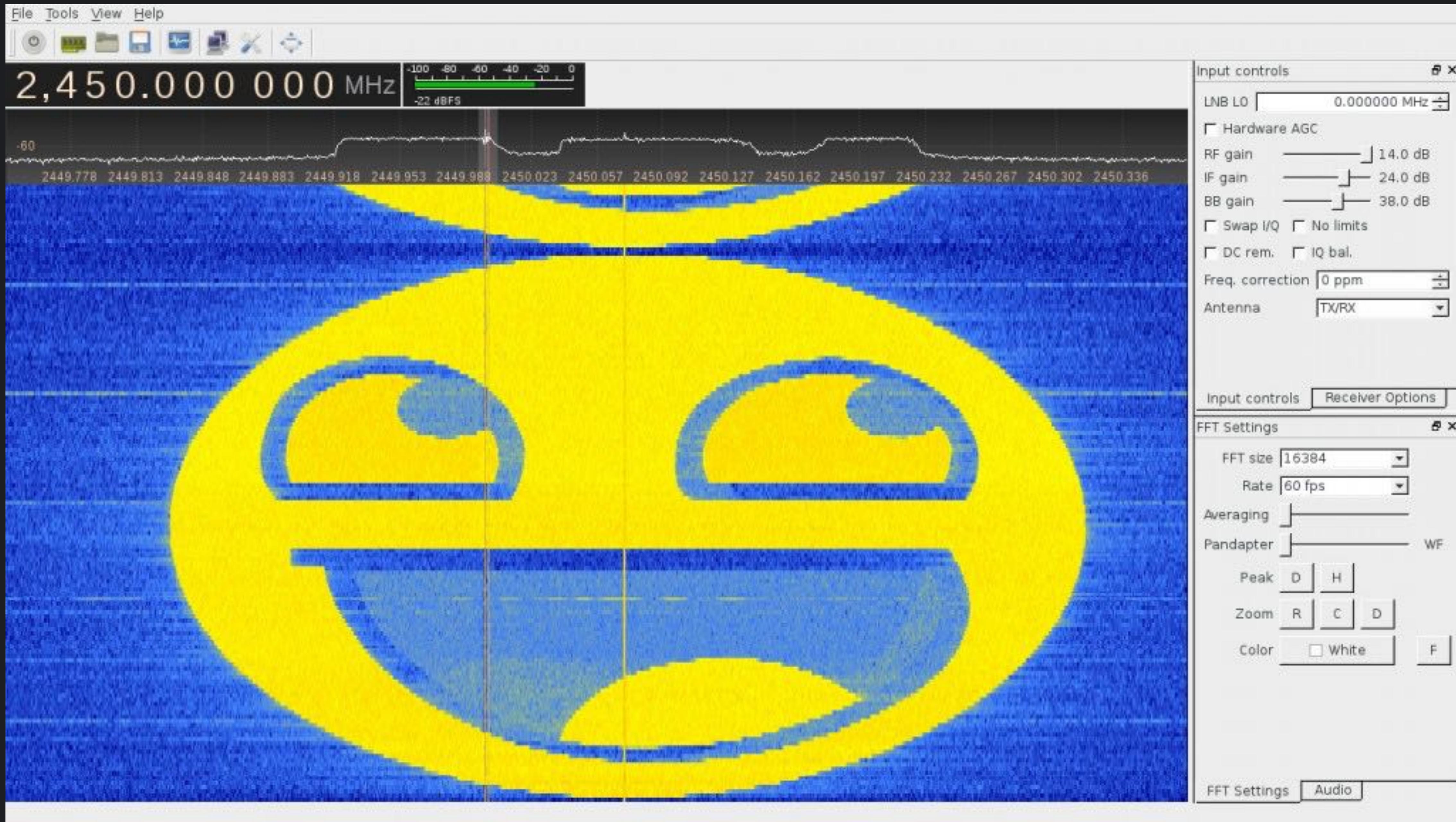




HackRF One Specs

- 1 MHz to 6 GHz operating frequency
- Half-duplex transceiver
- Up to 20 million samples per second
- 8-bit quadrature samples (8-bit I and 8-bit Q)
- Compatible with GNU Radio, SDR#, and more
- Software-configurable RX and TX gain and baseband filter
- Software-controlled antenna port power (50 mA at 3.3 V)
- SMA female antenna connector
- SMA female clock input and output for synchronization
- Convenient buttons for programming
- Internal pin headers for expansion
- Hi-Speed USB 2.0
- USB-powered
- Open source hardware

Demo Time!



Use Cases

Use Cases

- FM
- ADS-B
- GSM (Wireshark)
- GPS
- Streaming data over radio
- Doorbells
- Car keys
- Wi-Fi jamming



References

[github.com / watson / monster-drift](https://github.com/watson/monster-drift)

[github.com / mappum / node-hackrf](https://github.com/mappum/node-hackrf)

[greatscottgadgets.com / sdr](http://greatscottgadgets.com/sdr)

Gracias

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github.com/watson

 opbeat

(Pssst, we're hiring)