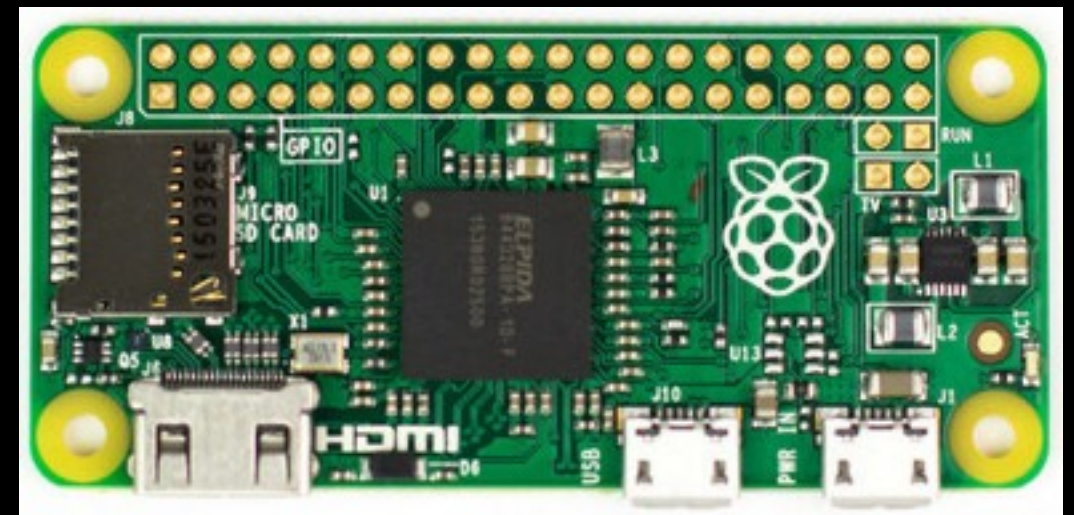
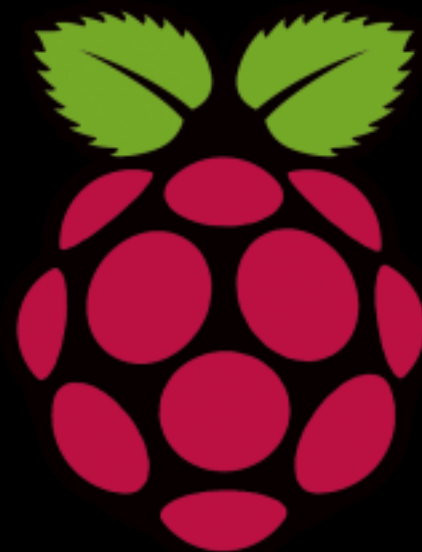


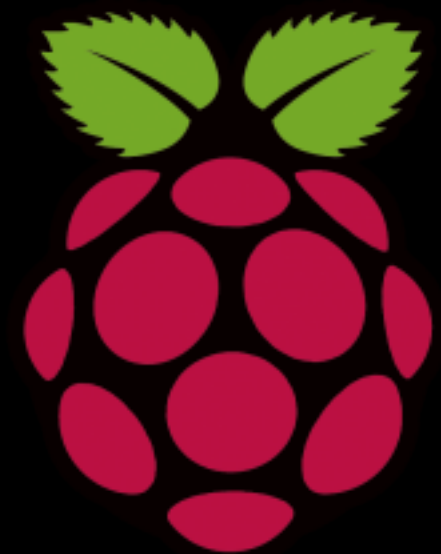
Amateur Radio Uses for the Raspberry Pi

by James M0JCC



What is the Raspberry Pi?

- Credit Card Sized Computer
- Designed to get kids into coding
- Manufactured in the UK
- Many Amateur radio applications
- Popular with Hobbyists
- Inexpensive for Experimentation
- No Hard Drive(?)



Flavours of Pi

- Raspberry Pi 1 (Model A/B/B+)
- Raspberry Pi 2 (Model B - £26)
- Raspberry Pi Zero (£4...)



Model A+



Model B



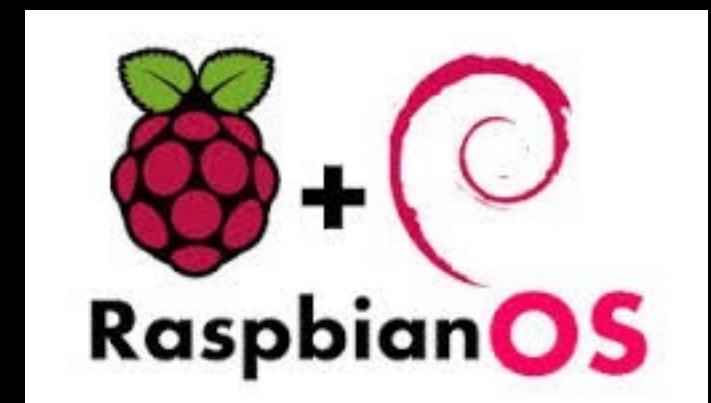
Model B+



2, Model B

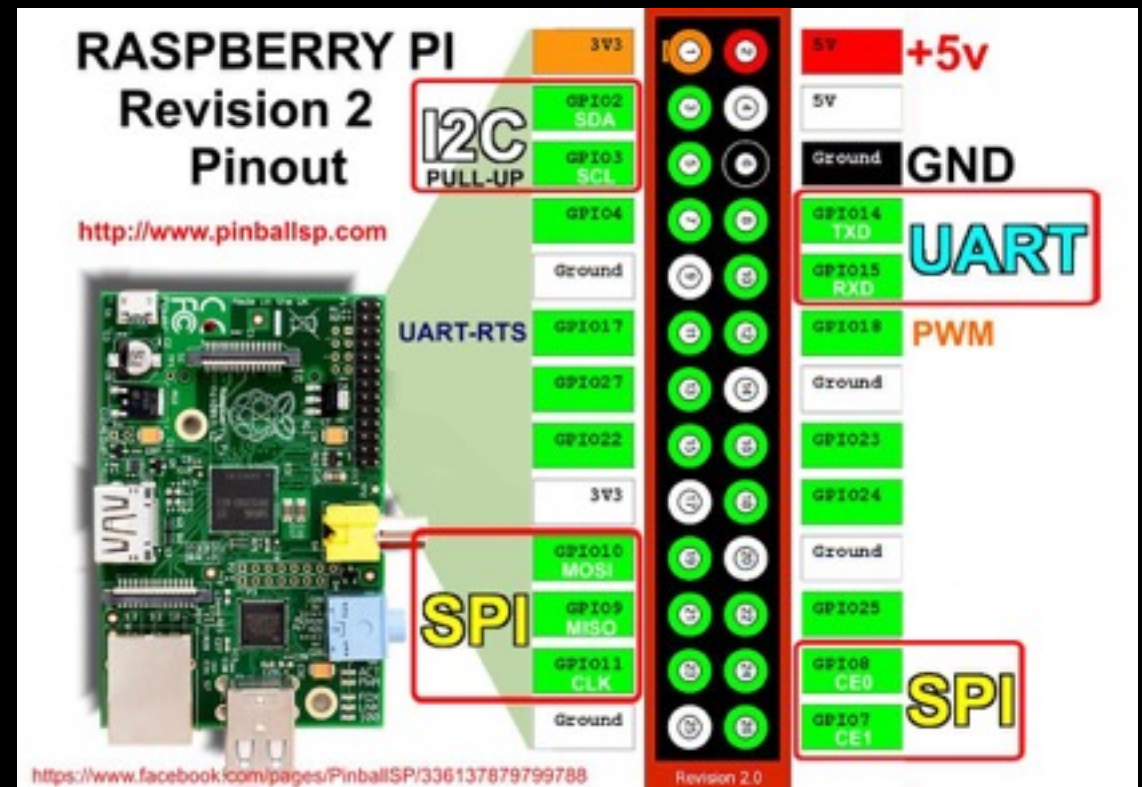
The Operating System

- No Microsoft Windows here
- Linux - Raspbian Distribution
- Open Source (Free!)
- 90% of the fastest supercomputers use...
- Android is based on Linux



GPIO Pins

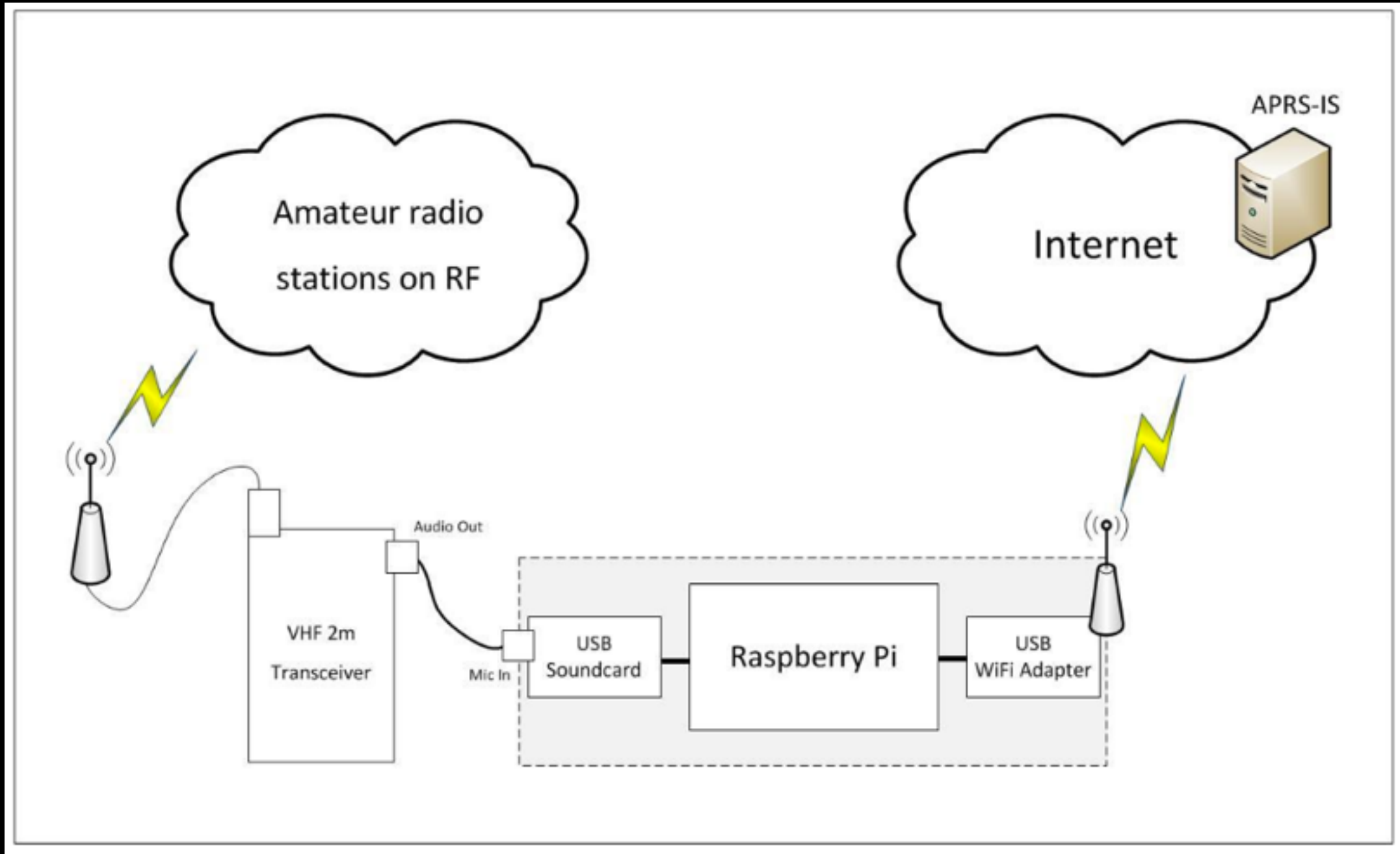
- 26-40 General Purpose Input Output Pins
- Physical Interface Between the Pi & Outside World
- Sensors
- Devices
- Breakout Board
- Pi HATs (Hardware Attached on Top)



APRS I-Gate

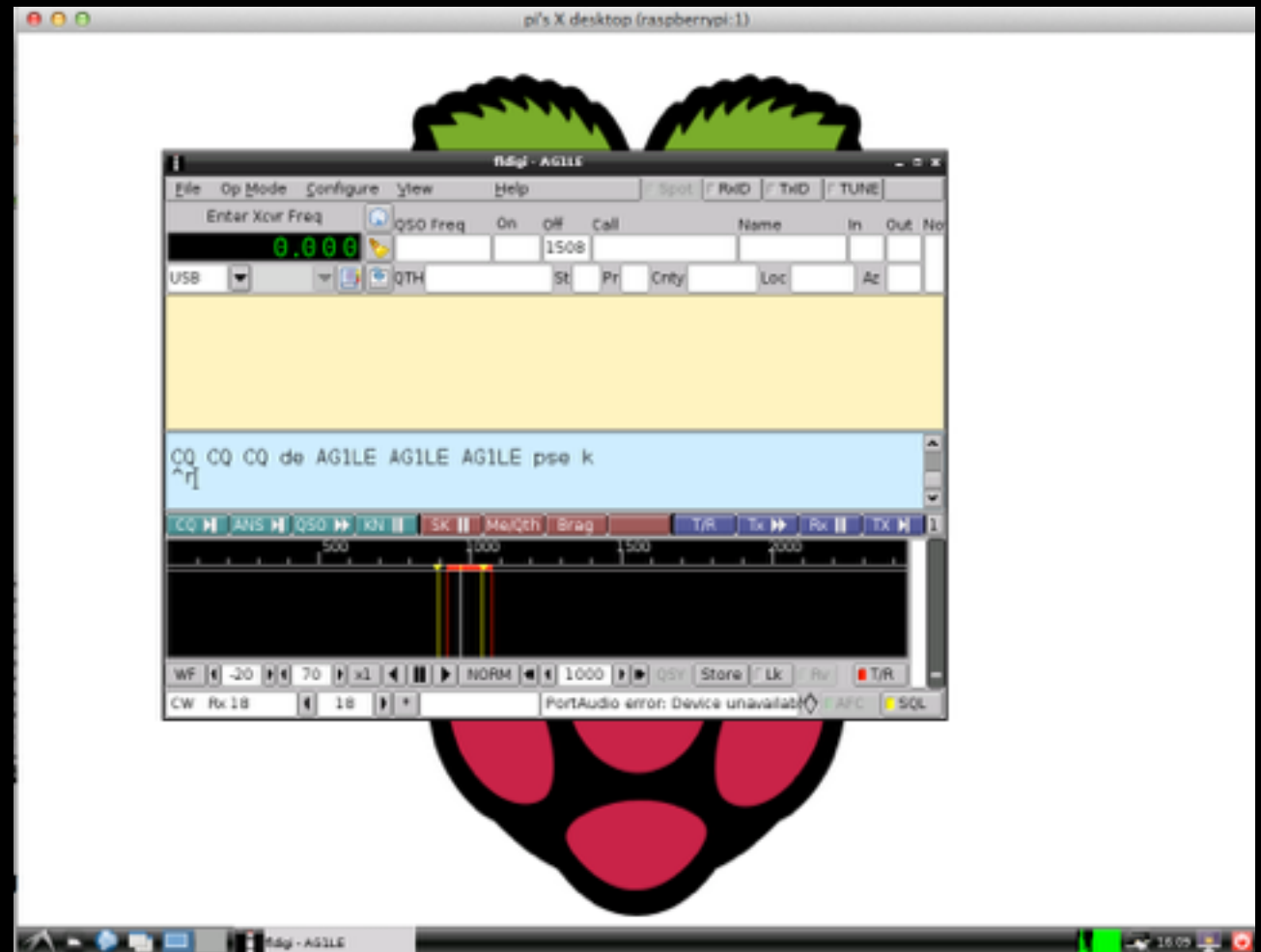
- **A**utomatic **P**acket **R**eporting **S**ystem
- APRS I-Gate (the PiGate)
- Sends packets from the radio/ RF side to the APRS-IS on the Internet (and vice-versa)
- APRS-IS is an Internet based network
- Connects APRS networks from all around the world & space





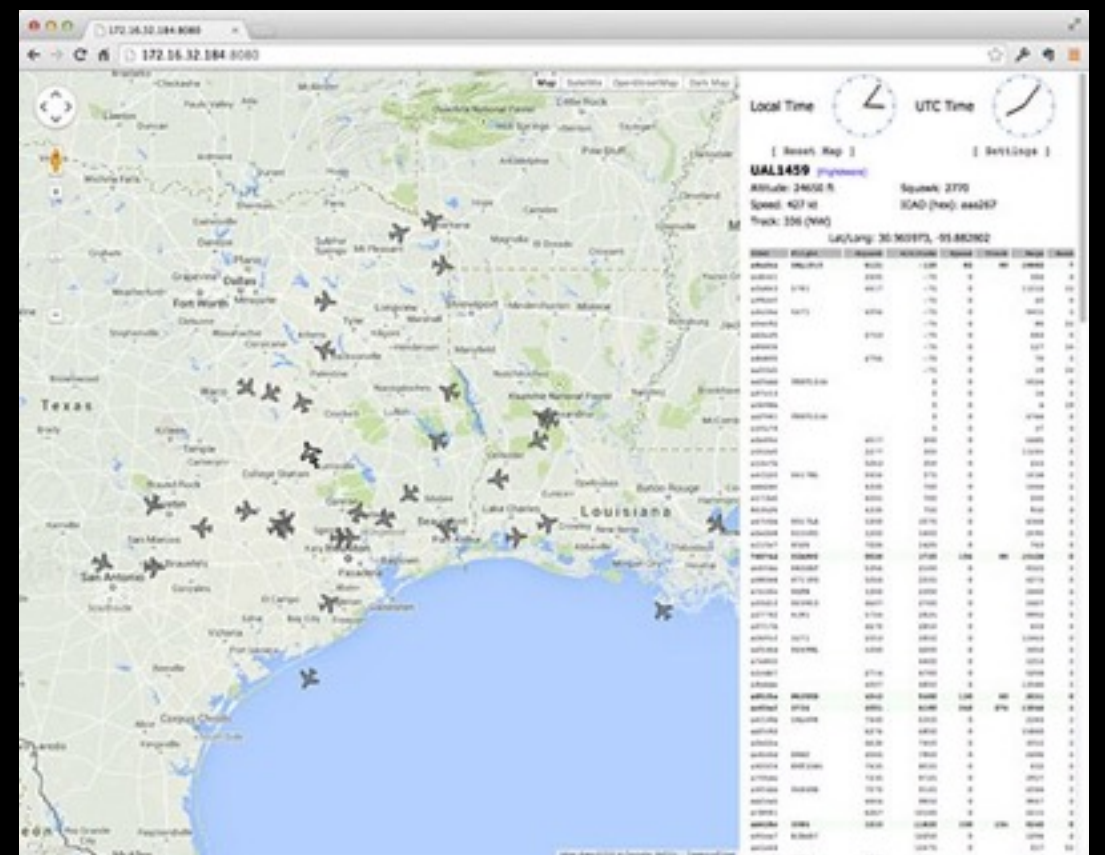
Decoding Data Modes

- Audio Input
- USB Soundcard
- Fldigi
- Decode RTTY, PSK, CW etc...
- Digi Spotter (RBN)
- Rig Control
- Web Based Rig Control



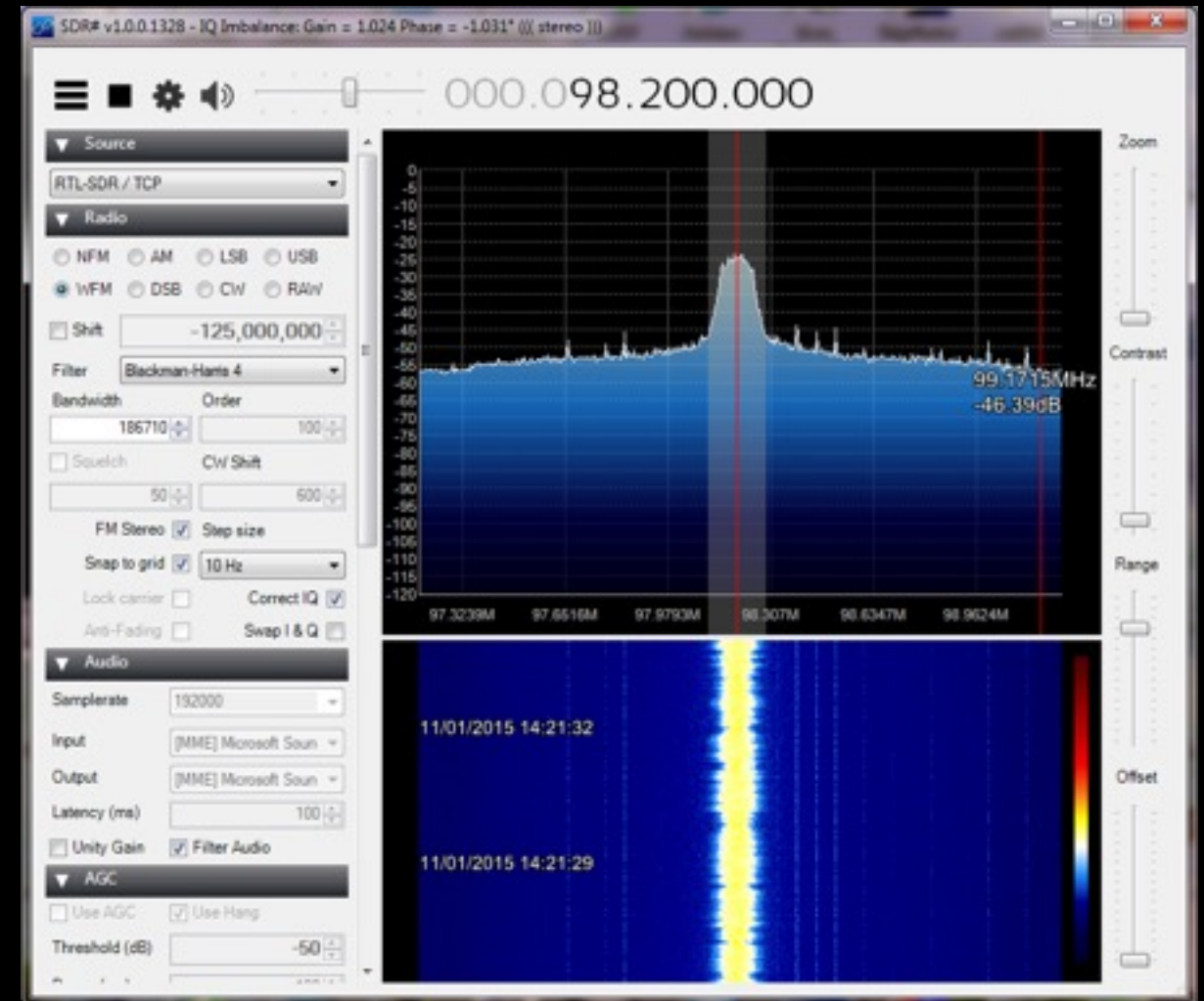
ADS-B Flight Tracker

- **A**utomatic **D**ependent **S**urveillance – **B**roadcast
- FlightAware PiAware ADS-B Ground Station
- Aircraft Positioning
- SDR Dongle
- 1090 MHz signals

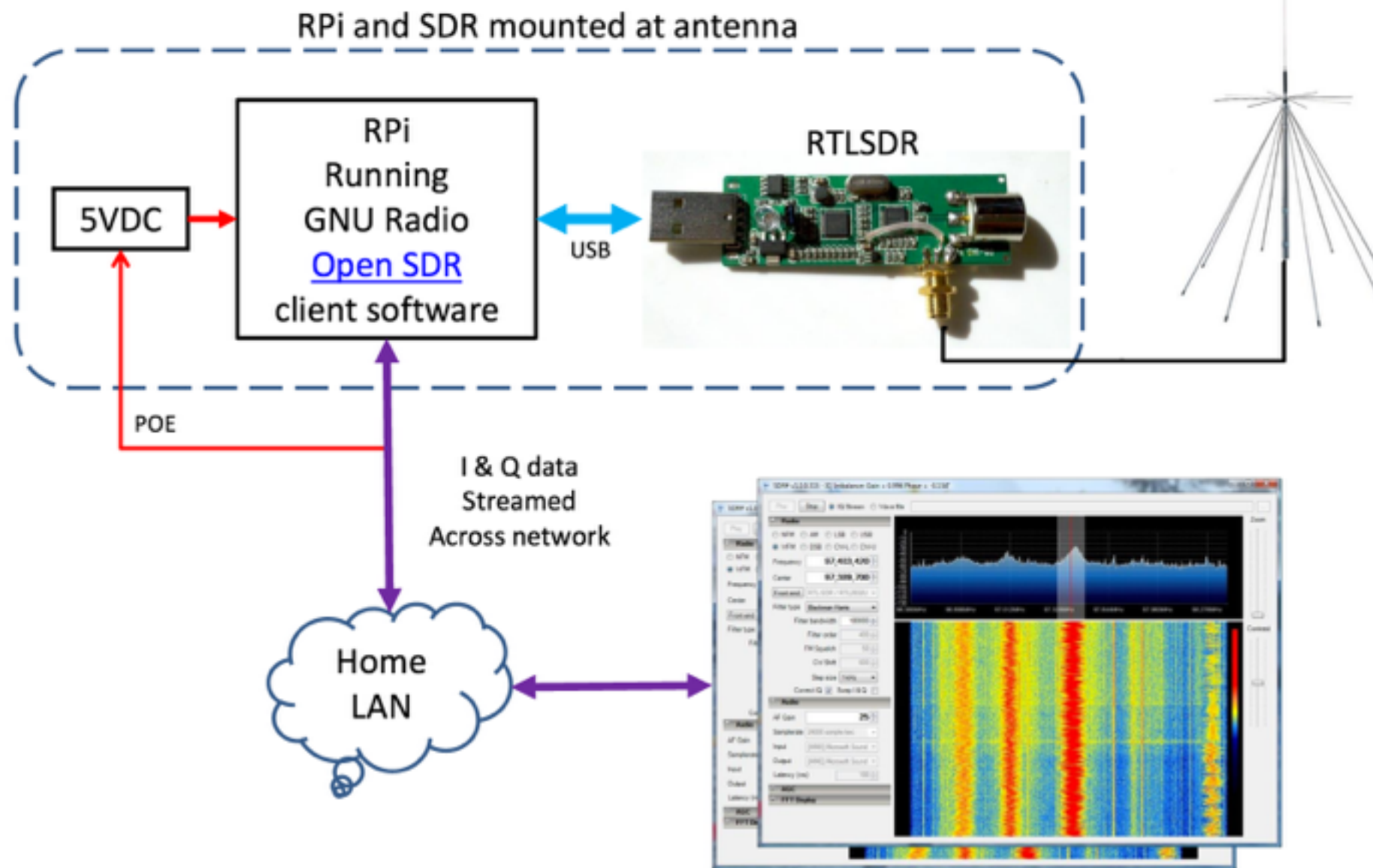


Remote SDR

- RTL Dongle Server
- RTL 820T2 SDR Dongle (£10)
- 25MHz to 1800MHz
- WiFi vs RJ45
- SDR#



A Software Defined Radio Server



LAN client(s) running SDR# software

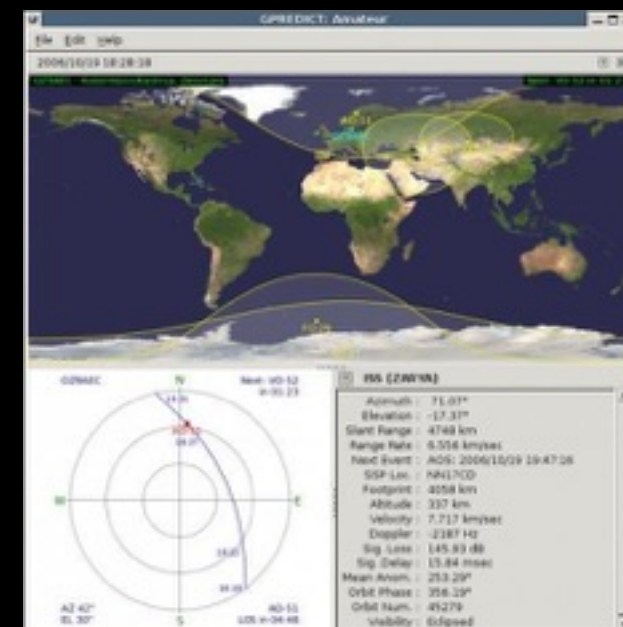
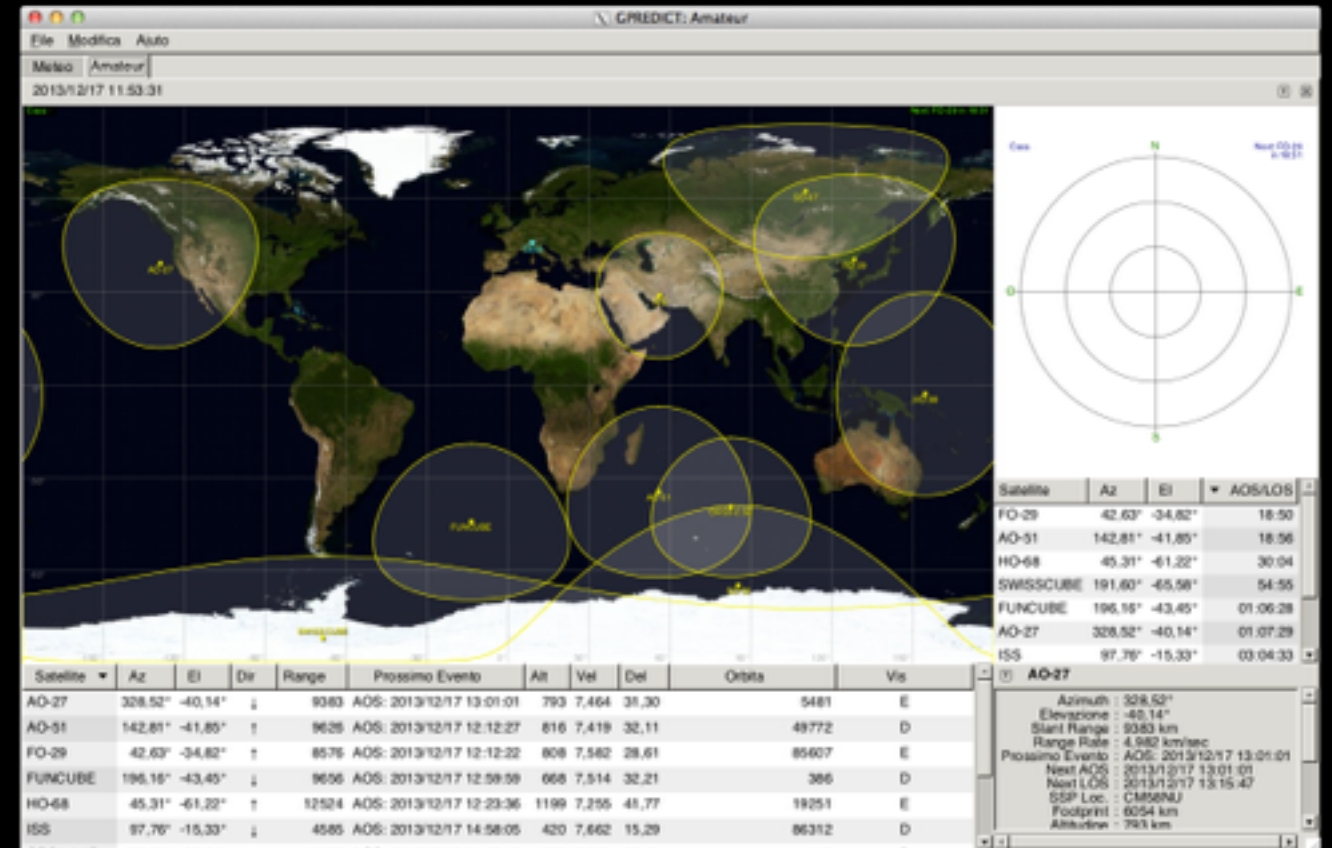
WSPR Transmitter

- LF/MF/HF/VHF WSPR Transmitter (0-250MHz)
- Pressing GPIO Pins into outputting RF
- Reference Crystal (needs calibration!)
- WsprryPi
- ~10mW out (unfiltered!)
- Square Wave Output
- Requires a Low Pass Filter
- Regulated Power Supply



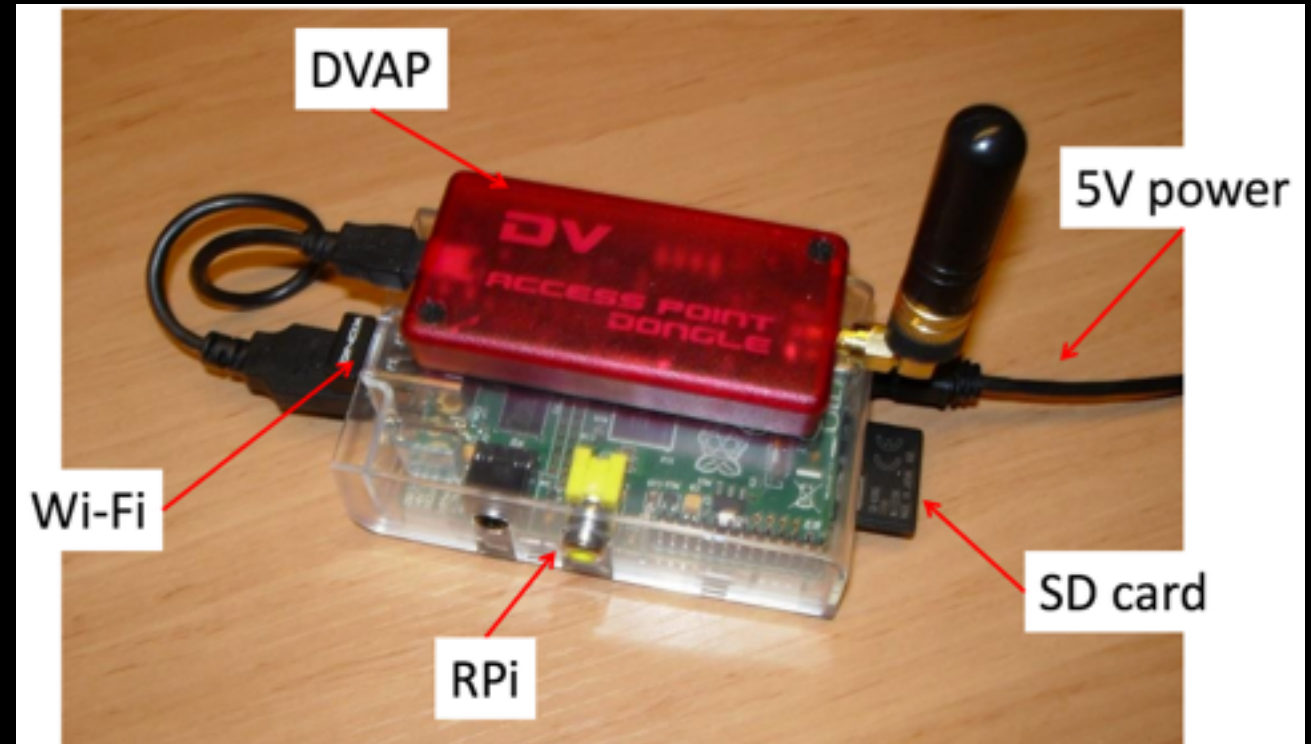
Amateur Satellite Tracking

- GPredict
- Track all types of satellites...
- Amateur Satellites
- FunCube, ISS
- Antenna Rotator Control



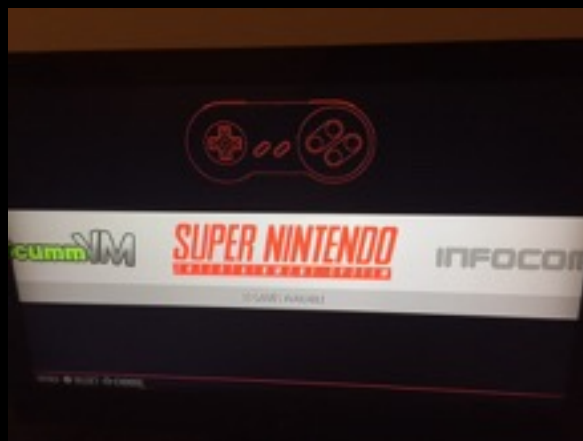
DV Hotspot

- D-STAR Access Point
- DV-Mega Add On Board
- Dual Band
- Internet Gateway
- Hand Held



RetroPi

- Retro Gaming Machine
- Nintendo
- SEGA
- Commodore 64
- ZX Spectrum
- Download Games Online



OSMC Media Center

- Media Center
- Connect to TV
- Stream Video Content
- Watch Downloaded Video
- Remote Control?



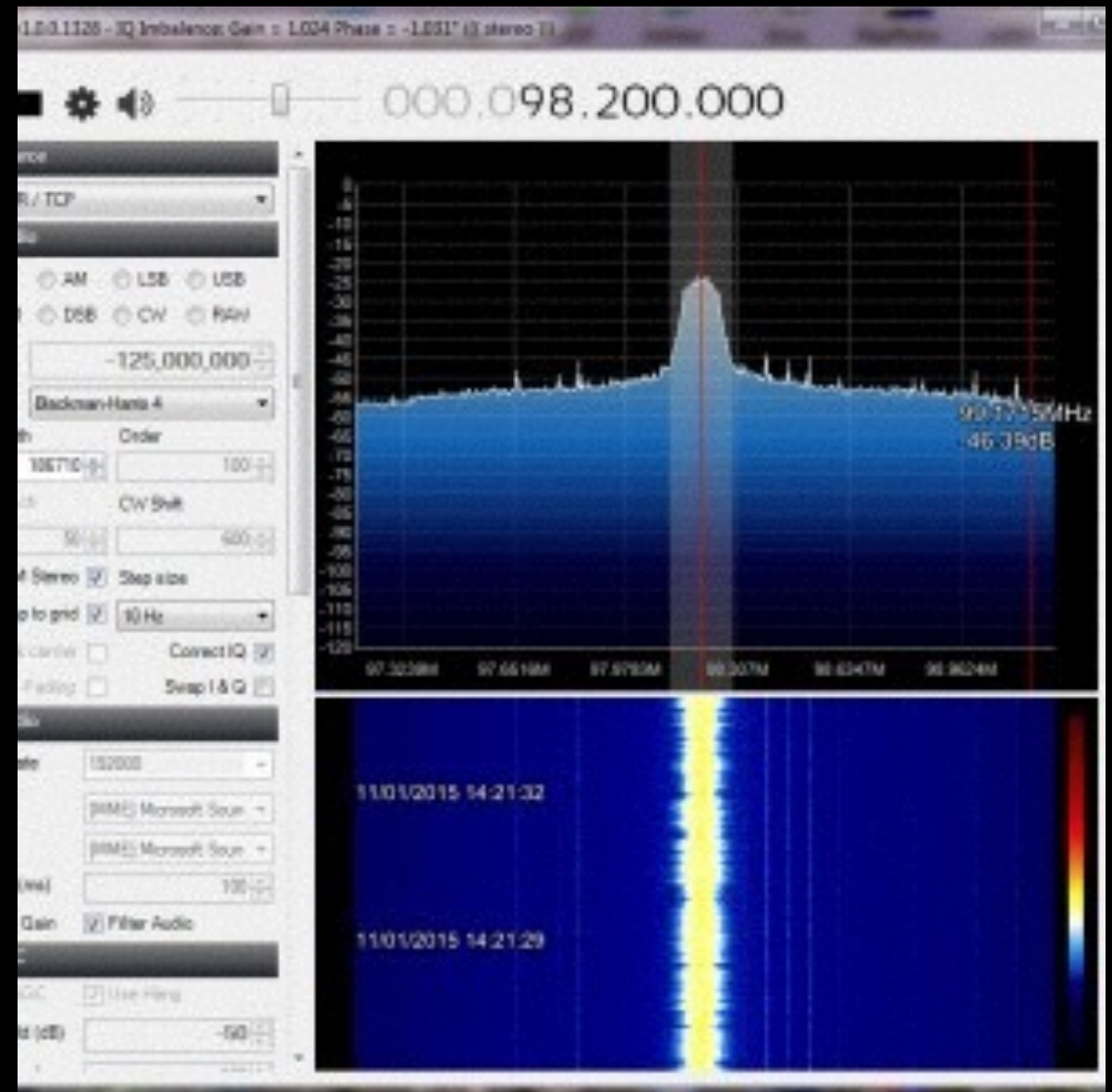
The Future of Experimentation?

- Transition from Traditional Home Brewing
- Hybridisation
- IT Experimenters
- Modular Approach
- The Rise of the SDR
- Raspberry Pi Zero & Arduino are leading the way!



Getting Started

- I need to be a computer whizz right? No!
- Mike Richards G4WNC
 - <http://photobyte.org/shop/>
 - Supplies Pre-Installed SD Cards



Conclusion

- Lots of Amateur Radio Uses
- Very Versatile
- Bringing the Maker Community In
- Expect to see more from the Pi Zero
- Questions?

