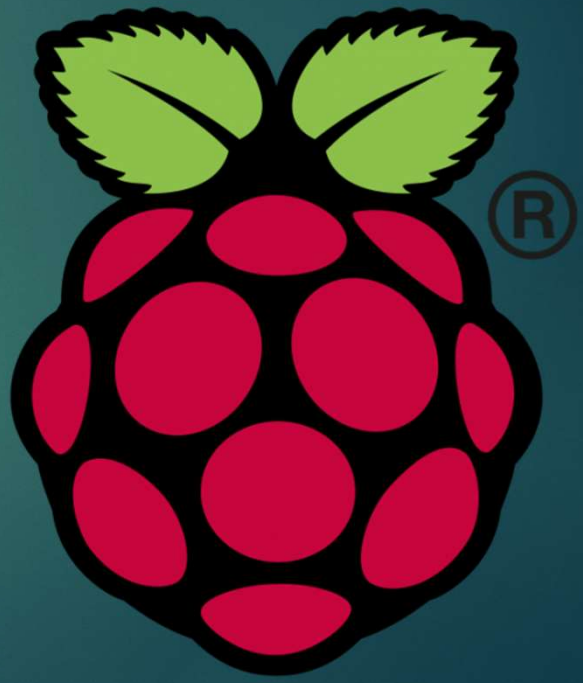
Raspberry Pi in the Ham Shack

MERGING HAM RADIO AND RASPBERRY PI APPLICATIONS



BEN - KM4ODT

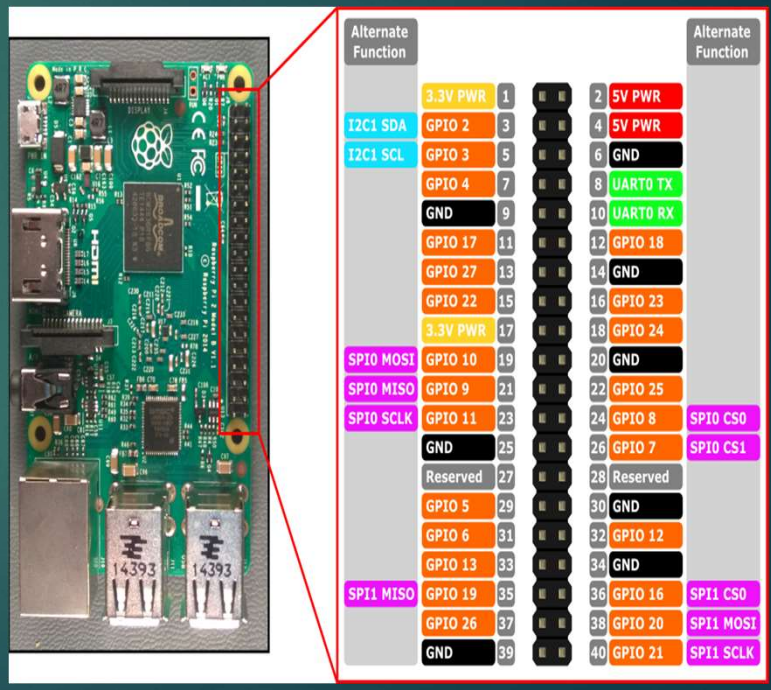
Raspberry Pi – what is it?

- A general Purpose single-board computer

- ARM microprocessor based. (1.4GHz 64-bit quad core CPU)
- Usually runs on a Linux variant
- Micro SD card is used for storage
- Micro USB power (5V @ 1W)

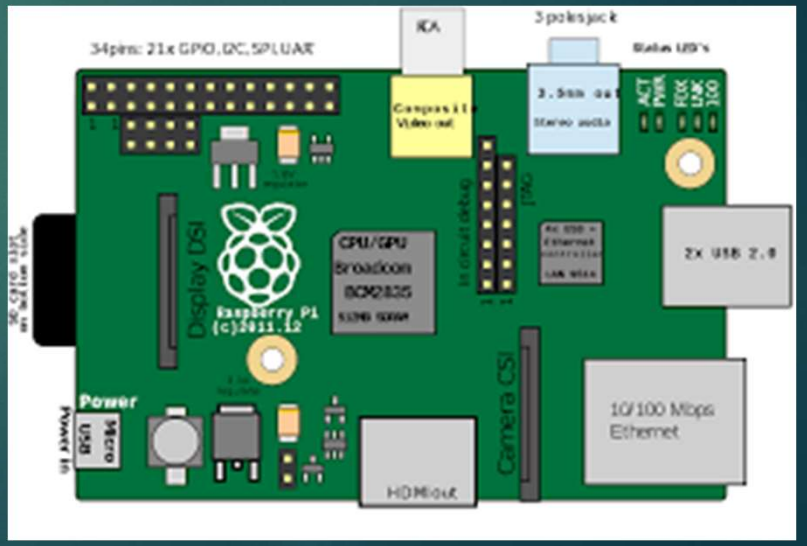
Raspberry Pi – Interface options

- USB ports: 4
- HDMI: 1
- Ethernet 10/100 Mbps (Gigabit over USB 2.0)
- Wi-Fi (802.11ac)
- Bluetooth 4.2
- 4 pole jack Composite A/V Jack 3.5mm
- GPIO and I2C I/O pins for hardware connectivity



Raspberry Pi – what it isn't

- How does it differ from an Arduino?
- Arduino is a microcontroller
- Programmable, can control external devices and circuits through analog and digital I/O pins
- **Usually controls one function**



Raspberry Pi - Uses

General Radio Usage

- SDR (RTL-SDR, SDR Play)
- ADS-B Aircraft Transponder reception (dump 1090)

Amateur Radio Usage

- Inexpensive PC for logging, QRZ look-ups etc. (Web browser)
- Weak Signal Propagation Transmitter (WSPR/WSprryPi)
- DSTAR and Fusion Access points (DVAP)
- Packet Radio (Pi TNC)

Raspberry Pi - Uses

- Decoding Data Modes : FLDigi - RTTY, PSK and CW
- Amateur Satellite Tracking (Gpredict)
- Packet DX cluster (DX Spider)
- APRS I-Gate / Digipeater

- DIY Projects: Remote Antenna rotator, antenna switches etc.
- Media Center (Kodi)

Raspberry Pi - Getting Started

- Download the OS from https://www.raspberrypi.org/downloads
- PC, MAC and Linux

- NOOBS, RASPBIAN
- Third Party: UBUNTU MATE, OSMC, WINDOWS 10 IOT CORE…
- Imaged must be burned onto a Micro SD Card (multiple preconfigured OS images available-menu driven)

Raspberry Pi - Set up

- HDMI
- Keyboard and Mouse
- Once the OS is up and running you can operate remotely through SSH or putty (remote desktop)

- Operating system is intuitive and extremely user friendly.
- Standard PC or MAC Graphic User Interface (GUI)

Raspberry Pi - Set up

Available installs for logging:

- sudo apt-get install xlog
- sudo apt-get install cqrlog

- FLDigi

- Various preconfigured OS images available

Raspberry Pi - RTL dongles

- RTL USB TV receiver (RTL-SDR)
- Install osmocom SDR software:
- http://sdr.osmocom.org/trac/wiki/rtl-sdr

- ADS-B Reception (1.090 GHz) Aircraft Flight following
- Needs rtl-sdr installed first
- https://github.com/MalcomRobb/dump1090

Raspberry Pi - WSPR (WsprryPi)

Weak Signal Propagation Reporting

- WsprryPi software:
- https://github.com/JamesP6000/WsprryPi

- TARP QRP shield ($29)
- http://www.tapr.org/kits_20M-wspr-pi.html

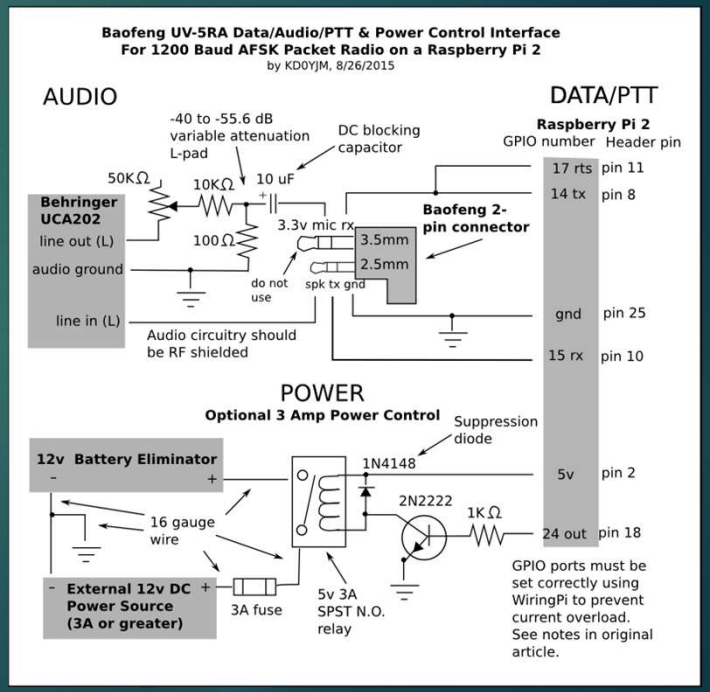
- Antenna

Raspberry Pi - DSTAR Access Point

- DVAP Dongle ($29)
- http://www.dvapdongle.com/DV_Access_Point_Dongle/Home.html

Raspberry Pi - Packet Radio

- Support APRS beacons, iGates (OS images available)
- TNC boards



Raspberry Pi - Benefits

General Radio Usage

- Lightweight
- Mobile
- Quick Start OS
- Low Power 5VDC @ 1W
- Software availability is growing
- Pre-configured OS to meet various functions and applications

Raspberry Pi – References

- Product Website
- https://www.raspberrypi.org

- http://www.hamblog.co.uk/top-10-amateur-radio-uses-for-raspberry-pi/

- Antenna rotator
- https://jkry.org/ouluhack/PiRotator

- Satellite Predictor
- http://gpredict.oz9aec.net/

Raspberry Pi – Questions?