Raspberry Pi
For Ham Radio
Raspberry Pi – What is it?

• Not your momma’s raspberry pie!
• Low-cost ($20-$35) single-board computer
• Small – the footprint is the size of a credit card
• Popular among Schools, Hobbyists, Hackers and Makers
History

- Created by several Academics at the University of Cambridge to promote Computer Science (who later created the Raspberry Pi Foundation)
- First model released February 2012
- Now 5 different models, each with slightly different specifications
- Over 6 million units sold
RPi Model A

RPi Model B (Rev 2)

RPi 2 Model A+

RPi 2 Model B+
Specifications (RPi 2 Model B+)

- 900MHz quad-core ARM Coretex-A7 processor
- 1GB RAM (shared with GPU)
- 4 USB 2.0 Ports
- HDMI output; Composite video via 3.5mm TRRS jack
- Audio output via HDMI or 3.5mm jack
- On-board storage via MicroSD slot
- 100Mbit Ethernet
- 40 GPIO pins
- Power consumption: 800mA 4W
- Power input: 5v via MicroUSB or GPIO
Specifications (RPi 2 Model B+)

- Limitations:
  - No Real Time Clock
  - No audio input
  - Memory shared between CPU/GPU
  - USB shared bus
  - GPIO are digital only; Have current limitations
Hardware/Accessories

- Most any USB device supported by the software (drivers): keyboards, mice, Wi-Fi adapters, flash drives, external hard drives, sound cards, etc. etc.

- HATs (Hardware Attached on Top): Displays, Servos/Motor control, LED indicators, development boards

- Raspberry Pi Camera Board
Software

• Runs multiple types of Operating Systems:
  • Linux (Arch, Debian, Ubuntu distributions)
  • RISC OS
  • Windows 10 IoT
• Any software package compiled or ported to run on ARM architecture
Software (Ham Radio)

- Radio programming: Chrip
- Logging: CQRLOG, Klog, xlog
- CW trainers
- Exam study tools
- Rig control
- Digital modes: fldigi, wsjt (many more!)
- APRS
- Even sign/upload your LoTW logs
• Raspberry Pi, $35 retail (RPi2 Model B+)

• Case, $10

• MicroSD Card, $5-$6 for 16GB Class 10

• 5v power via Micro USB or powered USB hub, $0-$25

• HDMI cable, $10

• Wi-Fi dongle, $10
So what about Raspberry Pi and Ham Radio?
ADS-B Receiver
+RTL-SDR Dongle

Source: https://uk.flightaware.com/adsb/piaware/
SDR Scanner
+RTL-SDR, TFT Display

Source: https://learn.adafruit.com/freq-show-raspberry-pi-rtl-sdr-scanner/overview
APRS Applications
+TNC-Pi, TFT Display

Source: http://tnc-x.com/TNCPi.htm
APRS Digipeater
+2x TNC-Pi

Source: http://tnc-x.com/TNCPi.htm
WSPR Beacon

Source: https://gerolfziegenhain.wordpress.com/2013/04/13/raspi-as-wspr-transmitter/
DV Access Point (DVAP) Dongle

Source: http://ab4bj.com/wordpress/2013/02/setting-up-a-raspberry-pi-to-work-with-a-dv-access-point-dongle-dvap/
Pan Adapter for Electraft KX3

Source: https://tigerstyleheavyindustries.wordpress.com/2014/04/20/aa6es-tiny-python-panadapter-on-a-raspberry-pi/
Other Raspberry Pi Projects

- SSTV Beacons
- Echo Link Nodes
- IRLP Nodes
- RMS Gateway
- Open Repeater Project
- APRS iGate
But Wait, There’s More!

• Dedicated Shack Computer

• CW Beacon

• Cheap replacement for your broken antenna rotator controller

• Record radio transmissions

• Monitor DX Clusters for that ONE station you need for your Worked-All-The-Things Award and send you an Email/TXT
What About ARES or EMCOMM?

- Standardize your team’s hardware/software
  - Hardware is cheap
  - Low power requirements
  - Small size
  - Light-weight
  - Operating System/Software easily cloned as many times as required

- Same attributed hold true for other field use
Where To Buy?

- Micro Center carries most every accessory you can purchase online. (They’re an Adafruit & Element 14 reseller)
- Adafruit.com
- Sparkfun.com
- SeeedStudio.com
- Amazon.com (compare pricing to other online vendors 1st)
Resources

- Google!

- Raspberry_Pi_4-Ham_RADIO Yahoo! Group
  https://groups.yahoo.com/neo/groups/Raspberry_Pi_4-Ham_RADIO/info

- NFARL Linux Special Interest Group (SIG)
  Send blank Email to linuxsig-subscribe@linuxsig.com

- The MagPi
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