Implementing an APRS Digipeater on a Raspberry Pi

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Introductions

• Clay Jackson – N7QNM
  – Licensed 1991
  – Amateur Extra
  – Computer/Data Background
  – Ham radio interests
    • Digital
    • EmComm
    • Search and Rescue
Agenda

• What the heck is a Raspberry Pi?
• Components of a Digipeater
• TNC-PI
• APRX
• Connecting the dots
• Gotchas
• Q & A
What the heck is a Raspberry Pi?

• “Good Eats”
• A small, low power single board computer
  – Quad Core ARM CPU
  – 1 Gb RAM
  – Powered by 5V USB supply
  – Built-in HDMI Video
  – General Purpose I/O
  – Linux
Pi Now Does Windows!
Components of a Digipeater

• TNC
  – May contain a limited Digipeater

• Computer
  – Many SingleBoard options

• Radio
TNC-PI

• Single Board Dedicated TNC
  – PIC Based
  – Native X25
  – KISS Mode

• Why?
  – Past experience with Coastal
  – Modular
  – Low power
3.5” Tracker - Just add radio and GPS
Under $300
PROSSR Digi
APRX

- Open Source
- Originally by Matt Aarnio, OH2MQK
- Now maintained by Kenneth Finnegan
- APRS Digipeater
- APRS iGate (Internet Gateway)
- APRS-to-DPRS Gateway
Connecting the dots

• Build the kit ($40)
  – No surface mount
  – About 4 hours
• Or pay Coastal $65 for the Assembled and Tested Version
• Connect a radio
  – Standard 9 pin D-Sub
  – Cables from Internet
Connecting the dots

• Configure TNC
  – Audio Levels
  – TX Delay
Connecting the dots

• Configure the Pi
  – HDMI Monitor (TV OK)
  – Mouse and Keyboard (USB)
  – Network (see Gotchas)
  – Get Raspbian (see Resources)
  – Use I2C (See Gotchas)
  – Follow the Friendly Manual
  – Get APRX (see Resources)
Connecting the dots

• Configure APRX
  – Decide what you want to do
  – PROSSR – Digi/iGate
  – Get APRS-IS Passcode
  – /etc/aprx.conf
mycall PROSSR
passcode xxxxx

<interface>
    serial-device /dev/ttyAMA0 19200 8n1 KISS
callsign $mycall
tx-ok true
</interface>
<beacon>
beaconmode BOTH

cycle-size 10M

beacon symbol "I#" $myloc comment "N7QNM Prosser iGate/Digi"
</beacon>
<digipeater>
  transmitter $mycall
</digipeater>

<source>
  source $mycall
  relay-type directonly
  viscous-delay 5
</source>
Gotchas

- Had to use I2C mode in TNC
  - See Manual
  - Download I2C

- Networking
  - Be prepared to hardwire
  - Network dongles have VERY small antennas
Resources

- [www.rasberrypi.org](http://www.rasberrypi.org)
- [http://tnc-x.com/TNCPi.pdf](http://tnc-x.com/TNCPi.pdf)
- [http://k4gbb.us/docs/tn CPI.html](http://k4gbb.us/docs/tn CPI.html)
Q & A
Thx
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