

Stupid Raspberry Pi Tricks

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What is the Pi?

A low-cost single-board computer intended to introduce computer science skills to school children



Specifications

- Broadcom BCM2835 SoC
- 700MHz ARM11 (Overclockable)
- 512Mb RAM
- SD Card



I/O Ports

- 2xUSB
- 10/100 Ethernet
- HDMI, Composite and DSI Video
- 3.5mm Audio Out
- Note the lack of Audio In



Power

- 5V in via a Micro USB connector
- 700mA (3.5W)
- Note issues providing much power to USB peripherals



Low Level Interface

The Fun Bits

- 17 GPIO Pins
- Some pins can be used for alternate uses
 - I2C
 - UART
 - SPI
 - PWM



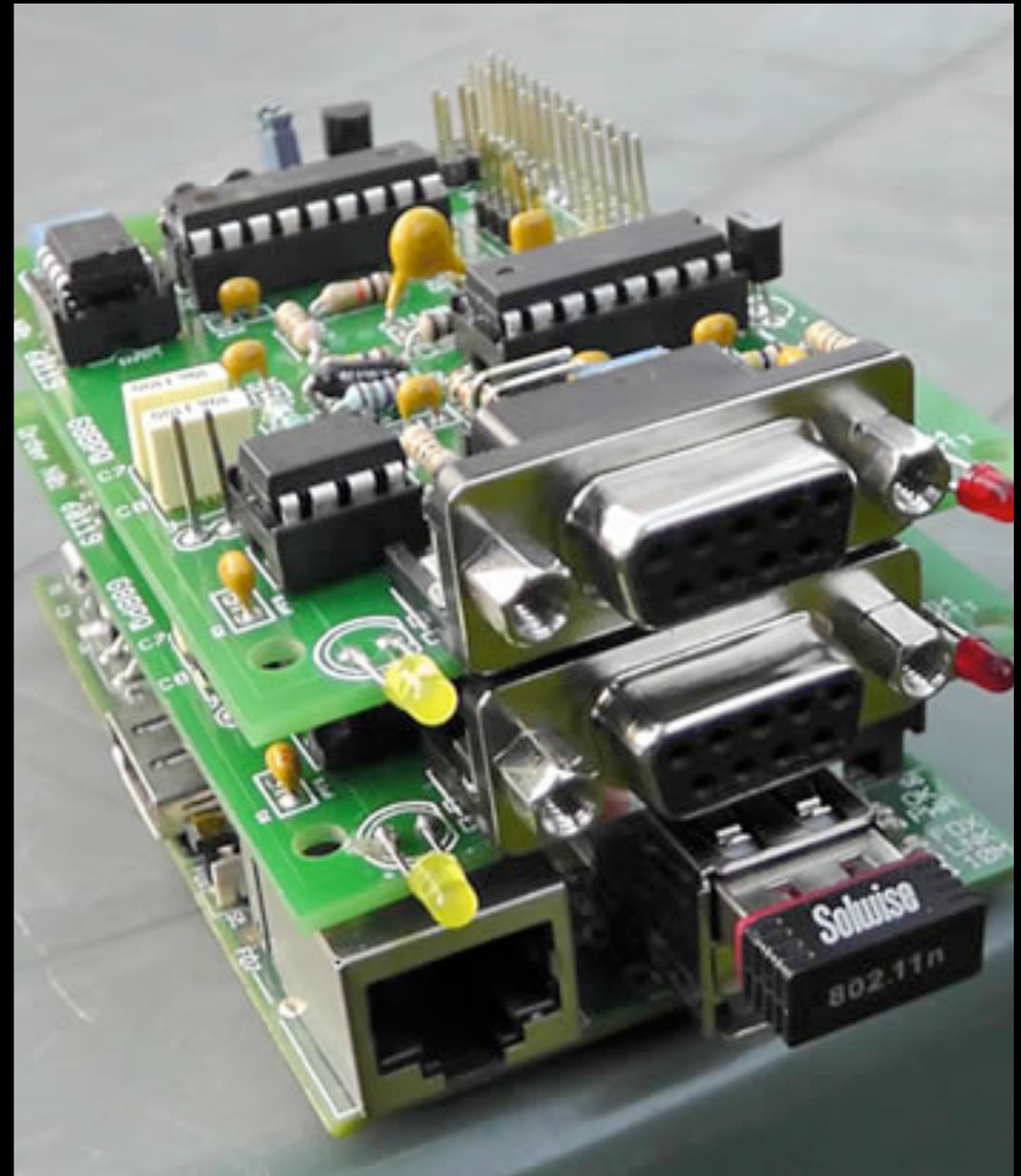
All this fun for \$35



But does it run Windows?
Answer: No

Ham Accessories

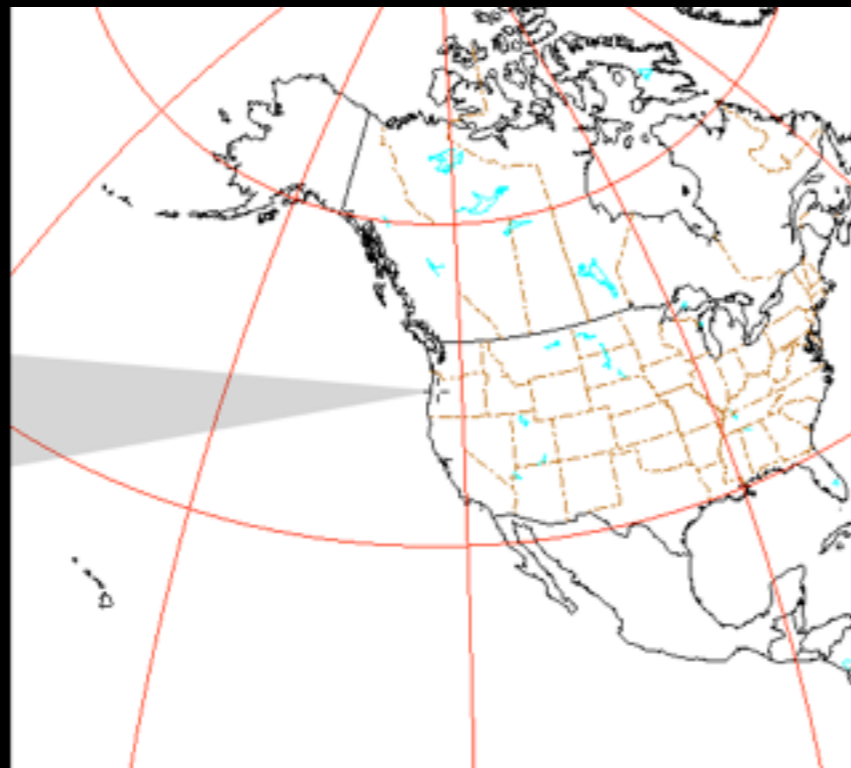
- TNC-Pi
- GMSK Daughterboard
- WSPR Beacon

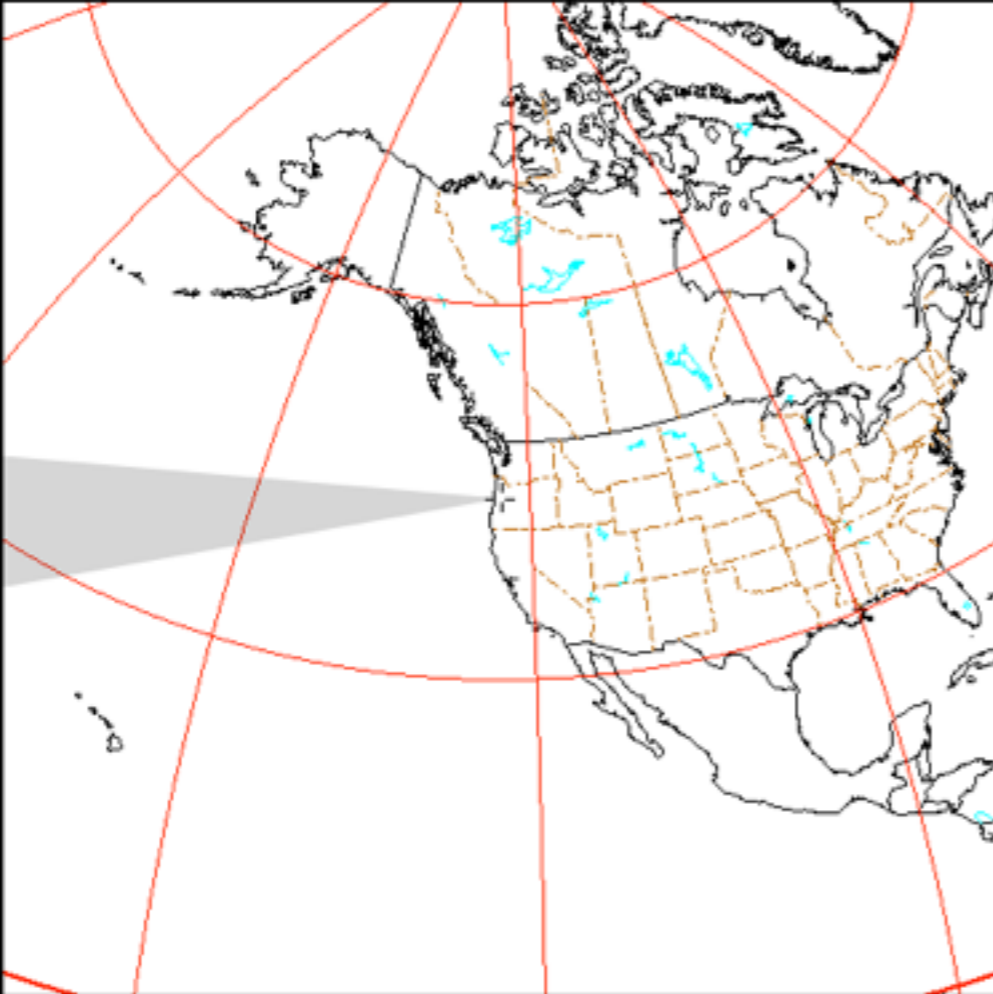


NH6Z Project #1

Rotor Controller

- Hardware Interface to HAM-M Rotor
- ADC to measure position
- Relays to turn rotor and actuate brake
- Web-based Interface using JSON-RPC over WebSockets implemented in Python





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NH6Z Project #1
Rotor Controller

Rotor Controller

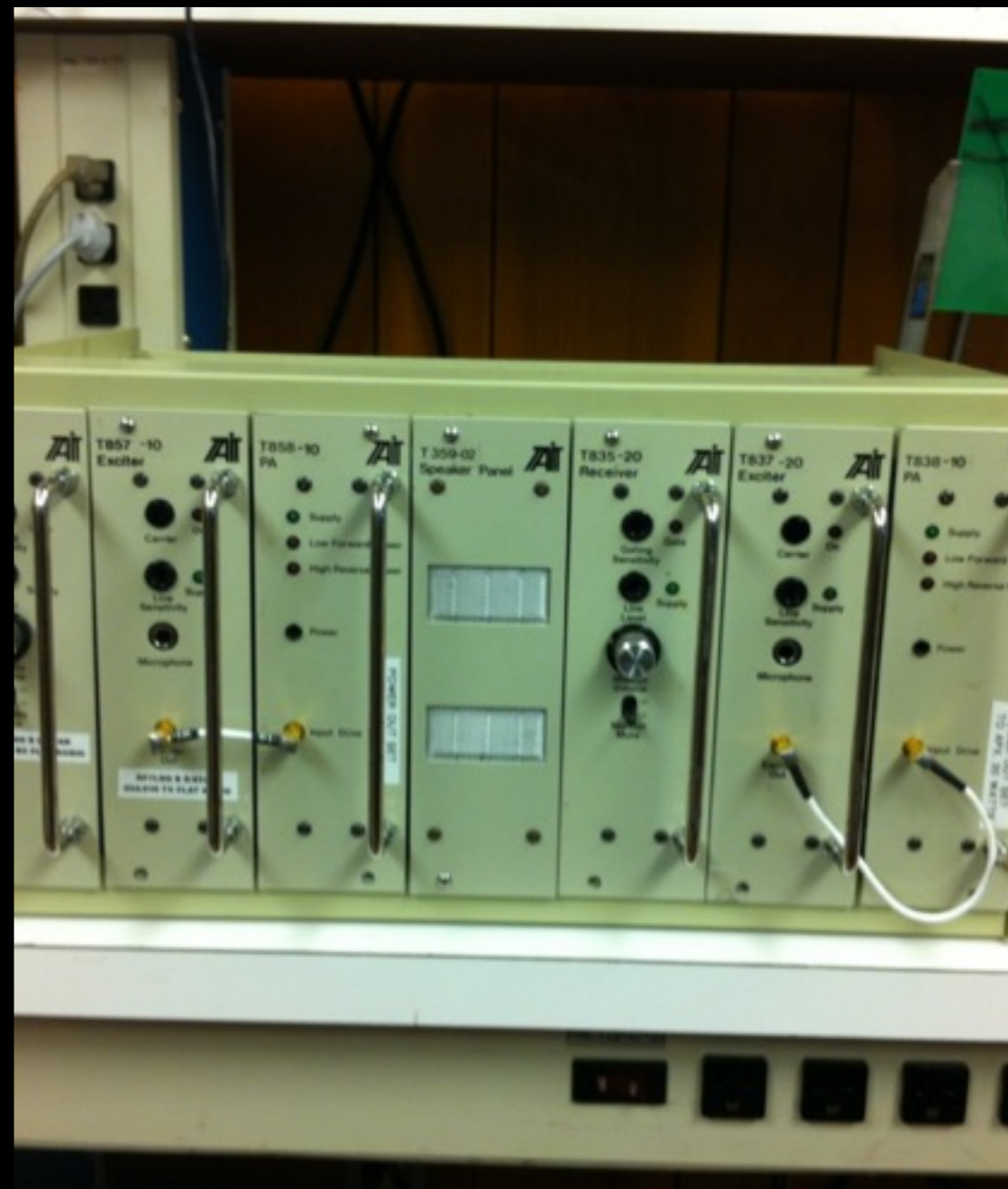
Possible Improvements

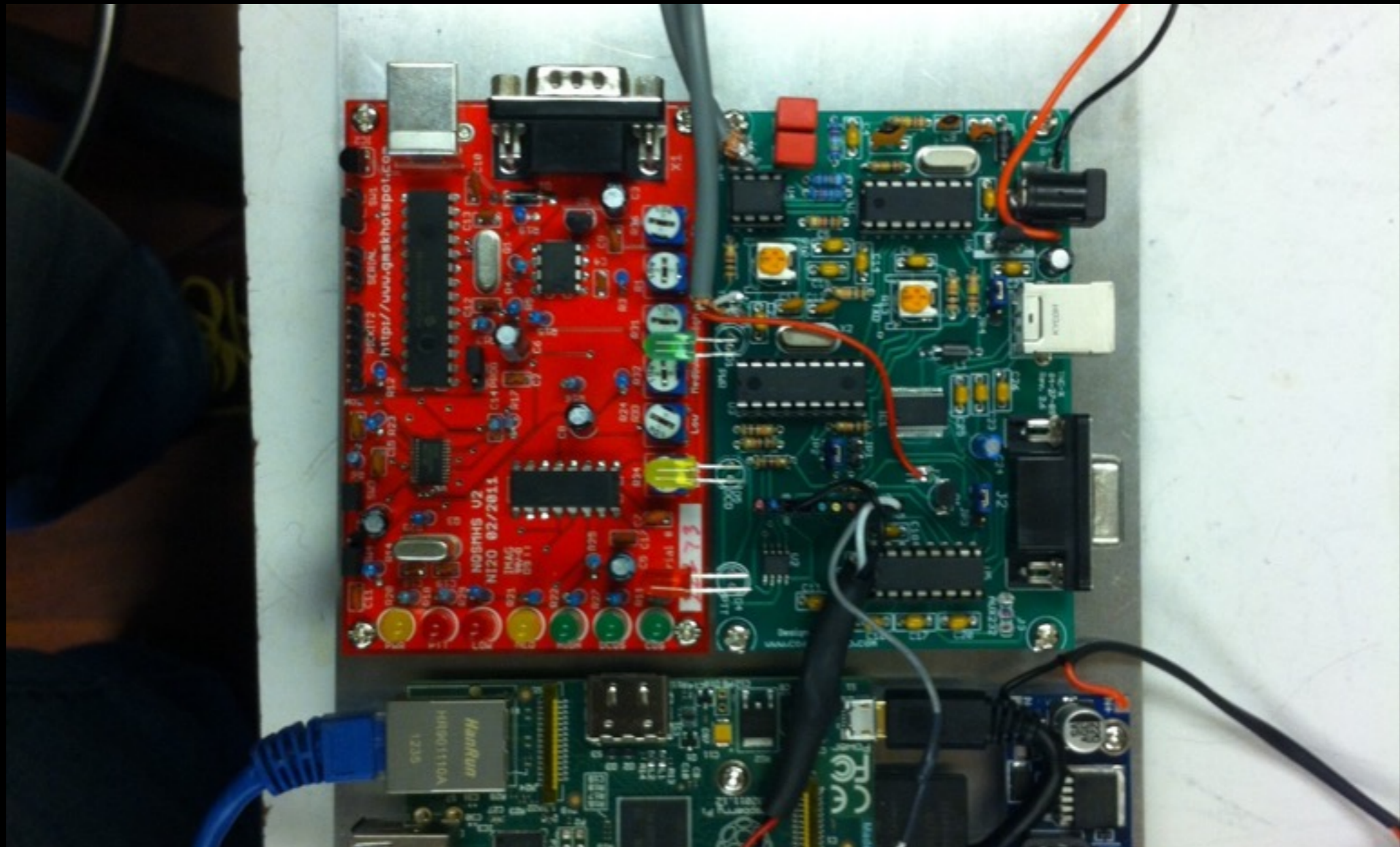
- Magnetometer for detection of beam heading
- GPS for determining position for map and possibly time
- PWM to implement variable frequency drive for speed control

NH6Z Project #2

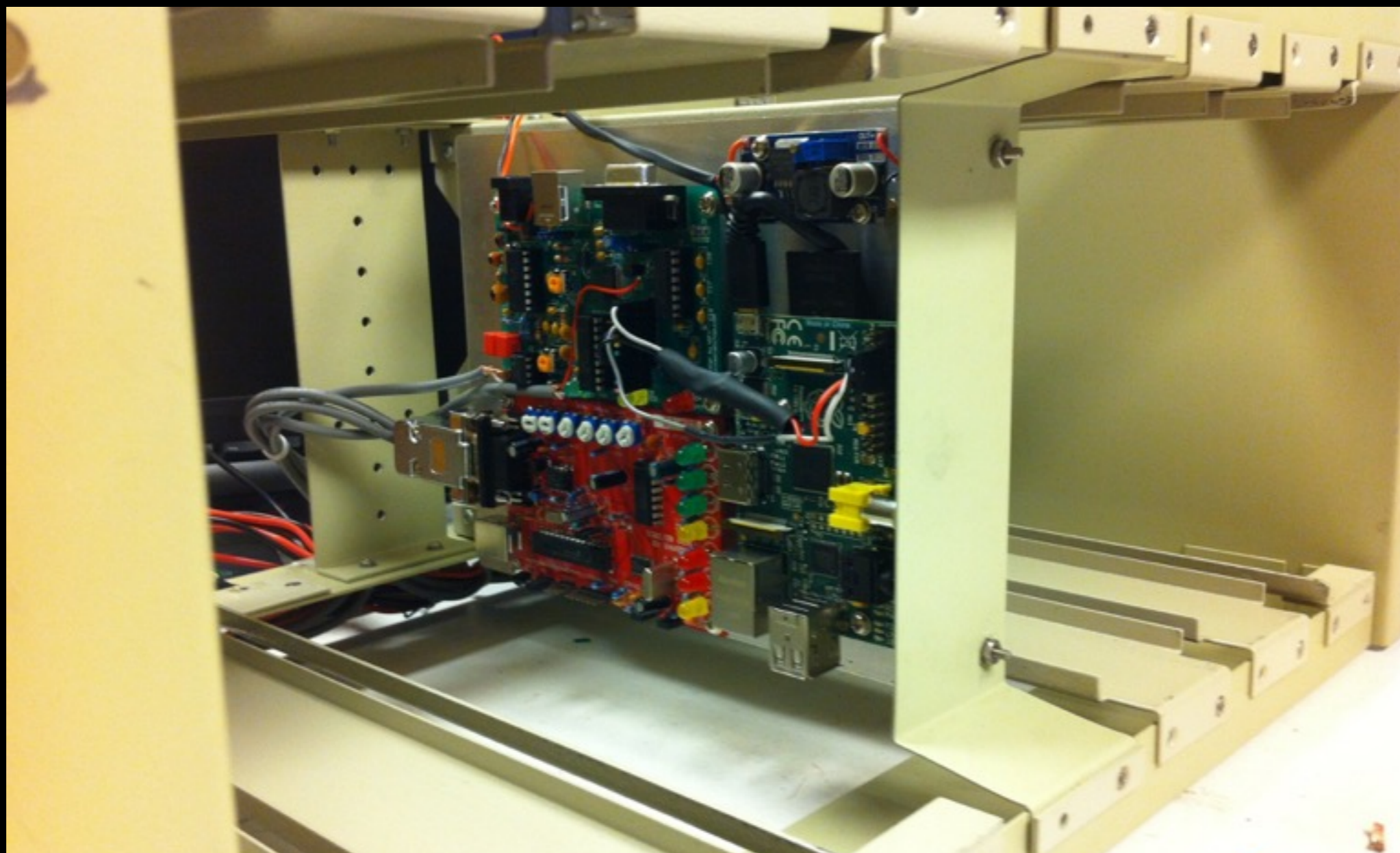
Repeater/Digi

- Intended to deceive computer-hating site owners
- Pi fits along with a TNC-X and GMSK Node Adapter behind speaker panel
- Everything runs off of 12VDC





NH6Z Project #2
Repeater/Digi



NH6Z Project #2
Repeater/Digi



NH6Z Project #2
Repeater/Digi

Repeater

Possible Improvements

- Use the TNC-Pi rather than hacked up TNC-X
- Better GMSK decoding

Future Project

Portable Analog Repeater

- Use USB sound fob on Raspberry Pi
- Surplus Kenwood TK-705D radios provide RF deck
- 802.11 wireless or cellular modem to connect to the Internet
- IRLP/EchoLink running on the Pi
- G4KLX “PCRepeaterController”

Pi Pitfalls

- The Ethernet is USB connected
- X-Windows/VNC
- Power budget can be tight
- Software still evolving
- No native mic/line-in audio



Alternatives

- ODROID series
www.hardkernel.com
- pcDuino
www.pcdduino.com
- Beagleboard
www.beagleboard.org
- USB stick computers



Questions?