

Art Nouveau Circa 1890-1910

1888 Heinrich Hertz Proves  
Electromagnetic Waves Exist

1890s Marconi's Wireless Telegraph

1900s Amateur Radio is Born

World War I ends Amateur Radio

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# The “APRS of Things”

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Bryan Hoyer K7UDR

MicroHAMs 2018

# Sheeva Plug

## 2009 \$99

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# NW Digital Radio SBC

## 2011 \$50

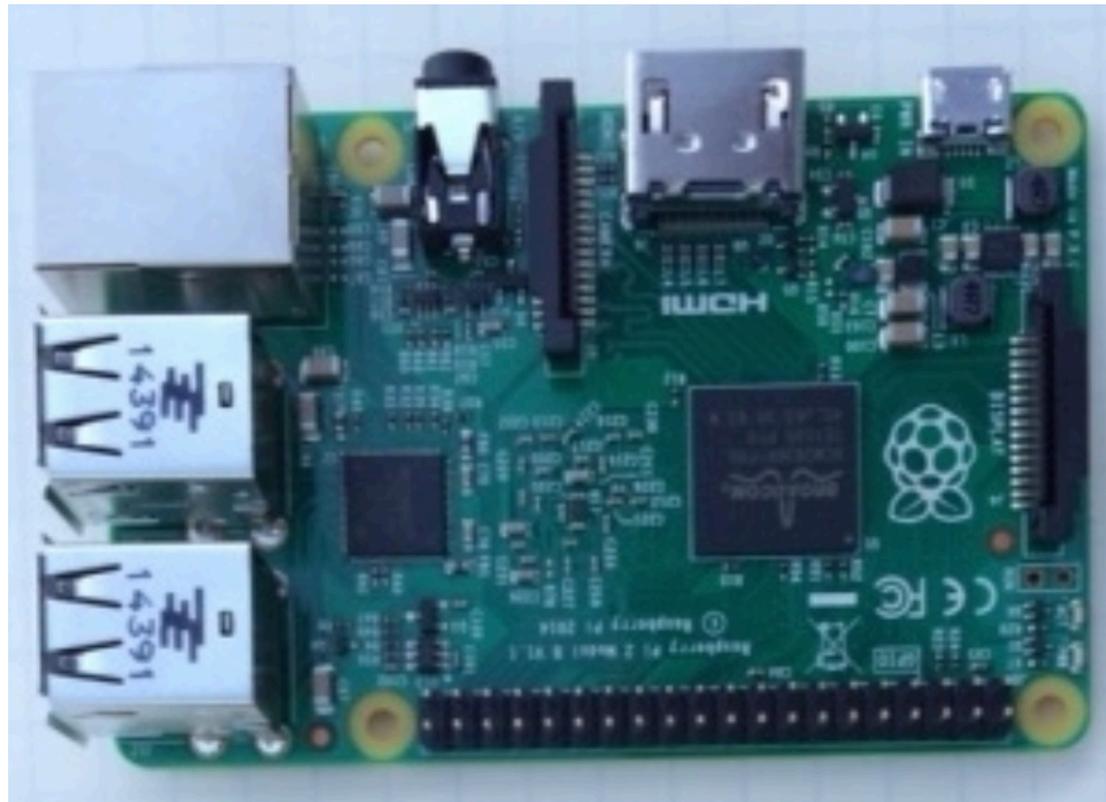
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# Raspberry Pi

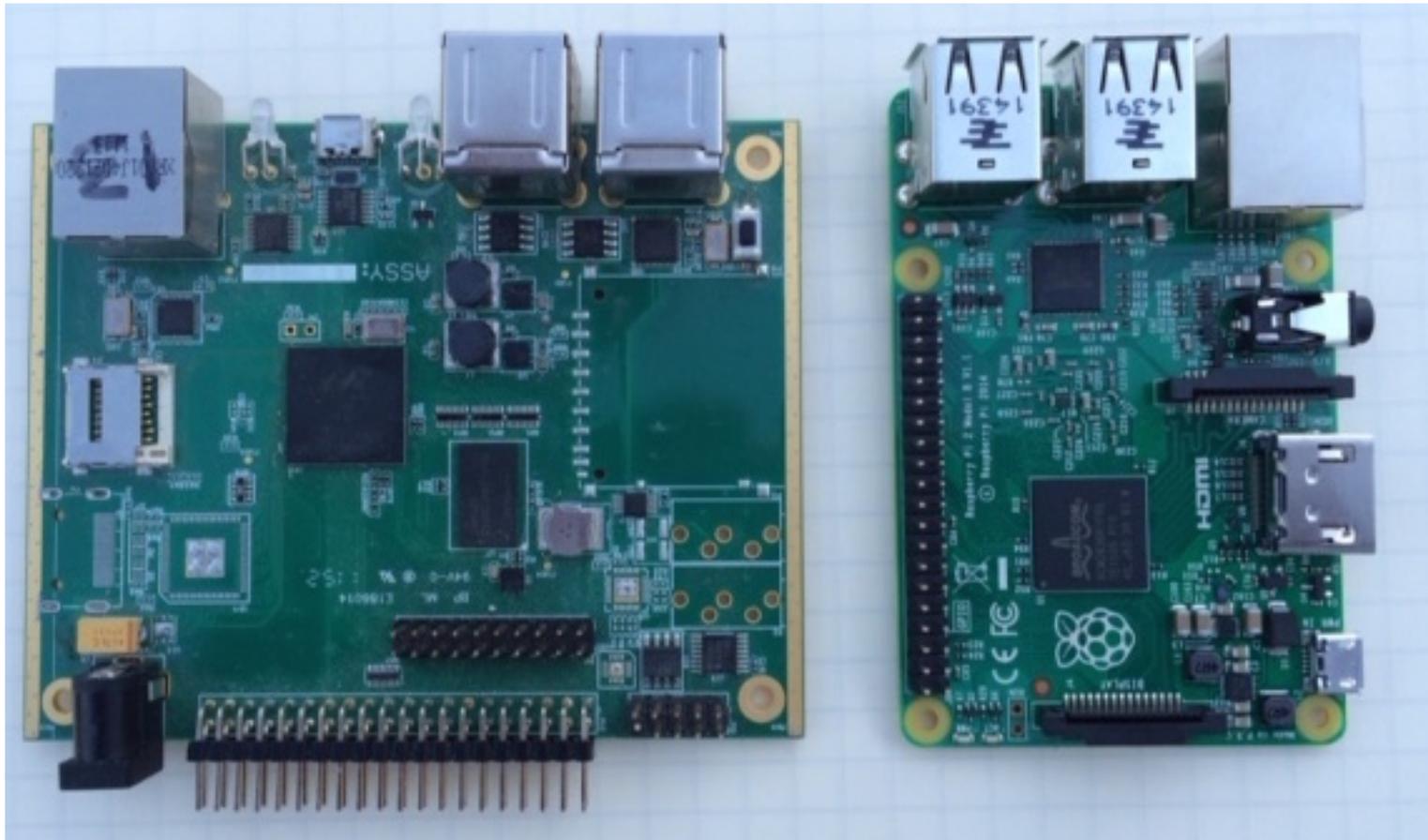
## 2012 \$35

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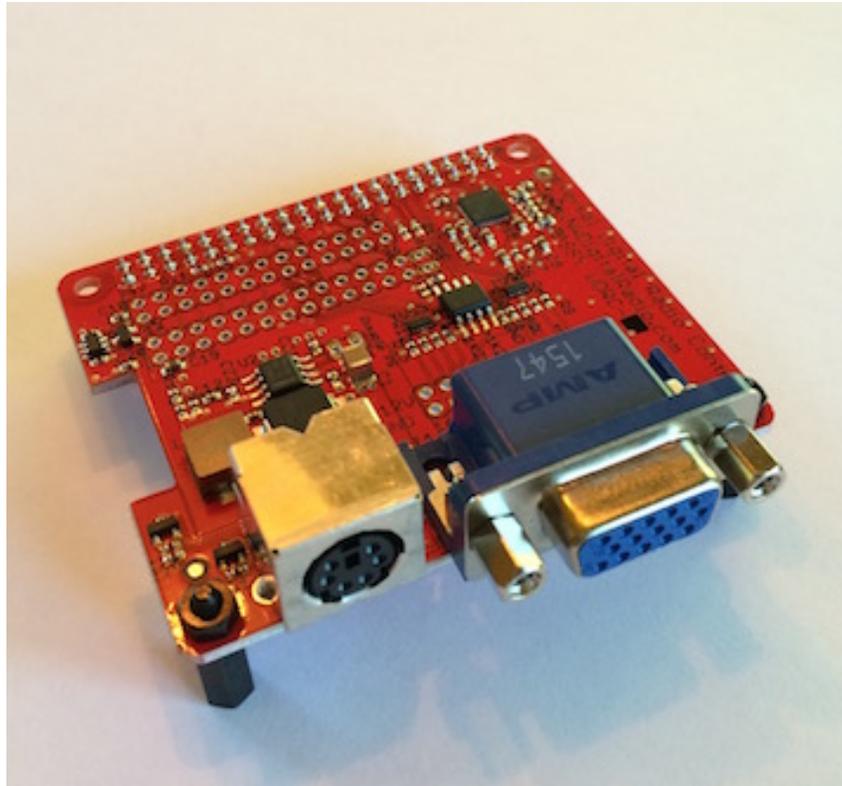
# UDR SBC vs Raspberry Pi2

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# UDRC-II

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# UDRC at a Glance

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- Provides “4 Wire Interface for 2 Radios
- Raspberry Pi HAT Compliant (Pi 2 or 3)
- 12V to 5V Buck Regulator
  - 3A at 5VDC Back Powers Pi
- Sound Card Interface
- PTT via GPIO

# Why Amateur Radio?

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- Can't we do everything with WiFi?
- Rural location without Internet
- Remote location Internet too expensive
- What about when Internet goes down?
- Hey, it's Amateur Radio

# Stuart Island Cabin



# Generator Monitoring

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- Stuart Island - off the grid slow Internet
- Generator runs 2Hrs twice weekly
  - Bad if it doesn't run worse if it doesn't stop
- UDRC to 2m rig to DIGI to IGate
  - To email and SMS

# Catherine Creek

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- KK4SOA Brett Hoyer
- Creek level Monitor
- Uses One Watt Spot
- Pi HAT w IW RF XCVR
- Frequency Agile

# A Hailing Frequency for Packet Radio DCC 2012

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- Control Channel / QSY for Traffic
  - Trunk Radio, Marine VHF, HF Nets
- Require Frequency Agile Radios
  - IW Spot
  - Rig Control HF Rigs AKA IC-706

# Aircraft Pre-Heat

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- Uses Telecommand to turn on Pre-Heater
- DTMK Authenticated Messaging

# Authenticated Messaging

## MicroHAMS 2012

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- Messages are Sent In The Clear
  - Your message here\SnH&87c
- Time based to prevent replay attacks
  - Requires TX/RX Clock < 1 Minute
- Works with Public or Private keys
- Andrew Pavlin, KA2DDO, YAAC

# TWEET-Gate

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- Gateway between 2m APRS Messages and
  - 30m HF Messages
  - Selectively Gated using Authentication
- Why?
  - 30m is pretty good everywhere always
- POE UDRC, SDR-DONGLE, QRP 30m

# NW Digital Radio

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- Questions?
- Comments

# NW Digital Radio XC-3006

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- Transcoding between incompatible DV
  - D-STAR, DMR, System Fusion
- HW/SW XLX team in Europe
- Initial build by NW Digital Radio
  - 39 units due in April

# NW Digital Radio UDRC

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- UDRC becomes netTNC
  - 2 Mini DIN6 Connectors
  - Packaged w/Pi3 in Aluminum Case
    - SW Preloaded and Configured
  - Built-in GPS w PPS and LNA/Antenna
  - Operates locally or headless

# Digital Radio Amateur Workstation

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- What do we really want?
  - Local Control
  - Automated Operation
  - Couch Control

# DRAWS

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- netTNC
  - KVM
  - Rig Control USB CI-V
  - WiFi

# NW Digital Radio IW-Spot

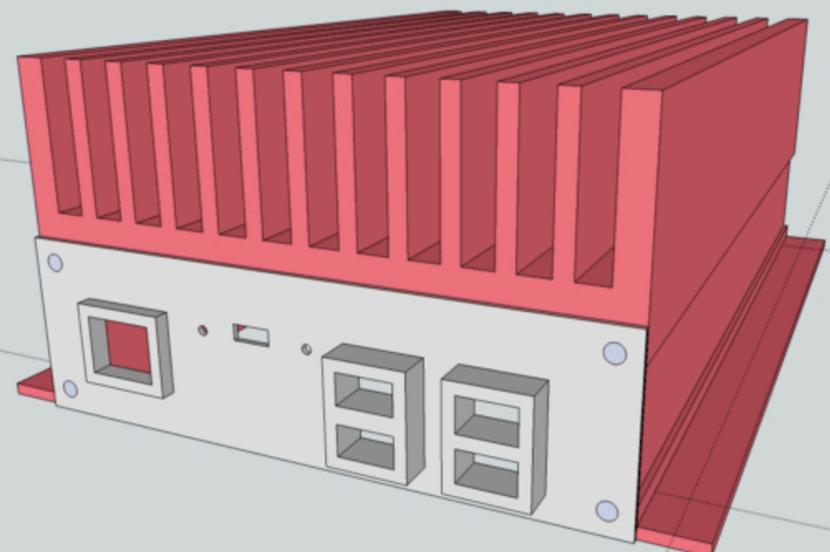
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- Based on netTNC
- IW Transceiver on Board
- Improved performance new Module

# What about the UDRX?

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Mythical Data Radio 2012 - 2018 RIP

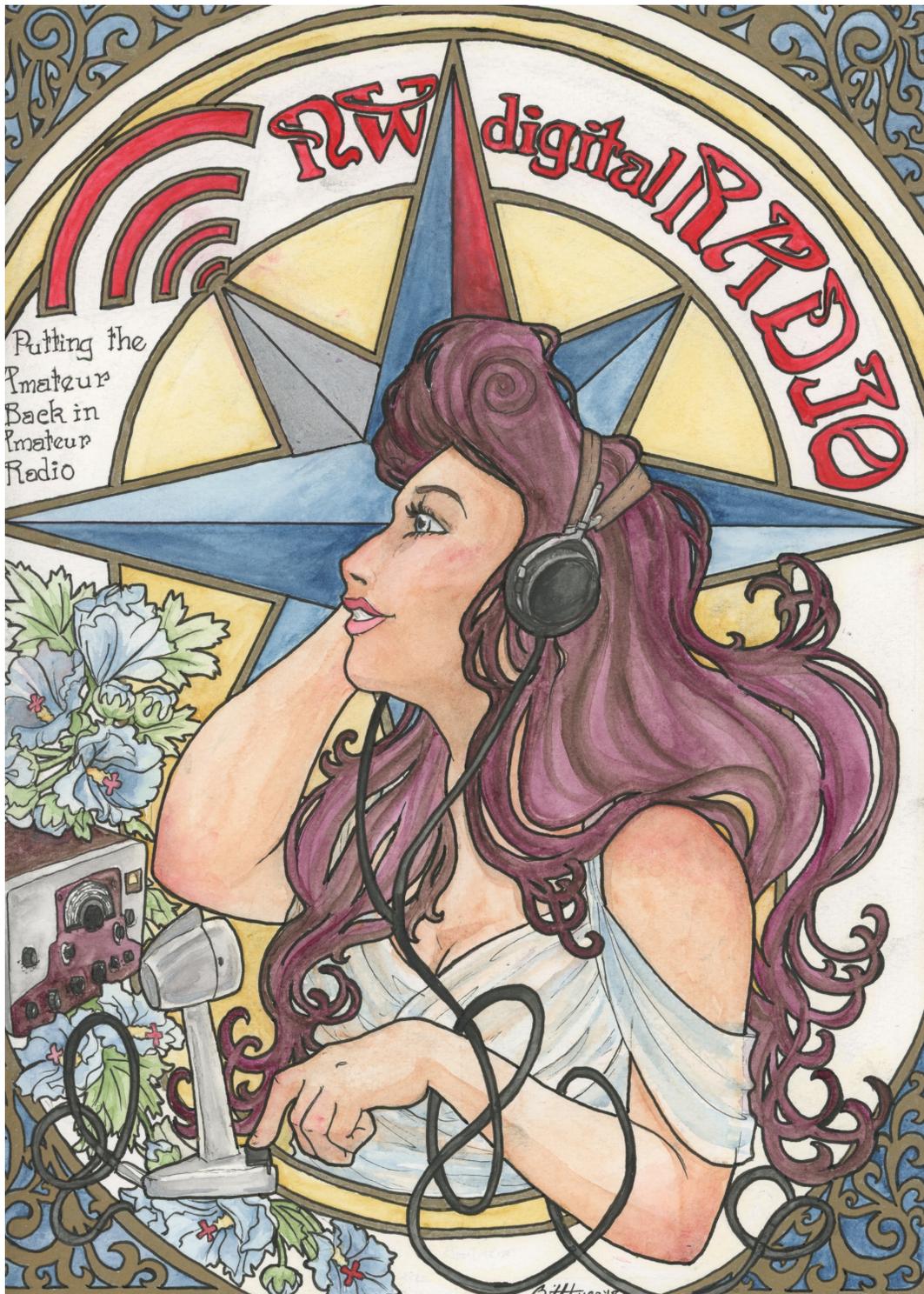


 **UDRX-440**  
25W 70cm Hi-Speed  
Universal Digital Radio

The UDRX Pilot boards have arrived from assembly

After dealing with component shortages and Holiday schedule, the UDRX pilot boards arrived this afternoon from our assembly house in Renton WA. The boards now go into the lab for initial bring-up, then they will be split into 3 task groups ...

[Read More](#)



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# It's about the Community

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- Amateurs who are willing to Experiment
- Inexpensive Linux SBC
- Standard HW Interface
- Open-Source SW

# And the SW

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- Direwolf
- JT\*
- FLDIGI
- SVX-Link, Allstarlink
- WinDV, BlueDV, XLXLink
- Paclink-UNIX

# So Where do we go Now

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- Things I'd like to see:
  - Packet Redux
    - Use QPSK with FEC and Gold Codes
    - IPV6
- But it's not compatible!
  - Who Cares if we all have access!