

Raspberry Pi talk notes

Went to HamSci in Cleveland and saw interesting looking small tablet running SDR app...turned out to be a Raspberry Pi.

Got me thinking...great Field Day or SOTA workstation.

What is a Raspberry Pi?

Raspberry Pi Foundation

<https://www.raspberrypi.org>

Used primarily for education, but now popular for all kind of applications.

Bionic leg:

<https://news.umich.edu/open-source-bionic-leg-first-of-its-kind-platform-aims-to-rapidly-advance-prosthetics/>

Cheap...\$35.

Runs Broadcom ARM low power processor

Operating system is a version of Linux named Raspberrian.

Lots of pins for I/O to control hardware devices.

Has USB ports, HDMI, Ethernet.

Most popular language is Python.

Powered by micro USB...latest model released Monday uses USB-C.

Uses micro SD cards for mass storage...8GB will work but try 16 or 32 GB.

Kits available that have keyboards, mice, power supplies but...

Most hams have all the peripherals in their computer junk boxes, so save your money and just buy the Pi.

Popular amateur radio applications run on the Pi.

Fldigi

WSJT-X

Setting up Raspberry Pi

Official instructions at

<https://www.raspberrypi.org/documentation/>

In short...

Download latest Raspbian image to your PC.

Copy image from PC to SD card...I found that Etcher works the best.

Insert SD card into Pi and boot.

Open terminal window and update to latest Raspberrian...this will take a while.

7 inch touchscreen display \$70-80.

<https://www.raspberrypi.org/products/raspberry-pi-touch-display/>

Case available from Amazon \$14.95.

Search Amazon for "raspberry pi 7 inch touchscreen case"

Pi board screws onto standoffs on display.

Attach a ribbon cable between board and Pi.
Connect supplied jumpers to share USB power for display and Pi.
Then boot...no other configuration necessary.

Installing Fldigi

Two ways:

Install from Raspberrian repository

Easiest way is through GUI app to add Fldigi.

But...Fldigi in repository is very old...better off building from source.

http://www.w1hkj.com/doku/doku.php?id=howto:building_on_debian-ubuntu-mint

Will likely need to increase virtual memory size. Note instructions in the wiki.
These instructions work! This is how I built Fldigi.

WSJT-X

Go to

<https://physics.princeton.edu/pulsar/k1jt/wsjsx.html>

Install one of the amd64.deb files...instructions are in the doc.

WSJT-X is too big for 7 inch display.

Trick – hold alt key and use mouse to move window around the display.

Demo Fldigi connected to KX3.

WKmini for CW.

http://www.w1hkj.com/FldigiHelp/cw_winkeyer_page.html

Cheap Chinese USB sound card with ferrites to eliminate noise.

Use WWV modem in Fldigi to validate accuracy of sound card. Better than checksr.exe. No Olivia errors with these soundcards.

Show screenshot of Olivia QSO with NZ.

Talk about Field Day logging with Fldigi and Field Day workflow.

http://www.w1hkj.com/FldigiHelp/contesting_page.html

Note all the contests and contesting macros.

Solar panels

PowerFilm

<https://www.powerfilmsolar.com/>

10W panel for \$60 from Amazon

LiFePO batteries

Lighter than AGM.

Can really only get 50% of capacity from SLA because of voltage drop off.

LiFePO batteries deliver nearly constant voltage right up to discharge.

Bioenno Power

<https://www.bioennopower.com/>

Solar charge controllers.

Do NOT use controllers designed for SLA batteries!

But many LiFePO controllers will also charge SLA batteries...check the specs.

<https://www.bioennopower.com/collections/solar-controllers>

Or from QRPWorks

<https://www.qrpworks.com/solmate.html>

Results...worked great at MCARC Field Day!

73 QSOs on Saturday using PAR end-fed antennas and 10W of CW.

NO COMMERCIAL POWER USED!

PAR EndFedZ antennas

<https://www.dxengineering.com/search/product-line/par-endfedz-antennas?autoview=SKU&sortby=Default&sortorder=Default>

Remote operating

Motivation

PAQP and WAE contests from hotel room.

Use NoMachine to connect to Pi.

What is NoMachine?

Why NoMachine?

How to get NoMachine

Free for personal use.

Runs on just about any platform.

Help from support forums.

Full commercial license inexpensive if higher level of support needed.

<https://www.nomachine.com/>

Raspberry Pi 4

Better performance than Pi 3.

Pi 3 works OK for operating remotely, Pi 4 is more reliable for me.

Worked well with KX3, failed often with IC-7200.

Runs hot, get heatsinks or fan or both.

Use only certain USB-C cables.

Need mini-HDMI cable, but can run "headless".

<https://www.canakit.com/raspberry-pi-4-starter-kit.html>

<https://www.raspberrypi.org/products/raspberry-pi-4-model-b/>

<https://www.tomsguide.com/reviews/raspberry-pi-4-model-b>

Flrig with Fldigi and WSJT-X

Flrig allows remote control of many popular rigs.

<http://www.w1hkj.com/flrig-help/>

Turn your Raspberry Pi into a way cool amateur radio clock.

<https://www.clearskyinstitute.com/ham/HamClock/>

Log on and demo remote operation.

Turn on IC-7200 from iPhone.

- Wi-fi enabled power socket for IC-7200 and Pi.

- Need to be able to shut everything down in case something locks up.

- Pi hard wired to router with ethernet cable.

- UPS on router and Pi.

Log on using NoMachine.

Discuss global IP and port number and NoIP.

Run audio_icom.sh

Discuss PulseAudio and how it interfaces with NoMachine.

How to identify sources and sinks for your USB soundcard.

Start Flrig.

Discuss pavucontrol.

Demo Fldigi.

Show major features of Flrig.

Discuss Fldigi's contesting functions and use in PAQP.

- Show list of contests.

- Show how to set up serial numbers.

- Discuss macros.

- Not as powerful or usable as N1MM, but adequate for S&P.

SSB operation

- Enable mic in NoMachine.

- Enable mic in pavucontrol.

- PTT in Flrig.

Demo WSJT-X

- Am I getting out? Check map with <https://pskreporter.info>

Log in with iPad and demo.

Be careful when integrating everything.

Emcomm applications?

- Get HF capability in command post where otherwise not possible.

- Complex, but they said the same about NBEMS, Winlink, and mesh networking.

- Don't use on amateur-only mesh channels due to encryption of NX protocol.

Wouldn't it be great if radio vendors supported Raspberry Pi?

Questions and discussion.

