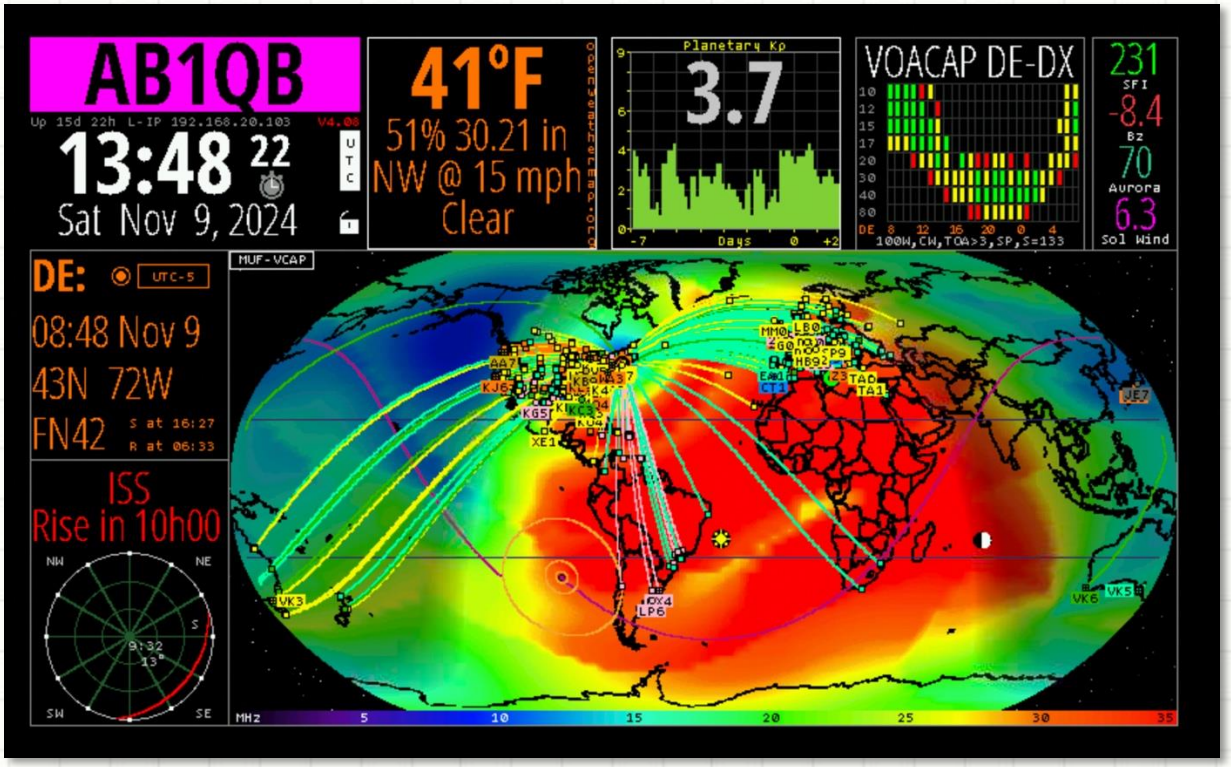


HAMCLOCK ON A RASPBERRY PI

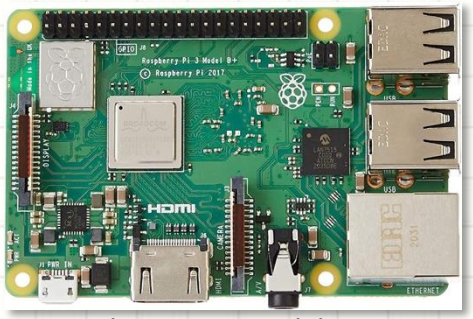
Anita Kemmerer, AB1QB

Why Build a HamClock?

- Inspiration from Vendor Display at Northeast HamXposition
- Interest in building my own as a Raspberry Pi Project
- Learn about propagation
- Provides useful information for operating.

Photo courtesy of Scott, NE1RD

AB1QB HamClock Hardware



Raspberry Pi 3 Model B+

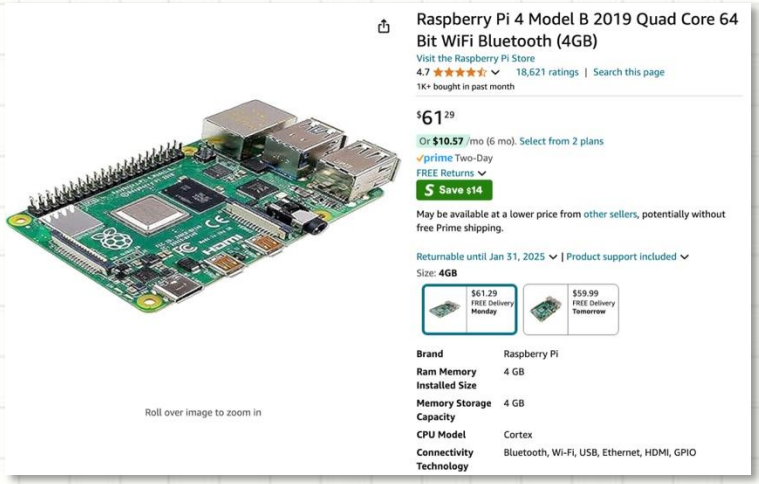
Power Supply w/on-off switch - Micro-USB for Rpi 3; USB-C for Rpi 4 and 5

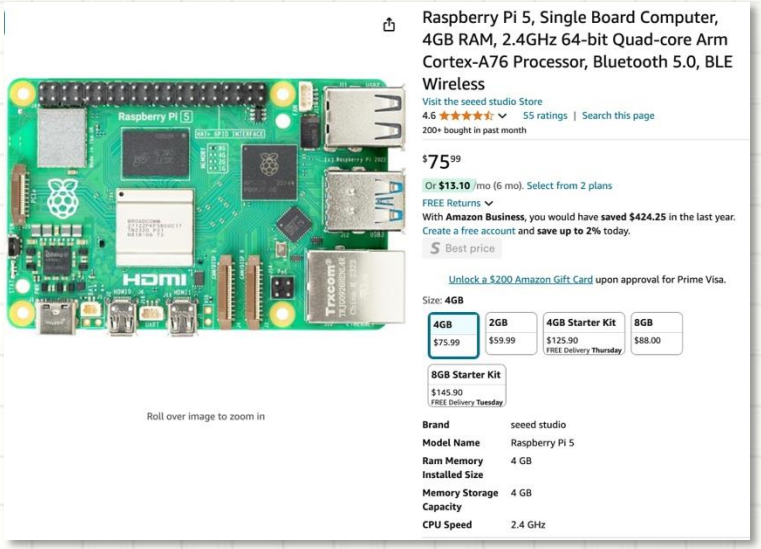
Part	Cost
Raspberry Pi 3 Model B+	$ 44.41
Power Supply w/on-off switch	$ 10.99
32GB MicroSDHC Flash card	$ 8.04
ROADOM 10.1" Touch Screen Monitor	$109.99
Total	$173.43

Raspberry Pi Models

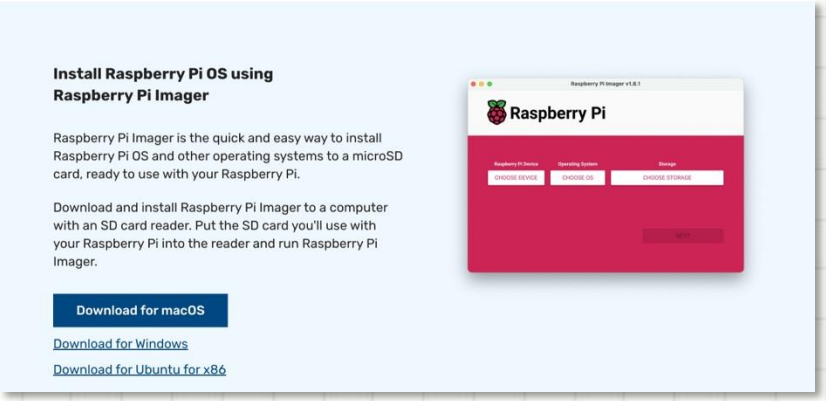
Family	Model	SoC	Memory	Form factor	Ethernet	Wireless	GPIO	Released
Raspberry Pi	B	BCM2835	256 MB	Standard[a]	Yes	No	26-pin	2012
			512 MB					2012[49]
	A		256 MB		No			2013
	B+		512 MB		Yes		40-pin	
	A+		256 MB	Compact[b]	No			2014
			512 MB					
Raspberry Pi 2	B	BCM2836 / 7	1 GB	Standard[a]	Yes	No	40-pin	2015
Raspberry Pi Zero	Zero	BCM2835	512 MB	Ultra-compact[c]	No	No	40-pin	2015
	W / WH					Yes		2017
	2 W	BCM2710A1[d][50]						2021
Raspberry Pi 3	B	BCM2837A0 / B0	1 GB	Standard[a]	Yes	Yes	40-pin	2016
	A+	BCM2837B0	512 MB	Compact[b]	No	Yes[e]		2018
	B+		1 GB	Standard[a]	Yes[f]			2018
Raspberry Pi 4	B[51]	BCM2711B0 / C0[52]	1 GB	Standard[a]	Yes[g]	Yes[e]	40-pin	2019[53]
			2 GB					
			4 GB					
			8 GB					
	400		4 GB	Keyboard				2020
Raspberry Pi Pico	Pico	RP2040	264 kB	Pico[h]	No	No	40-pin	2021
	W					Yes[i]		2022
	2	RP2350A	520 kB			No		2024
Raspberry Pi 5[56]		BCM2712	2 GB	Standard[a]	Yes[g]	Yes[e]	40-pin	2024
			4 GB					2023
			8 GB					

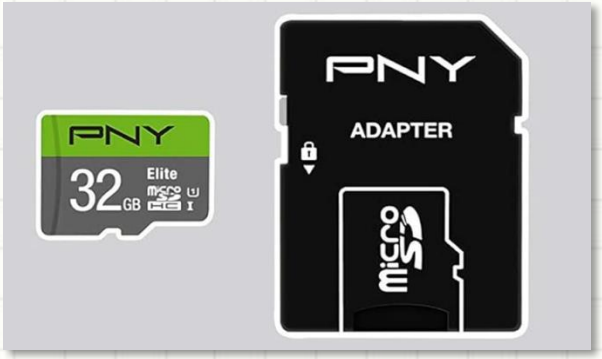
Table from Wikipedia



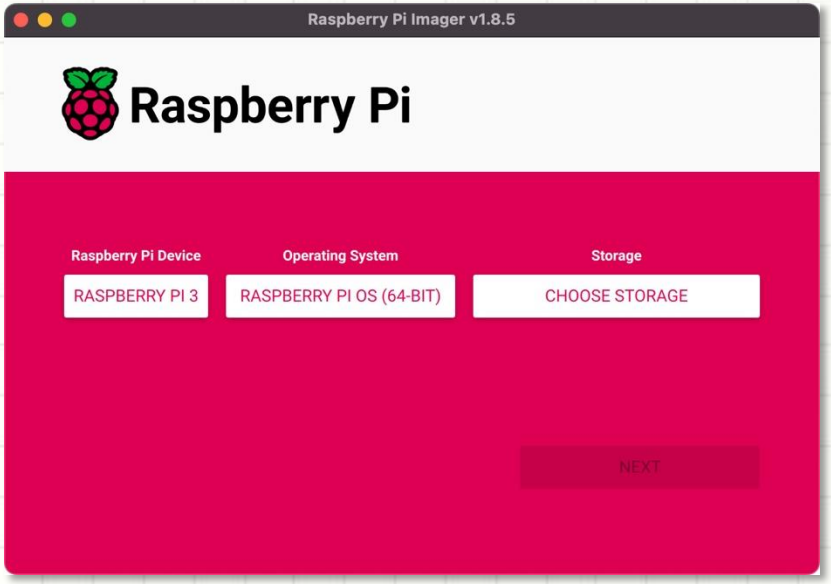


Downloading the Software





1. Download and install the Raspberry Pi Imager for your desktop OS from https://www.raspberrypi.com/software/
2. Use the Micro-SD card adapter to insert the micro-SD card into your machine's card reader.
3. Install and run the Raspberry Pi Imager. Just need to give it the type of device, OS, and choose your storage and it will download the RPi image to the Micro-SD card
4. It may be easier to insert the card into the slot on the RPi before you screw it to the board.

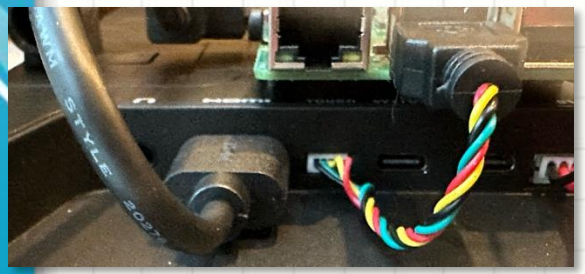


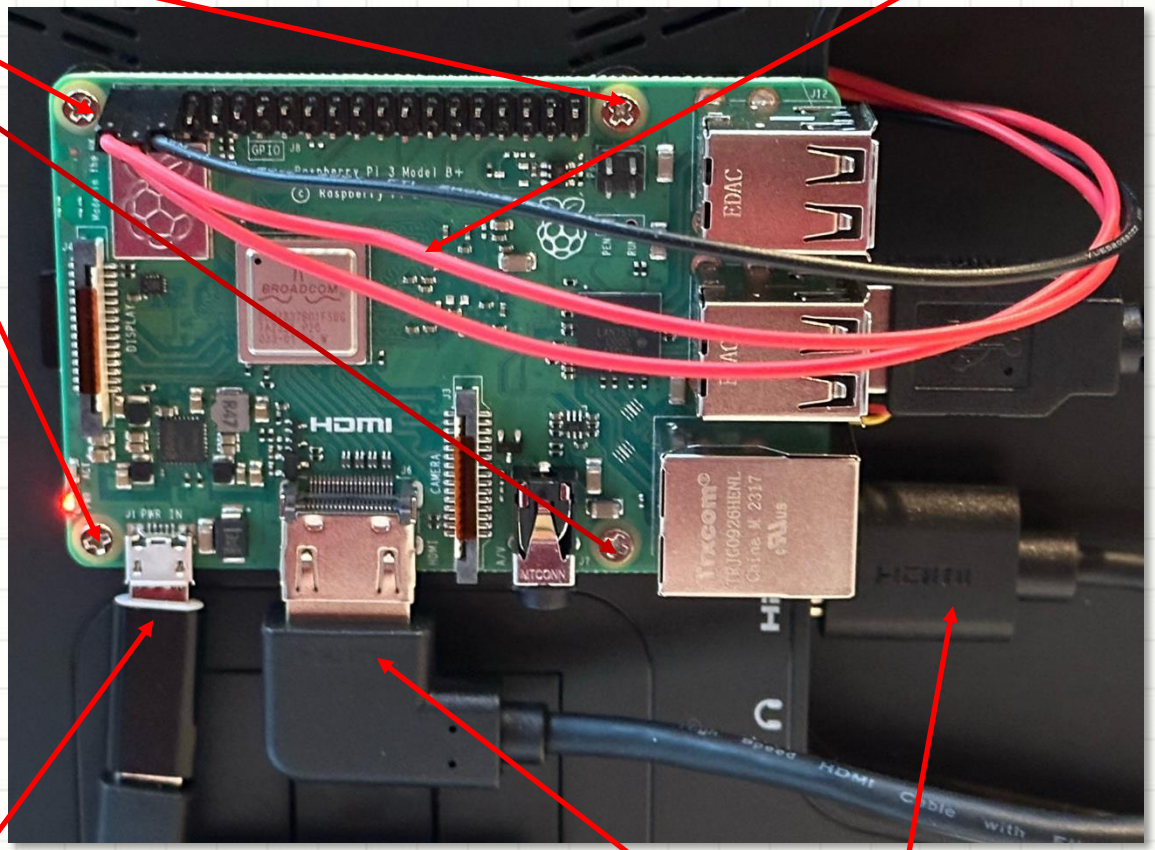
Assembling the Hardware

Step 1: Using 4 screws, fasten the RaspberryPi to the back of the monitor

Step 2: Connect 3-pin GPIO cable to monitor

Step 3: Connect 4-wire USB cable to enable touch feature



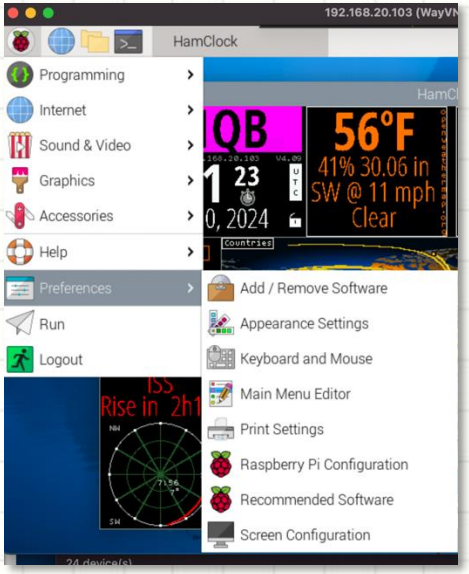


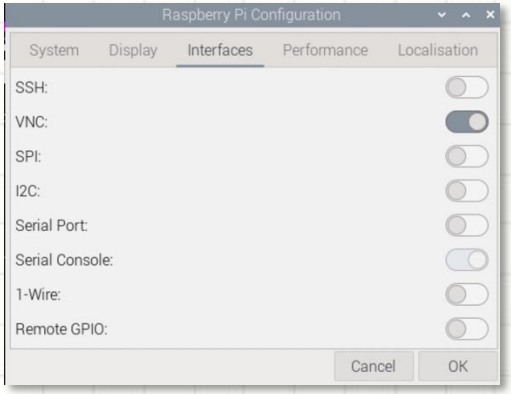
Step 4: Connect RPi HDMI port to Monitor

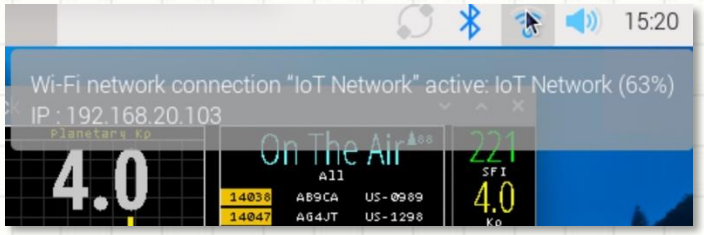
Step 5: Connect power cable

VNC: Remote Access to the Raspberry Pi

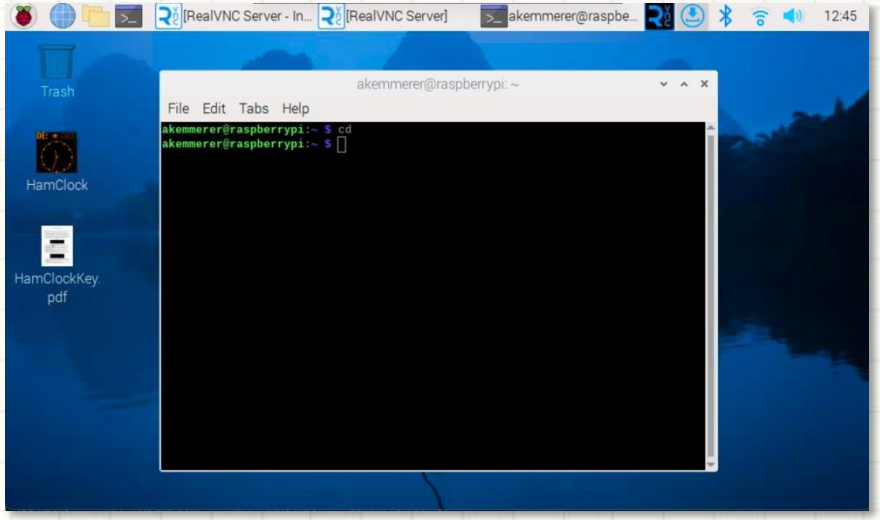
- To remotely access your Raspberry Pi from your desktop machine, use VNC
- Enable ***VNC Server*** in the Raspberry Pi Config options
- Download and install ***VNC Viewer*** on your desktop machine from https://www.realvnc.com/en/connect/download/viewer/
- Use the IP address of your Raspberry Pi to connect VNC Viewer to the Raspberry Pi







HamClock: Software Installation



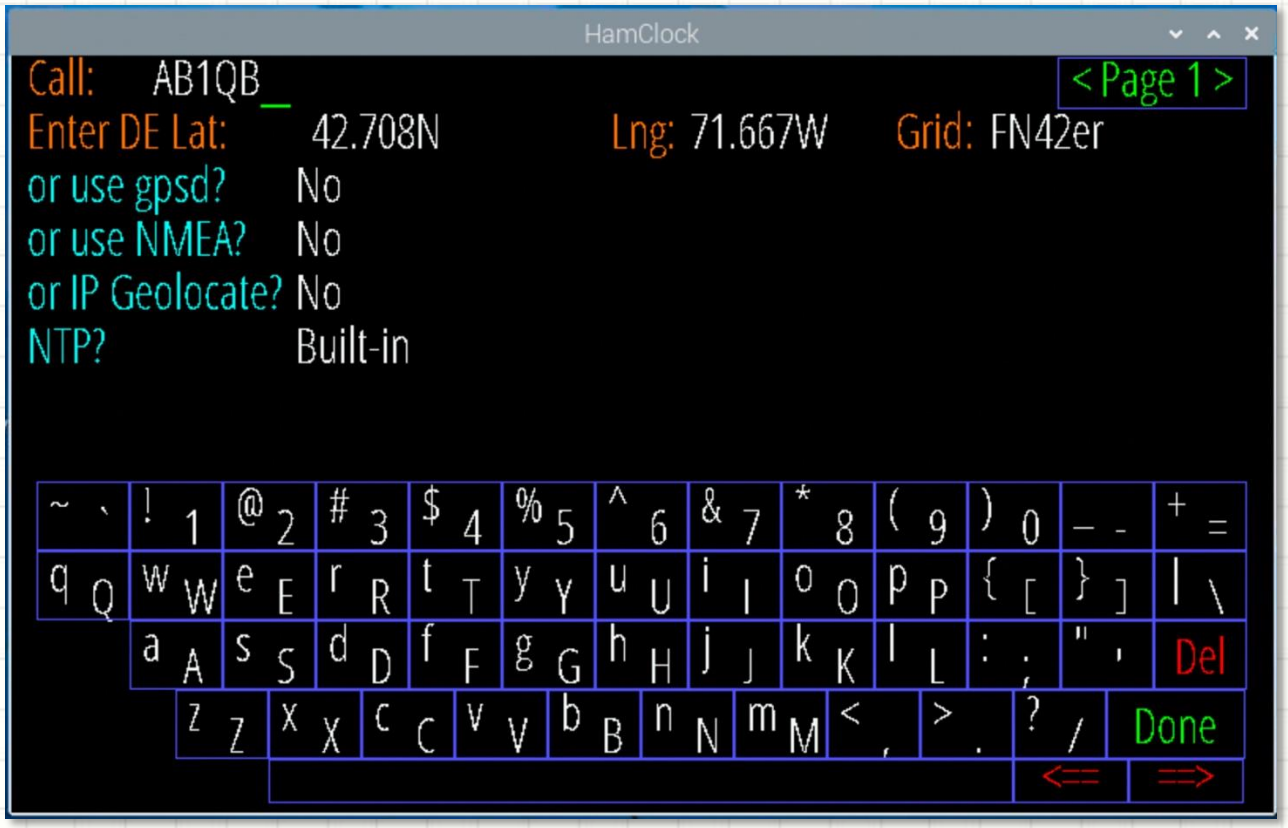
Once installed, run HamClock using the desktop icon.

Install, Setup and Configuration instructions can be found at
https://www.clearskyinstitute.com/ham/HamClock/

Download and run the installer script by entering the following commands in a terminal window on the RPi desktop. Install the desktop icon.

```
$ cd
$ curl -O https://www.clearskyinstitute.com/ham/HamClock/install-hc-rpi
$ chmod u+x install-hc-rpi
$ ./install-hc-rpi
```

HamClock: Software Setup



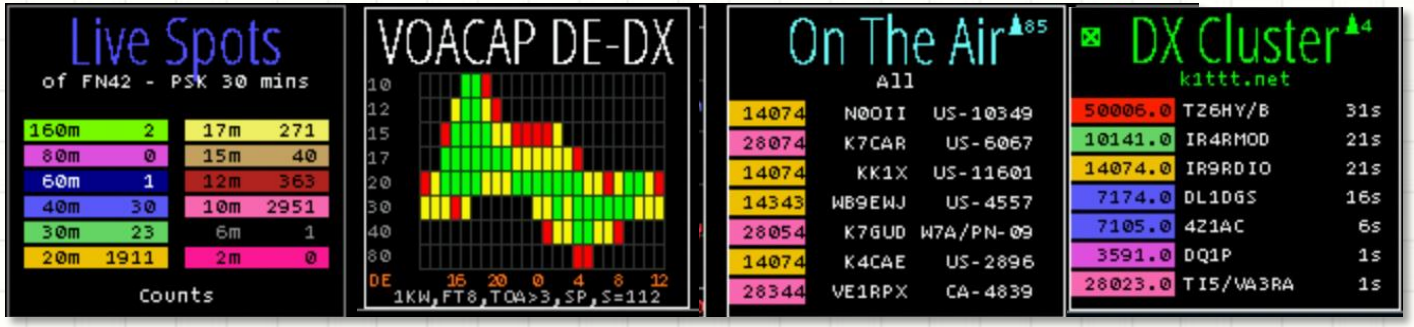
- **Page 1**: Set Call, Grid
- **Page 2**: Set Cluster – used k1ttt.net, my call for login, Port 7373
- **Pages 5,6**: Set display options per your preferences

Install, Setup and Configuration instructions can be found at https://www.clearskyinstitute.com/ham/HamClock/

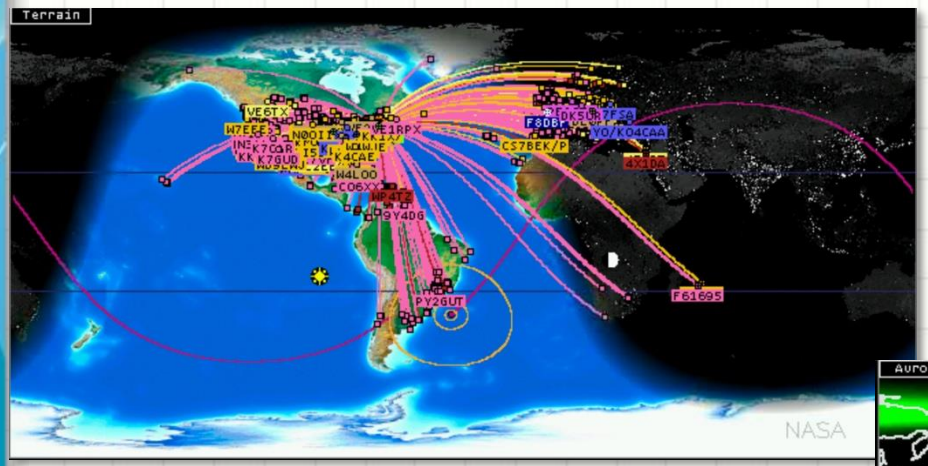
HamClock: Data Panes

Solar Conditions

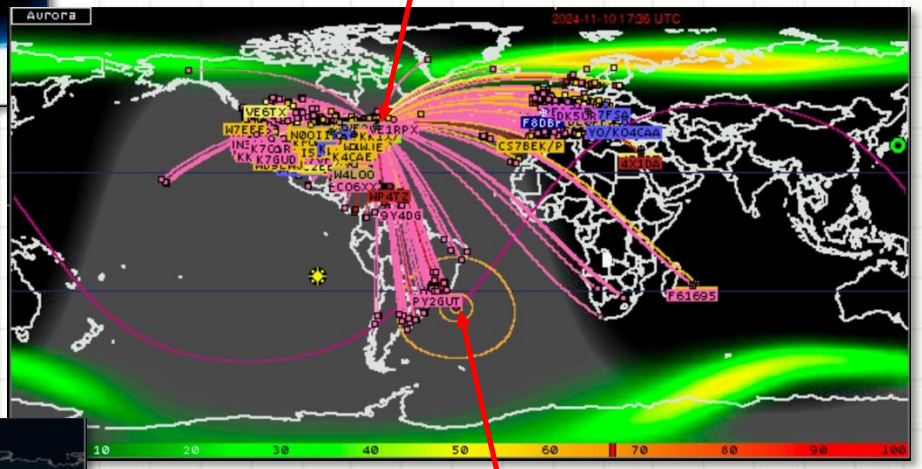
Operating / Finding DX



HamClock: Map Panes



Terrain Map



Aurora Map

Country Map

Lessons Learned / Steps

- Use a Raspberry Pi Model 4
  - Better performance
  - Correct power supply included with the monitor
  - Raspberry Pi 5 is probably overkill – requires bigger power supply and fan/cooler
- Quicker/easier access for configuration
  - Use a wireless keyboard and mouse with the Raspberry Pi
  - Use VNC to access RaspberryPi from a desktop machine
- Alternative design
  - Build a standalone Raspberry Pi in a small case
  - Use with a regular monitor
  - Eliminates the expense of the touch screen monitor
- Learn additional capabilities of the HamClock
  - Run on Windows, Mac, or Docker
  - Customization of Spotting cluster data
  - External I/O Options

Questions?