Andy’s Ham Radio Linux®

Andy Stewart
KB1OIQ
April 11, 2024

Presented to
Algonquin Amateur Radio Club
Marlboro, MA USA

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Biographical Info

Tech: 1/07, General 1/08, Extra 1/09

President: PART of Westford, MA (9/09 - 8/19)

ARRL EMA: Assistant Section Manager (2016), ACC (2017)

Founder: Worcester Linux Users' Group (1997)

Founder and Acting President:
Chelmsford Linux Meetup Group (2006-2020)

Linux Instructor:
Chelmsford Community Education (2004 - 2011)

Linux user since 1997

Computer Engineer – digital logic verification

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Most Recent Interests

- Antique radios
  - Electrical restoration, especially 1920s/1930s radios
- Homebrewing
  - Many kits
  - Built a 1920s style regenerative receiver with plugable coils for different frequency ranges
- FT-8, GridTracker, Fox hunting
- Of course: Andy's Ham Radio Linux
- A new project …. (more later)

Goals

- Promote Linux
- Give back to ham radio and Linux communities
- Build on top of an existing Linux distribution
- Create a software collection containing as much ham radio software as possible – nothing proprietary
- Goal: Everything just works!
- Focus on the radio hobby!
- The idea of ”Andy’s Ham Radio Linux” began this way

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Andy's Ham Radio Linux

- V25a is Xubuntu 22.04.* remastered
- Download the ISO file from SourceForge
  - Search for: Andy's Ham Radio Linux
  - Software is GPL or similarly free license
- Ways to get started:
  - Download the ISO first, then…..
  - Boot it in Virtualbox, or…..
  - Create a bootable USB thumb drive
- Install to the hard drive once you decide you like it
- ---> Be sure to read the GETTING_STARTED guide(!!!) <---

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Target Computer

- Any x86_64 computer 10 years old or less
- Minimum: 4 GB of memory
- Disk Space: 20 GB after installation
- Processor speed is not an issue for most ham radio programs, Exception: SDR
- Networking: wired or wireless
- USB required for installation

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Initial Boot before Installation

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GETTING_STARTED

- PLEASE - PLEASE - PLEASE:
  - Be sure to download and read the GETTING_STARTED document BEFORE you begin the installation.
  - Follow the helpful hints!
- If you have problems logging in, you likely didn’t read or properly follow the instructions in the document.

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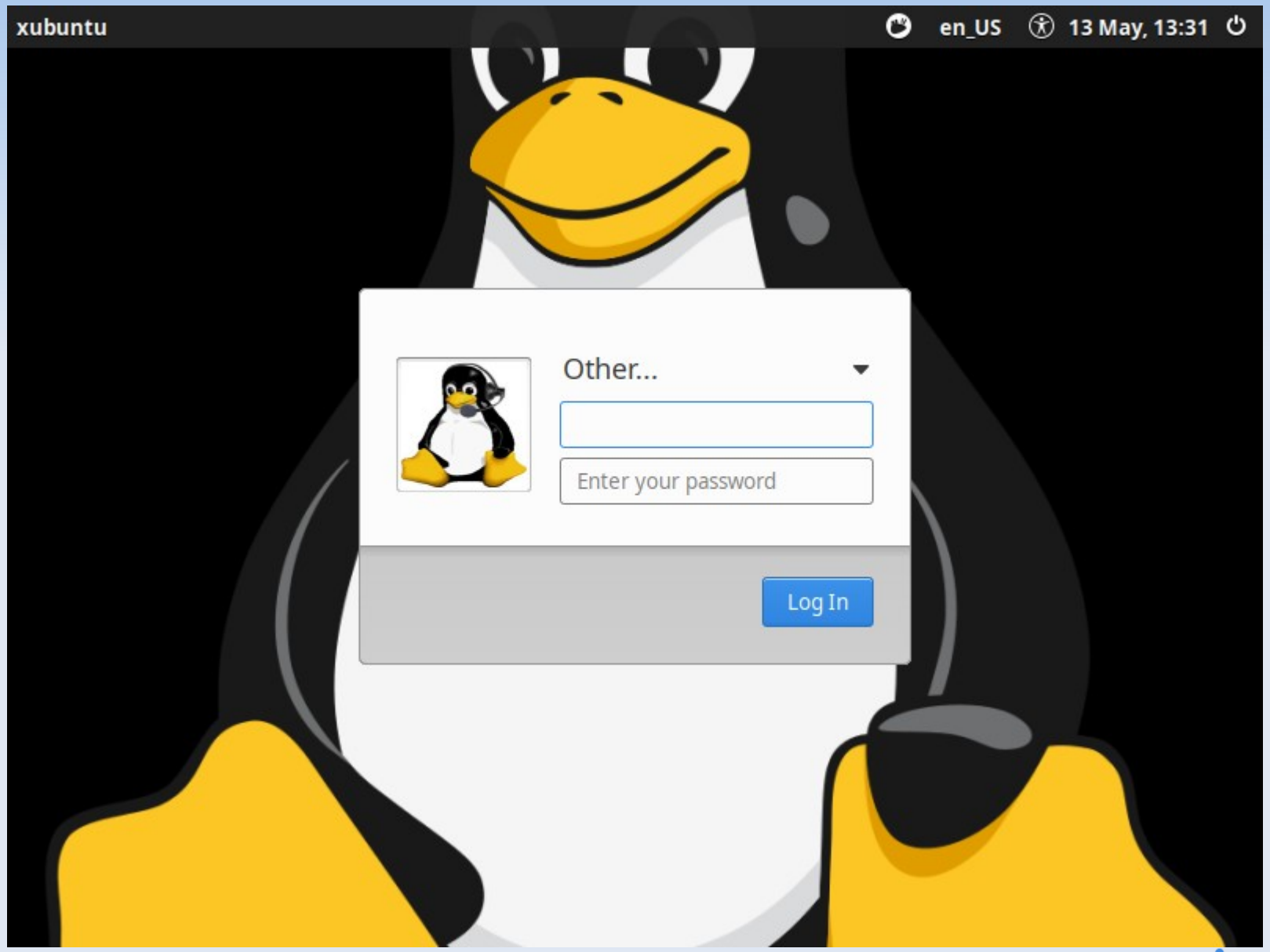
Initial Login Screen After Installation



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fix_account

- Login as user: xubuntu
- Hit enter
- Hit enter again or click ”Log In” (no password)
- Open a terminal window
- sudo /root/bin/fix_account
- Log out, log in using updated account
- Done! That was easy!

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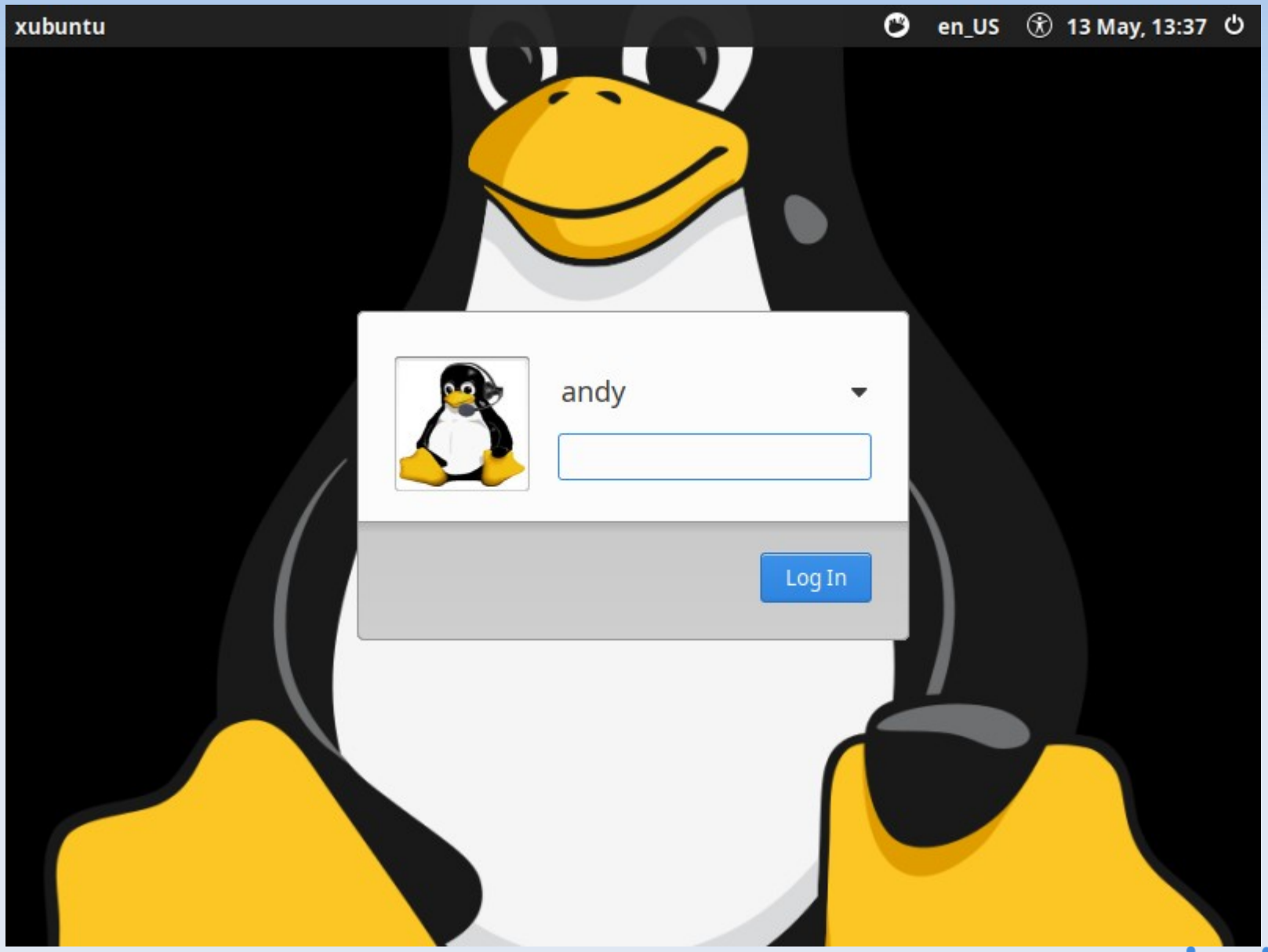
Initial Login Screen after fix_account



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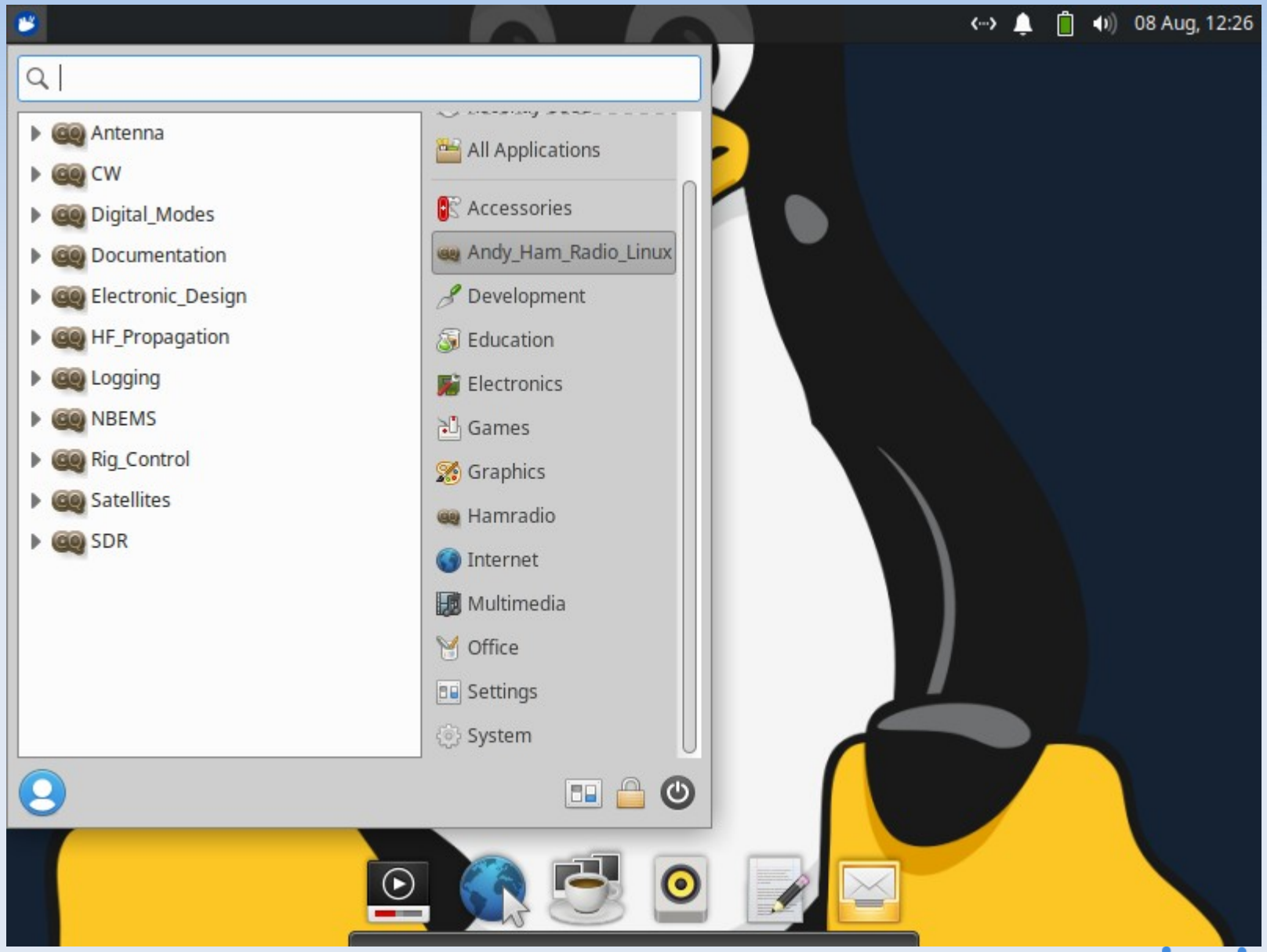
Initial Desktop



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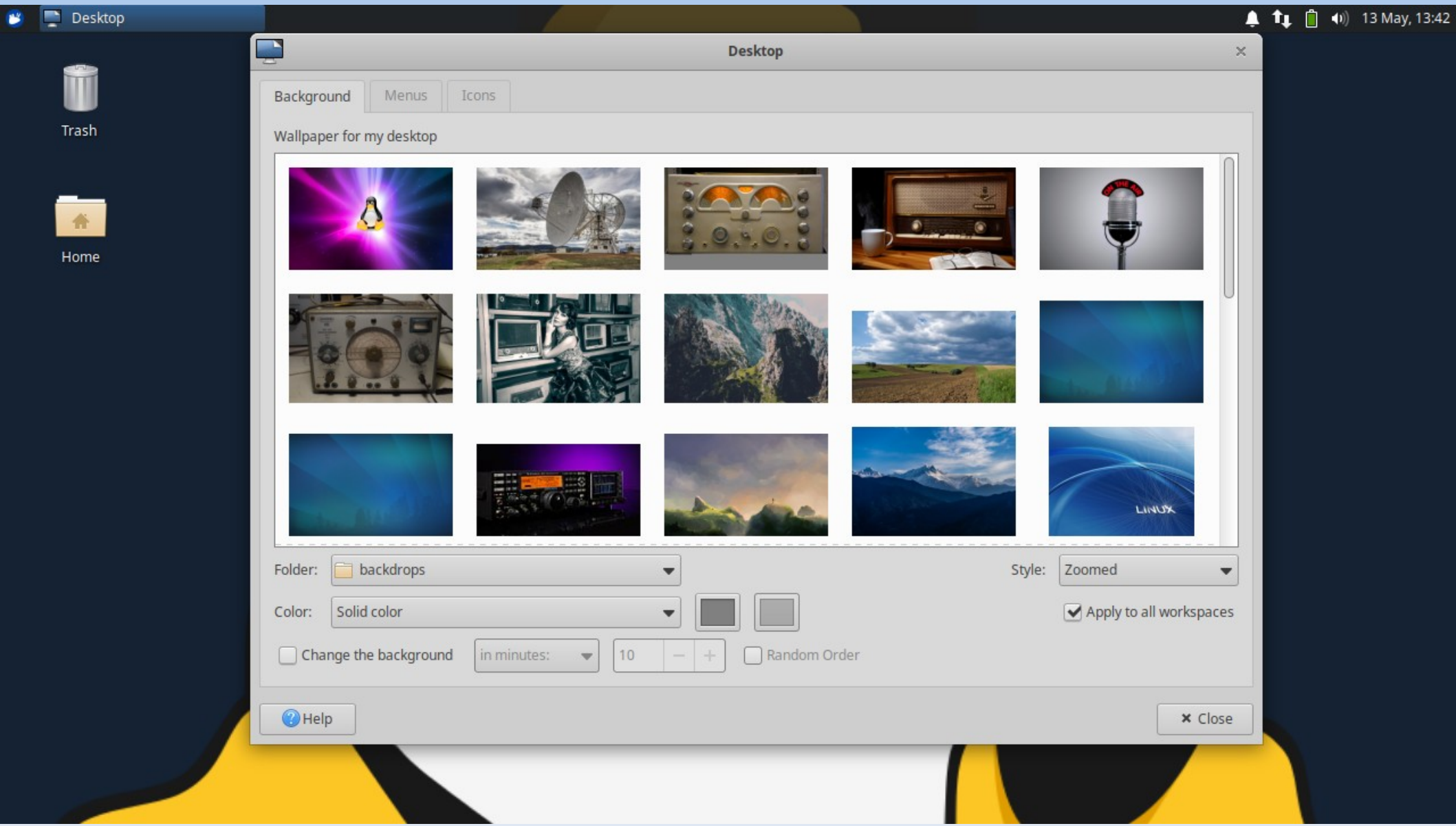
Desktop Backgrounds



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Documentation

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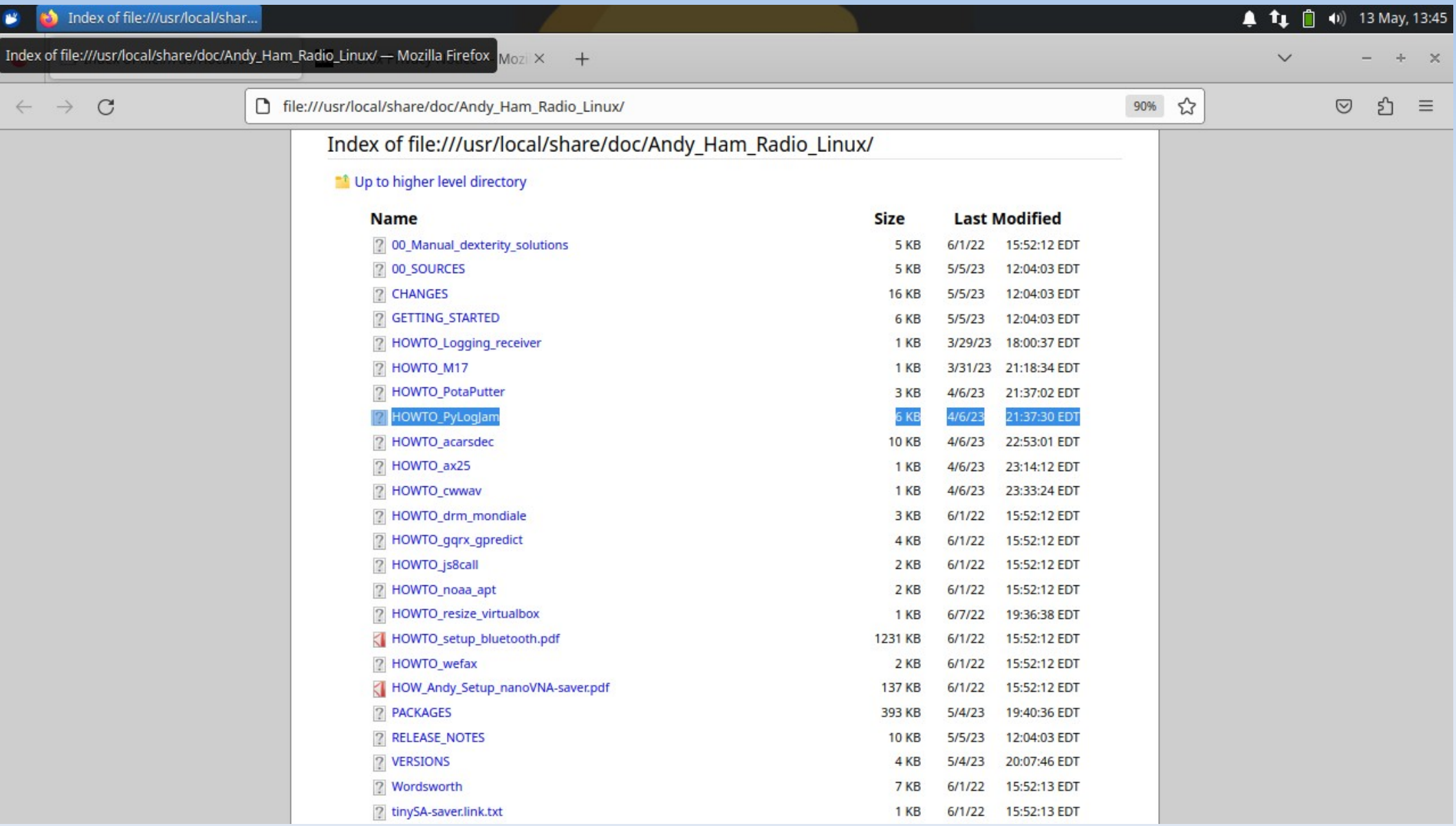
AHRL Documentation



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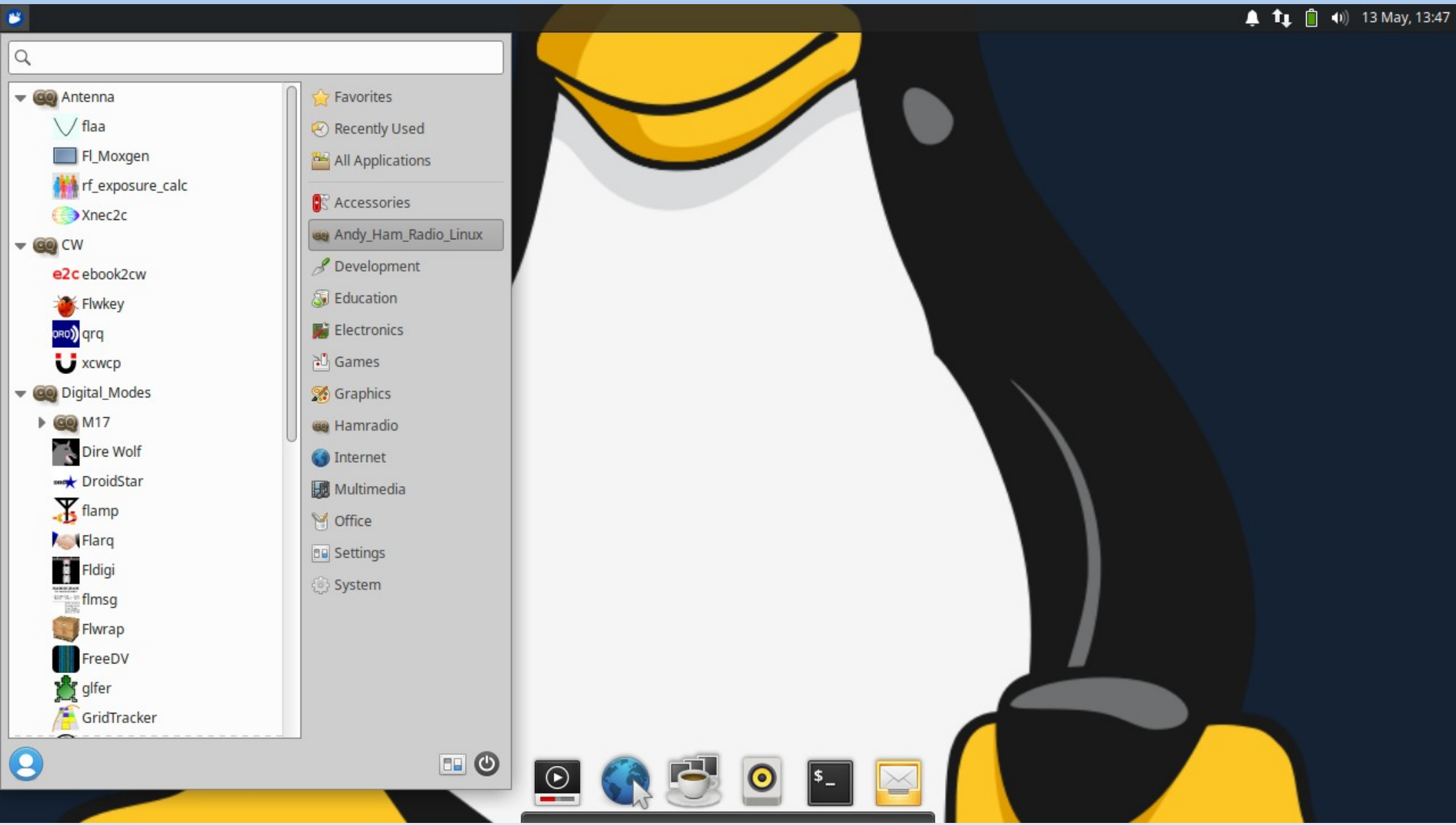
Menu #1



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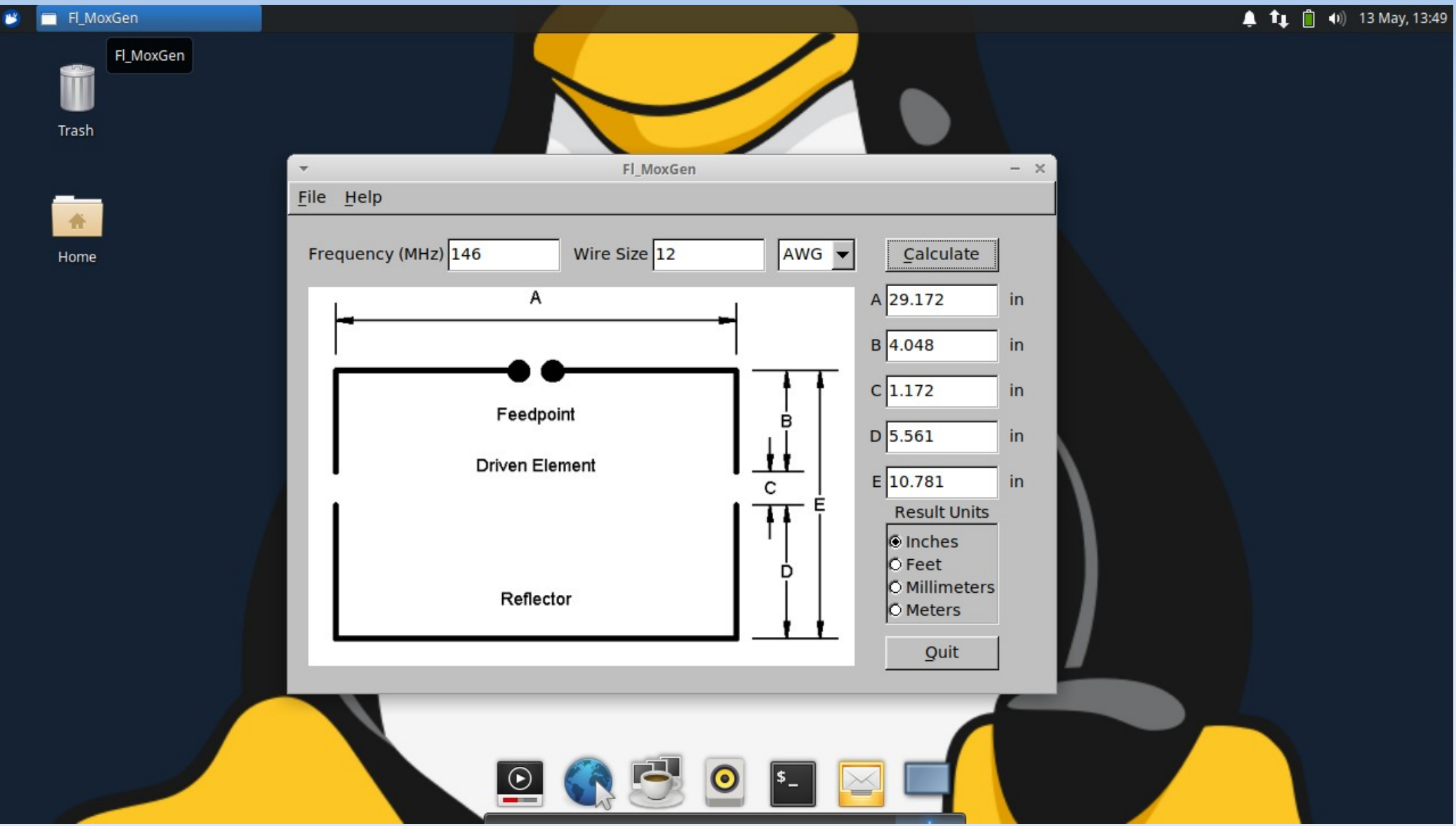
Moxon Rectangle - fl_moxgen



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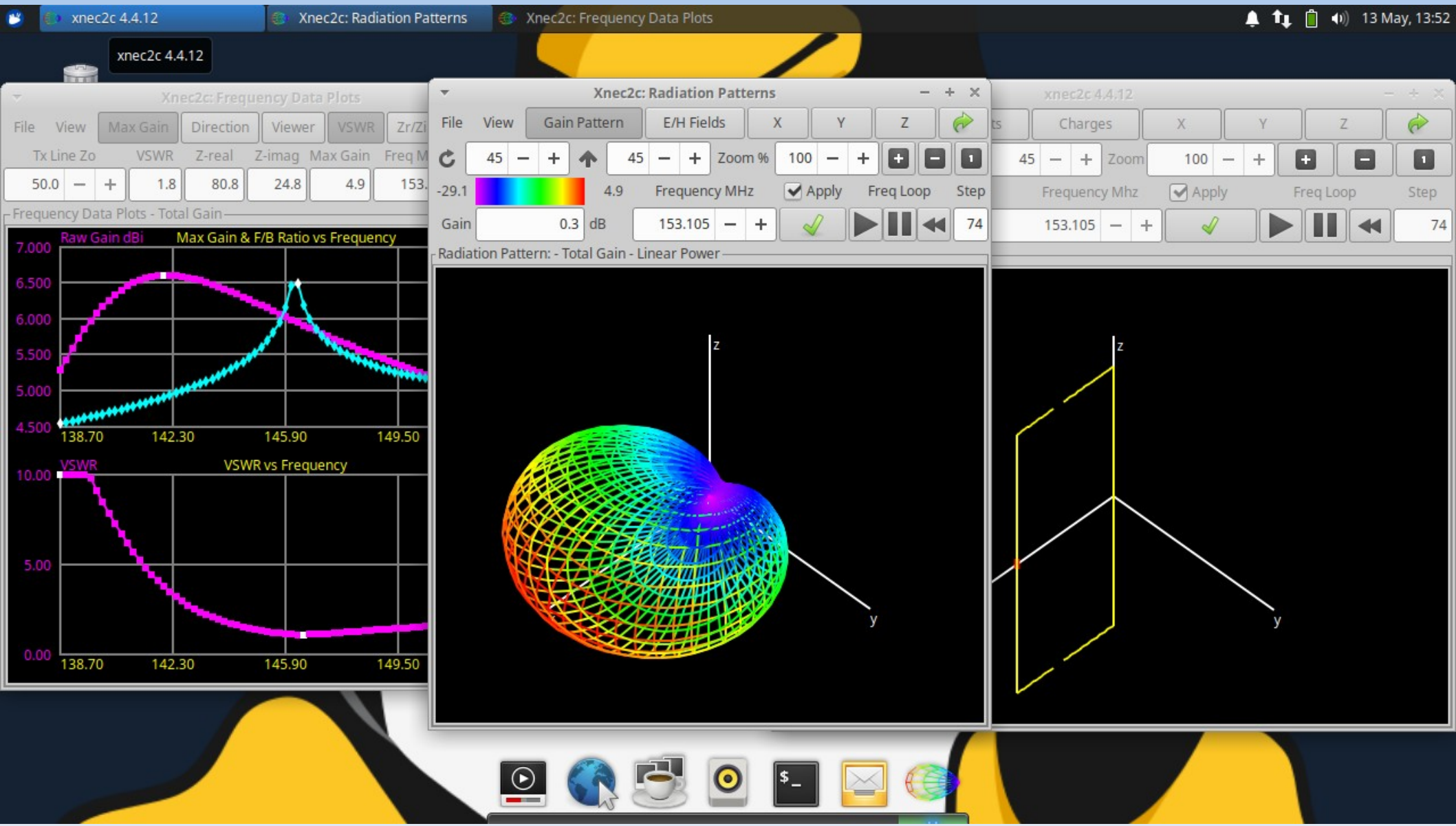
Antenna modeling - xnec2c



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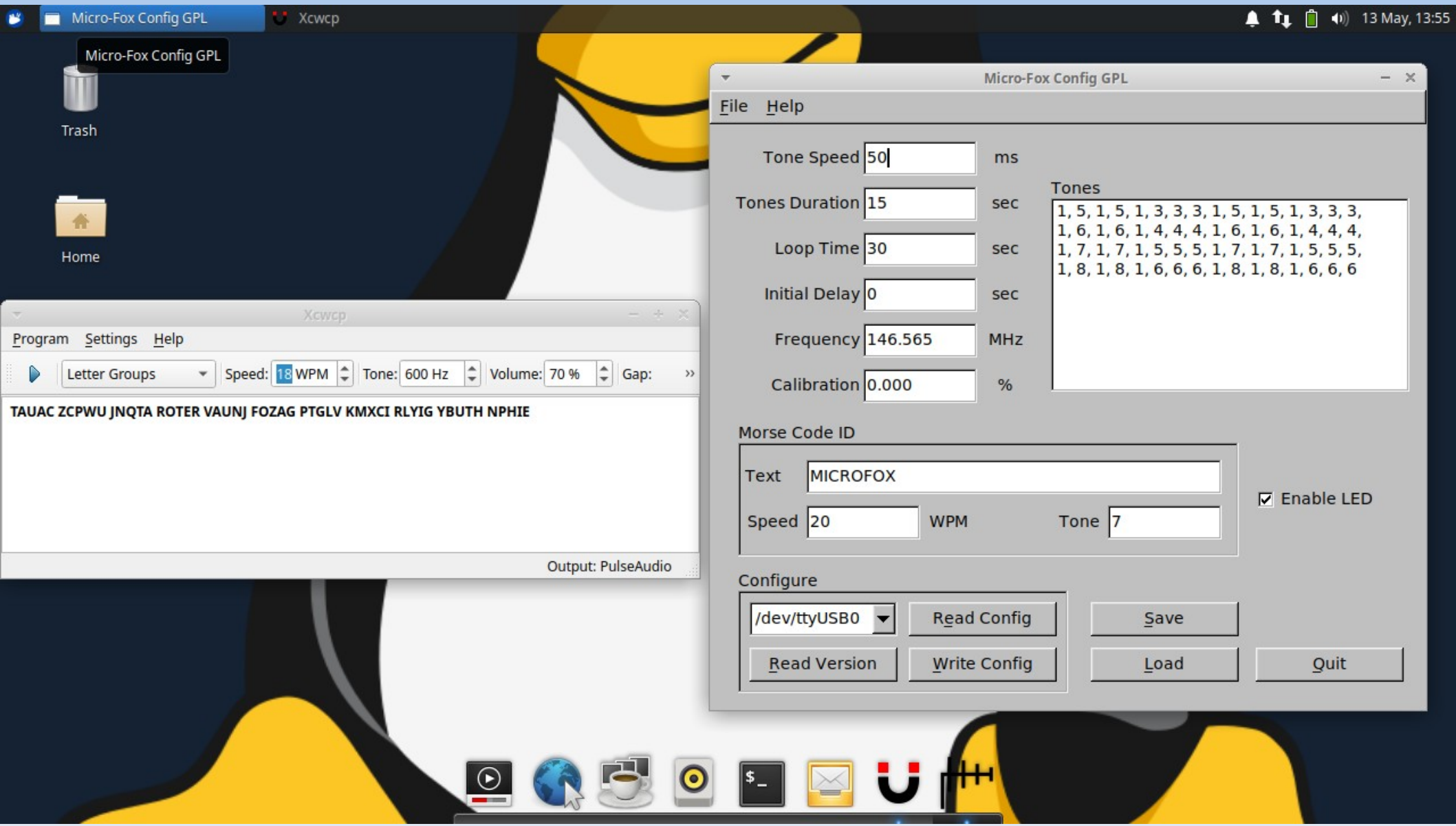
CW and Fox Hunting



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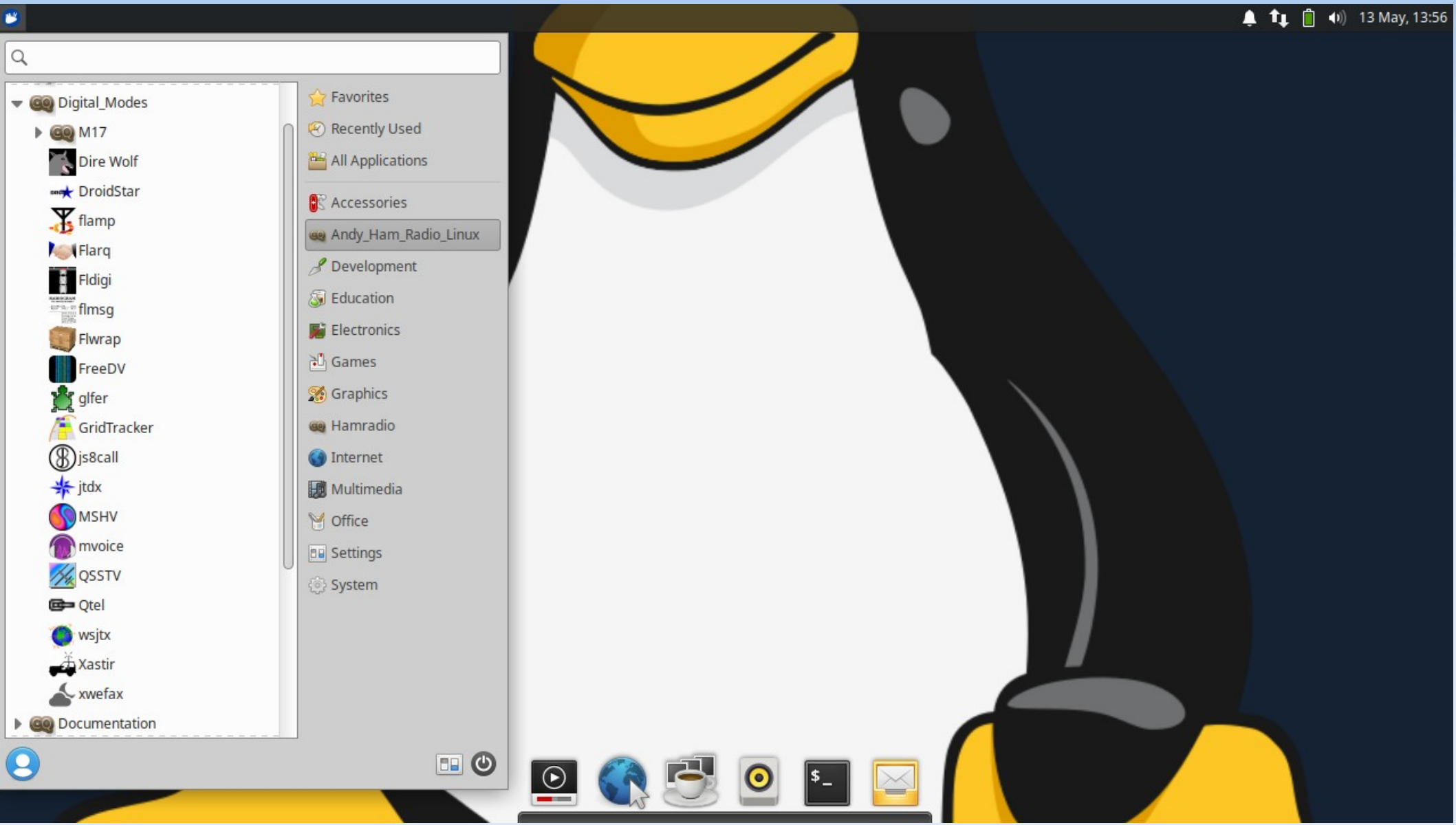
Menu #2



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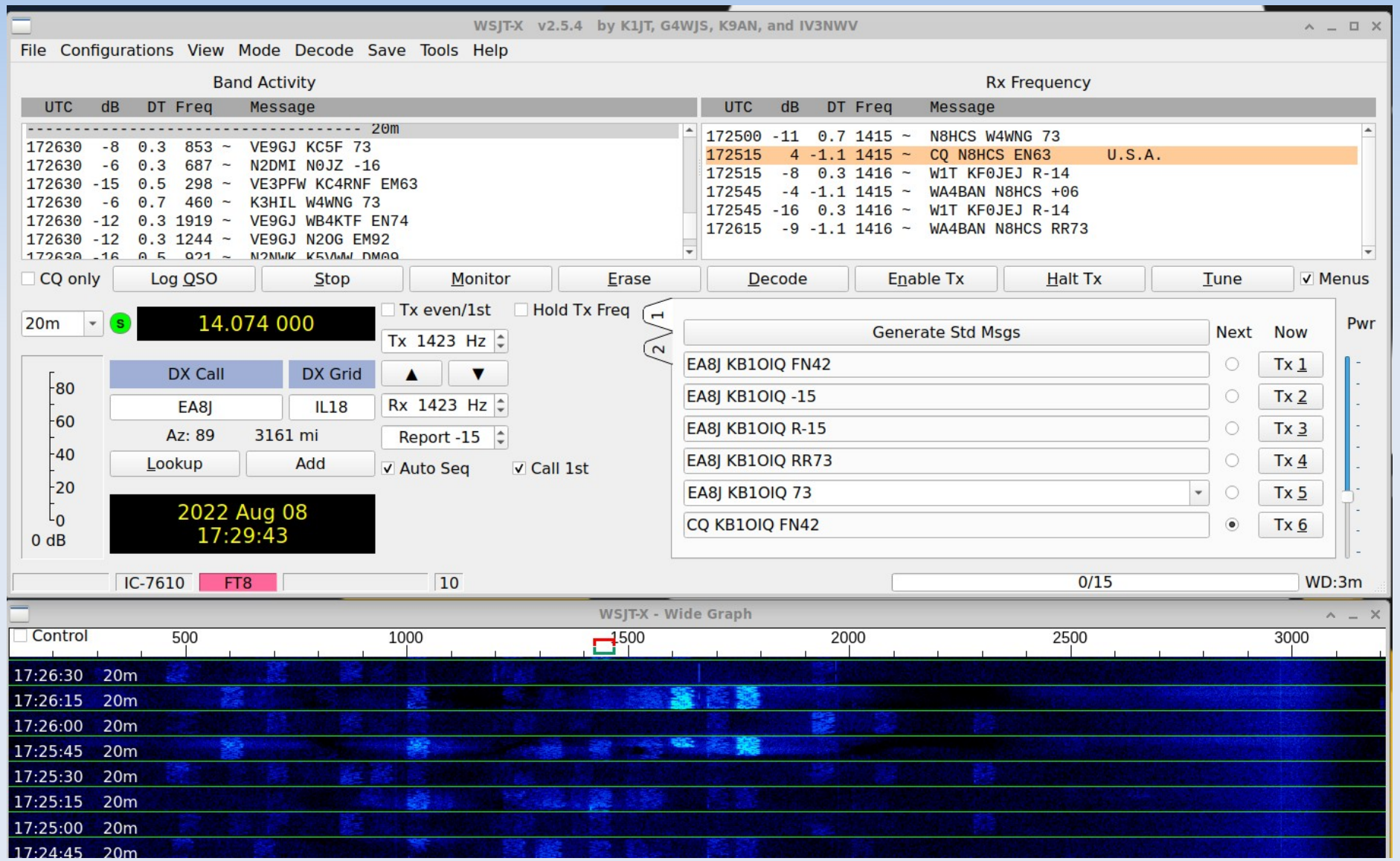
Digital Modes - wsjtx



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GridTracker

- As of v25a: GridTracker is installed by default
- This is a MOST EXCELLENT program!
- Graphically manage grids:
  - Needed, Contacted but not confirmed, Confirmed
- Talks to wsjtx (and wsjtx talks to xlog)
- Logs sent to LoTW and others

GridTracker

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Menu #3

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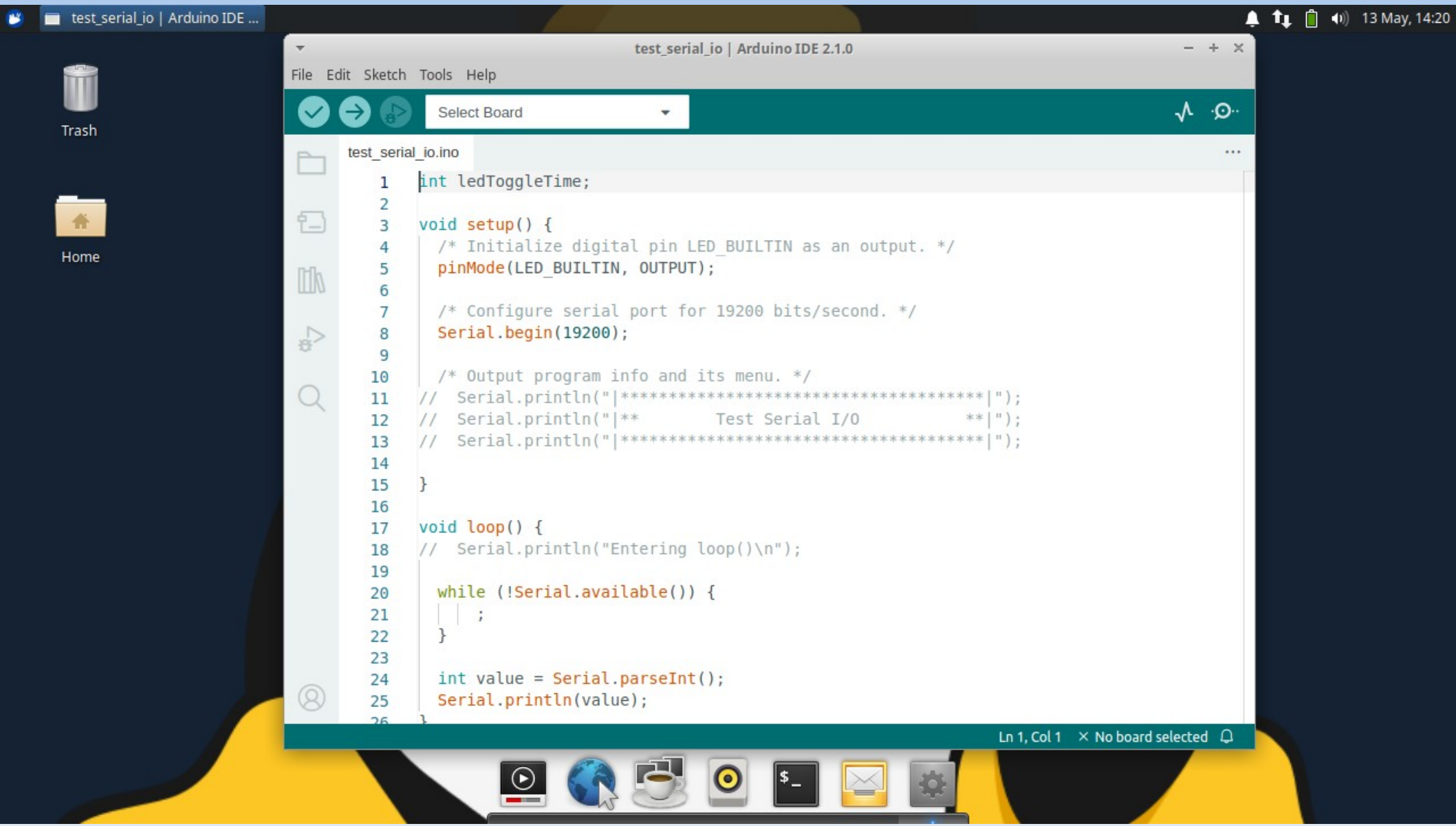
Electronic Design - arduino



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Electronic Design - coil64

Coil64 v2.1.26

13 May, 14:22

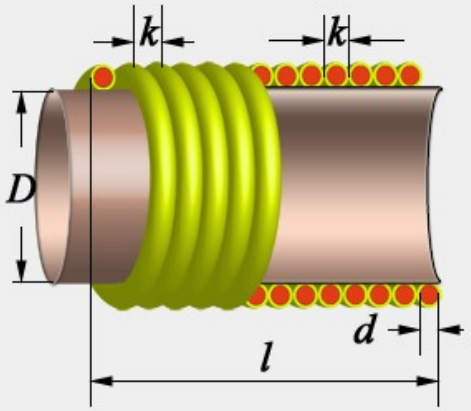
Coil64 v2.1.26

Trash

Home

Coil64 v2.1.26

File Actions Additional calculations Ferrite cores Branded cores Customize Help



Select the coil form

- One layer close-winding coil
- One layer coil with round wire
- One layer coil with rect wire
- One layer coil on a polygonal former
- Multilayer coil
- Multilayer coil with insulated pads
- Multilayer coil on a rectangular former
- Multilayer foil-wound coil
- Ferrite toroid coil
- PCB flat coil

Coil | Inductance | LC circuit

Inductance L: 50 microH

Frequency f: 0.6 MHz

Former diameter D: 37 mm

Wire diameter d: 3 mm

Wire diameter with insulation k: 3.27 mm

Select initial data of the calculation

- (•) Former diameter and wire diameter
- ( ) Former diameter and winding length

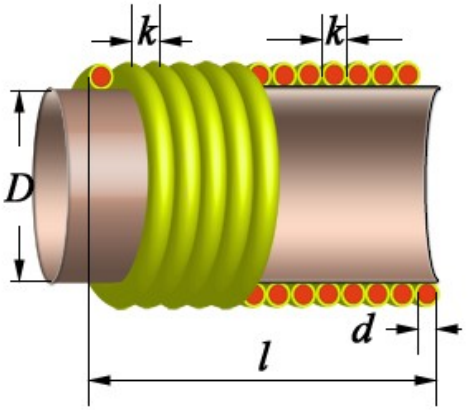
Wire material:

- (•) Copper
- ( ) Silver
- ( ) Aluminum
- ( ) Tin

Calculate

1 - 5/13/23 2:22 PM

Coil64 v2.1.26 - One layer close-winding coil



Input:
Inductance L: 50 microH
Frequency f: 0.6 MHz

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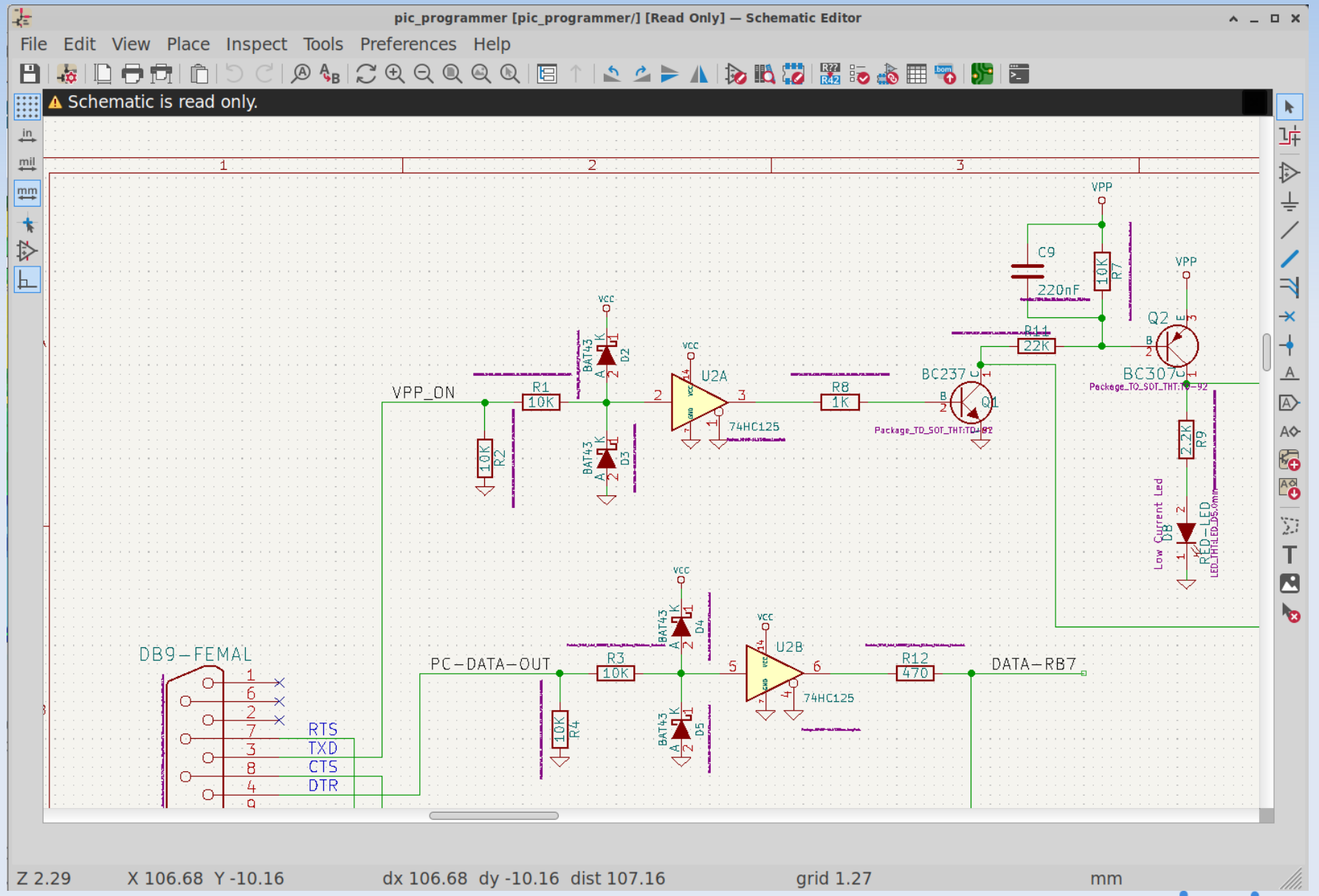
Electronic Design - kicad



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Menu #4

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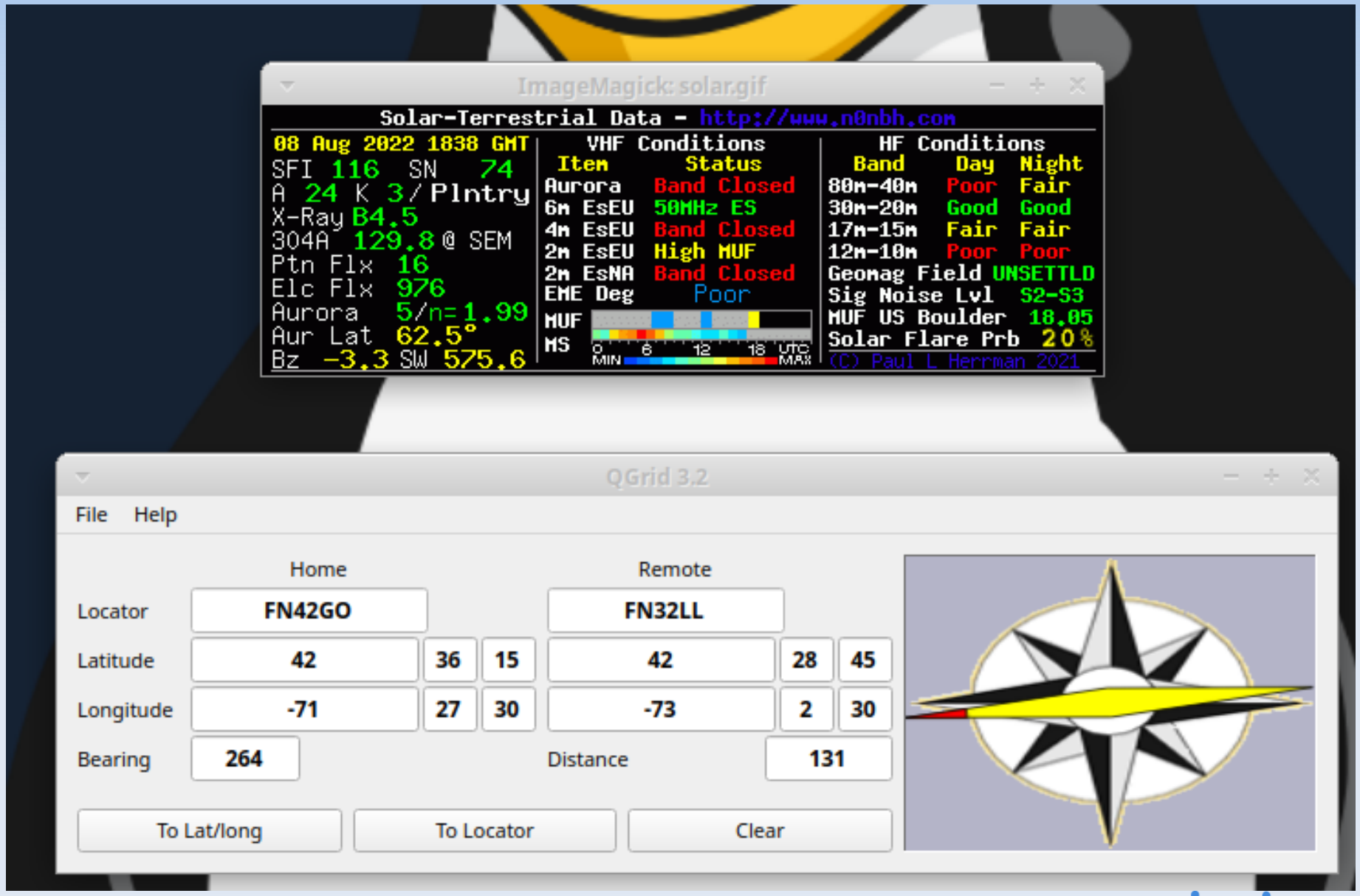
HF Propagation #1



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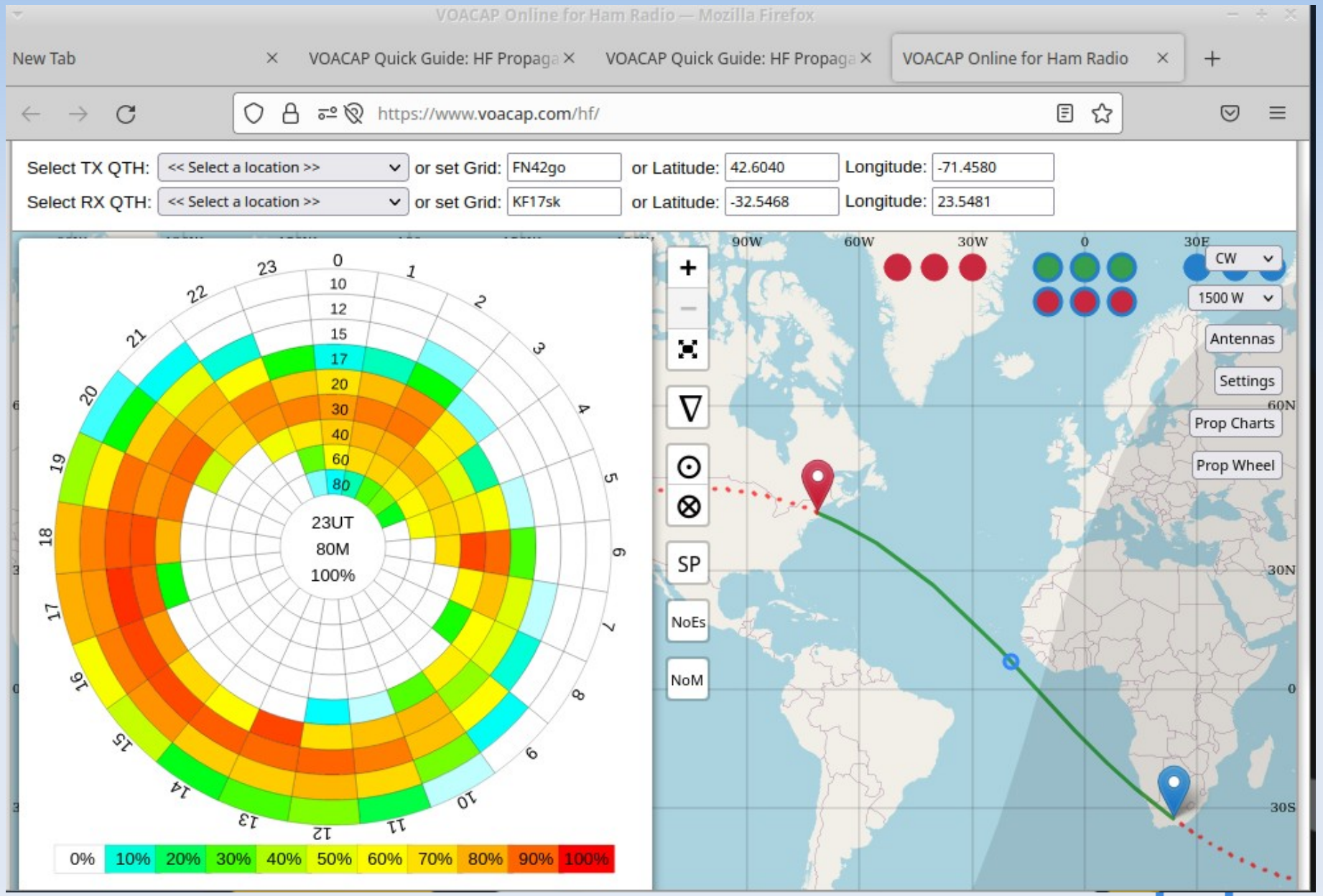
HF Propagation #2



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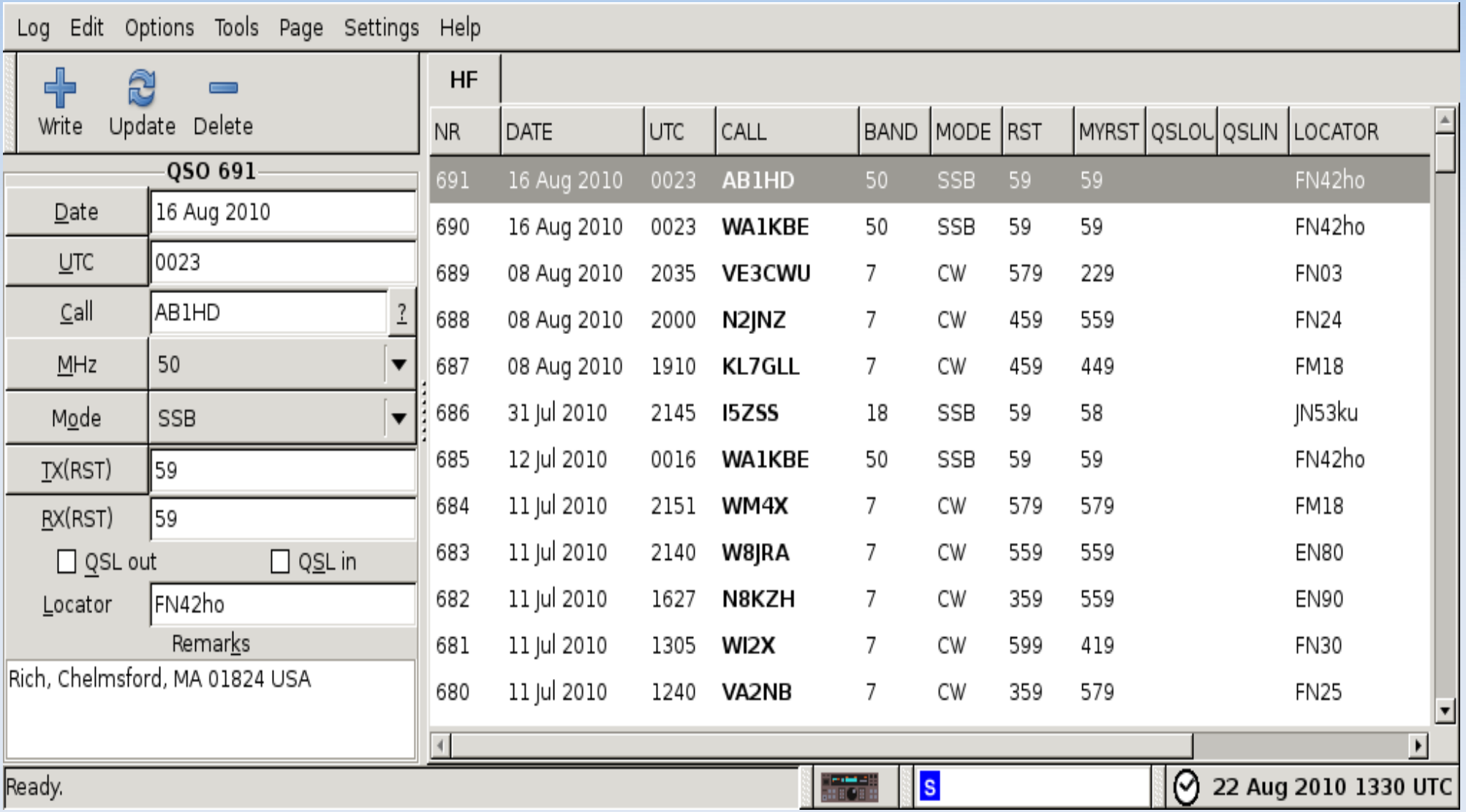
Logging SW: Xlog



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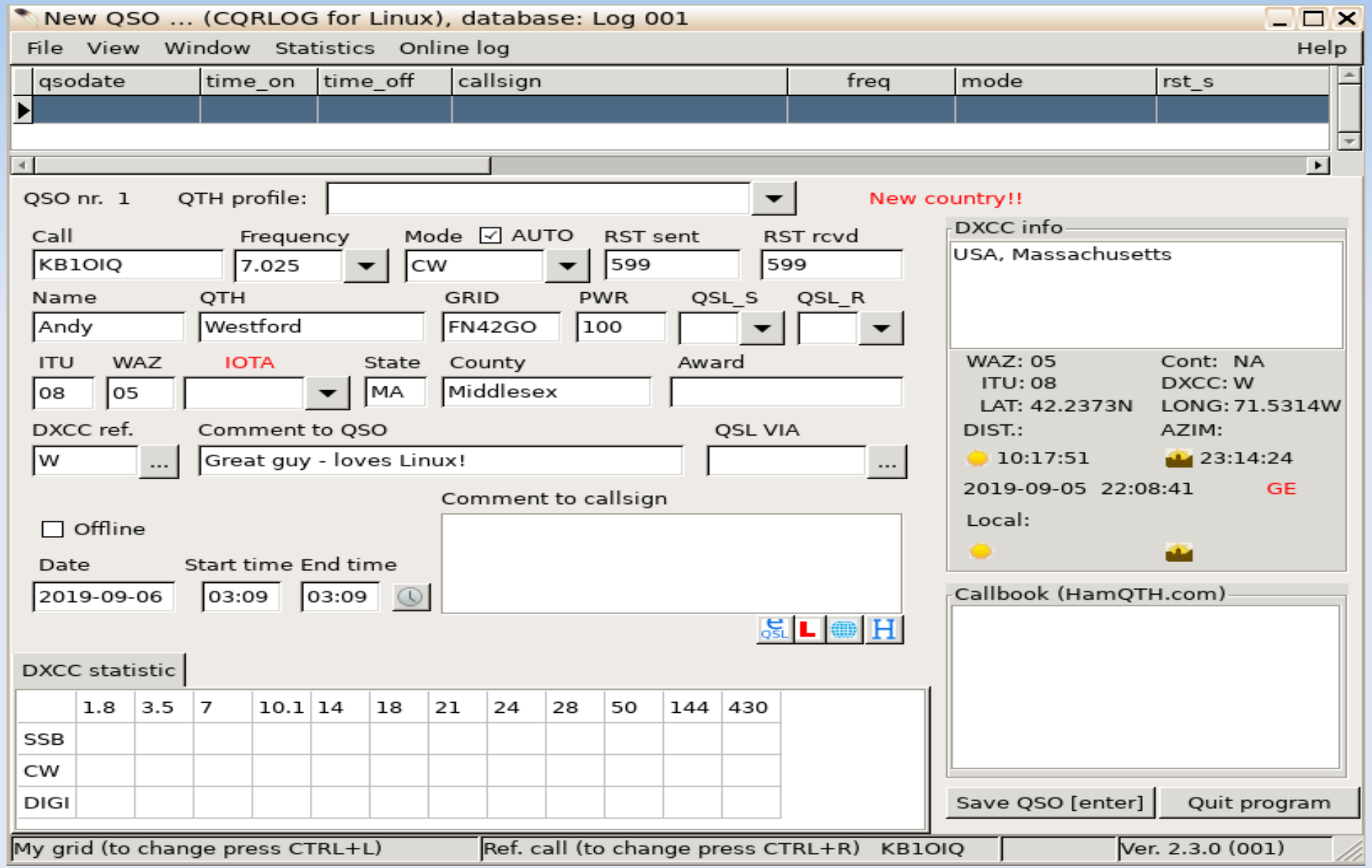
CQRLOG



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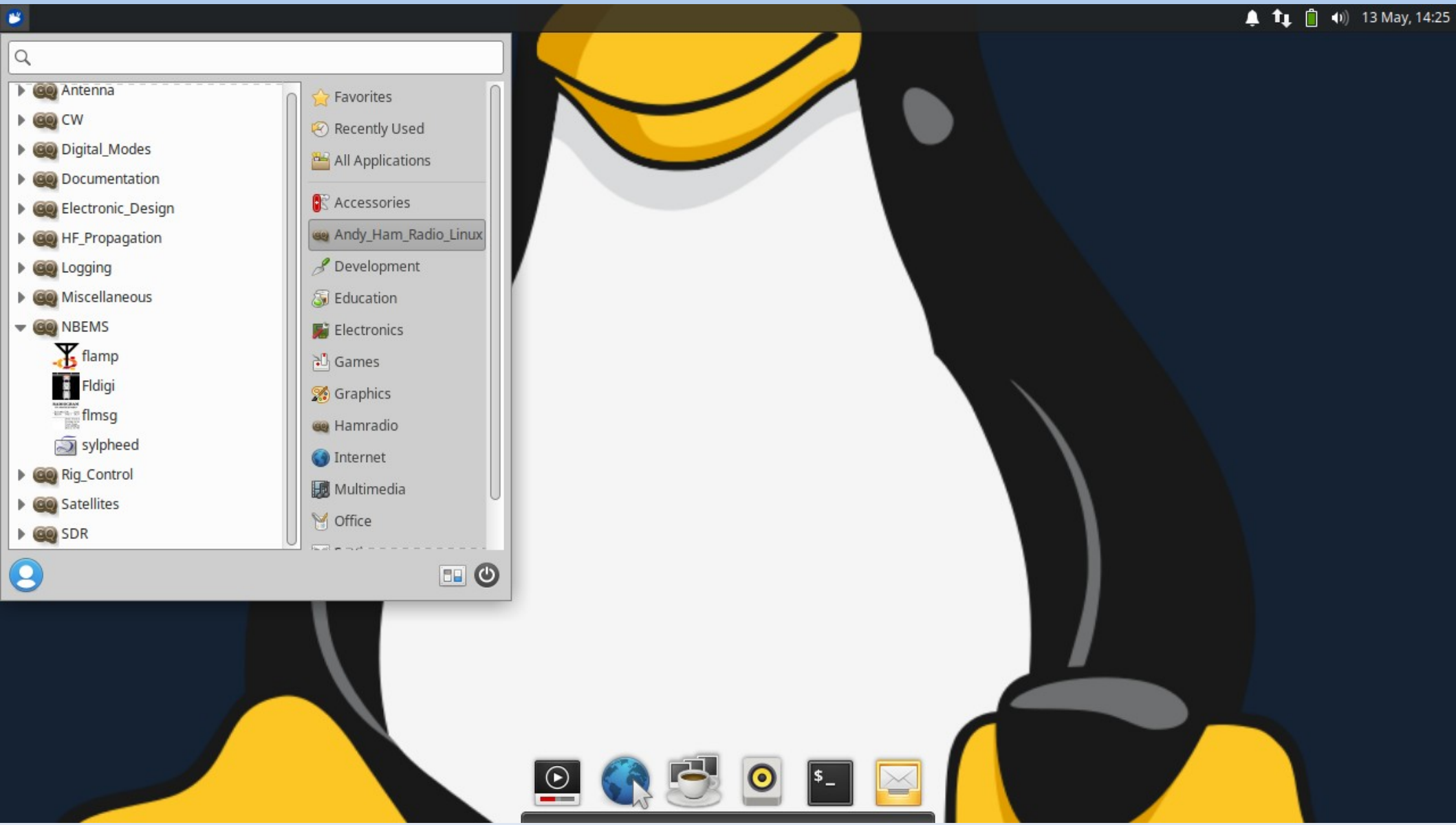
Menu #5



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NBEMS

- Narrow Band Emergency Messaging System
- Open Source software suite
- Runs on the 3 major operating systems
- No infrastructure required
- Used by EMCOMM folks
- Ties in with sylpheed email program

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Menu #6

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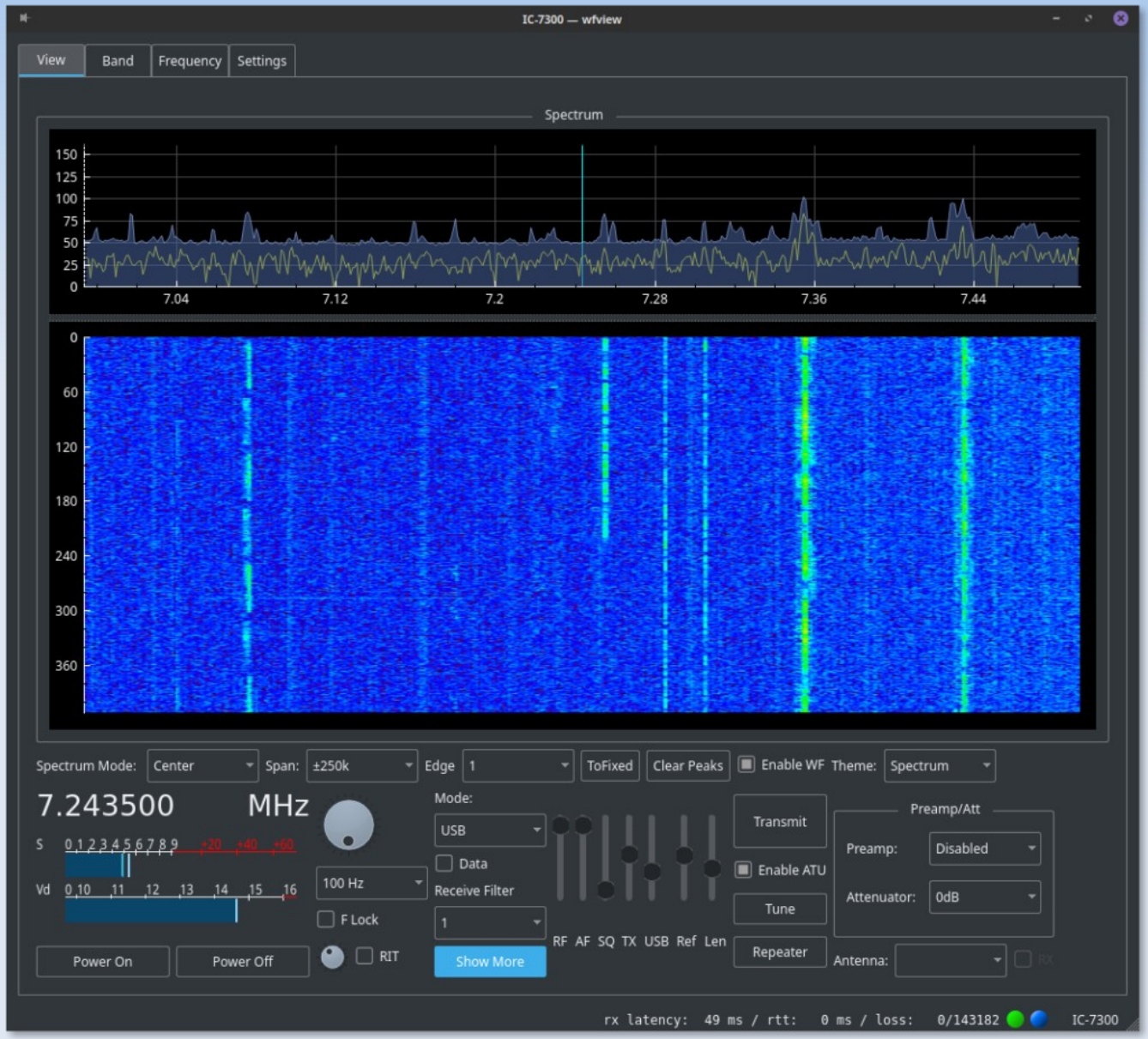
Rig Control - wfview



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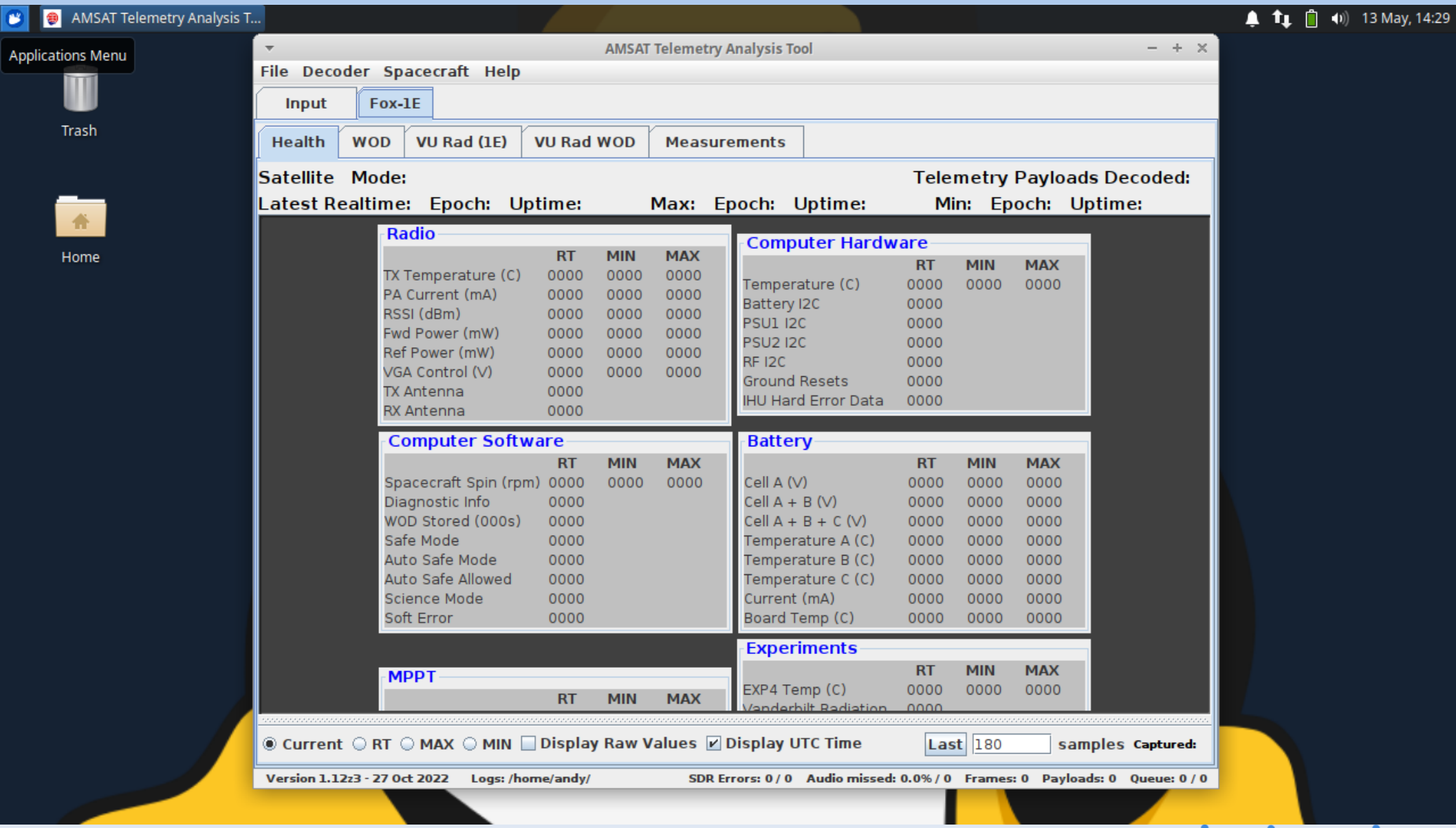
Satellites - FoxTelem



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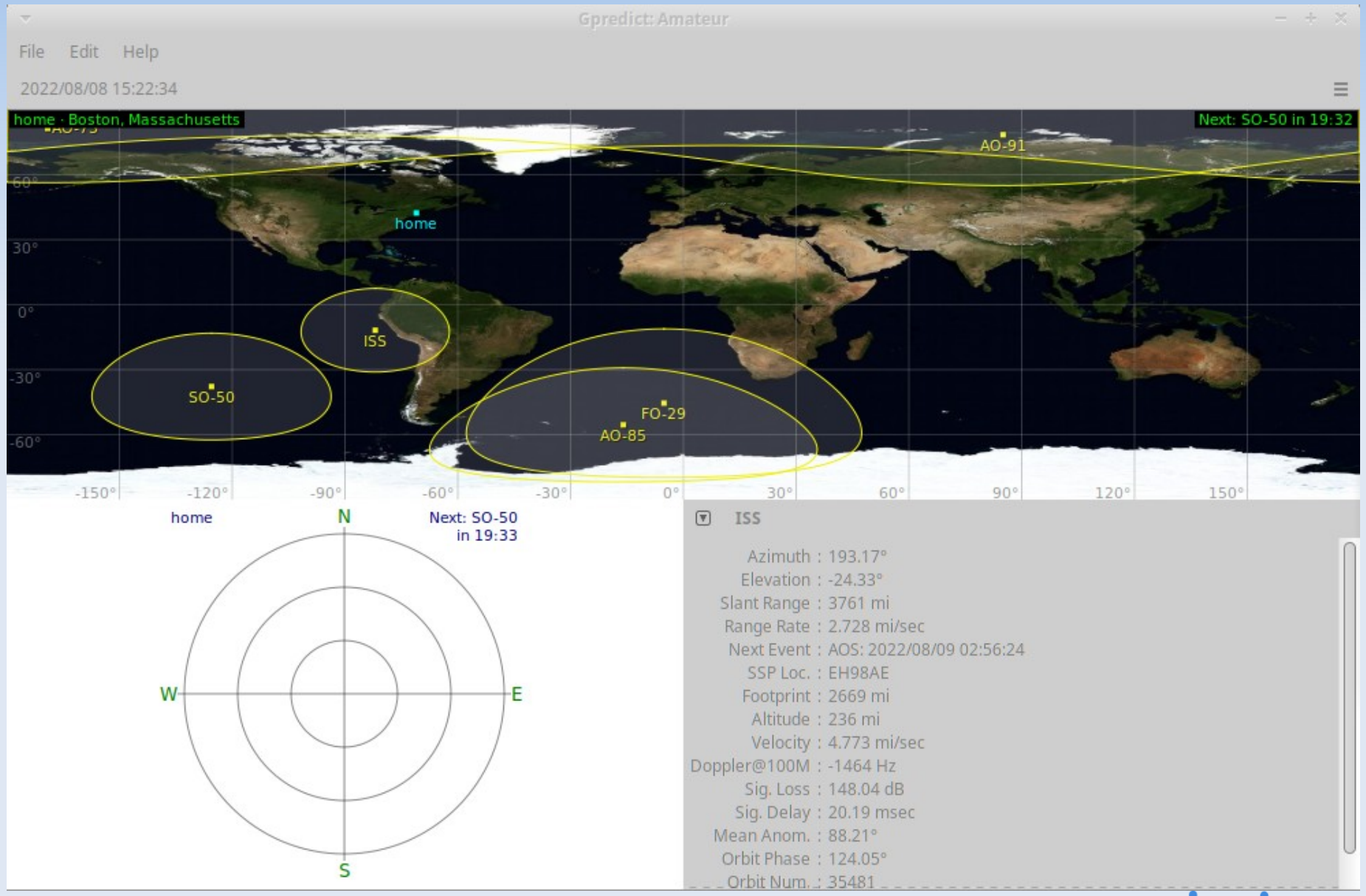
Satellites - gpredict



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SDR – GNU Radio Companion

- SDR = Software Defined Radio
- Draw a block diagram of your signal processing
- GRC will write the Python code and execute it
- Supports SDR devices such as:
  - RTL-SDR dongle
  - HackRF
- Many tutorials are available online

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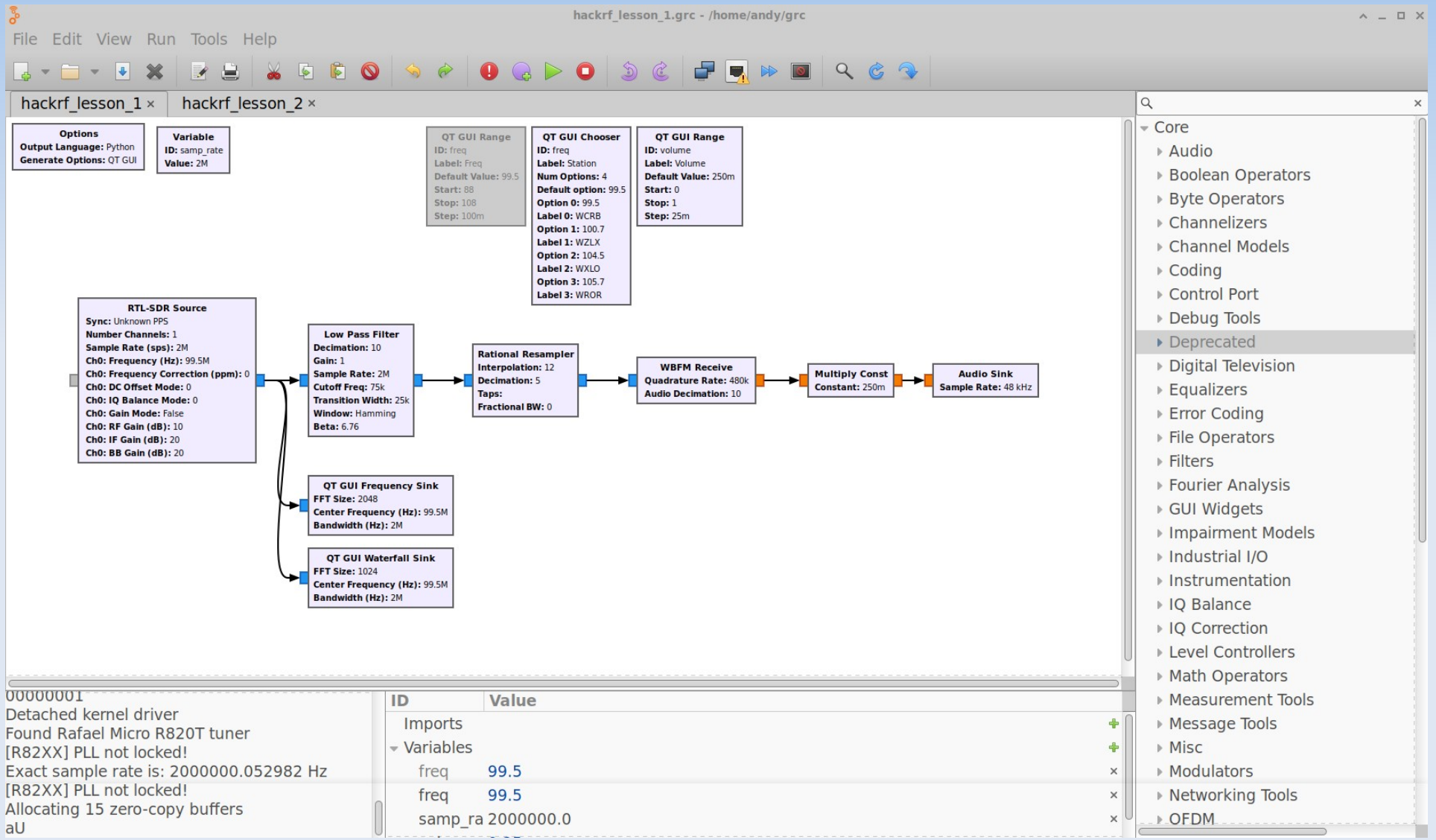
SDR – GNU Radio Companion #1



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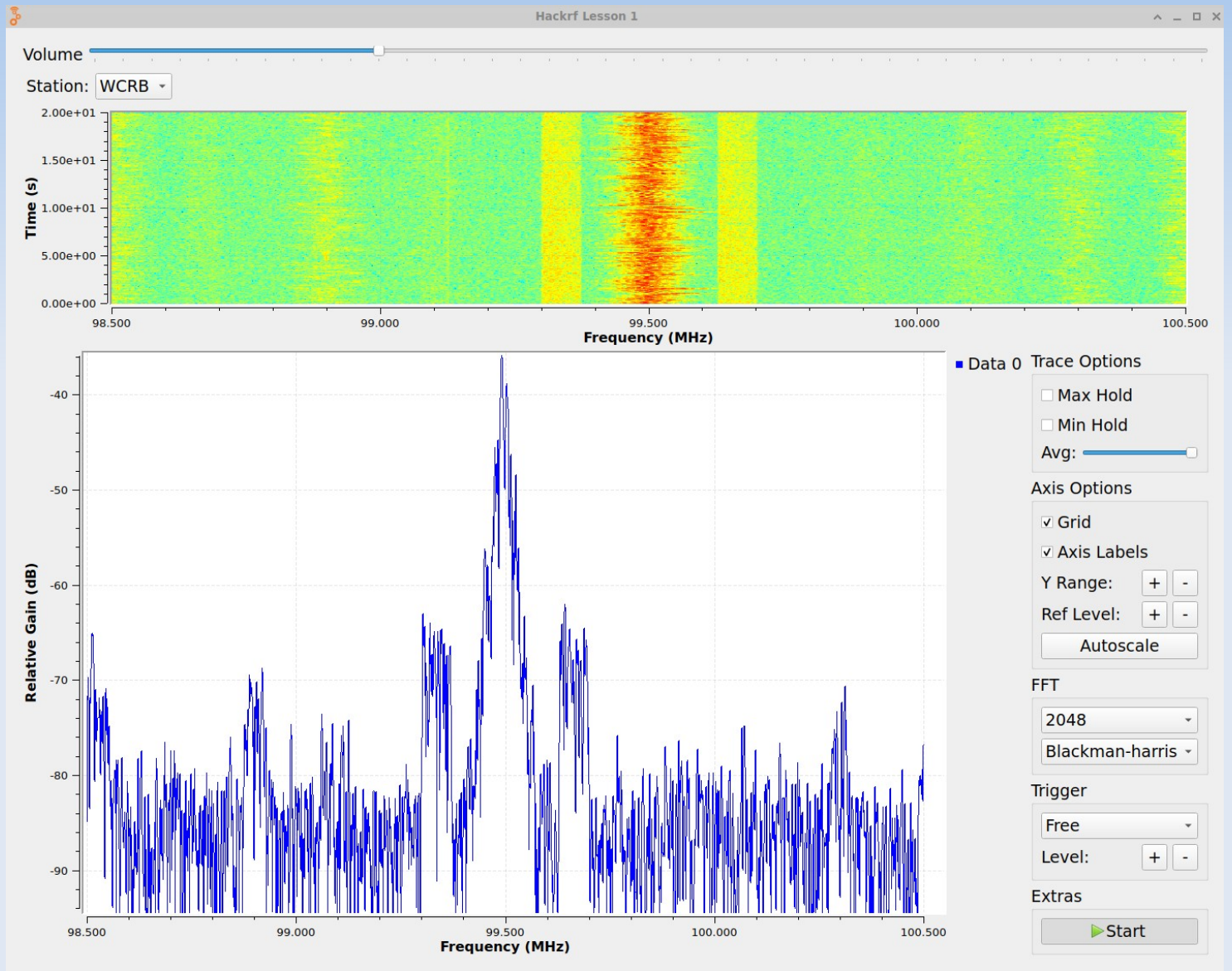
SDR GNU Radio Companion #2



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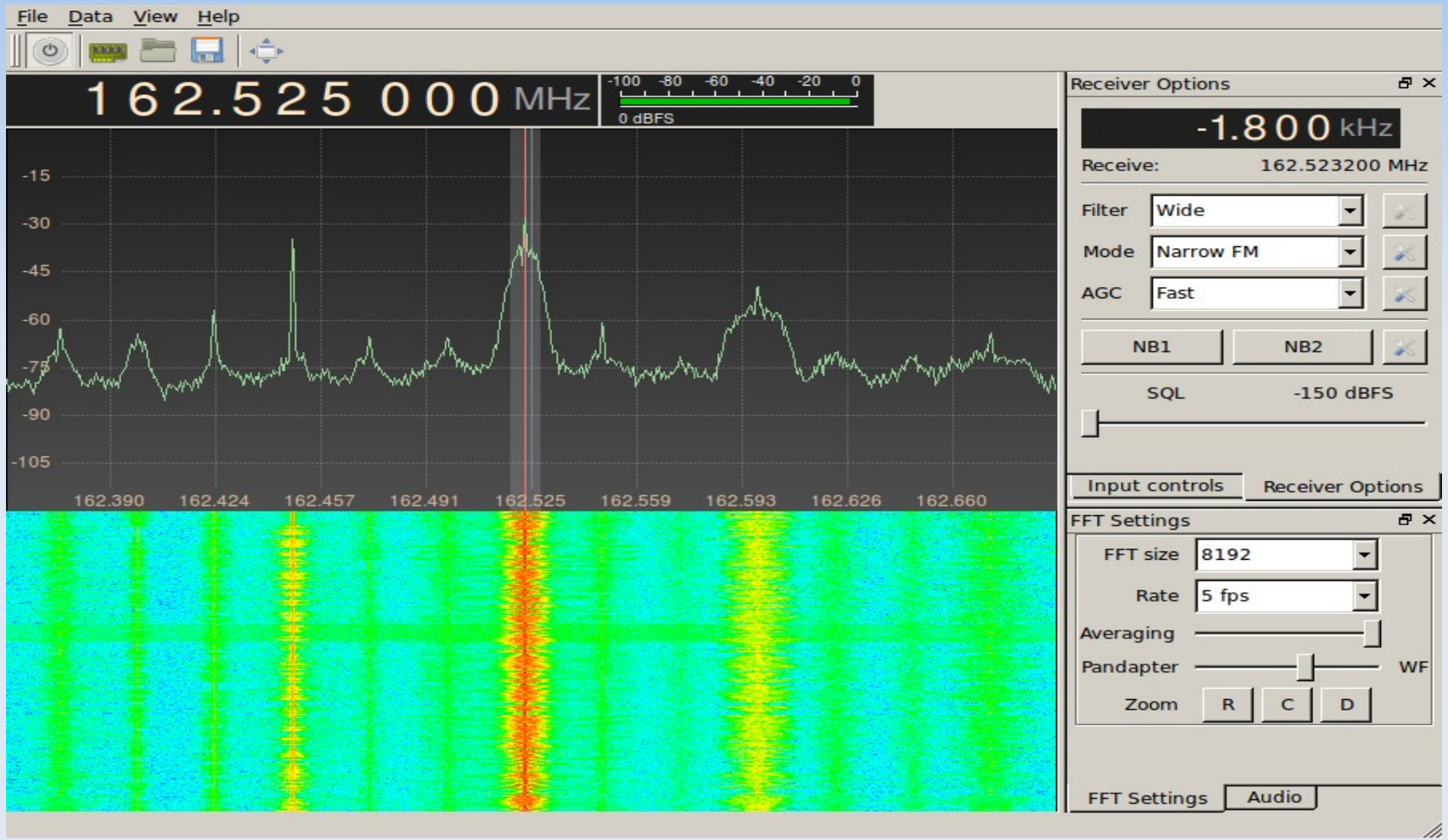
SDR - gqrx



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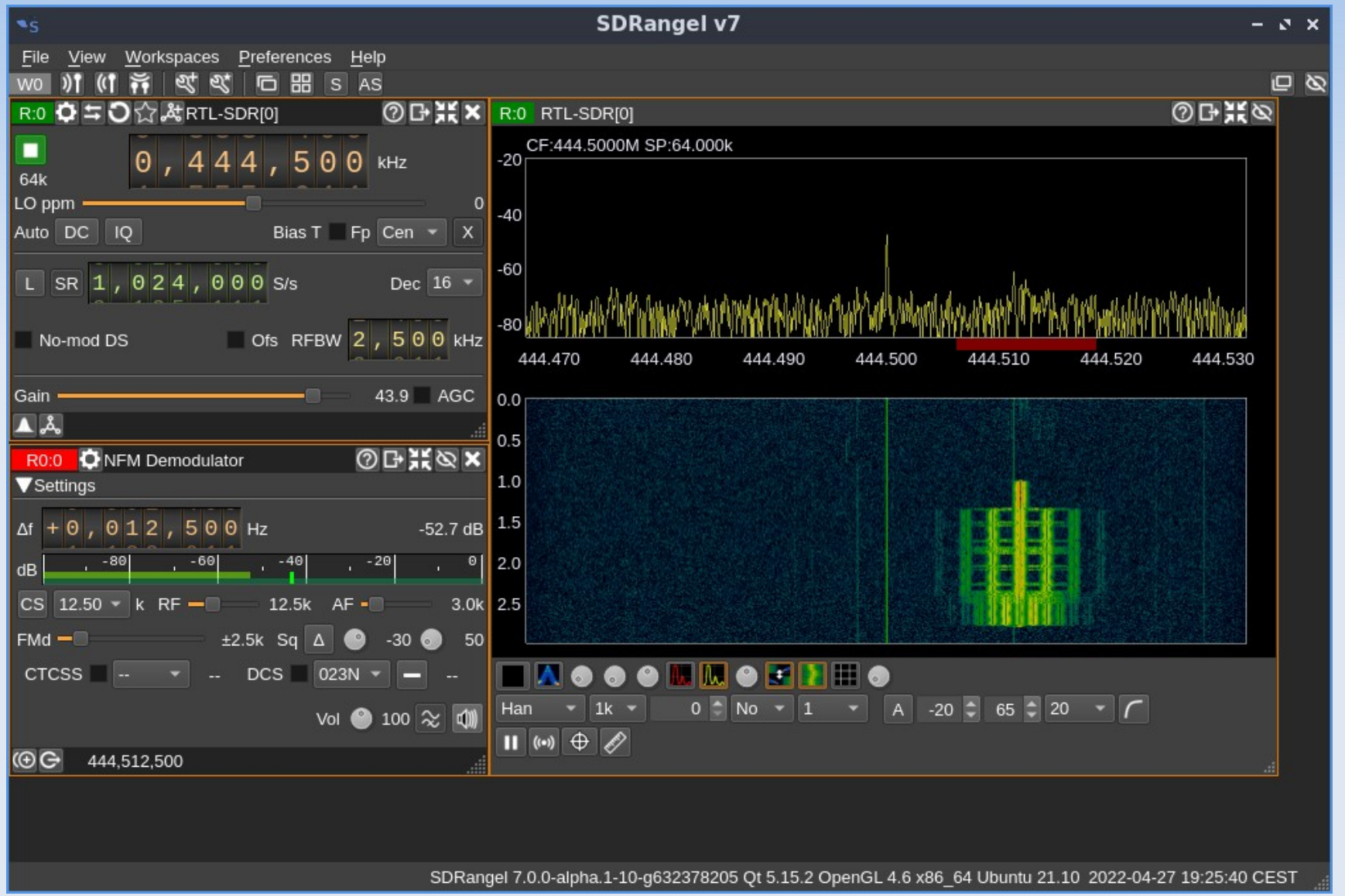
SDR - sdrangel



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What’s new and cool?

- Free Digital Voice (FreeDV)
  - Codec2: David (VK5DGR) Rowe
  - https://freedv.org/
- M17 Project
  - Low level protocols using Codec2
  - https://m17project.org/
  - Jan 2023: liberated two TYT MD-380s which now run M17(!)
  - M17 software available in AHRL v25a
  - I’m eager to learn more about M17

Raspberry Pi Version of AHRL

- 0.1alpha is IN PROGRESS
- Release date: prior to the Dayton Hamvention (middle of May 2024)
- Tested on:
  - Raspberry Pi OS 5.2
  - Raspberry PI 5
  - 64-bit OS
- Other configurations MIGHT work …….

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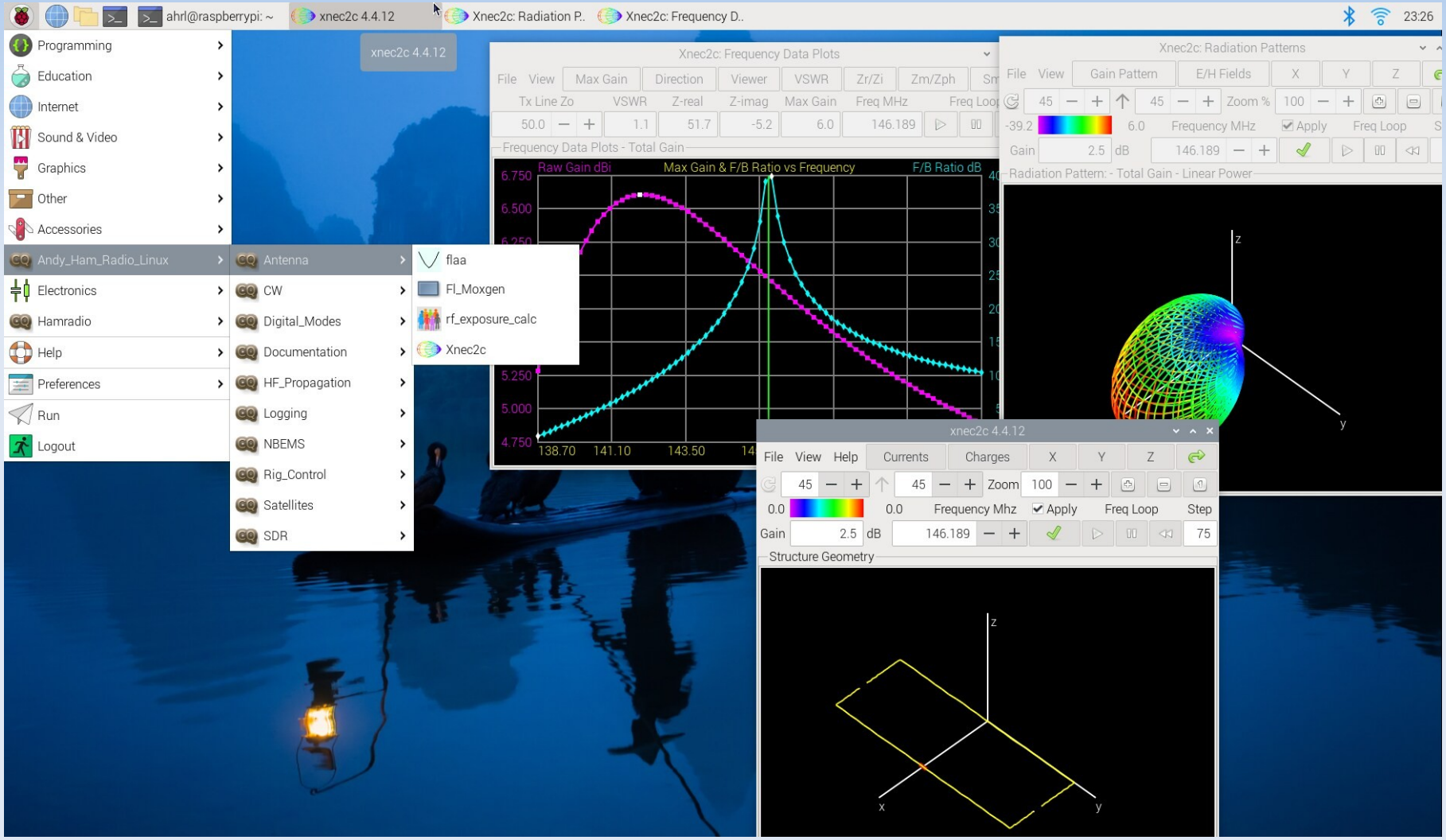
Raspberry Pi 5 AHRL Screenshot



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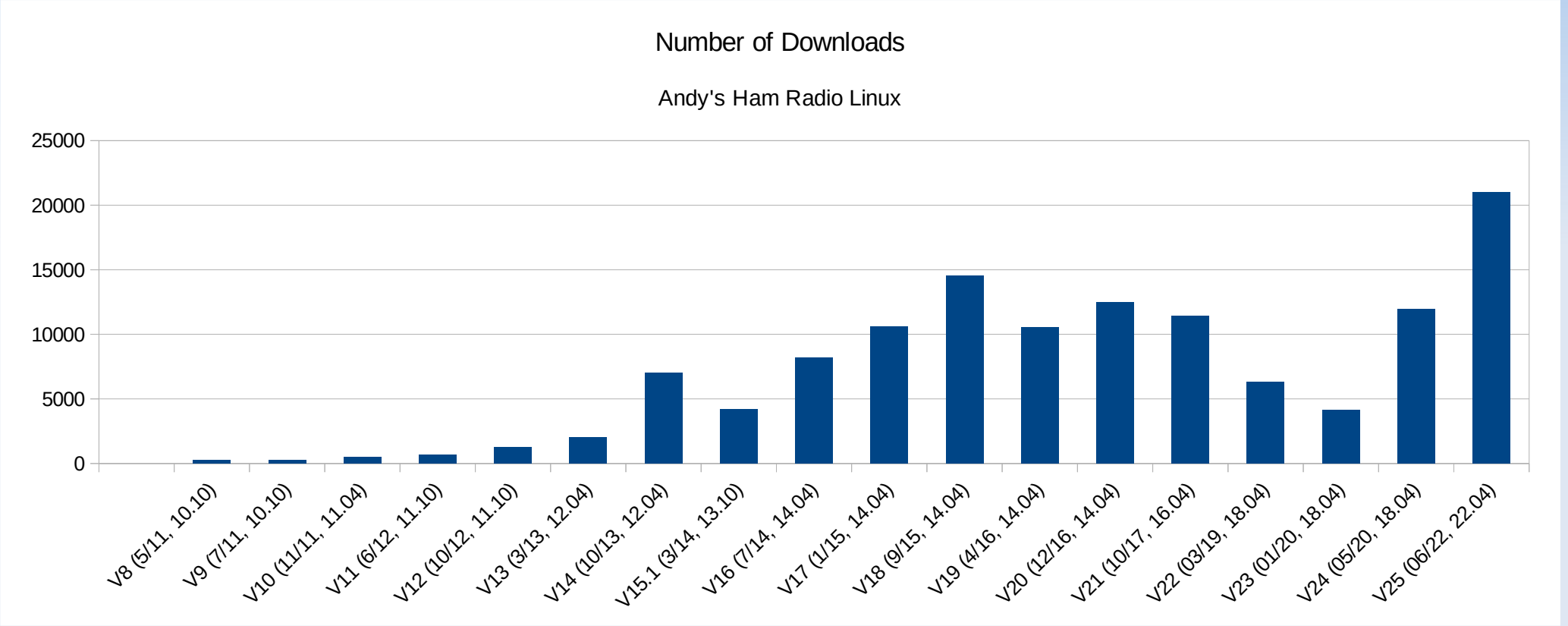
Downloads



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Awarded 03/2022

- 11 years and 100,000 downloads later…….
- https://nediv.arrl.org/2022/03/02

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Sourceforge

- Go there: http://www.sourceforge.net
- Search for KB1OIQ
- Other ham radio programs are there:
  - uBITX modified for blind amateur radio users
  - Bionics configuration programs
    - MicroFox, TinyTrack
  - Wordsworth – collaboration with K1IG
    - a way to learn CW
  - aa-analyzer for older Rig Expert analyzers

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Related Online Videos

- Online video of a similar talk to RATPAC:
  - Radio Amateur Training
    Planning and Activities Committee
  - https://youtu.be/BOlHi73zY74
- Online Review of AHRL by KB9RLW
  Kevin, ”The Old Tech Guy”
  - https://www.youtube.com/watch?v=HEd5uMoksa8

Last Slide!

- Questions?
- Slides available:
  - Email: kb1oiq@arrl.net
- Thanks for coming to this talk!
- Have a lot of fun, and 73 de Andy KB1OIQ

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