Digital Data Communications in Amateur Radio

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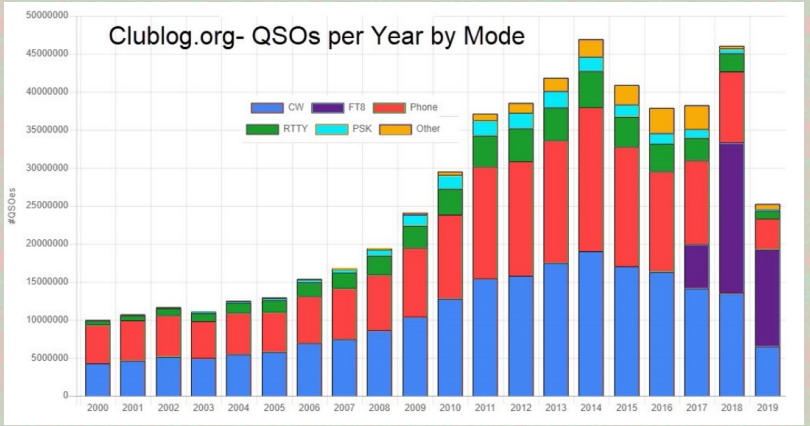
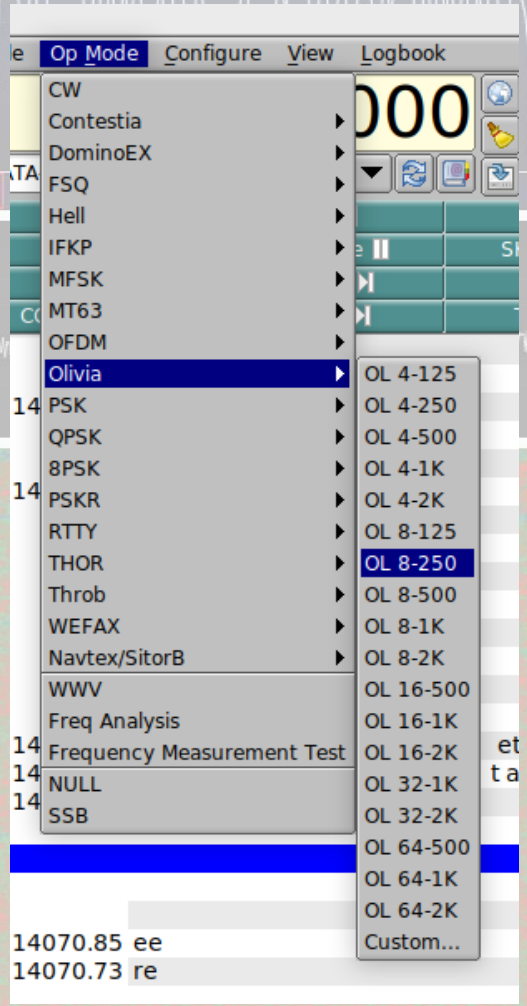
History of Digital Communications in Amateur Radio

- David Casler (KE0OG) provides an excellent, in-depth overview of Amateur Radio digital data communications on YouTube at https://www.youtube.com/watch?v=tXLXe9C7JX8
- Morse Code to FT8
- Evolution over the decades: from RTTY to modern digital modes (up to 2019)

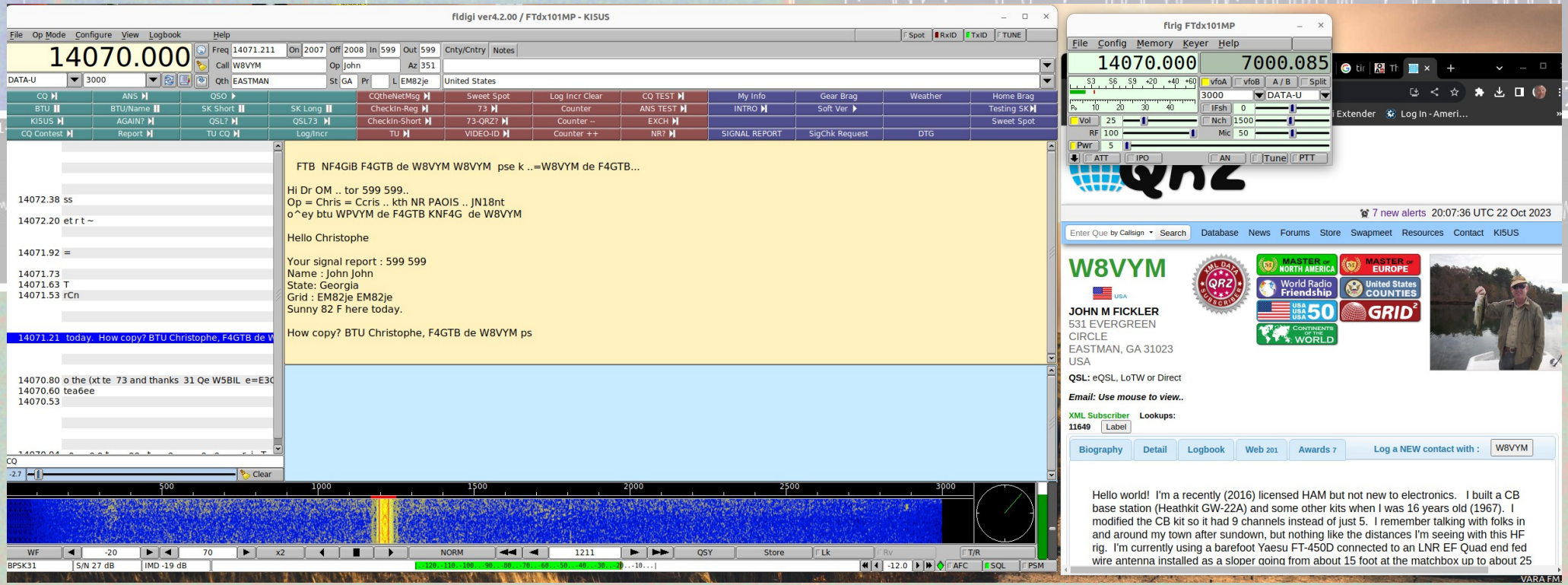


Digital Data Modes

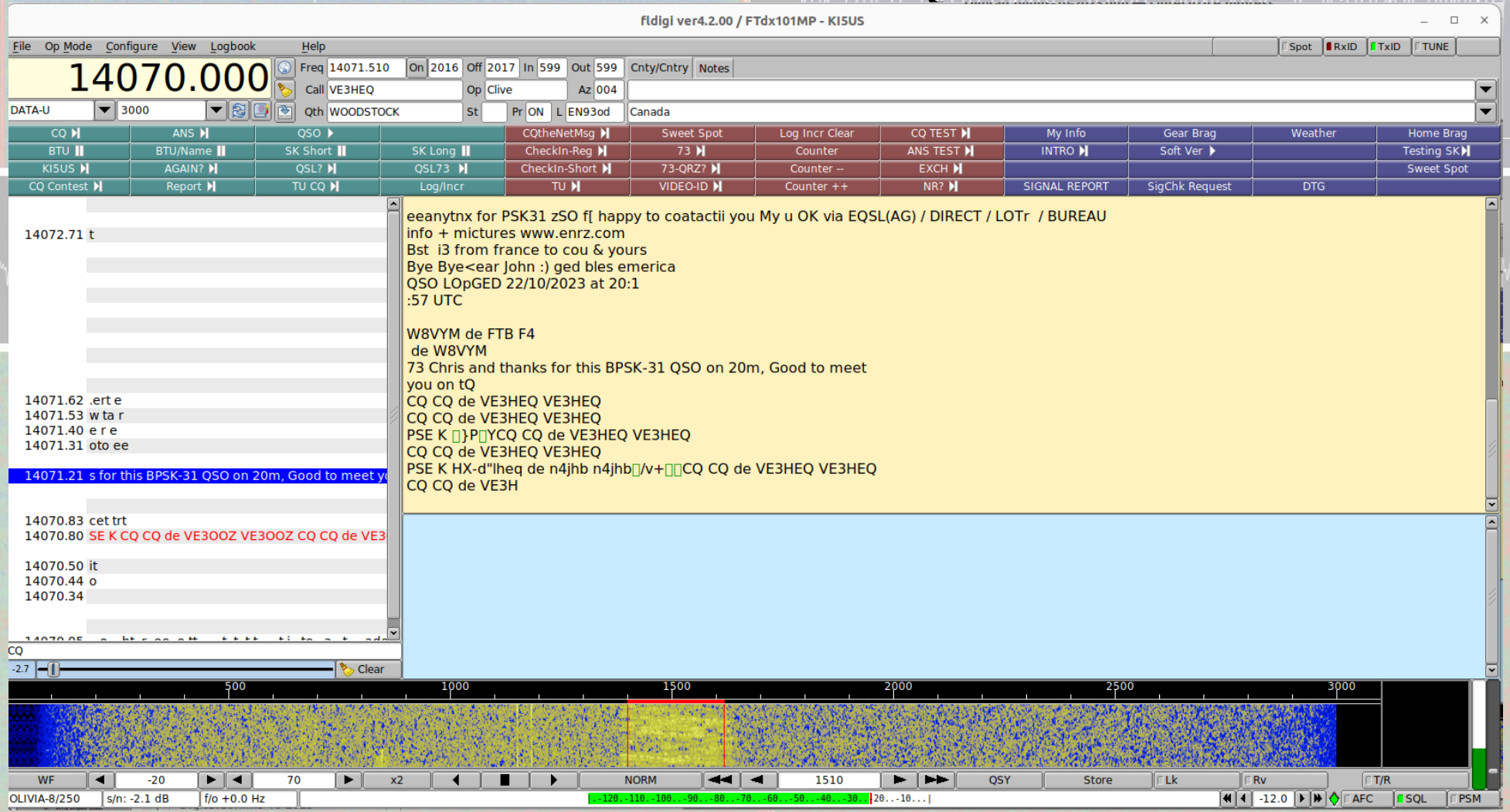
- Introduction to what constitutes a digital mode
- Highlighted Common HF Modes:
  - PSK (Phase Shift Keying) - PSK31, PSK63, etc.
  - RTTY (Radio Teletype)
  - Olivia, Contestia, Thor
  - Many more…..



Typical PSK31 QSO

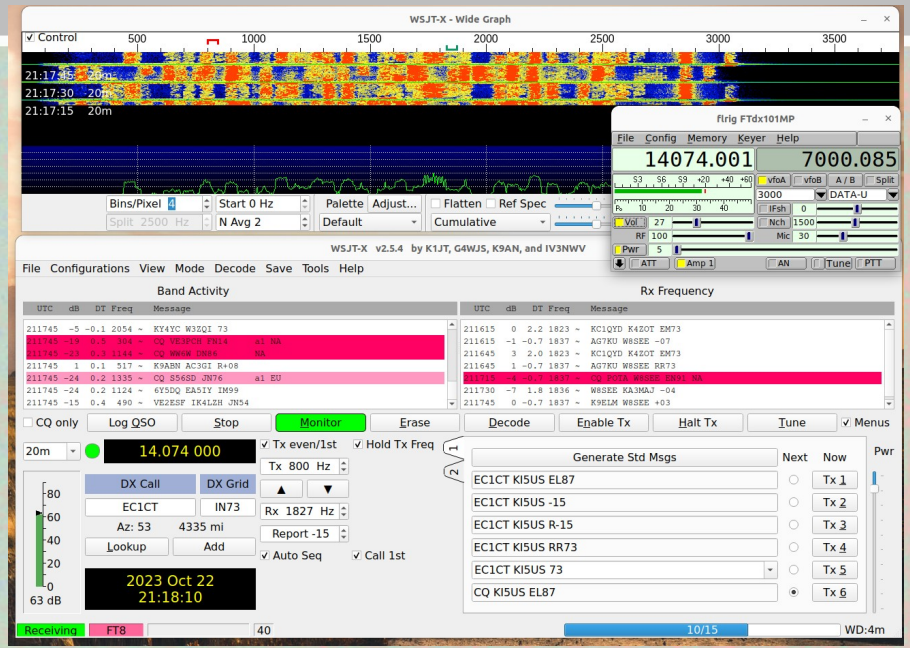


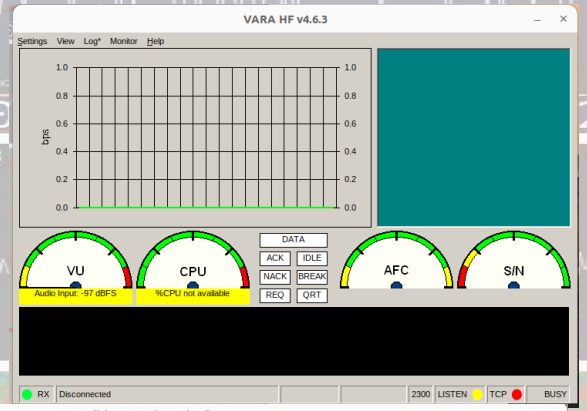
Olivia 8/250 CQ

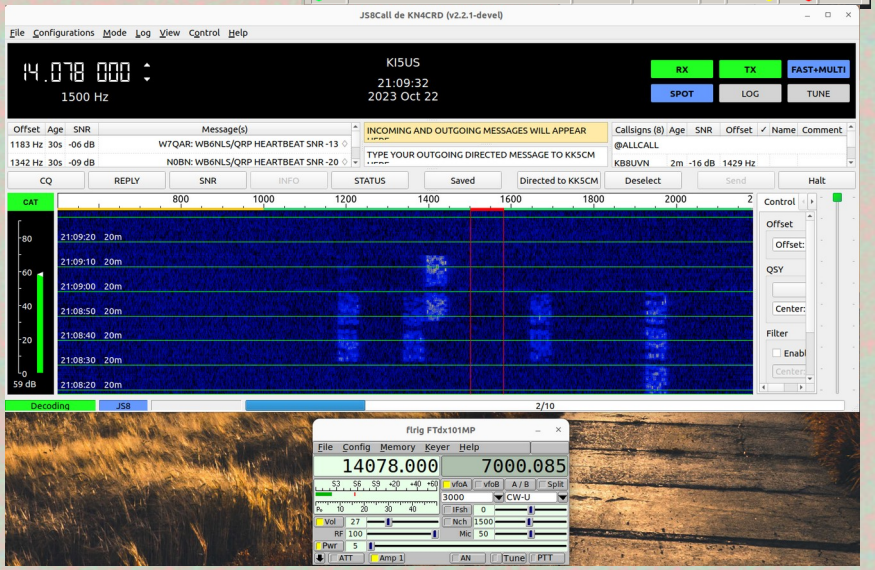


Digital Data Modes - cont'd

- VARA
- Others (e.g., FT8, JT65, JS8Call, WSPR, Packet, APRS and more)







Worth Mentioning: SSTV

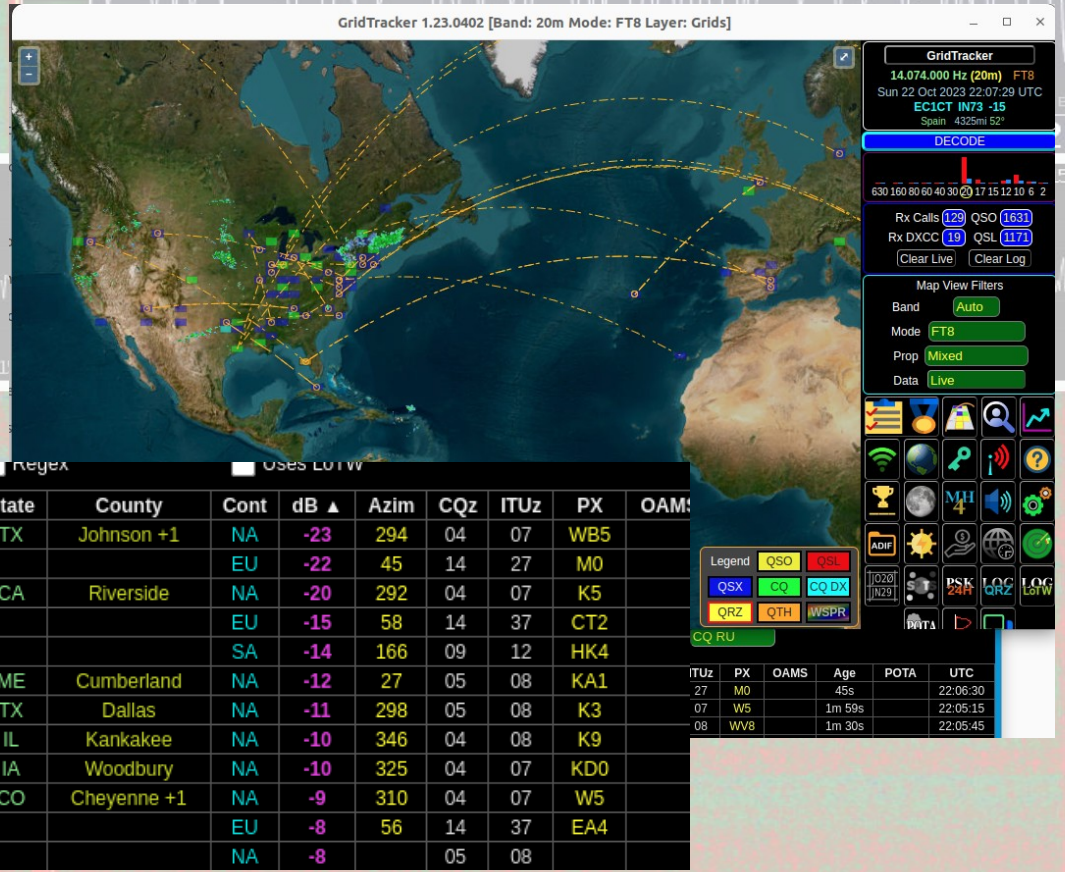
- MMSSTV (Windows)
- QSSTV (linux)
- Generally use the same hardware configuration as the digital modes
- Also worth mentioning: ALL of these Digital Data Modes work on VHF & UHF (just not as far!)

Applications Implementing Digital Modes

- Software overview:
  - Winlink (RMS) Express [1-to-1 / email]
  - WSJT-X, JS8Call, GridTracker
  - FLDIGI, FLRIG, FLAMP, FLARQ, FLMSG [1-to-Many]
  - Ham Radio Deluxe
- Hardware interfaces:
  - Modern radio that supports CAT control (internal sound card)
  - DigiRig
  - Signalink
  - RigBlaster, etc.

Why Digital Data Communications in Amateur Radio? - Part 1

- Enhanced communication in weak signal environments
- Efficient bandwidth usage
- Ability to transmit text, data, images, and more

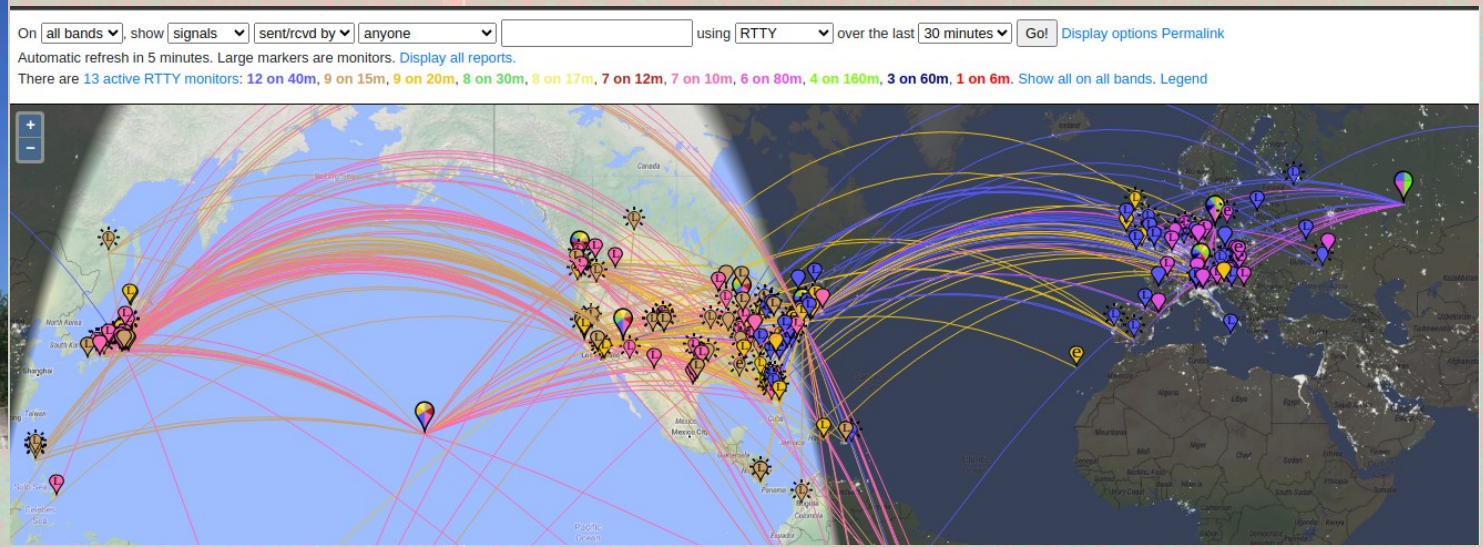


Why Digital Data Communications in Amateur Radio? - Part 2

- ARES (Amateur Radio Emergency Service) applications
  - Disaster communications
  - Relay of critical information
- RACES (Radio Amateur Civil Emergency Service) applications
  - Civil defense purposes
  - Backup communications for governmental entities

Real-world Applications & Examples

- Digital modes in DXing (long distance communication)
- Moonbounce (EME) and Meteor Scatter
- Remote telemetry and control

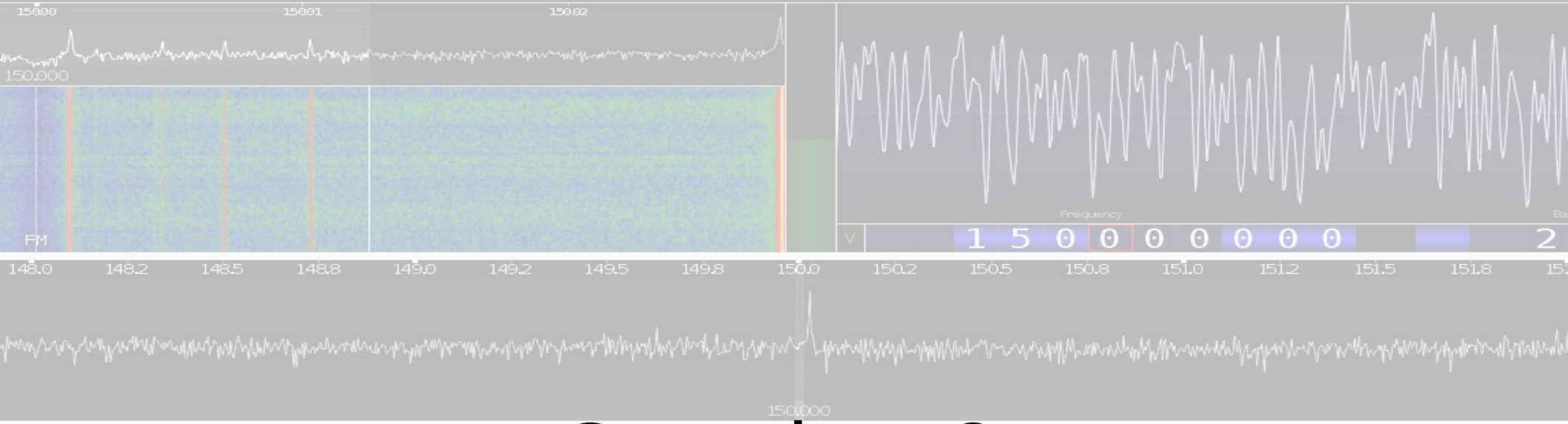


On-The-Air Opportunities

- W1AW (www.arrl.org/w1aw)
  - Receive-only digital bulletins
  - Weekdays at 6pm & 9pm [RTTY/PSK31/MFSK16]
- HF Digital Bands
  - FT8 is hard to miss when the band is up (ex: 14.074 MHz)
  - Free-form QSOs within designated digital bands
    - https://www.bandplans.com/
  - Winlink nodes (HF/VHF/UHF)

Challenges & Considerations

- Balancing mode efficiency vs. bandwidth
- Ethical operating practices
- Future trends and emerging modes
  - Starlink, Network-based methods
- Attracting new, and mentoring junior, Hams


150.000
150.001
150.002
FM
Frequency
1 5 0 0 0 0 0 0 0 0
148.0
148.2
148.5
148.8
149.0
149.2
149.5
149.8
150.0
150.2
150.5
150.8
151.0
151.2
151.5
151.8
150.000

Questions?