



# Digital Modes on VHF 2020

*Alaska VHF - Up Group*

## Purpose

This is a beginner-friendly overview that will show you how to get started with digital modes.

## Topics

1. What are digital modes?
2. Why use digital?
3. What gear do I need?
4. How do I set it up?



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## What are digital modes?

It's not your grandma's ham radio!

- Instead of using voice or CW, you send and receive text, images, email, etc.
- Many modes are more efficient than CW . . . and faster too!

What makes it different?

- Analog SSB sends the sound of your voice by modulating a CW signal.
- Digital SSB modes send text by using tone combinations to encode the letters.

Examples:

- RTTY, PSK31: keyboard to keyboard modes that are fast, efficient, and fun.
- 1200 baud packet: Sends data in discrete chunks at a time. Great for
- WSJT modes: *extreme* weak signal work. (FT8, JT65, etc.)

What about digital **voice**?

*DMR, System Fusion, and DSTAR are also digital modes, but they encode the sound of your voice rather than text. These modes are slowly replacing FM voice, and perform much the same functions. For this presentation we are focusing on non-voice, SSB-based modes that can give greatly increased range and efficiency.*



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## Why use digital?

### Because it's fun!

- These modes are a great way to try something new.
- Digital is dominating ham activity. Go where the action is!

### Make the most of a “little gun” station.

- Using more than 20 watts (HF) is usually excessive.
- Basic antennas can be very effective.
- Some modes even work when signals are so weak they are inaudible.

### Open up new ways of operating.

- Digital contests abound: RTTY Roundup, ARRL VHF, Field Day, etc.
- Emergency communications is HEAVILY digital (especially Winlink).
- Amateur satellites use digital modes (packet, telemetry especially).
- Can operate QRP from the back country, in camp, or from your RV.

### Allows you to precisely change the bandwidth for your application.

- Wider bandwidth for faster data rates.
- Narrower more range and/or efficiency.

### Connect to the next generation.

- Youth intuitively “get it” with digital and computers.



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## What gear do I need?

### Start with a radio.

- Must have SSB capability. (Exception: Winlink and most packet uses FM.)
- 6 M is the best VHF band. Stay tuned for upcoming AK VHF Up digital activities.
  - On HF there is digital activity on every band.

### Add a basic Windows 7 or 10 computer.

- Any computer less than 20 years old should work.
- Buy a CAT cable to control the radio from the computer.
  - The computer now knows what the radio is doing (mode, frequency, etc.).

### Use an “interface” to link the radio and computer.

- Windows thinks the interface is both a microphone and a set of speakers.
  - That gives you audio in, and audio out.

### Good interfaces:

- Signalink USB: very adjustable, but bulky.
- MiniProSC: more compact, less adjustable.

### Take it outside!

*The “WolphiLink” and Raspberry Pi are two options for creating fully portable digital stations. These are more involved to set up, but allow you to take ham radio out of the shack and into the field. See <http://oh8stn.org/> for examples.*



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## How do I set it up?

Find someone to help you set up the first time.

- Connect with Alaska VHF-Up members through our email reflector.
- Other reflectors: WSJT, LinuxHam, Win-FLDigi, APRS, APRSIS32 . . . .
- YouTube is also a great resource.

Set up the computer.

- Install FLDIGI from: <http://www.w1hkj.com/>
- Connect the CAT cable to the radio and computer
  - Find the COM port number in “Device Manager”.
  - FLDIGI will then display your radio’s frequency and mode.
- Connect the interface (Signalink or MiniProSC).
  - The manufacturers have step-by-step manuals for setup.
  - In FLDIGI, choose “USB Audio Codec” for the audio in out.

Listen first!

- Tune in to a digital sub-band and see if you can decode transmissions.
- Next, set up your transmit audio level with help from another station.
- That’s it! you’re on air!