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# Motivating Amateur Radio Clubs to Open New Initiatives (MARCONI)

# Program 10: DIGITAL MODES

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## Operational Guidelines

**Statement of Program Purpose:** Digital Modes, the common name for using amateur radio bands to transmit computer data from one place to another over the air, is an aspect of the amateur radio hobby that is open to all license classes. It provides opportunities for licensed amateurs, with a modest investment in specialized equipment, to participate in an engaging Club activity on a regular basis.

**Digital Modes – Defined:** Today, the most commonly used and widely accepted digital mode is FT8. FT8, FT4, WSPR and a host of other digital modes are integrated into a free software application called WSJT-X. There are other modes and software applications to run them, such as VarAC or FLDigi, which has a suite of modes included such as RTTY.

Once up and running on WSJT-X, these other applications can be added to a computer using the same audio and control mechanisms used for WSJT-X to further experiment with.

**Scope of a Digital Modes Program:** There are many ways digital modes can be used to engage existing club members as well to attract new members. Contesting is an excellent group activity and there are multiple such digital mode contests. The ARRL runs a digital mode contest each June that could be organized into a club activity. The World Wide Radio Operators Foundation (WWROF) and the Slovenia Contest Club (SCC) also sponsor the WW DIGI contest at the end of August each year.

In addition, ARRL's Field Day includes digital modes as one of the accepted modes for making contacts. Digital mode contacts are worth 2 points each and can help a club increase their scores and log states that may not be easily contacted on SSB due to poor propagation. Field Day is a great way to introduce new hams to digital modes and show them how computer technology can integrate into amateur radio.

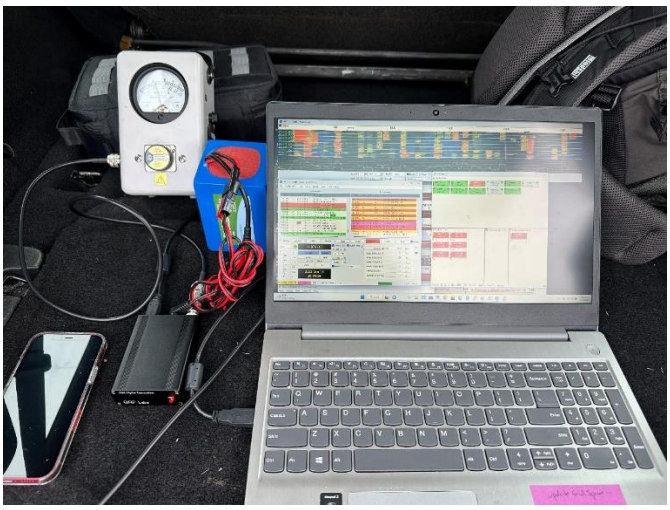
Digital Modes are also an accepted mode for Parks on the Air (POTA). POTA naturally lends itself to a group activity. Gathering in a park, setting up a mobile station and making contacts at a picnic table is extremely easy and the outdoor environment in a public park makes it simple for any club to meet, even if they do not have an official clubhouse or radio shack at an EOC.

For those interested in antenna technology and signal propagation, digital modes can provide near real-time results of antenna transmission and reception performance. It is an excellent tool for experimentation.

If your club members participate in ARES, digital modes can be helpful by using Winlink to communicate emergency traffic via digital modes as Winlink is essentially over-the-air email. Learning how to set up and configure Winlink can be an activity unto itself.

**Equipment Needed to Operate on Digital Modes:** The type of activity, such as the few examples described above, will drive the decision on what equipment would be best to use and the cost to acquire.

A POTA outing, for example, could be accomplished with a laptop computer, a QRP Labs QDX QRP Transceiver and a simple end-fed half wave antenna suspended from a tree branch. The QDX kit as of this writing is listed on their web site for $69 ($114 fully assembled and tested). An end fed half wave antenna from QRPguys.com can be purchased for $30 (you need the wire to complete the kit). A laptop with free WSJT-X software and USB cable plus $100 worth of components and a 12v battery and you could be on the air.



"QRP Labs QDX QRP Transceiver with laptop running WSJT-X"

For field day, it would be desirable to run with a better antenna and more power. A typical setup could include an Icom IC-7300 100 watt transceiver with a USB cable connected to a laptop. An example of a good antenna would be some type of dipole suspended with some height above ground, say 20 or 30 feet up. Depending on the band you would operate on, a vertical antenna would also work. Verticals can work very well on 20 meters up to 10 meters.  In this scenario, the transceiver is in the $1,000 range and a horizontal dipole that can handle the power can cost anywhere from $50-$150. A mast to get the antenna suspended in the air from Spiderbeams or Sotabeams can run roughly anywhere from $100-$300.

"Sotabeams dipole with Spiderbeam fiberglass telescoping mast on 40 meters"

A more complex setup would likely be needed to compete in a contest. These contests typically include points and multipliers for QSO's on multiple bands. In order to run digital modes on more than one band at a time, multiple antennas, transceivers, and band pass

filters would be required. A base station at a clubhouse or a generous ham's home would be best to be competitive.


"K1WAS Club during WW DIGI Contest 2025"

The scenarios listed above detail possibilities for club gatherings. It should be noted that if an individual amateur operator already has a transceiver connected to his/her home computer configured to do rig control for logging SSB contacts, then it's likely all that individual would need to try out a digital mode would be to download and configure the free software application WSJT-X.

**Digital Mode Challenges:** The initial setup of the equipment used for digital modes can be difficult for the uninitiated. CAT and CI-V (rig control), comm ports, baud rates, audio cards, audio levels and how the computer controls the transceiver requires a definite learning curve. Also, the introduction of nearby RF fields into this equation can add to the frustration. If RF is not handled properly with ferrite chokes and 1:1 baluns on the

transmission line/coaxial cables, computers can be negatively impacted by freezing up and disconnecting from the equipment during transmission. Good, shielded USB cables and audio cables are a must.

The addition of third-party software programs such as grid-tracking and logging programs can also be challenging and even a deterrent to someone who isn't motivated to do a lot of googling to find solutions to configuring all of these. Having someone in the club with experience at managing through these challenges and assisting amateurs new to learn digital modes will be a big plus in any successful activity.

**Key Focus:** The health of your club depends on attracting new members. That translates into finding younger members, many of whom don't know a world without desktop, laptop, and mobile computers. Making digital modes a part of your club's activities can provide a relatable experience to the computer literate. Once a new ham sees what the possibilities are of making QSO's worldwide with the use of an internet connection, they'll be hooked and you'll have a new member who will become the club's digital mode evangelist. It's important to encourage them and be careful not to allow the SSB only crowd to discourage them from participating.

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