

AI-01863 Ham Radio Digital Mode

| | |
|--------------|-------------------------|
| Owner | Ⓒ Rigel Arcayan |
| Tags | Ham Radio |
| Created time | @July 22, 2025 10:52 AM |

I'm a ham radio operator from the 1990, Technician license. I used to work on 2m Packet Radio using Kantronics KPC 3 in Texas.

1. Is ham radio packet radio dead?
2. Is there a packet radio activity in Cebu?
3. What are new technologies now for ham radio digital mode?
4. What equipment do I need?
5. What's next on ham radio digital mode?

It's great to hear from a seasoned ham like you! The world of ham radio has certainly evolved since the 90s, especially with digital modes. Let's break down your questions:

1. Is ham radio packet radio dead?

No, packet radio is not entirely dead, but it has certainly transformed and its usage has shifted. While the widespread, chat-oriented bulletin board systems (BBSs) of the 90s are largely gone due to the rise of the internet, packet radio still has a significant role, primarily through:

- APRS (Automatic Packet Reporting System): This is the most active and visible form of packet radio today. APRS uses packet radio to transmit location data, weather information, short messages, and telemetry. You see stations, vehicles, and even high-altitude balloons tracked on maps online via APRS. It's heavily integrated with the internet through "I-gates" that link RF packets to the internet.

- Emergency Communications: Packet radio remains a vital tool for emergency communications where internet or traditional cellular networks are down. Its robust nature and ability to "digipeat" (digitally repeat packets) make it valuable for ad-hoc networks.
- Specialized Applications: Some niche uses, like dedicated point-to-point links (e.g., TARPEN), continue to use packet radio, sometimes with newer protocols like IL2P for better error correction.
- Software TNCs: While you used a hardware Kantronics KPC 3, modern packet radio often leverages software TNCs (sound card modems) which use your computer's sound card to encode and decode the audio signals, eliminating the need for a separate hardware TNC for many applications. So, while "rag-chewing" on packet BBSs might be a thing of the past, packet radio, especially APRS, is still very much alive and evolving.

1. Is there packet radio activity in Cebu?

Finding specific, up-to-the-minute packet radio activity in Cebu can be challenging without being on the ground and scanning frequencies or contacting local clubs. However, it's highly probable there is APRS activity in and around Cebu. The Philippines has an active ham radio community, and APRS is globally popular.

- How to find out:
 - Check online APRS maps: Websites like aprs.fi allow you to see live APRS activity worldwide. Zoom in on the Cebu area to see if there are active stations.
 - Contact local ham radio clubs: The Philippine Amateur Radio Association (PARA) is the national organization. They or local clubs in Cebu (e.g., Cebu Amateur Radio League) would be the best source for information on local packet radio or digital mode activity. Their websites or social media might have contact information.
 - Listen on 144.390 MHz: This is the standard APRS frequency in many parts of the world, including likely the Philippines.

1. What are new technologies now for ham radio digital mode?

The landscape of ham radio digital modes has exploded! Here are some of the

most prominent "new" (or newly popular) technologies:

- Weak-Signal Modes (WSJT-X suite): This is perhaps the biggest game-changer.
 - FT8: By far the most popular digital mode for HF, designed for making contacts under very weak signal conditions. It's highly automated and uses short, fixed-length transmissions.
 - FT4, JT65, MSK144: Other modes in the WSJT-X suite, each optimized for different propagation conditions (e.g., JT65 for extremely weak signals, MSK144 for meteor scatter).
- Digital Voice Modes: These modes digitize your voice and often use internet-linked networks of repeaters.
 - DMR (Digital Mobile Radio): Very popular due to affordable radios and a robust worldwide network of repeaters and hotspots.
 - D-STAR: An older, open-standard digital voice mode, primarily supported by Icom.
 - Yaesu System Fusion (C4FM): Yaesu's proprietary digital voice mode, often found on their modern transceivers.
 - P25: Often found in repurposed public safety equipment.
 - FreeDV / M17: Open-source digital voice modes that aim to be more accessible and less reliant on proprietary codecs.
- Keyboard-to-Keyboard (Chat) Modes:
 - PSK31: Still active, a narrow-bandwidth mode for real-time text conversations on HF.
 - RTTY (Radio Teletype): A classic, still used in contests.
 - JS8Call: Builds on the FT8 engine but allows for more conversational, keyboard-to-keyboard interactions.
- Software-Defined Radio (SDR): While not a "mode," SDR technology has revolutionized how radios are designed and used, making it easier to experiment with different modes and providing incredible flexibility.

- Internet Linking: Technologies like Echolink and IRLP (Internet Radio Linking Project) allow hams to connect repeaters and even individual stations over the internet, extending reach for voice and sometimes digital modes.
- Contesting and Portable Operations: Modes like FT8 and the gamified activities like POTA (Parks on the Air) and SOTA (Summits on the Air) have brought new life and activity to the hobby, often leveraging digital modes.

1. What equipment do I need?

Your existing Technician license will allow you to operate on 2m/70cm, which is great for local digital voice modes and APRS. For the newer HF digital modes (like FT8), you'll need a General or Extra class license, but you can certainly start exploring digital on VHF/UHF.

Here's a breakdown of equipment, depending on what you want to do:

- For 2m/70cm Digital Voice (DMR, Fusion, D-STAR):
 - Digital Handheld or Mobile Radio: You'll need a radio specifically designed for the digital mode you want to operate (e.g., a DMR radio for DMR). Many manufacturers offer multi-mode radios now.
 - Hotspot (Optional but recommended): A personal hotspot (e.g., Pi-Star based on a Raspberry Pi and MMDVM board) allows you to connect to digital voice networks over your internet connection, even if there are no local repeaters or you're out of range. This is very popular.
 - Antenna: A 2m/70cm antenna (e.g., a simple whip for handhelds, or a larger omnidirectional antenna for a mobile/base station).
- For Packet Radio (APRS):
 - 2m Transceiver: A standard 2m (VHF) radio.
 - TNC (Terminal Node Controller):
 - Software TNC: A computer with a sound card interface (like a Signalink USB or similar) is the most common and cost-effective method. Software like Direwolf acts as the TNC.
 - Hardware TNC: Your Kantronics KPC 3 might still work if you can interface it with a modern computer, but software TNCs are generally preferred for their flexibility.

- Computer: To run the TNC software and APRS client (e.g., APRS-IS for tracking, Xastir or UI-View for client operation).
- GPS Unit (for mobile APRS): To provide your location data to the radio/TNC.
- For HF Digital Modes (FT8, PSK31, etc.):
 - HF Transceiver: A radio capable of SSB (Single Sideband) on the HF bands. A 100-watt transceiver is common, but QRP (low power) operations are also very popular.
 - Computer: A modern laptop or desktop.
 - Sound Card Interface: This is crucial. Devices like the Signalink USB, RigExpert, or internal radio interfaces convert the analog audio from your radio into digital signals for your computer and vice-versa. They also handle Push-To-Talk (PTT) control.
 - Software: Programs like WSJT-X (for FT8/FT4/JT65), FLdigi (for PSK31, RTTY, etc.), and logging software (e.g., Ham Radio Deluxe, Log4OM).
 - Antenna: An appropriate HF antenna for the bands you wish to operate on (dipole, vertical, end-fed, etc.).

1. What's next on ham radio digital mode?

The future of ham radio digital modes is exciting and dynamic! Here are some trends and potential developments:

- Increased Integration of AI/Machine Learning: AI is already being explored for noise reduction and signal processing. Expect more advanced AI integration directly into radios and software, potentially leading to even better weak-signal performance, intelligent tuning, and enhanced user interfaces.
- More Open-Source Development: Projects like FreeDV and M17 highlight a growing movement towards open-source digital modes, which could lead to greater interoperability and innovation without proprietary limitations.
- Refined Data Transmission: While voice is popular, the ability to send data (files, images, larger messages) reliably over radio will continue to evolve, especially for emergency communications.

- **Mesh Networking and High-Speed Data:** Experimentation with higher-speed digital data modes and mesh networking (like AREDN - Amateur Radio Emergency Data Network) on higher frequencies (2.4 GHz, 5 GHz) is ongoing, aiming to create robust, self-healing data networks for emergency use and general experimentation.
- **Satellite Communications:** Digital modes are crucial for amateur satellite operation, and as more CubeSats and other amateur satellites are launched, expect more activity and innovation in this area.
- **Continued Simplification and Accessibility:** Software and hardware are becoming more user-friendly, aiming to lower the barrier to entry for new hams interested in digital modes.
- **Cross-Mode Gateways:** The ability to seamlessly link different digital voice modes (DMR, Fusion, D-STAR) and even bridge them to analog repeaters or internet services will continue to improve.
- **More Advanced Error Correction:** As signals become weaker, more sophisticated error correction techniques will be developed to ensure reliable data transmission.

Welcome back to the airwaves! The world of ham radio has changed a lot, but the spirit of experimentation and communication remains strong. Enjoy exploring the new digital frontier!