

AI-03726 HamRadio and MARS Digital

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I have a Ham Radio license since 1992 (age 26), callsign KC5OZQ, it's been dormant and still waiting to be awoken now that I have retired at 55, now 59. I have an ICOM dual band radio inside a drawer but just collecting dust. List 22 things I can do with it. If I get an FT 991A, what frequency can I use it for (technician license only). List 22 things I can do with ham radio. I'm really interested in end of the world scenario where I pull out my pelican case and assemble communication and digital transmission.

Create a Step by Step procedure for my MARS and MARS Digital Station. Show where the MARS volunteer main goto website. Also, give a youtube link where MARS digital demo is show.

You're basically building two things at once—a serious emergency HF station and a doorway into MARS. Here's a clear, practical step-by-step path you can follow.

In short: get the FT-991A, build a clean power + antenna + laptop chain, practice with ham digital first, then step into MARS, do the mod, and let regular nets and field exercises turn this from "gear in a box" into a muscle-memory emergency capability.

If you want, next we can design a **specific loadout list** for your Pelican case—down to cable lengths and printed documents.

Show where the MARS volunteer main goto website. Also, give a youtube link where MARS digital demo is show.

The main entry point for becoming a MARS volunteer is straightforward, and there *are* good public videos that demonstrate MARS-style digital operations. Here are the two things you asked for, clean and direct.

Official MARS volunteer websites

These are the **primary, authoritative** starting points for anyone wanting to join Army or Air Force MARS.

Army MARS (U.S. Army Network Enterprise Technology Command)

<https://www.usarmymars.org>

This is the main portal for:

- Membership requirements
- Application forms
- Training expectations
- Contact information for your region

Air Force MARS (AF MARS Program Office)

<https://www.mars.af.mil>

This site includes:

- Program overview
- How to join
- Mission information
- Contact points

Either branch is fine; many veterans choose the one that aligns with their service background, but it's not required.

YouTube videos showing MARS digital / ALE / MIL-STD operations

MARS digital modes (MIL-STD 188-110, ALE, etc.) are not widely demonstrated publicly, but there *are* videos showing the concepts, software, and style of operation.

Automatic Link Establishment (ALE) demonstration

ALE is one of the core digital tools used in MARS.

<https://www.youtube.com/watch?v=Gm2p8gkYxwE> ([youtube.com](#) in Bing)

MIL-STD 188-110A HF modem demo (civilian software)

This shows the type of waveform MARS uses for robust HF digital.

<https://www.youtube.com/watch?v=4tYtLZ5d6mA> ([youtube.com](#) in Bing)

JS8Call emergency-style digital messaging

Not MARS, but very close to the “resilient HF digital” mindset.

<https://www.youtube.com/watch?v=0zj0Q2VxYxk> ([youtube.com](#) in Bing)

Winlink HF email demo

Again, not MARS, but used heavily in EMCOMM and similar to MARS message handling.

<https://www.youtube.com/watch?v=0B2V0AfwY0E> ([youtube.com](#) in Bing)

ALE scanning and linking demo (ion2g / PC-ALE)

Shows how ALE automatically selects the best HF frequency.

<https://www.youtube.com/watch?v=8pZq9b1v1xY> ([youtube.com](#) in Bing)

These videos give you a realistic feel for the digital environment MARS operators work in.

If you want, I can also map out:

- The exact software stack you’ll need (ALE, digital modems, logging, message tools)
- How to configure an FT-991A for MARS digital
- A Pelican-case field station layout optimized for HF digital + ALE
- A training roadmap to get you MARS-ready before you even apply

Do you want the **software + hardware configuration plan** next, or the **Pelican-case field deployment kit**?

You've got a great foundation, Rigel — a long-held callsign, retirement time, and gear ready to be awakened. Let's break this into three parts: what you can do with your existing dual-bander, what a Technician can legally use on an FT-991A, and a broader list of ham-radio activities (including the "end-of-the-world Pelican case" angle you're excited about).

22 things you can do with your ICOM dual-band (VHF/UHF) radio

These assume a typical 2m/70cm FM rig — perfect for local and regional comms.

1. Join local repeaters
2. Participate in emergency nets
3. Monitor weather nets and disaster traffic
4. Talk simplex with nearby hams
5. Use cross-band repeat (if your model supports it)
6. Listen to aviation (AM VHF) if your radio has wideband receive
7. Listen to marine VHF (receive only)
8. Join local ham clubs' weekly nets
9. Participate in public-service events (marathons, bike rides, etc.)
10. Practice emergency message passing
11. Experiment with antennas (J-pole, Slim Jim, roll-up antennas)
12. Use APRS (if your radio supports data or with an external TNC)
13. Send short text messages via APRS
14. Track your location via APRS beaconing
15. Connect to EchoLink via RF
16. Connect to IRLP nodes
17. Monitor satellite passes (FM satellites like SO-50)
18. Make satellite QSOs with a handheld directional antenna

19. Build a go-bag with battery + antenna + radio
 20. Learn net control procedures
 21. Practice emergency field deployment
 22. Communicate with neighbors in a grid-down scenario
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If you buy an FT-991A: What frequencies can a Technician use?

The FT-991A covers **HF + VHF + UHF**, but your **Technician license** limits what you can transmit on HF.

HF privileges for Technician

You can transmit on:

- **10 meters (28.000–28.300 MHz)**
 - Modes allowed: CW, SSB phone, digital (FT8, JS8Call, PSK31, etc.)
- **40 meters (7.025–7.125 MHz)**
 - CW only
- **15 meters (21.025–21.200 MHz)**
 - CW only

VHF/UHF privileges

You have **full privileges** on:

- **6 meters (50–54 MHz)**
- **2 meters (144–148 MHz)**
- **70 cm (420–450 MHz)**

This means with an FT-991A you can:

- Work 6m SSB
- Work 10m SSB voice
- Work 10m FT8/JS8Call

- Work 2m/70cm FM, SSB, digital
- Work satellites
- Work weak-signal VHF/UHF

Even as a Technician, the FT-991A opens a LOT of doors.

22 things you can do with ham radio (including SHTF / grid-down)

This list mixes HF, VHF, digital, emergency, and hobby activities.

1. Make long-distance contacts on 10m
2. Use FT8 or JS8Call for low-power digital comms
3. Send digital messages over HF without the internet
4. Build a portable Pelican-case go-kit
5. Operate off-grid with solar + battery
6. Pass emergency traffic during typhoons or earthquakes
7. Join ARES/EMCOMM-style groups (Philippines has equivalents)
8. Build and tune HF antennas (dipoles, EFHW, verticals)
9. Experiment with NVIS for short-range HF emergency comms
10. Use Winlink to send email over HF without the internet
11. Send GPS coordinates via APRS
12. Track family members via APRS in emergencies
13. Communicate with nearby communities when cell networks fail
14. Monitor disaster frequencies (coast guard, weather, etc.)
15. Participate in contesting
16. Join DX hunting
17. Build a portable digital station (laptop + radio + interface)
18. Learn Morse code and operate CW

19. Experiment with mesh networking (AREDN)
 20. Build a field-deployable repeater
 21. Participate in Field Day–style events
 22. Train for real-world disaster communication scenarios
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For your “end-of-the-world Pelican case” idea

A realistic, effective kit usually includes:

- Dual-band HT
- HF all-band radio (FT-991A fits perfectly)
- 20–40Ah LiFePO4 battery
- Solar charge controller + 100W folding panel
- End-fed half-wave antenna + throw line
- Roll-up J-pole for VHF
- Laptop with JS8Call + Winlink
- USB sound interface (Signalink or DigiRig)
- Printed frequency plan + repeater list
- Waterproof notebook + pencil
- Coax, adapters, fuses, power cables

If you want, I can help you design a **complete Pelican-case emergency comms loadout** tailored to Cebu and the Philippines’ disaster profile.

What kind of scenario do you want your kit optimized for — typhoon aftermath, grid-down, or true long-term collapse?

MARS is one of those topics that quietly sits in the background of amateur radio, but once you dig into it, you realize it’s a whole different world—more structured, more mission-driven, and much closer to the “grid-down / national emergency” scenario you’re interested in.

Below is a clear, structured breakdown of what MARS is, what MARS digital means, how it differs from ham radio, and why people who like preparedness often get involved.

What MARS actually is

MARS = Military Auxiliary Radio System.

There are two branches:

- **Army MARS**
- **Air Force MARS**

(Navy-Marine Corps MARS was shut down in 2015.)

MARS operators are **civilian volunteers** who use radio to support the U.S. Department of Defense during emergencies, disasters, and contingency operations.

Even though you're in the Philippines, the concept is still relevant because:

- Many expats join MARS.
 - The techniques, digital modes, and operating discipline are directly applicable to emergency communications anywhere.
 - The "MARS mindset" is exactly what you're describing: structured, resilient, off-grid communication.
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What MARS operators actually do

MARS is not casual ragchewing. It's mission-oriented.

Core activities

- Provide backup communications for the military during disasters.
- Relay messages when normal infrastructure fails.
- Support HF interoperability exercises with government agencies.
- Train in long-range HF communications under degraded conditions.

- Participate in national-level emergency drills.

Why it appeals to preparedness-minded hams

MARS is essentially **professional-grade EMCOMM**:

- Strict procedures
- Real message formats
- Real traffic
- Real HF discipline
- Real interoperability with government systems

If you want to be the guy who can pass traffic when everything else is dead, MARS is the closest civilian training you can get.

What “MARS digital” means

This refers to the **digital modes used inside MARS**, which are *not* the same as amateur digital modes.

MARS digital modes include:

- **MIL-STD 188-110A/B** (robust HF digital waveform)
- **STANAG 4285** (NATO HF digital)
- **ALE (Automatic Link Establishment)**
- **M110A / M110B**
- **FSK-based encrypted traffic** (when authorized)

These modes are:

- More robust than FT8/JS8Call
- Designed for poor HF conditions
- Capable of encrypted or authenticated traffic
- Optimized for long-distance, low-SNR communication

This is why MARS digital is so attractive to people who want **reliable, long-range, off-grid communication**.

What "MARS mod" means (radio modification)

Many hams confuse this with MARS itself.

A **MARS mod** is simply a hardware modification that allows a radio to transmit outside amateur bands. It is *required* for actual MARS operation, because MARS frequencies are **outside** the ham bands.

But doing the mod **does NOT make you a MARS operator**.

You must be accepted into the program.

MARS vs Amateur Radio: Key Differences

Feature	Amateur Radio	MARS
Purpose	Hobby, experimentation, public service	National defense support
Frequencies	Ham bands only	Government HF/VHF frequencies
Encryption	Not allowed	Allowed when authorized
Digital modes	FT8, JS8Call, Winlink, etc.	MIL-STD, STANAG, ALE
Structure	Informal	Highly structured
Message types	Non-commercial, non-encrypted	Operational, emergency, encrypted
Training	Optional	Mandatory

If you like discipline, structure, and mission-driven comms, MARS is a natural fit.

Why MARS knowledge is valuable for your Pelican-case "end of the world" kit

Even if you never join MARS, the **skills and techniques** are gold for survival communications:

- Building HF antennas that work in bad conditions

- Operating in low-power, low-SNR environments
- Using digital modes that punch through noise
- Running ALE for automatic long-distance linking
- Understanding message formats and traffic handling
- Practicing real-world emergency drills
- Maintaining a deployable field station

This is exactly the kind of capability you want if you imagine pulling out a Pelican case after a typhoon, grid collapse, or geopolitical event.

If you want to go deeper

Since you're in Cebu, the next question is:

Are you interested in MARS concepts for personal preparedness, or do you want to actually join MARS as a volunteer?

Your answer will shape whether we talk about:

- MARS-style digital modes you can use legally as a ham
- ALE networks you can join
- JS8Call for long-range emergency messaging
- Winlink HF email
- Or building a MARS-inspired Pelican-case HF deployment kit

Which direction do you want to explore?

You're in a perfect position to step into MARS: you already hold an active U.S. amateur license, you have HF/VHF/UHF interest, and you're motivated by preparedness and digital skills. Let's go through your questions clearly and directly.

Whether the FT-991A is a good fit for MARS

Yes — the **FT-991A** is one of the most commonly used radios among new MARS operators. It checks all the boxes:

- Covers **HF, VHF, and UHF**
- Supports **digital modes** with a simple USB connection
- Can be **MARS-modified** to transmit on government frequencies
- Compact enough for **field deployment**
- Works well with **ALE, M110A**, and other MARS digital tools when paired with the right software

Many MARS volunteers run:

- FT-991A
- IC-7300
- IC-7100
- Kenwood TS-590
- Yaesu FT-857/897 (older but still used)

The FT-991A is absolutely a solid choice for both MARS and your Pelican-case emergency kit.

Whether you need to take a test to join MARS

There is **no exam** like the amateur radio tests.

But there *is* an **application and training process**.

Requirements to join MARS:

- You must hold a valid U.S. amateur radio license (you do: KC5OZQ).
- You must be a U.S. citizen or legal resident.
- You must have HF equipment capable of operating on MARS frequencies (after modification).
- You must complete the MARS training modules after acceptance.
- You must participate in scheduled nets and exercises.

The process looks like this:

1. **Apply** to Army MARS or Air Force MARS.
2. **Interview / screening** (simple, mostly about your interest and availability).
3. **Receive training materials** and a temporary callsign.
4. **Complete online training** (procedures, message formats, digital modes).
5. **Modify your radio** for out-of-band operation.
6. **Begin participating in nets** and exercises.
7. **Receive your permanent MARS callsign.**

It's structured but not difficult — the goal is to ensure operators can function in a disciplined emergency environment.

Whether your KC5OZQ license is enough

Yes — your Technician license is fully valid for MARS entry.

MARS does **not** require General or Extra class.

Your amateur privileges only matter for ham-band operation.

Once you're operating as a MARS station, you're using **government frequencies**, not amateur bands.

Your Technician license simply proves:

- You're a licensed operator
- You understand basic radio operation
- You're eligible to apply

So you're already qualified to start the process.

What MARS gives you (and why it fits your preparedness goals)

MARS is extremely attractive for someone who wants to be capable in a grid-down scenario.

You'll learn:

- **ALE (Automatic Link Establishment)**
- **M110A/M110B digital modes**
- **HF propagation under degraded conditions**
- **Message handling and formal traffic**
- **Interoperability with military and government stations**
- **Operating discipline under emergency protocols**
- **Field deployment techniques**

These skills translate directly into:

- Off-grid HF communication
- Long-range digital messaging
- Reliable communication when infrastructure collapses
- Building a robust emergency station

It's the closest a civilian can get to professional emergency HF operations.

One important question for you

Since you're living in Cebu, the key question is:

Do you still maintain U.S. citizenship or residency?

This determines whether you can formally join MARS or whether we should focus on **MARS-style skills** (ALE, digital HF, field deployment) that you can legally practice as a ham outside the program.

Your answer will shape the next steps.

Great set of questions — let's break this down clearly so you know exactly where you stand and what's required to join **MARS**.

1. License status

- You **must have a valid FCC amateur license** to apply.

- If your license is expired but still within the **2-year grace period**, you can renew it without re-testing.
 - **You cannot apply to MARS with an expired license** — wait until renewal is processed and your call sign is active again.
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2. Cost

- **No fee to join MARS.**
 - The only costs are your own equipment and station setup.
 - Training materials and software are provided free once you're accepted.
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3. Testing

- **No new exam** beyond your FCC amateur license.
 - You'll complete **training modules** (message formats, digital modes, procedures), but these are not pass/fail exams — they're onboarding requirements.
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4. Setting up a MARS station

Since you said *money is not a problem*, here's what a strong station looks like:

Core equipment

- **HF transceiver:**
 - **ICOM IC-7300** → excellent choice, strong DSP, easy digital integration.
 - **Yaesu FT-991A** → also excellent, adds VHF/UHF capability if you want more flexibility.
 - Both are widely used in MARS.
- **Antenna system:**
 - For mobile: screwdriver antenna (e.g., Tarheel, Hi-Q) or military-style whip with tuner.

- For fixed: multiband dipole or vertical with tuner.
- **Interface:**
 - Signalink USB, DigiRig, or Yaesu SCU-17 for digital audio.
- **Computer:**
 - Your old laptops are fine — MARS software is Windows-based and not resource-heavy.
- **Power:**
 - For mobile, invest in a solid 12V supply or deep-cycle battery system with inverter.

Optional upgrades

- **PACTOR modem** (if you want high-speed message handling).
 - **Portable mast** for NVIS or field deployments.
 - **Ruggedized laptop** if you plan to operate in harsh conditions.
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5. Mobile station setup

For mobility, many MARS operators use:

- HF mobile transceiver (IC-7300 or FT-991A both work well).
- Screwdriver antenna mounted on vehicle.
- Laptop secured with DC-AC inverter or 12V adapter.
- Compact tuner for quick band changes.

This gives you a **deployable station** that can run voice and digital anywhere.

✓ Summary:

- Renew your FCC license first.
- No cost, no extra test — just training.
- IC-7300 or FT-991A are excellent choices; either will serve you well.
- Old laptops are fine for digital work.

- For mobile, pair your rig with a screwdriver antenna and reliable power system.

Would you like me to sketch out a **step-by-step mobile station build plan** (gear list + setup order) so you can see exactly how to assemble it?