ADDENDUM H

Communication: Zero to Full Competency

Curious how Tier, Stage, and Phase relate? See the Glossary.

Why This Addendum Exists

Chapter 9 tells you what to have and do at each tier of a disruption. It does not walk you through the actual licensing and skill progression behind amateur radio, which is the single most capability-dense skill in that chapter and the one most households have never touched. This addendum is a skill-building curriculum for radio communication specifically, built from the real FCC licensing structure and Utah's amateur radio community, not just equipment lists.

It's organized by skill stage, not by disaster duration, following the same structure as the other addenda. Conveniently, amateur radio already has a real, standardized 3-tier license progression (Technician, General, Extra) that maps almost directly onto this addendum's stages.

Four stages: Foundations (basic safe practice), Applied Practice (hands-on competence), Self-Sufficiency (independent, resilient skill), and Mastery & Teaching (able to teach others and operate at community scale). Each stage covers two sub-skill tracks that run in parallel: radio operation and licensing, and emergency communication protocol.

Stage 1: Foundations (Awareness)

Goal: understand the actual landscape of emergency communication options and terminology well enough to make an informed choice about which to pursue. This stage is readable in a weekend.

Radio: Core Knowledge

The core concept at this stage is understanding what each radio service actually does and doesn't do. FRS (Family Radio Service) requires no license but is short-range and low-power. CB (Citizens Band) radio also requires no license at all, not even GMRS's flat fee, and runs 40 channels near 27 MHz at up to 4 watts AM or 12 watts PEP single-sideband; its real value is universal compatibility with truckers and off-roaders already using it (channel 19 for highway traffic, channel 4 for off-road

groups), not household range, which typically runs 1 to 5 miles mobile with no repeater network behind it. GMRS (General Mobile Radio Service) requires a simple, no-exam $35 FCC license (already covered in Chapter 9) and allows higher power and repeater use. Amateur (ham) radio requires passing an actual exam but opens vastly more frequency access, power, and range, including the ability to relay messages across the state or country via repeaters and the National Traffic System. None of these substitutes for the others; a household's real Tier 2/3 plan likely uses more than one.

Emergency Communication: Core Knowledge

The core concept at this stage is understanding IPAWS (already covered in Chapter 9): Wireless Emergency Alerts, the Emergency Alert System, and NOAA Weather Radio are all downstream of the same federal system, and none require you to sign up for anything, unlike your county's separate opt-in notification system (Everbridge for most northern Utah counties). Understand that emergency communication has structure and discipline (who talks when, how messages get relayed accurately) that casual conversation doesn't, which is why formal training exists for it.

Stage 1 Learning Path

Resource	Cost / Format	Notes
ARRL "Getting Licensed" overview	Free, online	arrl.org/getting-licensed. Explains the three license classes and what privileges each unlocks before you commit to studying.
FCC GMRS licensing information	Free to review; $35 to license	fcc.gov. Already cited in Chapter 9; a genuinely low-barrier entry point.
Your county's Everbridge/emergency notification sign-up page	Free	Already covered in Chapter 9's Tier 1; confirm you're actually registered, not just aware it exists.

Stage 1 Practice Exercises

- **Inventory your household's actual radio gear and range:** List every radio-capable device you own (FRS walkies, a GMRS radio, a scanner) and test its real range in your actual neighborhood, not its rated range. See the Family Communication Plan & Emergency Radio skill guide for how this fits into a full household communication plan, not just a gear list.

- **Confirm your county notification registration:** Verify you're actually signed up for your county's opt-in emergency notification system, not just assuming a past registration is still active.
- **Listen to a real net or repeater for an hour:** Even without a license, you can legally listen to amateur radio traffic; find a local repeater frequency and listen to a scheduled net to understand real on-air discipline before you're the one transmitting.

Self-Check: Ready for Stage 2?

You should be able to explain the practical difference between FRS, GMRS, and amateur radio without looking it up, and confirm your household is actually registered for local emergency notifications, not just theoretically aware of them.

Stage 2: Applied Practice (Competent)

Goal: hold a real license and have actually operated on the air under real conditions, not just studied the material.

Radio: Applied Practice

- **Get your GMRS license:** No exam required; a straightforward FCC application and $35 fee covers your entire immediate family (GMRS licenses cover the licensee's immediate family members). Do this even if you're also pursuing amateur radio, since GMRS repeater access is genuinely useful and doesn't require ongoing study. The Family Communication Plan & Emergency Radio skill guide covers how to actually build the household plan around it.
- **Study for and pass the Technician-class amateur radio exam:** 35 questions on radio theory, regulations, and operating practices; Technician class unlocks all privileges above 30 MHz, including the popular 2-meter band most local repeaters use. Free question pools and practice exams are widely available online (ARRL's question pools page is the authoritative source). See the Ham Radio Licensing & Off-Grid Mesh Networking skill guide for a walkthrough of the licensing process itself.
- **Actually get on the air:** Passing the exam without ever transmitting is incomplete; make your first real contact on a local 2-meter repeater within your first month of licensing.

Emergency Communication: Applied Practice

- **Attend a real net:** Most local ham clubs run a weekly practice net specifically to give new operators low-stakes airtime; check in on one as your actual first transmission.
- **Practice message relay accuracy:** Practice passing a written message verbatim through two or three people by radio, then compare the received version to the original; this is the exact skill that breaks down under real stress if never practiced.
- **Build your household's radio go-bag:** Cross-reference Chapter 9's Tier 1 equipment list; confirm your actual radios, spare batteries, and frequency list are packed and current, not just purchased. See the Go-Bags & 72-Hour Kits skill guide for what belongs in the rest of that bag.

Stage 2 Learning Path

Resource	Cost / Format	Notes
FCC GMRS license	$35 (covers immediate family)	fcc.gov/wireless/bureau-divisions/mobility-division/general-mobile-radio-service-gmrs. No exam required.
ARRL Technician license study guide / free question pools	Free online pools; ~$25–$30 study book	arrl.org/question-pools. Multiple free practice-exam sites use the same official pool.
Local ARRL-affiliated exam session	Typical exam fee ~$15	arrl.org/find-an-amateur-radio-license-exam-session. Search for Salt Lake City, Provo, or your local area.

Self-Check: Ready for Stage 3?

You should hold a current GMRS license and a Technician-class amateur radio license, and have made at least one real, unscripted contact on the air. Passing the exam without ever transmitting is still Stage 1 competency in practice, even with a license in hand.

Stage 3: Self-Sufficiency (Proficient)

Goal: genuine independent communication capability across a wider range and under real emergency-management structure, the actual skill level Chapter 9's Tier 2 and Tier 3 assume a household has.

Radio: Self-Sufficiency

- **Pass the General-class amateur radio exam:** Another 35-question exam (requiring a passed Technician exam first) that unlocks most HF (high frequency) privileges, meaning genuine long-distance communication independent of local repeater infrastructure, which is exactly what Tier 3's "no cell or internet infrastructure expected" scenario requires. The Ham Radio Licensing & Off-Grid Mesh Networking skill guide covers what General-class privileges actually unlock.
- **Get real HF experience, not just VHF/UHF:** Local 2-meter repeater use (Technician-level) depends on that repeater staying powered and functional; HF skills (General-level) let you reach other operators directly across long distances without any local infrastructure at all. Practice this distinction hands-on, not just conceptually.
- **Learn to build or troubleshoot a basic antenna:** A genuinely practical, low-cost skill (a simple dipole or end-fed wire antenna) that meaningfully extends range and doesn't require expensive commercial equipment.

Emergency Communication: Self-Sufficiency

- **Complete FEMA's ICS-100 and IS-700:** These free, online, self-paced FEMA courses (Introduction to the Incident Command System, and an introduction to the National Incident Management System) are the actual prerequisite for ARRL's own emergency communication coursework and for most ARES deployment.
- **Complete ARRL's EC-001: Introduction to Emergency Communications:** The standard course for amateur radio operators specifically supporting emergency management, building directly on the ICS-100/IS-700 foundation.
- **Join a local ARES or RACES group as an active (not just registered) member:** Chapter 9 already references Salt Lake, Davis, and Weber County ARES groups; Stage 3 is where you actually participate in drills and nets rather than just holding a license.
- **Learn Winlink:** Winlink is a real email system carried over amateur radio instead of the internet: free Winlink Express software on a laptop, connected to a radio through a sound-card interface, sends and receives actual email, including attachments and standard ICS forms, through a network of volunteer-run gateway stations. Registration requires a current amateur license. VHF/UHF packet access to a local gateway is workable at Technician level; reaching a gateway directly over HF, with no local infrastructure at all, needs General-class privileges. This is the actual mechanism behind ARES and RACES sending formatted, verifiable messages

during a real event, not just voice traffic, and it's what let hams relay health-and-welfare messages during Hurricane Maria when normal infrastructure was down for weeks.

Stage 3 Learning Path

Resource	Cost / Format	Notes
ARRL General license study guide / free question pools	Free online pools; ~$25–$30 study book	arrl.org/question-pools. Requires a passed Technician exam.
FEMA ICS-100 and IS-700 (independent study)	Free	training.fema.gov. Self-paced, online, no cost.
ARRL EC-001: Introduction to Emergency Communications	Course fee applies	arrl.org/train-courses-for-amateur-radio-public-service. Requires ICS-100/IS-700 completion first.
Utah County ARES Groups	Free to join	slcoares.org (Salt Lake), dcarc.net (Davis), webercountyutah.gov/emergency-management (Weber). Already cited in Chapter 9's references.

Self-Check: Ready for Stage 4?

You should hold a current General-class amateur radio license, have made real HF contact independent of local repeater infrastructure, and have completed ICS-100, IS-700, and EC-001. Active ARES/RACES participation (drills, nets), not just membership, should be underway.

Stage 4: Mastery & Teaching (Expert)

Goal: the highest license class, the ability to teach and license others, and real leadership capacity within emergency communication structure. This is the stage Chapter 9's Tier 4 (shared community network) actually depends on.

Teaching & Certification

- **Pass the Amateur Extra exam:** A more demanding 50-question exam requiring all previous license classes passed first; Extra class unlocks the full amateur radio frequency allocation

with no remaining restrictions.

- **Become an accredited Volunteer Examiner (VE):** Requires holding a General class license or higher; becoming a VE lets you personally administer FCC license exams to others, directly removing the biggest practical barrier (finding a local exam session) for the next person trying to get licensed. The ARRL VE accreditation process is a short application plus a 40-question open-book review.
- **Complete deeper FEMA/ICS coursework if pursuing an emergency management leadership role:** IS-200 and IS-800 go beyond the ICS-100/IS-700 basics for anyone likely to serve in an Emergency Operations Center or command-post role, not just as a field radio operator.

Community-Scale Practice

- **Build the shared community network described in Chapter 9's Tier 4:** Chapter 9 calls for a shared community communication network; Stage 4 is where you're capable of actually designing repeater coverage, mesh networking (Meshtastic, already referenced in Chapter 9), or a structured net schedule rather than just listing it as a goal. See the Ham Radio Licensing & Off-Grid Mesh Networking skill guide for how Meshtastic actually pairs with licensed radio in a community network.
- **Run drills that stress-test message accuracy at scale:** A community-wide communication drill involving relayed messages through multiple operators surfaces real failure points (garbled relays, unclear priority) that a single household's practice can't.
- **Mentor new licensees through their first exam and first contact:** Being a VE gets someone licensed; actually helping them make their first real on-air contact and their first net check-in is what turns a license into genuine capability.

Stage 4 Learning Path

Resource	Cost / Format	Notes
ARRL Amateur Extra license study guide / free question pools	Free online pools; ~$30–$35 study book	arrl.org/question-pools. Requires passed Technician and General exams.
ARRL Volunteer Examiner (VE) accreditation	Free application	arrl.org/become-an-arrl-ve. Requires General class license or higher.
FEMA IS-200 and IS-800	Free	training.fema.gov. For emergency management leadership roles beyond field radio operation.
Meshtastic (open-source LoRa mesh networking)	Hardware cost (~$30–$60/node)	meshtastic.org. Already cited in Chapter 9's Tier 3 equipment; a genuinely modern community-mesh option.

Self-Check: Have You Actually Arrived?

The real test of Stage 4 isn't the Extra-class license alone; it's whether you've personally administered an exam session as a VE or helped license someone new, and whether your household or neighborhood's communication plan has actually been drilled with multiple operators, not just designed on paper.

A Suggested Learning Sequence

The two tracks (radio, emergency communication protocol) build on each other more tightly here than in other addenda, since ARES participation genuinely requires both a license and ICS coursework. As a rough guide, not a requirement:

- **Weeks 1–2:** Stage 1: understand the radio service landscape, confirm your county notification registration, listen to a local net.
- **1–3 months:** Stage 2: get licensed for GMRS and Technician-class amateur radio, make your first real on-air contact.
- **6–12 months:** Stage 3: pass the General exam, get real HF experience, complete ICS-100/IS-700/EC-001, join ARES actively.
- **Ongoing:** Stage 4: pursue Extra class and VE accreditation, and start mentoring new licensees through their first exam and first contact.

At a Glance: Communication Deep Dive

A single-page reference for planning purposes. This does not replace the detailed guidance above; use it to see how the four stages scale, and cross-reference against Chapter 9's tiers, which describe what a household needs to have and do rather than how skilled it needs to be.

Stage	Focus	Key Milestone	Primary Resource
Stage 1: Foundations	Radio service landscape, no license requirement yet	Can explain FRS vs. GMRS vs. amateur radio from memory	ARRL Getting Licensed overview
Stage 2: Applied Practice	Entry-level licensing and first real airtime	Holds GMRS and Technician-class licenses; made a real contact	ARRL Technician question pool
Stage 3: Self-Sufficiency	Long-range capability and formal emergency-comm training	Holds General-class license; completed ICS-100/IS-700/EC-001; active in ARES	ARRL General license, FEMA ICS courses
Stage 4: Mastery & Teaching	Highest license class, teaching, community network design	Holds Extra-class license or VE accreditation; has licensed or mentored someone new	ARRL Extra license, VE accreditation