Amateur Radio

Lesson 3

Class Overview

- Safety
- Radio Etiquette/Procedures/Traffic Handling
- Radio Go Bags
- What do you need to take your Exam
- How to Program your Radio (Bring your Radios)
- Exam Review

Safety

Safety

- Amateur radio is relatively safe.
- Besides other typical outdoor precautions, Hams need to guard against electrocution and too much exposure to RF radiation.
- Technician class operators using handheld radios broadcasting at 5 Watts are virtually immune to even these risks, however, some operators might buy 50 Watt mobile units or be around other hams with more powerful equipment.

Safety: Electrocution

- 30 volts is a commonly accepted value for the lowest voltage that can cause a dangerous electric shock.
- 100 milliamperes is the lowest amount of electrical current flowing through the human body that is likely to cause death.
- Make sure all plugs are grounded and on a ground-fault interrupter.
- Everyone in your home should know how to quickly shutoff the power to your station.

Safety: Electrocution

Take the following precautions when a lightning storm is expected:

- Disconnect the antenna cables from your station and move them away from your radio equipment.
- Unplug all power cords from AC outlets and stop using your radio.

Safety: RF Radiation

- Antennas emit RF radiation when they transmit.
- Touching an antenna during transmit can cause RF burns.
- For an HT (Handheld Radio) on 5 watts, this won't pose any problems but larger, higher powered radios can cause dangerous burns.

Towers

- As a Technician class operator, do not climb or install large antenna towers without learning the proper tower related safety precautions.

Safety: Batteries

- A conventional 12-volt storage battery presents a number of hazards, it contains dangerous acid that can spill and cause injury, short circuits can damage wiring and possibly cause a fire and explosive gas can collect if not properly vented. Please use safety glasses when working with lead acid car batteries.
- A storage battery could overheat and give off dangerous gas or explode if a battery is charged or discharged too quickly.
- If you install a 20-ampere fuse in your transceiver in the place of a 5-ampere fuse the circuit could draw excessive current and cause a fire.

Radio Etiquette

Radio Responsibility

- As a Ham, you are the “Control Operator”.
- An amateur operator designated by the licensee of a station to be responsible for the transmissions from that station to assure compliance with the FCC rules.
- You can however, allow another licensed amateur to use your station equipment and call sign.

Third-Party Traffic

- As a Ham, you can let an unlicensed radio operator use your equipment and call sign while you are there supervising.
- You are ultimately the one responsible for your station and what is broadcast using it and your call sign.

Station Identification

- The FCC requires that you identify yourself by stating your FCC call sign at least once every 10 minutes and at the end of transmission.

When Can You Start to Transmit?

- Q: How soon may you operate a transmitter on an Amateur radio service frequency after you pass the examination required for you first amateur radio license?
- A: As soon as your name and call sign appear in the FCC's ULS database

Radio Etiquette

Some Simple Amateur Radio Rules:

- No Obscenities or Profanity. Be Nice!
- No Music
- No using Ham Radio as a revenue generating tool.

Radio Etiquette: Do's & Don'ts

- Amateur radio does not mean we don't act professional.
- Don't interrupt conversions, listen first before keying up.
- Don't use CB slang, 10-Codes, or Q-Codes (my opinion); use simple straight-forward language.
- Speak clearly and slowly.
- Key the Mic a second before you start speaking, unkey after you finish speaking.
- Remember: The whole world is listening!

Radio Etiquette

- In an Emergency give your call sign followed by “Emergency”. Radio operators will yield to Emergency traffic.
- In Life or Property threatening situations, anything goes!

Transmit Power

- Rule of Thumb: Use the least amount of power to reliably pass traffic.

ITU Phonetic Alphabet

- Its use has come about because of the need to be able to distinguish letters accurately when spoken over radio channels where the bandwidth of the audio is limited and there may be interference.

- Always use the proper words, they were carefully selected so no two sound alike.

ITU Phonetic Alphabet

A Alpha	J Juliet	S Sierra	1 One
B Bravo	K Kilo	T Tango	2 Two
C Charlie	L Lima	U Uniform	3 Three
D Delta	M Mike	V Victor	4 Four
E Echo	N November	W Whiskey	5 Five
F Foxtrot	O Oscar	X X-ray	6 Six
G Golf	P Papa	Y Yankee	7 Seven
H Hotel	Q Quebec	Z Zulu	8 Eight
I India	R Romeo	0 Zero	9 Niner

Net Protocol

- A "Net" is an on-the-air meeting of amateur radio operators. Usually, the group's discussion centers on a particular topic. EmComm, Training, an event, etc…

- Nets are usually held on a regular basis on a pre-determined frequency. Most nets are "directed nets" meaning there are certain rules that must be followed. One operator, acting as Net Control, is responsible for moderating the conversation and keeping order on the air.

Net Protocol

- When on a directed net, you should not speak until you are called on by Net Control.
- Think of it like a classroom - you must raise your hand and wait for the teacher to call on you before you address the class. Same thing on the air! You can imagine that if everyone spoke at once, there would be chaos.
- When Net Control calls on you, you should address the group and close with your call sign.
- If you wish to address a comment to a particular person, you need to ask Net Control for permission first. If permission is granted, have your conversation with that person and then indicate that you are returning the frequency to Net Control.

Net Protocol

- So, you're on a net and you want to speak up. How do you "raise your hand" on the air?

- Wait for a quiet moment when no one is passing traffic and state your call sign or tactical call sign.

- ALWAYS, wait for Net Control to acknowledge you before speaking further. Once Net Control acknowledges you, pass your traffic then close with your FCC call sign (Not tactical call sign). If your traffic takes long, identify yourself by your FCC call sign every 10 minutes and again when you are finished speaking.

Net Protocol

- Some repeaters have a 2 to 3 minute timeout timer, so you may have to unkey and rekey before the repeater cuts you off!

- That's all there is to it! The best advice is to listen to a few nets before jumping in to participate. You'll get the hang of this in no time!

Using Tactical Call Signs

- In some events or emergency scenarios, you may take on a role that represents a particular group or location.
- Advantages: It clarifies the function and location of the station. Increases comprehension and reduces operator fatigue.
- Staying Legal: Use your tactical call sign but always end your exchange with your FCC call sign.
- Initiating a Call: Simply transmit your tactical call sign. Wait for Net Control to acknowledge you. Then proceed with your traffic. Close the exchange with your FCC call sign.

Using Tactical Call Signs

Example:

- You: “Red Cross Shelter 3”
- Net Control: “Red Cross Shelter 3”
- You: “Be advised Red Cross Shelter 3 is ready in all respects to receive refugees. KE7TPD. ”
- Net Control: “Roger. This is Net Control.”

EmComm Go Bag

Ham Radio Go Bag

- As a Ham Radio Operator you may choose to be ready to provide communications in an emergency.
- Just like you have an emergency evacuation kit for disasters, you should consider a “Go Bag” for communications.
- Add your “EmComm Go Bag” to your Evacuation Priority List.

Ham Radio Go Bag

Radio:

- HT Radio(s) (Programmed)
- 1/4 Wave Antenna
- Radio Manual
- Speaker Mic
- Headphones
- Mounted Antenna (mag mount, J-Pole, etc.)
- Coax cable for Mounted Antenna
- Adaptors (HT Radio to Coax to Mounted Antenna)
- Spare Batteries
- Battery Pack (Alkaline)
- HT programming cheat sheet
- Radio Frequency Guide
- Tiger tail
- Radio Programming Cable
- 12v Car Charger

Ham Radio Go Bag

Tools:

- adjustable wrench (if mounted antenna)
- charger for radio, 110V
- charger for radio, 12V
- extension cord with cigarette lighter connectors, 12V
- LED flashlight
- LED headlamp

- Money for gas, food, etc…
- multipurpose leatherman
- Clipboard, Pencil and Paper
- spare 2A fuses for HT cord
- tape, electrical
- Wire ties

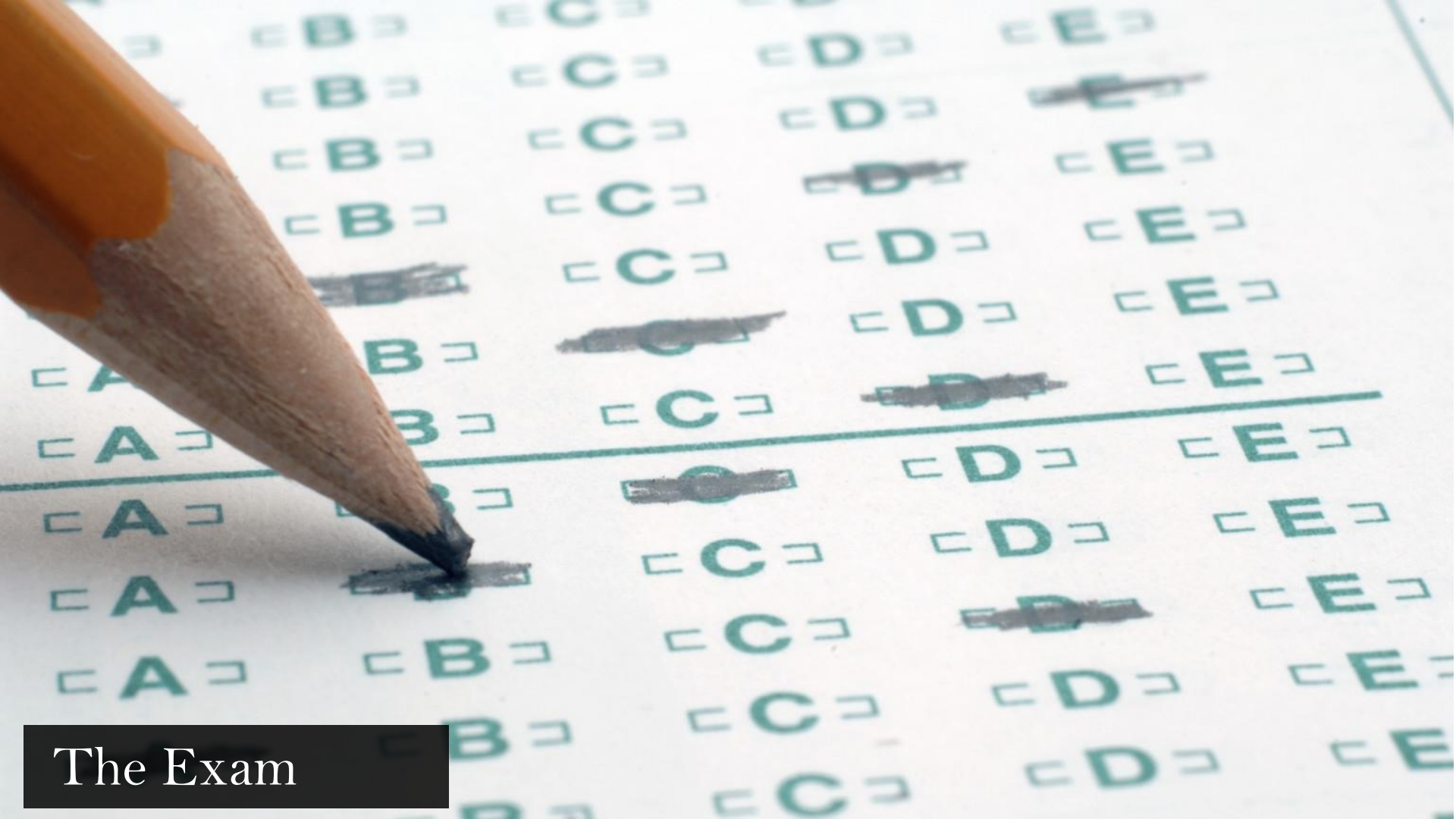
Ham Radio Go Bag

Other:

- Bandaids, Moist Towelettes, Sunscreen
- Compass, GPS
- Watch
- Copy of FCC License
- Matches or Lighter
- Spare Prescription Glasses
- Reflective Safety Vest
- Flashing Runner's LED Tail Light
- Ear Plugs, Shooting Ear Muffs

To Consider:

- Seasonally appropriate clothing
- Chair/table/Sunshade
- Food and Water



The Exam

Exam Expectations

- The Exam will be next week!
- 7:00pm post exam expectations and final review.
- 7:45pm Exam
- Stay for a while after the exam to network with other Hams, ask questions and help with programming radios.

What to Bring to the Exam

- $15 Cash (FCC Exam Fee)
- #2 Pencil
- Scratch Paper
- Calculator (No Phone)
- Driver's License (Children need Birth Certificate)
- Social Security Number or FCC FRN Number (Link)

Taking the Exam

- Exam contains 35 multiple-choice questions. You must get 26 right to pass (You can miss 9).
- Do not write in the test booklets.
- You can take a retest any time, but not usually in the same test session. There is a $15 charge for each retake.
- The test is not timed.

When Can I get on the Air?

- Anyone can monitor (listen to) radio traffic, but only licensed ham radio operators with a call sign can transmit.
- You can get on the air as soon as your name and call sign are posted to the FCC Universal Licensing System Database at: www.fcc.gov/uls
- Your license will arrive in the mail in a couple weeks.

BAOFENG

Radio Programming

Simplex (Direct Radio to Radio) Manual Programming

What You Will Need to Program your Radio:

- **Receive/Transmit Frequency:** ex. 144.520
- Select **Memory Channel** to store the new Frequency

Legend:

Click corresponding button

Type-in selection using number keys

Select using Up and Down Arrows

1. Set your display to "Frequency Mode" from "Channel Mode". (No channel listed to the right of the display)

   VFO/MR

2. Set your display to "A". The triangle to the left of the frequencies will be on the top line and pointing up.

   A/B

3. Type in your Receive/Transmit Frequency

   Receive Frequency

4. Set Offset/Frequency Direction to "OFF"

   MENU → 25 → MENU → OFF → MENU → EXIT

Duplex (Using a Repeater) Manual Programming Guide

What You Will Need to Program your Radio:

- **Receive Frequency:** ex. 146.720 or 449.375
- **Transmit PL Tone:** ex. 100.0 Hz or 88.5 Hz
- **Offset Direction:** Off, + or – (See Step 6)
- **Offset Value:** 600 kHz or 5 MHz (See Step 7)
- Select **Memory Channel** to store the new Frequency

Legend:

Click corresponding button

Type-in selection using number keys

Select using Up and Down Arrows

1. Set your display to "Frequency Mode" from "Channel Mode". (No channel listed to the right of the display)

   VFO/MR

2. Set your display to "A". The triangle to the left of the frequencies will be on the top line and pointing up.

   A/B

3. Type in your Receive Frequency

   Receive Frequency

4. Set Transmit CTCSS Tone [PL Tone assigned to the desired repeater]

   MENU → 13 → MENU → Tone Frequency → MENU → EXIT

Radio Programming

Simplex Frequencies:

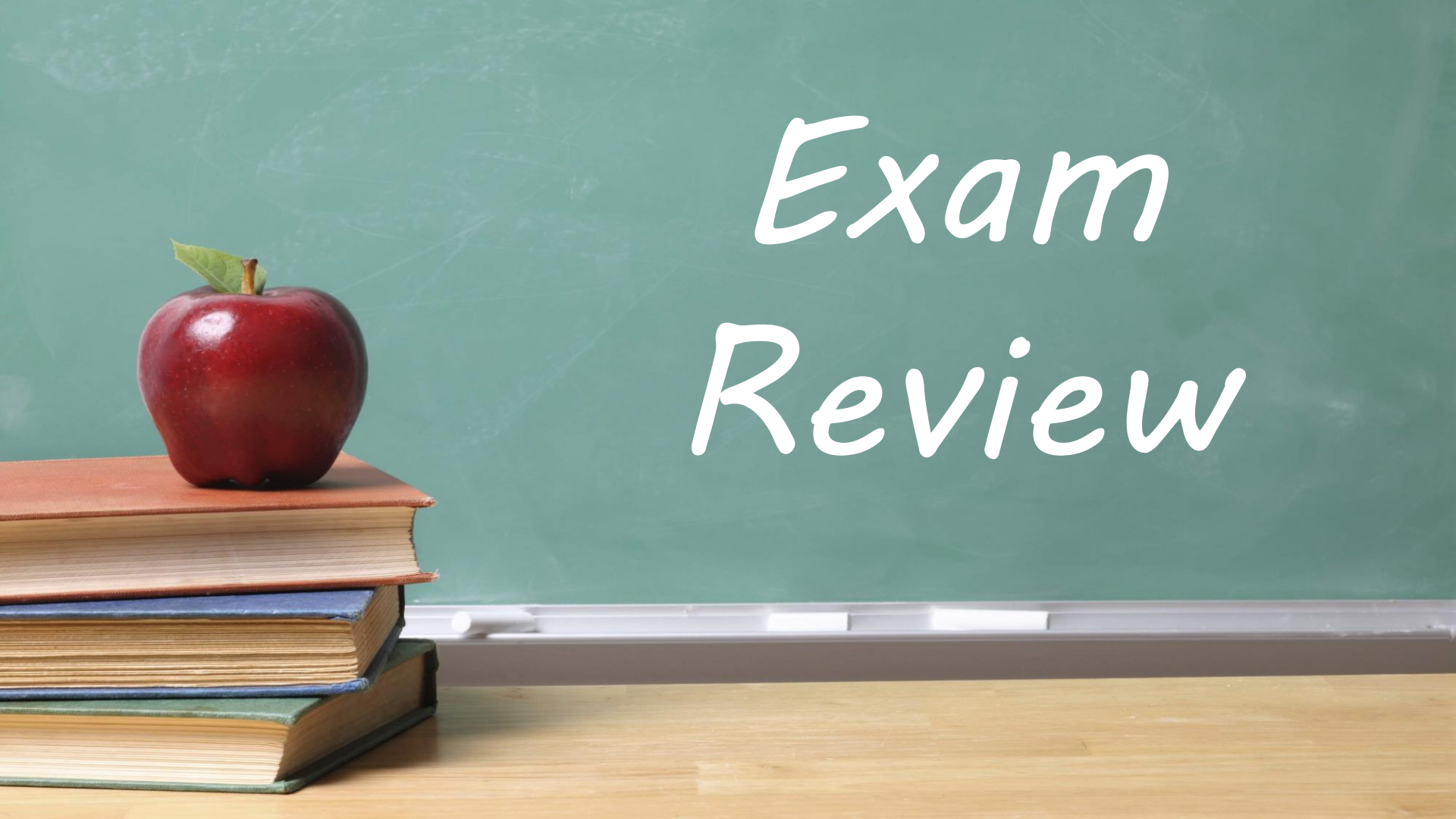
1. 147.520 (xRECON)
2. 146.520 (xCall 2M)
3. 446.000 (xCall 70cm)

Radio Programming

Duplex/Repeater Frequencies:

	Name	Freq.	Dir.	Offset	PL Tone
1.	ORD 92	146.92	-	0.6	162.2
2.	SHAW24	147.24	+	0.6	162.2
3.	OCOTI32	449.325	-	5.0	100.0


Questions?


Exam
Review

Next Week!

Lesson 4:

- Post Exam Opportunities
- Exam Review
- The Exam
- Networking / Radio Programming Continued


Questions?

See You Next Week

thanks for joining us