

## Ham 10A – First Radio: Simplex for Emergency

Dr. Marc & Rosemary © 220516 / 240205

1. So now you are a Ham. You observed on the FCC database that your license is online. What do you do now?
2. Which radio you choose depends on your expected use, which will likely change. Perhaps most people pursue ham radio for emergency capabilities. Our recommendations orient to reliable, always-available communications.
3. Before deciding on a radio, we need to address Simplex and Duplex.  
Simplex is just what it sounds like, Simple: It is one radio talking directly to another radio on the same frequency.  
Duplex is one radio talking through a repeater system to another radio, using different transmit and receive signals.
4. Emergency communications must occur regardless of outside circumstances. So, Simplex is the only dependable mode, when disaster or a situation outside your control happens. (\$tuff hits the fan, \$htf.) (Keep it simple Sam, Kiss)
5. **Radio:** The transceiver category is mobile/base, since it operates from 12 Vdc. One can operate fixed or mobile. The unit should be a minimum of 50-Watts to operate in our urban, hilly terrain. Select both VHF/UHF to communicate with Nets, SuperLink and weather. Icom and Yaesu are highly reputable. Anytone, BTech and TFT have a following. Costs about \$200-300.
6. **Power:** To obtain 12 Vdc, a power supply converts from 120 Vac wall power. Output current should exceed 15 Amp or whatever your radio requires. Variable can destroy a radio. Costs about \$130.
7. **Antenna:** To get the signal into the air, use a quality antenna with gain and elevation. If space is limited or you are behind a hill, a Not-Line-Of-Sight (NLOS) Compactenna works fine. J-pole is great on VHF, a dual band J-pole also works UHF. Colinear improves gain. Keep antenna in attic to protect from lightning and HOA. Diamond and Comet make conventional. I use Compactenna 9", Diamond X-50, dual-band J-pole. Costs about \$120.
8. **Coax** connects the antenna to radio. Lower loss is better. Keep length as short as possible. RG-213/U is lower loss and better but larger and stiffer. RG-8X is much smaller and more flexible, suitable for jumper. Cost about \$35.
9. **Emergency power:** This depends on your unique needs, desires, and budget. The minimum is a back-up battery like an alarm battery. A charger is highly-desirable. Solar panels are off-the-grid. Generators (Honda EU2200i) provide other support. Costs depend on size of credit card.
10. Plug it in, hook up antenna. Switch to Frequency mode (VFO) and you can talk to most anyone around the county. More power with a specialty, higher antenna can reach over 75 miles. Normal simplex is about 20 miles.
11. National calling simplex frequency for VHF = 146.52 or UHF = 446.0 Mhz. Then move to another such as 146.470. More commonly, we monitor a frequency our network group selects to use.
12. **Hand-held:** A handi-talkie is inexpensive, but should not be only radio.  
It is often the first investment, because of the incredibly low price for Baofeng about \$20.  
I have a couple. They are convenient for a carry radio. The cheapy Baofeng causes no tears if lost or damaged. Their power rating is only 4 – 8 Watts, which is similar to FRS, GMRS, or CB hand-talkies from big-box stores. Their performance improves somewhat by connecting to a better antenna, like the base described above.  
Caution: Because of low power, they almost require a remote repeater. Even then, communication is not assured. From our group experience, they are not suitable or dependable for an emergency communication radio.
13. More information about each of these topics is available in separate articles.
14. How to talk.
  - a. Select appropriate frequency.
  - b. If hand-held, hold antenna as vertical as possible to match vertical polarization of others.
  - c. Press PTT. Speak in normal voice. Microphone is small 1/16" hole on front. Space next to side of mouth.
  - d. I am available to talk to anyone: My call-sign (NM0D) monitoring.
  - e. Calling specific person: K5CAY this is (de) NM0D.
  - f. Answering: My call-sign, their call-sign (K5CAY), go ahead Fred.
  - g. Discussion: Genteel. Whatever you want, like a good neighbor. No music.
  - h. Ending call: 73 (goodbye, best wishes, etc) NM0D. If no answer, just say: NM0D.
  - i. Relax: Just be yourself. If you miss something, so what? Go with the flow.
  - j. AVOID: Anything that sounds like CB, the hangout of unqualified & unskilled.
15. Welcome to real radio, where you can experiment, aid, or just chat. The radio which works when nothing else does.

**Icom 2730**  
Personal  
favorite



## Ham 10B – First Radio: Duplex to Reach Out

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1. Duplex allows a radio to talk via a repeater. A repeater is a remote base radio, which can hear your radio, boost the signal, then retransmit to another radio. A repeater may work up to 30-mile or so radius from the station. In our area, most do not do that well, because of terrain and older equipment.
  2. Repeater links can expand from Kansas to North Texas, using Tulsa Amateur Radio Club (TARC) network.
  3. AllStar uses the Internet to extend radio range even further around the world.
  4. Analog radios use traditional electronics and are more reliable in an emergency. Digital offers more features and can link around the world.
  5. Your radio must be programmed to talk on the correct frequencies in the proper way.  
What do I need before programming?
  6. Go on the web to find frequencies for the repeater you want, such as Tulsa Amateur Radio Club. RepeaterBook.com is a common source. Evergreen repeater is 145.250, negative offset, tone 141.3.
  7. Receive, RX, downlink, repeater output: *The receive frequency displays on your radio screen.*  
Transmit, TX, uplink, repeater input: *The transmit frequency is what the repeater hears.*  
Offset, sometimes used instead of Transmit: *Offset is the difference between the receive and transmit.*  
CTCSS, Continuous tone-coded squelch system: *Sub-audible tone allows multiple groups on freq w/o hearing*
  8. Think about the meaning of offset. That is the separation the transmitter must be from receiver to stay within the band.  
+ means add the offset to the RX frequency to get the TX frequency.  
VHF offset is normally 0.6 MHz, UHF is normally 5.0 MHz.
  9. Program a channel with your first frequency. I use channel 2, so I have channels 0 and 1 for simplex.  
Repeater example:   RX, +offset, CTCSS       RX, TX, CTCSS  
Evergreen           145.250, -0.6, 141.3       145.250, 144.650, 141.3  
Tulsa Repeater Org: 146.805, -0.6 MHz, 88.5   146.805, 146.205, 88.5  
Tulsa Amateur RC:  443.85, +5 MHz, 88.5       443.850, 448.850, 88.5
- CTCSS also called PL  
for Private Line
10. To operate duplex, switch your radio to Channel Mode (Memory Recall, MR).
  11. A word about VHF & UHF. In our region, you want and need both.
    - a. Most local communications and Nets operate on VHF.
    - b. However, the TARC SuperLink of repeaters from Kansas to Oklahoma, Arkansas, and Texas uses UHF.
    - c. The National Weather Service operates emergency weather Nets on the SuperLink UHF gateway. Without UHF, you cannot talk or listen.
    - d. My Icom 2730, and some others, has two separate receivers. This allows cross band operations when one is set for VHF and one for UHF. Not frequently used, it does occasionally come in beneficial in remote situations.
  12. Remote programming.
    - a. Obviously entering more than one or two frequencies with tones would be a pain in the laticibles.
    - b. Obtain a programming cable for your radio.
    - c. Obtain CHIRP software for your computer.
    - d. Program the channels you want to use on the computer.
    - e. Download the files to your radio.
    - f. It is still beneficial to know how to manually do a channel, when something different arises in the field.
  13. We have a complete article on how to do Chirp.



**Ham 10C - First Not Only Radio: Setup**  
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1. For dependable, emergency communications, you must have a more powerful mobile/base radio.
2. Far and away the most common radio is a Handi-Talkie. The cheapest is a Baofeng UV-5R series, at about \$25. Buy through Baofeng Tech (BTech) store, since they are a company in the US that will assist you on problems. The step-up Alinco DJ-VX50 is an easier to program choice.
3. The instructions are for the Baofeng / Radioddity series of inexpensive radios.
4. Charge radio before you turn on the first time.  
 To turn on: Rotate top knob clockwise, rotation increases volume
5. [PTT] Transmit while holding button down, receive when release. —  
 [VFO/MR]: Switches between Frequency (variable frequency oscillator) and Channel (memory recall) modes.  
 [A/B] Switches between upper and lower display for RX.  
 [▲][▼] Scroll up / down.  
 [MENU] Enter menu mode. Then confirms and save entry.  
 [EXIT] Change between menu steps. Quit current operation.  
 If you screw up, hit exit, and start over.
6. Use Simplex channel:
  - a. Set to Frequency mode: Press [VFO/MR]. Channel # on right disappears.
  - b. Enter RX/TX frequency, no decimal: 146.520
  - c. Ready to talk.
7. Program a channel:
  - a. Switch to upper display: Press [A/B] until get arrow on left of upper line.
  - b. Set to Frequency mode: Press [VFO/MR] until channel # on right disappears.
  - c. Delete prior data (menu28), e.g. chan 2: [MENU]...[2][8][MENU]...[2][MENU]...[EXIT]
  - d. Set TX CTCSS tone (menu13): [MENU]...[1][3][MENU]...88.5[MENU]...[EXIT]
  - e. Enter RX frequency, 6 digits: 443850
  - f. Store RX (menu27), e.g. chan 2: [MENU]...[2][7][MENU]...[2][MENU]...[EXIT]
  - g. Enter TX frequency, 6 digits: 448850
  - h. Store TX, e.g. chan 2: [MENU]...[2][7][MENU]...[2][MENU]...[EXIT]
  - i. Set to Channel (Memory recall) mode: Press [VFO/MR]. Channel # on appears on right.
8. Program a simplex channel:
  - a. Follow above steps to program: Substitute new channel in step c.
  - b. If CTCSS: Follow step d. If no tone, ignore d.
  - c. Continue: Substitute new frequency and channel in e, f, i. Ignore g.
9. Program a repeater:
  - a. Set to Frequency mode: Press [VFO/MR]. Channel # on right disappears.
  - b. Enter repeater out, your receive: Press [▲][▼] or enter frequency from keyboard.
  - c. Set frequency offset, 0.600 or 5.000 [MENU]...[2][6][MENU]...600[MENU]
  - d. Set direction, [▲][▼] for +/-: [2][5]...[▲][MENU]...[EXIT]
  - e. To save to memory channel: see manual program a channel.
10. Use Menu shortcuts:
  - a. Set desired value, e.g. squelch: [MENU] [0][MENU] [▲] / keypad [MENU saves] or [EXIT cancels]
  - b. Keys are labelled with first 10 menus 0=squelch, 1=freq step, 2=TX power hi/lo, 3=save bat, 4=VOX, etc
11. Other fun keys.
  - a. [CALL] Switch to FM receive. Long= alarm. Press again to turn off.
  - b. [MON] Turn on flashlight. Again= flash. Press again to turn off.
  - c. [BAND] Switch bands. Changes depending on mode.
  - d. [MENU][7] TDR, turn on dual receive for both A and B.
  - e. [MENU][22] MDF-B, display name for channel B.
12. Life is good. Enjoy

