Ham 13 – Chirp Programming
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1. VHF/UHF ham radios, which operate on a repeater, have numerous channels, that are a complex arrangement of receive frequency, offset, transmit frequency, squelch tones, and myriad specific capabilities of manufacturers and radios. To accommodate the diversity, radios typically store from 128 to over one-thousand channels. Although it is possible, that is a lot of data to very tediously input by hand.

2. Consequently, manufacturers have designed-in the ability to program the channels with a USB cable from a computer, which connects to a custom plug on the radio. Three common software apps are available. Each manufacturer has their own app, which is unique. RT Systems has developed a top performing commercial app. Chirp is a free, open-source app. If you have more than one radio, then you need a common app. Although RT Systems is perhaps the most capable, 'free' moves most hams to Chirp. A frustration with Chirp is that it must be updated every time you use it, since daily updates are released for all the new radios, their capabilities, and fixes or tweaks. Chirp has become so common that many manufacturers are now supporting its development and maintenance.

3. First the programming cable should have the FTDI brand USB driver chip. Several knock-off cables use an older technology chip, which does not work well with drivers on Windows computers. RT Systems does their own.

4. The most difficult chore is determining receive frequency, direction, offset, tones for a repeater to put in a channel.
   a. Talk with Elmer. Copy a clone-file from another ham. Check web for club repeaters. Get info for other repeaters.
   b. https://www.repeaterbook.com/repeaters/location_search.php?type=county&state_id=40&loc=Tulsa.
   c. https://www.radioreference.com/apps/db/?ctid=2199&tab=ham
   d. https://oklahomarepeatersociety.org

5. This is not trivial, but a very involved process. Be prepared for frustration, but the results are worth it. Call Elmer.

6. *Install* Chirp and check supported radios. https://chirp.danplanet.com/projects/chirp/wiki/Home
   - Chirp has 'live' and 'clone' methods. We will look at the clone, which transfers a complete file to the radio.

7. *Prepare* radio to communicate with Chirp.
   Turn radio OFF. Plug FTDI cable in PC USB-port. Plug cable into radio. Turn radio ON.

8. *Download* contents of radio:
   a. Start Chirp. Click [*Radio*] menu. Click [*Download From Radio*].
   b. The Clone window pops-up with drop down menus. Select Serial [*Port*]. Select [*Manufacturer*]. Select [*Model*].
   c. Click [*OK*] to start the download process. Clone-mode radios will display a progress bar.
      Live-mode radios will jump to the memory editor and begin to populate it with memories.
   d. YAESU radios notice: VX-7, hold down [*Mon/F*] key when turn [*on*] to put in clone mode before click [*OK*]. After [*OK*], press button on radio to initiate clone, usually [*Band*] or [*Clone Tx*].
   e. Save old radio image. Click [*File*] menu. Click [*Save As*]. Input file name. Saves an image (*.img) file.

9. *Edit* the file in Excel.
   a. Export radio data as CSV to an Excel file. Click [*File*]. Click [*Export*]. Choose memory channels to export.
   b. Do not change headings in any way or column location. Use only +/- or plus/minus in format radio uses.
   c. Edit the columns for each channel number. Include location, receive frequency, direction, offset, tones.
   d. Save the edited file as CSV.

10. *Import* a file back to Chirp.
    a. Start Chirp. Obtain a temporary image of the target radio.
       - Click [*Radio*] menu, Click [*Download From Radio*].
       - OR Click [*File*] menu, Click [*Open Recent*] *.img.
    b. Import source file (*.csv, *.chirp, *.img, *.idf). Click [*File*]. Click [*Import*].
    c. Choose channel memories to import. Import overwrites the temporary target radio file.
    d. Save radio image. Click [*File*] menu. Click [*Save As*]. Input file name. Saves an image (*.img) file.

11. *Upload* new image to radio.
    Click [*Radio*] menu. Click [*Upload to Radio*].

12. For more info or help. https://chirp.danplanet.com/projects/chirp/wiki/Documentation

13. Life is good. Enjoy.