How to Program Your Software Defined Radio

What is SDR?

- What is a Software Defined Radio?
  - The newer radios use a computer chip, Analog To Digital converters, Digital To Analog converters , memory chip and Digital Signal processors to make the transmitter-receiver circuits in a Software Defined Radio (SDR).
- So what does this technical gibberish mean?
  - Digital code that is “1”s and “Zero”s make up the information to make the SDR radios work.
- Most SD radios have a means by which we can store information such as frequencies, modes of operation, radio settings and other details. This is called memory management.
- What do you need to have to do this?
  - You will need a computer with Windows Based operating system such a Windows 10.
  - You need an interface cable. Some of the cable have electronics in them although they will look like a usb cable. You must have the correct cable for your radio. Some radios come with the correct cable, other you will have to order the cable separately.
  - You will need software installed on the computer that is used to program your specific radio.

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What software do I need?

- There is free software available that you can download. One common piece of software is called “Chirp”. Chirp is for placing frequencies and tones in the radio.
- The Chirp website is found here :
  https://chirp.danplanet.com/projects/chirp/wiki/Home
- See the handout for details of the radios it can be used to program.
- A lot of the radios listed are the Chinese Handy-Talkies. However there are some listed that are mobile/desktop rigs.
- Some vendors may have software you can down load from the internet for your specific radio.
- If you have to purchase software, one company called RTsystems has programming software for many different vendors radios such as Kenwood, Yaesu, Icom, Elantec and other.

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How do I install the software?

- Most of the software uses the Universal Serial Bus or USB port on the computer. The USB port may require some code called a “driver” to work with the programming software.
- The “driver” code is also software. This piece of code allows the computer to understand how utilize the electronics in the programming cable if there is one. Also some radios have a usb port built in to them which may also require a “driver” for programming.
- Order of software installation:
  - Install the radio programming software first.
  - install the software driver second.

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How do I connect to the radio?

- You will need to read the manual to determine how to get the radio into a mode for programming.
- The may require using multiple simultaneous keystrokes to prepare the radio for using the programming cable.
- Turn on the computer and after it is booted up, start the software to program the radio.
- With the radio turned off, connect the programming cable to the radio.
- Turn on the radio and use the keystrokes defines by the manufacture to place the radio in programming mode.

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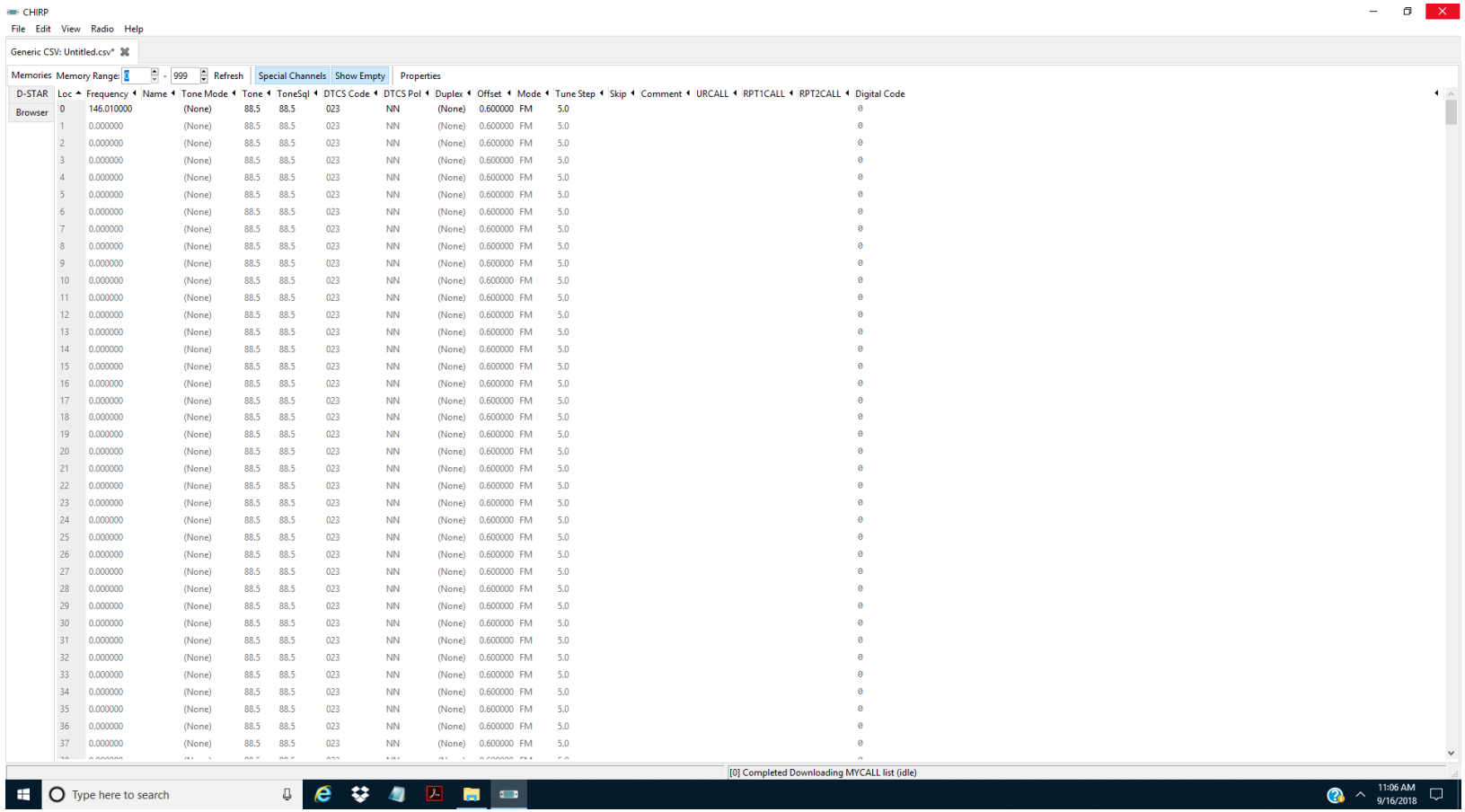
What do I do with what I see on the computer? (Baofeng BF-F8)

Opening screen



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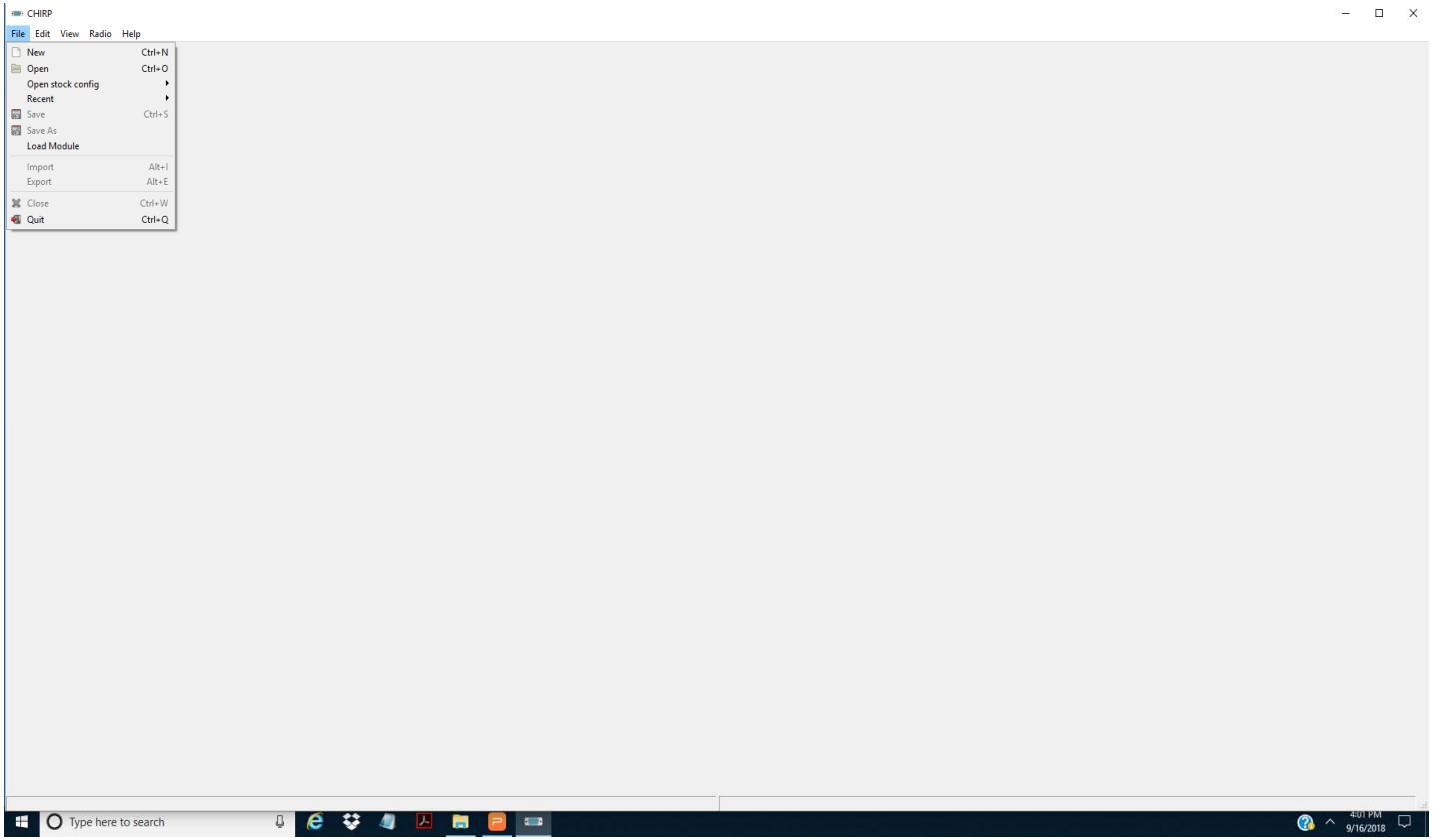
What do I do with what I see on the computer? (Baofeng BF-F8)

Get the file for the radio



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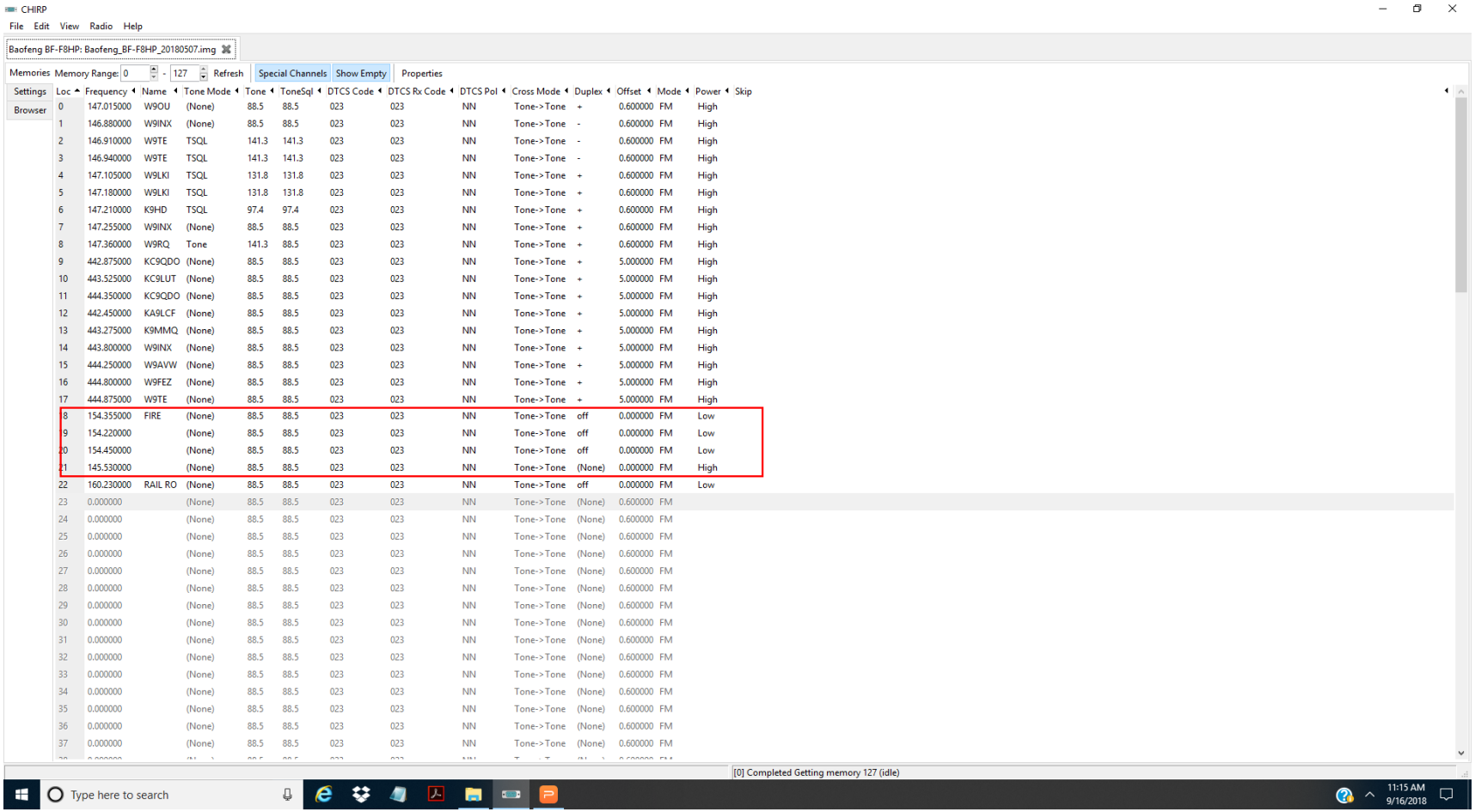
What do I do with what I see on the computer? (Baofeng BF-F8)

Prevent out of band transmissions



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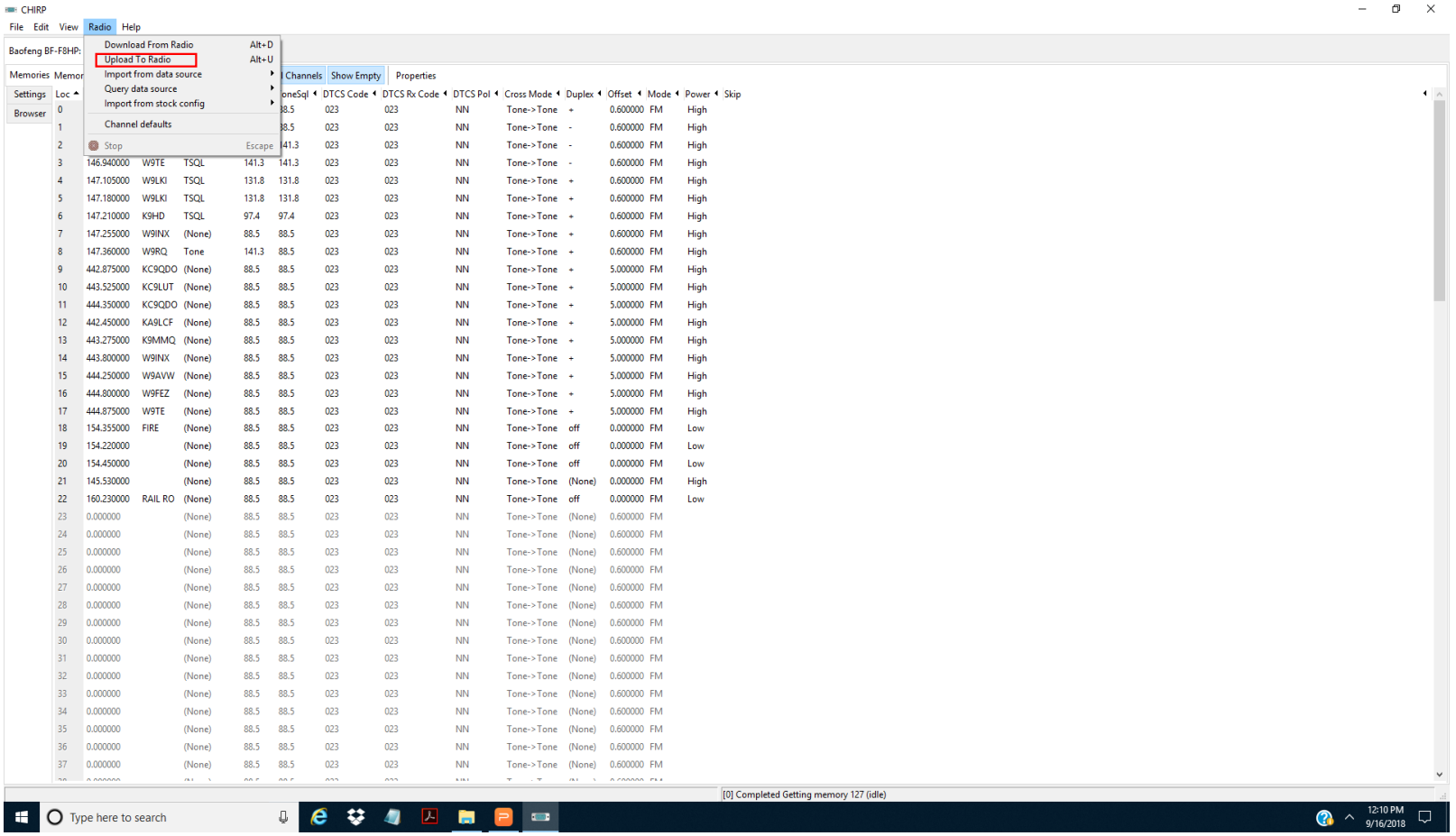
What do I do with what I see on the computer? (Baofeng BF-F8)

Upload changes to the radio



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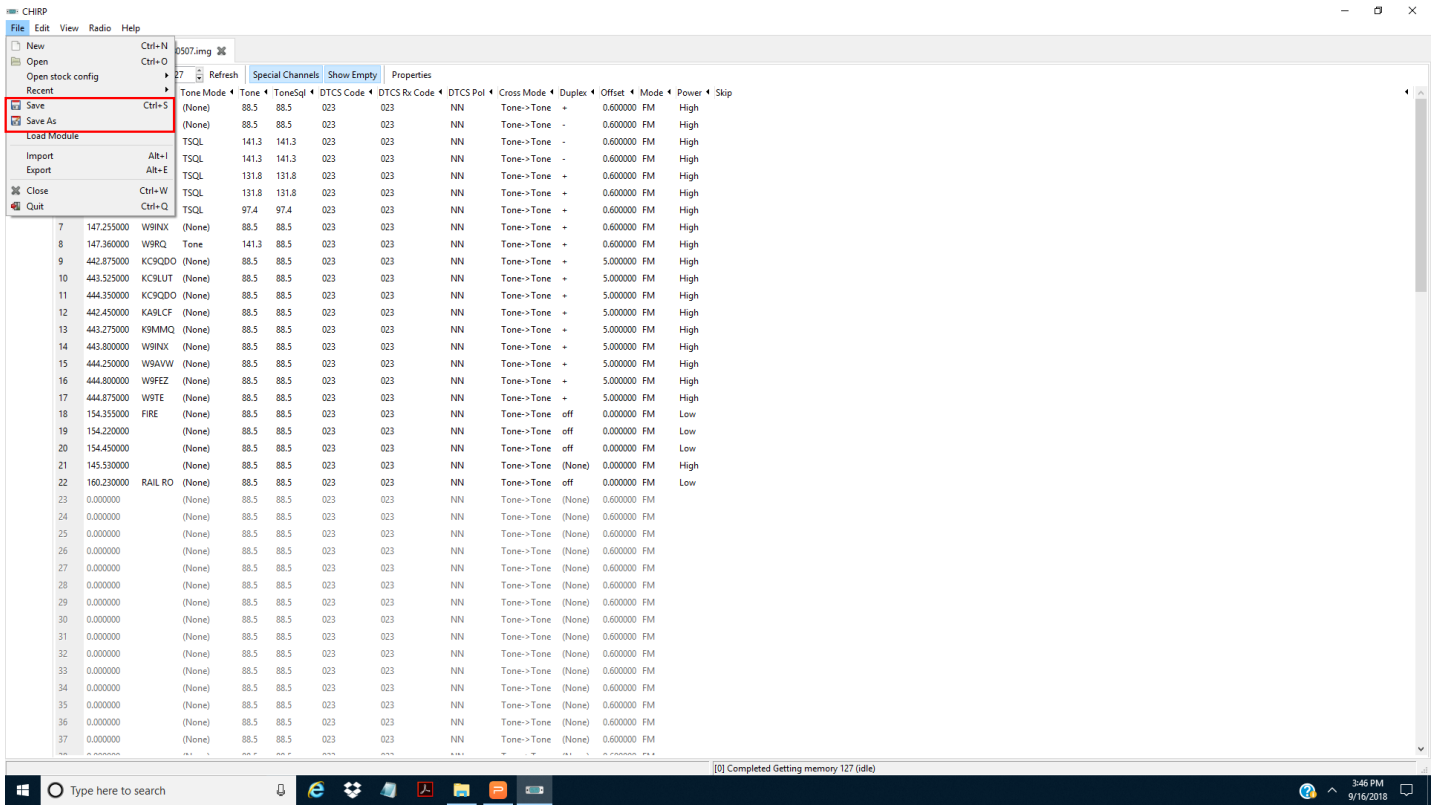
What do I do with what I see on the computer? (Baofeng BF-F8)

Save the radio setting to the disc drive.



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What is firmware and how is it updated?

- The new HF radios and Handy-Talkies have firmware that may be needed to be updated.
- Firmware is actually the operating system used by your radio. It is similar to the operating system used by your computers.
- There may arise the requirement to update the firmware. This an be concerning since if it is done wrong could make your radio unusable.
- The firmware update requires an installer program which is different from the software to update frequencies and tones.
- The installer program may use the same cable as previously discussed.

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What is firmware and how is it updated?

- Read the direction from the manufacturer of the radio very carefully!!
- Some radio have a switch internal to the radio to allow it to have a firmware update. The direction are specific as to when to power up, install the firmware and power down the radio. The internal switch then has to be changed to a non-programming mode. This is the case with the Yeasu FTM-400.
- To show how this is done, I will place an update into a DMR GD-77 radio.

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What is firmware and how is it updated?

- First : Install the software on the computer for the firmware upgrade.
- Second : If drivers are required for the computer, install them as well. Also any settings for the USB cable must be updated or changed.
- Third : Check the radio setting for the USB interface settings.
- Fourth : Read the direction throughly before doing the upgrade to ensure the radio is ready to be programmed.
- Observe the process that the manufacturer has described for the upgrade.