

## Programming Alinco -135T, 235T, and 435T VHF/UHF Radios

**RADIO DISPLAYS and CONTROLS:** The front panel of the radio is shown in Figure 1.

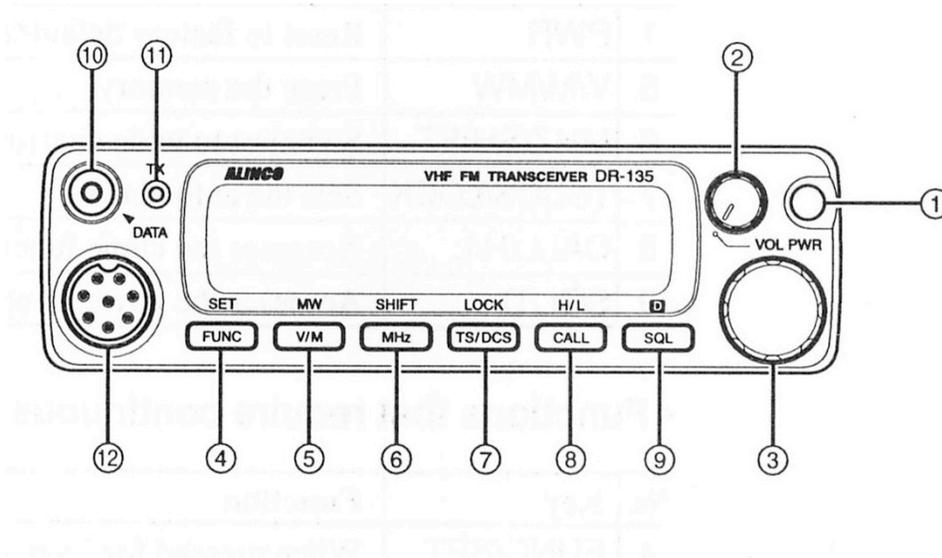


Figure 1

**Turning The Radio On:** The power switch is the pushbutton in the upper right hand corner of the radio.

**Volume Control:** The Volume Control is the small knob to the left of the Power On Pushbutton.

**Tuning Knob:** The Tuning Knob is the large knob below the Volume Control and Power On Pushbutton.

**Function Keys:** There are 6 function keys located below the display. The keys are labeled as follows:

SET	MW	SHIFT	LOCK	M/L	D
FUNC	V/W	MHz	TS/DCS	CALL	SQL

The functions engraved on the keys (the lower set of functions shown above) are performed by directly pushing the appropriate keys. The functions labeled above the keys (the upper set of functions) are second level functions. These functions are performed by first pushing the Function (FUNC) key followed by the key under the desired function label.

**End Function Selection:** Usually, the radio will return you to the normal display after selecting a function. Occasionally you can get stuck in the function selection process. It is therefore

important to know how to terminate a function selection. On the Alinco, you push the V/M function key to terminate or close function selection.

**SIMPLEX OPERATION:** Simplex is the simplest mode of operation. Simplex does not involve a repeater and is used to communicate with a “near by” ham who is approximately in your line of sight. Line of sight could be several miles away if you are standing on top of a hill, or less than a half mile if you are surrounded by hills, buildings or other obstructions.

To operate simplex you tune the radio to the frequency that you and the ham that you want to talk to agree upon. In addition, you have to turn off the radio’s repeater frequency shift function. Frequency shift is utilized only when communicating through a repeater. It is not used for simplex operation. Finally, set the radio’s output power to an appropriate level (usually low or medium power), set the squelch control to eliminate background noise, and turn the volume control to a comfortable listening level. You are now ready to begin simplex communications. These steps are described in more detail below

**Frequency Selection:** Radios have two operating modes, VFO mode and memory mode. To set the radio to the correct frequency you must be in the VFO mode. If the radio is in the memory mode, an M will appear on the left edge of the display. If you are in the memory mode, the V/M function key must be pushed to enter the VFO mode (the M will disappear from the display).

The Variable Frequency Oscillator (VFO) is the module that controls the radio’s frequency. Turning the Tuning Knob causes the radio to change frequency in very small steps. If the person that you want to talk to is on a frequency of 147.555 MHz and the radio is tuned to 144.000 MHz, it will take you all day to “crank” the Tuning Knob to a frequency of 147.555 MHz. To move across the band quickly push the MHz function key. The display will change to 144. Turn the Tuning Knob 3 clicks. The frequency display will change from 144 to 145, then 146, and finally 147. Pushing the MHz key again puts the radio back in the normal mode. Now turn the Tuning Knob until you reach 147.555 MHz.

**Turn Off Shift:** When communicating through a repeater, the frequency that you are listening to (the repeater output frequency) will be automatically changed (shifted) by the radio to the repeater input frequency when you begin to transmit. In simplex mode you do not want this to happen. In simplex mode, the frequency that you are listening to is also the frequency that you want to transmit on. To ensure that this happens, you must turn off the shift function. Notice that the word SHIFT is displayed above the MHz function key. Since SHIFT is written above the key, it means that you activate the Shift function by first pushing the Function (FUNC) key and then the MHz key. Repeating this two keystroke operation will cycle you through three options, minus shift (a – appears at the top of the display), plus shift (a + appears at the top of the display), no shift (neither a + nor – symbol appears at the top of the display). It is this last option (no shift) that you want for simplex operation.

**Power Level:** The Alinco radio has three transmit power levels, High, Medium, and Low. To minimize interference to others and to minimize the drain on your power supply or batteries, set

the radio to the lowest power level needed to communicate with the person that you are talking to. A good level to start with is Medium. On the Alinco, H/L (High/Low power) is displayed above the CALL key. This means that power selection is a second level function. Push the Function (FUNC) key followed by the CALL key to select power level. Repeating this set of key strokes will cycle you through the High, Medium, and Low power levels of the radio. For a Medium power setting, Mi appears in the upper left corner of the display. For a Low power setting, Lo appears in the upper left corner of the display. For a High power setting, neither Mi nor Lo appears in the upper left corner of the display. Stop at the setting that you want.

**Squelch:** Push the Squelch (SQL) function key. Turn the Tuning Knob counter clockwise until you hear continuous background noise (hissing). Now turn the knob the other direction until the hissing stops and the radio is quiet. Push the Squelch (SQL) function key again to terminate the function. This sets the sensitivity of the radio so that you can hear others without the nuisance of background noise.

**Volume Control:** Finally set the volume control to an audio level that is comfortable.

**Receiving:** You should now be able to receive the transmissions from the person that you want to talk with.

**Transmit:** To transmit, push the PTT (Push To Talk) key on the microphone. Wait a second after pushing the PTT key before speaking to give the radio time to enter the transmit mode. If you do not do this, the first word that you speak may not be clearly transmitted. Speak in a normal voice. Speaking too loudly will distort your transmission. Also, talk across your microphone, from the side, instead of directly into it. Talking directly into the microphone can cause background hissing.

**REPEATER OPERATION:** Repeater operation permits communications over an extended area. A repeater located on a high hill or mountain top has line of site coverage over a considerable area, often 15 to 20 miles.

A repeater amplifies signals it receives on its input frequency and retransmits them on its output frequency throughout its area of coverage. As a repeater user, you will listen to others on the repeater output frequency. This is the frequency that is listed for the repeater in repeater directories. For example, the output frequency for the Bozo Repeater is 147.885 MHz and the Grissom Repeater is 146.850 MHz. The repeater input frequency, for 2 meter repeaters, is off set or shifted either +600 KHz or -600 KHz from its output frequency. When you transmit to a repeater, the output of the radio must shift + or - 600 KHz, as appropriate, to the repeater's input frequency. The off set for both Bozo and Grissom is negative. The Bozo output frequency is 147.885 MHz. So when you transmit to Bozo, your radio must transmit at a frequency of 147.285 MHz. You must program this + or - off set into the radio in order to use the repeater.

Most repeaters in metropolitan areas utilize an access tone to avoid receiving and retransmitting signals actually intended for a different repeater operating on the same frequency. This tone is known as a PL or CTCSS tone. There are actually 39 tones available for use ranging in

frequency from 67.0 to 250.3 Hz. A repeater will only retransmit signals which contain its particular PL tone. For example, the PL for Bozo is 127.3 Hz while that for Grissom is 94.8 Hz. To utilize a repeater, your radio must be programmed to transmit the PL tone which the repeater is expecting. If you don't, the repeater will ignore your signals. In some cases a repeater will not use a PL tone, for example the Ojai repeater does not use a PL. In that case you will not program a PL tone into the radio for that repeater.

Programming the radio to work with a repeater is similar to programming it for simplex operation with the addition of the +/- off set and the PL tone. The programming procedures for repeater operation follow:

**Frequency Selection:** If the radio is in the memory mode (there is an M showing on the left edge of the display indicating memory mode), then push the V/M function key to place the radio in the VFO mode. Tune the radio to the output frequency of the repeater that you wish to use, using the same tuning procedures that were used to select a simplex frequency.

**Select +/- Shift:** Select the appropriate +/- off set for the repeater that you plan to use. This is done with the SHIFT key. The word SHIFT appears above the MHz function key which means that the FUNC key must be pushed followed by pushing the MHz key to activate the Shift function. Performing this two keystroke operation causes a – to appear at the top of the display indicating that the radio is now set up for a negative off set. Performing the two keystroke operation again causes a + to appear at the top of the display indicating a + off set. Performing the operation again causes the – and + signs to disappear, indicating that you are back in the Simplex mode. Perform the operation as many times as needed to achieve either a – or a + off set, as appropriate for the repeater that you will be using.

**Select PL Tone:** If the repeater that you will be using requires a PL tone, then you must select the tone which the repeater expects. Tone is selected by pushing the TS/DCS function key. Pushing the key once will cause a T to appear at the top of the display plus a tone frequency. Turn the Tuning Knob until the tone frequency expected by the repeater is displayed. Complete the tone selection by pushing the V/M key to exit the selection process. The normal display will return, except that a T is now showing on the display indicating that a PL tone has been selected. Pushing the TS/DCS function key multiple times will cause other functions to appear on the display. If this occurs, continue pushing the key until only a T accompanied by a tone frequency is shown on the display and proceed as described above.

**Power Level:** Set the radio's transmit power level to the lowest power needed for the repeater to clearly receive your signal. A good level to start with is Medium. Set this power level in the same way as was done for simplex operation.

**Squelch:** Set the squelch in the same manner as was done for simplex operation.

**Volume Control:** Finally set the Volume Control to an audio level that is comfortable.

**Transmitting and Receiving:** You are now ready to communicate with others via the repeater. Before beginning to transmit, make sure that the person that has been transmitting is really finished before starting your transmission. Then delay a little longer so that if someone has emergency traffic, they will be able to break in and use the repeater. If all is quiet, then you may transmit by pushing the PTT key on the microphone. Remember to wait a second after pushing the PTT key before speaking to give the radio and the repeater time to enter the transmit mode.

**RADIO MEMORY OPERATION:** Programming radio simplex and repeater frequencies is a lot of work. After you have set up the radio for a particular simplex frequency or repeater, you can store that information into the radio's memory so that you will not have to repeat the set up the next time that you want to use that simplex frequency or repeater.

**Writing to a Memory Channel: Storing the information that you have programmed into the VFO is particularly easy on the Alinco radio. Push the V/M key to place the radio in the memory mode. An M will appear on the left edge of the display. Turning the Tuning Knob will select different memory channels. As each channel is selected, its memory channel number will appear on the display below and slightly to the right of the M. Select an unused memory channel. The M will blink if that memory channel is empty. Push the FUNC key followed by the V/M key to write the contents of the VFO into the selected memory channel, ie to do a memory write function (MW).**

**Writing to the Call Channel:** The Call Channel is a special memory channel that contains the frequency and settings for an important repeater, such as the Ventura County ARES/RACES emergency repeater on 146.880 MHz, minus offset, and PL of 127.3 Hz. Pushing the CALL function key immediately switches the radio to the Call Channel. Pushing it a second time, or pushing the V/M function key, returns the radio to its original mode. The information programmed into the VFO is stored in the CALL Channel in the same way as writing into any other memory channel, with the exception that the Tuning Knob must be turned to the Call Channel (C appears in place of a channel number on the display) before pushing the FUNC key followed by the V/M key to perform a memory write function (MW).

**Memory Read:** Once you have stored all of your favorite repeater and simplex frequencies into memory, all that you have to do is select the appropriate memory channel to begin operating on that frequency. To do this, you switch the radio from the VFO mode to the memory mode by pushing the V/M key, select the appropriate memory channel, and begin operating. For example, if operation on the Bozo repeater (Memory Channel 02 for this example) is desired, push the V/M key to place the radio in the memory mode (an M appears on the left hand edge of the display). Turn the Tuning Knob until Memory Channel 02 appears on the display. Begin operating on Bozo. That is all there is to it.

**Labeling A Memory Channel:** A memory channel can be given a name which is up to 7 alphanumeric characters long. The name will appear in place of the frequency display. If you want to see the frequency instead of the channel name, push the Function (FUNC) key. Pushing the FUNC key again restores the channel name.

To name a memory channel proceed as follows. In the memory read mode, select the channel that you want to name. Push the FUNC key for more than 2 seconds. Repeatedly push the SQL function key to cycle through the various set up functions. Stop when the letter A appears flashing on the screen. Rotate the Tuning Knob to select the desired first letter of the channel name. Push the VM key to enter the character. The same character that you just entered will now appear flashing to the right. Again rotate the Tuning Knob to select the next character of the name. Push the VM key to enter the character. Continue this process until the desired name is entered, up to 7 characters. To complete the naming process, push the FUNC key.