06/01/2011

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

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

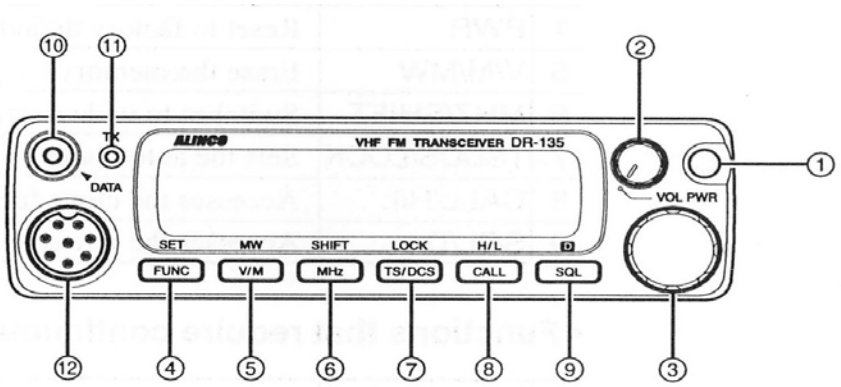

Figure 1

Turning The Radio On: The power switch [1] is the pushbutton in the upper right hand corner of the radio.

Volume Control: The Volume Control [2] is the small knob to the left of the Power On Pushbutton.

Tuning Knob: The Tuning Knob [3] is the large knob below the Volume Control and Power On Pushbutton.

Function Keys: There are 6 function keys [4 – 9] located below the display. The keys are labeled as follows:

SET	MW	SHIFT	LOCK	H/L	D
FUNC	V/M	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. The exception is the SET function. To access the SET function, push and hold the FUNC key for 2 seconds or more. This will cause the radio's Menu to appear on the screen. You scroll through the menu by pushing the SQL key. Exit the SET mode by pushing either the FUNC or V/M key.

End Function Selection: Usually, the radio will return you to the normal display after selecting a function. Occasionally the radio will remain in the function selection process. If this occurs, and you wish to terminate a function, push the V/M function key to terminate or close function selection.

FUNCTION KEY SUMMARY:

Level 1 Functions

FUNC: → None → Function →

V/M: → VFO → Memory →

MHz: → 146.445 → 146.___ → (Example)
(Only works in VFO mode)

TS/DCS: → None → T → T SQ → DCS →

CALL: → Selected Freq → Call Freq →

SQL: → None → Set Squelch Level →

Level 2 Functions

SET = Push & hold FUNC for 2 Sec: → Normal → Menu → Push V/M to exit →

MW = FUNC + V/M: → Normal → VFO contents written to Memory →

SHIFT = FUNC + MHz: → No Shift → Minus (-) Shift → Plus (+) Shift →

LOCK = FUNC + TS/DCS: → Normal → Keys Locked →

H/L = FUNC + CALL: → High Pwr (blank) → Medium Pwr (Mi) → Low Pwr (Lo) →

DATA = FUNC + SQL: → Normal → Data →

KEY-LOCK FUNCTION: Pushing the Function (FUNC) key followed by the TS/DCS key will "lock" the controls on the radio to avoid unintentional changes. A skeleton key icon will appear on the upper part of the display indicating that the radio has been placed in the Lock mode. When in the Lock mode, push the FUNC key followed by the TS/DCS key to unlock the radio and return it to normal mode.

NOTE: The examples used in the operating instructions given below are for the 2 meter DR-135T radio. However, operation of the 220 MHz DR-235T radio and the 440 MHz DR-435T radio are identical

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

To operate simplex, tune the radio to the frequency that you and the station that you want to talk to agree upon. In addition, 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: Alinco 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 (while in the VFO mode) 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 written 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 sight 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. 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 offset 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 offset for both Bozo and Grissom is negative. The Grissom output frequency is 146.850 MHz so when you transmit to Grissom, your radio must transmit at a frequency of 146.250 MHz. You must program this +

or - offset into the radio in order to use the repeater. For example, for the Grissom repeater you select the – offset.

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 on 145.400 MHz, minus offset, 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 +/- offset 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, 146.850 MHz for Grissom, using the same tuning procedures that were used to select a simplex frequency.

Select +/- Shift: Select the appropriate +/- offset 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 offset. Performing the two keystroke operation again causes a + to appear at the top of the display (replacing the minus) indicating a + offset. Performing the operation again causes the + sign to disappear, indicating that you are back in the Simplex mode (no offset). Perform the operation as many times as needed to achieve either a – or a + offset, 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. If no tone has been selected, 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 the radio to cycle through T, TSQ, DCS, None, T, etc. Normally continue pushing the key until only the T is shown on the display.

Some repeaters will transmit a PL tone as well as receiving a PL tone. The tone that it transmits is the same PL tone that it expects to receive. If the repeater that you are communicating through does transmit a PL tone, then you may select either T or TSQ. If there is a distant repeater transmitting on the same frequency as your repeater, and if your repeater transmits a PL tone, then by selecting TSQ you will receive only the transmissions from your repeater. You

will not hear the other repeater. This is a very nice feature. HOWEVER, if the repeater that you are using does not transmit a PL tone, then selecting TSQ will prevent you from hearing your repeater. If your repeater does not transmit a PL tone, you can not hear your repeater, and you know you should be able to hear it, check your tone selection. If TSQ is selected, turn it off and select T instead following the procedures given above. If you do not know if your repeater is transmitting a PL tone, first select T. Verify that you can hear the repeater. Change the selection to TSQ. If you can still hear the repeater, then the repeater is transmitting a PL tone. If you can no longer hear the repeater, that means that it is not transmitting a tone. Select T and you should again hear the repeater.

Recommendation: If the repeater you are using requires a PL tone, then:

1. Normally select the T mode.

2. Select the TSQ mode ONLY:

    - IF you are receiving interference from a distant repeater on the same frequency,
    - AND you have verified that your repeater IS transmitting a PL Tone,
    - OTHERWISE continue to use the T mode.

We do not use the DCS functions on any of our local repeaters. If DCS is selected, turn it off.

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 a 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 V/M key to put the radio back into the VFO mode. Verify that the VFO information is what you want to save. Push the FUNC key followed by the V/M key to write the contents of the VFO into the selected memory channel, i.e. to do a memory write function (MW). The radio will remain in the VFO mode after this operation. Push the V/M key to enter the Memory mode. You should see a non-blinking M on the left edge of the display along with the information that you saved to memory.

Performing a memory write function over-writes the contents of the selected memory channel. If you write to a memory channel that already contains information (the M is not blinking), you will replace the contents of that memory channel with the VFO information.

If the Frequency, Shift, or Tone information that you wrote into memory is not correct, you can change it in the Memory mode. However, when you change to a different memory channel, the information that you entered will be lost. When you return to that memory channel, you will find that the old erroneous information is still there.

If the information that you wrote to memory is incorrect, you must return to the VFO mode, re-enter ALL of the information you want stored in memory (Frequency, Shift, and Tone) and then perform another memory write by pushing the FUNC key followed by the V/M key.

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 ACS/ARES 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 frequency. The information programmed into the VFO is stored in the CALL Channel in the same way as writing into any other memory channel. However, 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 by turning the Tuning knob, and begin operating. For example, if operation on the Grissom repeater (Memory Channel 2 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 2 appears on the display. Begin operating on Grissom. 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 and the frequency for that memory channel will appear. After about 5 seconds, the radio will automatically return to the memory channel name. Pushing the FUNC key again or the V/M key will also restore the channel name.

To name a memory channel proceed as follows. In the memory mode, select the channel that you want to name. Push the FUNC key for more than 2 seconds. The Menu display will appear. Repeatedly push the SQL function key to cycle through the various Menu set up

functions. Stop when the letter A appears flashing on the screen to the left of center. Rotate the Tuning Knob to select the desired first letter of the channel name. Push the V/M key to enter the character. The same character that you just entered will now appear flashing to the right (in the second character position of the name). Again rotate the Tuning Knob to select the next character of the name. Push the V/M key to enter the character. Continue this process until the desired name is entered, up to 7 characters. The V/M key must be pushed to enter each character. So you must push the V/M key after selecting the last character of the name in order to enter that character. To complete the naming process, push the FUNC key.

REVERSE MODE (Optional): Many VHF and UHF radios have a reverse mode. When this mode is selected, the radio listens (receives) on the repeater's input frequency and transmits on the repeater's output frequency.

This mode is useful for trouble shooting repeater operation. This mode is also sometimes useful in communicating with a station that is having difficulty reaching the repeater, that is their transmissions through the repeater are weak, scratchy, broken, and difficult to understand. You know the station is transmitting on the repeater's input frequency and listening on the repeater output. By selecting the reverse mode on your radio you may discover that you can clearly hear their transmissions even though the repeater can not. When you transmit back to them (while in the reverse mode), you will be transmitting on the repeater's output frequency, which you know they are listening to. Since you can hear them, they will probably be able to hear you. Thus, by using the reverse mode you may be able to communicate with them even though communications with them through the repeater is difficult or impossible. However, when in the reverse mode you are not using the repeater, you are simply transmitting on the repeater's output frequency. This means that others on the net listening to the repeater may not hear your transmissions. You will have to switch your radio back to the normal mode for everyone on the net to hear you

The Alinco radios described in this manual do not support the reverse mode.

However, the reverse mode is easy to duplicate on the Alinco radios. Normally the repeater that you are using will be programmed into one of the memory channels. A single push of the V/M key will switch the radio between the memory and VFO mode. Communicate with the repeater by selecting the appropriate memory channel. Switch to the VFO mode and program the repeater's input frequency into the VFO. Switch back to the memory mode and communicate through the repeater in the usual manner. If someone has difficulty communicating through the repeater, push the V/M key (switch to the VFO mode) and see if you can hear them on the repeater's input frequency. If you can hear them, great! When they are done transmitting, again push the V/M key (switching back to the memory mode) so that you can hear the rest of the net. When it is time for you to transmit, make sure that you are in the memory mode and transmit through the repeater as usual. The person having difficulty, as well as the rest of the net, will hear your transmissions. In this way you can relay traffic for the person having difficulty. Switching back and forth between memory and VFO is quick and easy.

Note: You should never use the reverse mode or switch back and forth between memory and VFO if you are the net control operator. As net control, you will be much too busy coordinating traffic on the net. Operating in the reverse mode or switching back and forth between memory and VFO is a function to be performed by the net's technical staff.

ALINCO RADIO PRE-NET CHECK LIST

- Verify that the radio is in the memory mode (an M appears on the left edge of the display screen)

- Verify that the radio is set to the proper memory channel for the repeater that you wish to use (for example, Memory Channel 2 for the Area 2 Grissom Repeater, that is, a 2 is displayed below the M on the left edge of the display screen.)

- Verify that the radio frequency is the correct frequency for the desired repeater (example 146.850 MHz for Grissom). If a memory channel name (for example, T.O. for the Grissom Repeater) appears on the screen, push the FUNC key to display the frequency.

- Verify that the Shift (-, +, or none) is set correctly for the repeater (example, minus shift for Grissom, that is, a – appears at the top center of the display screen).

- Verify that the proper PL Mode (None, T or TSQ) for the repeater has been selected along with the correct PL Tone (example T selected with a Tone of 94.8 Hz for Grissom, that is, a T appears at the top of the display screen). You can check the Tone simply by pushing the TS/DCS key. Push the V/M key to return to the normal frequency display. Note: the Tone setting is wrong for the Grissom repeater if TSQ or DCS appears at the top of the display.

- Ensure that the proper power level has been selected, typically medium power (Mi displayed at the top left side of the display screen).