User Manual

DUAL BAND MOBILE RADIO
(Scanning Receiver)

Model: AT-778UV

Qixiang Electron Science & Technology Co., Ltd
NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) this device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

WARNING: MODIFICATION OF THIS DEVICE TO RECEIVE CELLULAR RADIO TELEPHONE SERVICE SIGNALS IS PROHIBITED UNDER FCC RULES AND FEDERAL LAW.
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1. FUNCTIONS & FEATURES

AT-778UV Mobile Radio has nice housing, stoutness & stability, advanced and reliable functions, perfect & valuable. This amateur mobile radio especially designs for drivers and it pursues philosophy of innovation and practicality. More functions as follows:

♦ Adopt superior quality material, better technology and high quality radiator to ensure stable and durable operation;
♦ 180 degree rotatable TFT LCD display;
♦ Full alloy body for heat radiation;
♦ Amateur mode and professional mode for different operation requirement;
♦ Distribute buttons reasonably, convenient for operation;
♦ Separate band width setting for each single channel, Wide 25K, Middle band 20K, Narrow band 12.5K;
♦ 200 programmable memory channels, identified by editing name;
♦ Separate CTCSS, DCS, DTMF, 5Tone setting for each single channel, rejecting extra calling from other radios;
♦ Various scan functions including CTCSS/DCS Scan function;
♦ Smart menu control and PC programming control;
♦ Voltage level protection;
♦ LCD brightness control;
♦ Automatic power on function;
♦ Main unit and microphone key lock function;
♦ 5Tone signaling for data transfer, alarm, all call, ANI, remote kill, remote waken.
♦ DTMF-ANI or 5Tone-ANI for automatical calling recognition;
♦ Scrambler(Optional).
2. ACCESSORIES

2.1 Standard Accessories

- Transceiver
- Microphone
- Mobile Bracket
- Screws
- Pads
- Adjusting screws
- DC Power Cable with Fuse Holder
- non-slip mat
- Fuse (10A 250V)

2.2 Optional Accessories

- PC cable (PC51)
- External Speaker
- Regulated Power Supply
- Programming Software
3. INITIAL INSTALLATION

3.1 Mobile Installation
To install the transceiver, select a safe, convenient location inside your vehicle that minimizes danger to your passengers and yourself while the vehicle is in motion. Consider installing the unit at an appropriate position so that knees or legs will not strike it during sudden braking of your vehicle. Try to pick a well ventilated location that is shielded from direct sunlight.

1. Install the mounting bracket in the vehicle using the supplied self-tapping screws (2pcs) and flat washers (2pcs)

![Diagram of mounting bracket installation]

2. Position the transceiver, then insert and tighten the supplied hexagon SEMS screws.
   ♦ Double check that all screws are tightened to prevent vehicle vibration from loosening the bracket or transceiver.

3.2 DC Power Cable Connection

- Locate the power input connector as close to the transceiver as possible.

3.2.1 Mobile Operation
The vehicle battery must have a nominal rating of 12V. Never connect the transceiver to a 24V battery. Be sure to use a 12V vehicle battery that has sufficient current capacity. If the current to the transceiver is insufficient, the display may darken during transmission, or transmitting output power may drop excessively.
AT-778UV UHF/VHF Two Way Radio

3.2.2 Fixed Station Operation
In order to use this transceiver for fixed station operation, you will need a separate 13.8V DC power supply (not included), power supply as optional accessories. Please contact local dealer to require.

The recommended current capacity of your power supply is 12A.

1. Connect the DC power cable to the regulated DC power supply and ensure that the polarities are correct. (Red: positive, Black: negative).
   ♦ Do not directly connect the transceiver to an AC outlet.
   ♦ Use the supplied DC power cable to connect the transceiver to a regulated power supply.
   ♦ Do not substitute a cable with smaller gauge wires.

1. Route the DC power cable supplied with the transceiver directly to the vehicle’s battery terminals using the shortest path from the transceiver.
   ♦ We recommend you do not use the cigarette lighter socket as some cigarette lighter sockets introduce an unacceptable voltage drop.
   ♦ The entire length of the cable must be dressed so it is isolated from heat, moisture, and the engine secondary (high voltage) ignition system/ cables.

2. After installing cable, in order to avoid the risk of damp, please use heat-resistant tap to tie together with fuse box. Don’t forget to reinforce whole cable.

3. In order to avoid the risk of short circuit, please cut down connection with negative (-) of battery, then connect with radio.

4. Confirm the correct polarity of the connections, then attach the power cable to the battery terminals; red connects to the positive (+) terminal and black connects to the negative (-) terminal.
   ♦ Use the full length of the cable without cutting off excess even if the cable is longer than required. In particular, never remove the fuse holders from the cable.

5. Reconnect any wiring removed from the negative terminal.
6. Connect the DC power cable to the transceiver’s power supply connector.
   ♦ Press the connectors firmly together until the locking tab clicks.
Before connecting the DC power to the transceiver, be sure to switch the transceiver and the DC power supply OFF.

Do not plug the DC power supply into an AC outlet until you make all connections.

If you use the transceiver for a long period when the vehicle battery is not fully charged, or when the engine is OFF, the battery may become discharged, and will not have sufficient reserves to start the vehicle. Avoid using the transceiver in these conditions.

### 3.2.3 Replacing Fuses

If the fuse blows, determine the cause, then correct the problem. After the problem is resolved, replace the fuse. If newly installed fuses continue to blow, disconnect the power cable and contact your authorized AnyTone dealer or an authorized AnyTone service center for assistance.

<table>
<thead>
<tr>
<th>Fuse Location</th>
<th>Fuse Current Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transceiver</td>
<td>10A</td>
</tr>
<tr>
<td>Supplied Accessory DC power cable</td>
<td>10A</td>
</tr>
</tbody>
</table>

Only use fuses of the specified type and rating, otherwise the transceiver could be damaged.

NOTE: Before connecting the DC power to the transceiver, be sure to switch the transceiver and the DC power supply OFF.

NOTE: Do not plug the DC power supply into an AC outlet until you make all connections.
3.3 Antenna Connection
Before operating, install an efficient, well-tuned antenna. The success of your installation will depend largely on the type of antenna and its correct installation. The transceiver can give excellent results if the antenna system and its installation are given careful attention. Use a 50Ω impedance antenna and low-loss coaxial feed-line that has a characteristic impedance of 50Ω, to match the transceiver input impedance. Coupling the antenna to the transceiver via feed-lines having an impedance other than 50Ω reduces the efficiency of the antenna system and can cause interference to nearby broadcast television receivers, radio receivers, and other electronic equipment.

NOTE Transmitting without first connecting an antenna or other matched load may damage the transceiver. Always connect the antenna to the transceiver before transmitting.

NOTE All fixed stations should be equipped with a lightning arrester to reduce the risk of fire, electric shock, and transceiver damage.

The possible locations of antenna on a car are shown as following:

![Antenna Locations in a Car](image)

3.4 Accessories Connections
3.4.1 External Speaker
If you plan to use an external speaker, choose a speaker with an impedance of 8Ω. The external speaker jack accepts a 3.5mm (1/8") mono (2-conductor) plug.

NOTE External speaker adopt double port BTL, please care about the connecting way. The speaker can not connect with the ground, otherwise the speaker will be fault. The wrong connecting way as the following picture.
3.4.2 Microphone

For voice communications, connect a microphone equipped with an 8-pin modular plug into the modular socket on the front of the main unit. Press firmly on the plug until the locking tab clicks.
4. GETTING ACQUAINTED

4.1 Front panel

<table>
<thead>
<tr>
<th>NO.</th>
<th>Key</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>Power On/Off/Mute</td>
</tr>
<tr>
<td>2</td>
<td>P1</td>
<td>Self define key</td>
</tr>
<tr>
<td>3</td>
<td>P2</td>
<td>Self define key</td>
</tr>
<tr>
<td>4</td>
<td>P3</td>
<td>Self define key</td>
</tr>
<tr>
<td>5</td>
<td>P4</td>
<td>Self define key</td>
</tr>
<tr>
<td>6</td>
<td>P5</td>
<td>Self define key</td>
</tr>
<tr>
<td>7</td>
<td>P6</td>
<td>Self define key</td>
</tr>
<tr>
<td>8</td>
<td>FUNC</td>
<td>Function key/ function group key</td>
</tr>
<tr>
<td>9</td>
<td>MIC</td>
<td>Microphone Jack</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>Channel switch/ Push button/ Key lock</td>
</tr>
<tr>
<td>11</td>
<td>LCD display</td>
<td>Display channel/ frequency/ function setting</td>
</tr>
</tbody>
</table>

4.2 Rear panel

ANT  EXT SP
### 4.3 Display

<table>
<thead>
<tr>
<th>NO.</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Displays the self define function when press P1</td>
</tr>
<tr>
<td>2</td>
<td>Displays the self define function when press P2</td>
</tr>
<tr>
<td>3</td>
<td>Displays the self define function when press P3</td>
</tr>
<tr>
<td>4</td>
<td>Displays the self define function when press P4</td>
</tr>
<tr>
<td>5</td>
<td>Displays the self define function when press P5</td>
</tr>
<tr>
<td>6</td>
<td>Displays the self define function when press P6</td>
</tr>
<tr>
<td>7</td>
<td>Displays main channel TX or RX status</td>
</tr>
<tr>
<td>8</td>
<td>Displays when Automatic power off function is on</td>
</tr>
<tr>
<td>9</td>
<td>Displays the main channel field strength</td>
</tr>
<tr>
<td>10</td>
<td>Displays main channel number in channel mode</td>
</tr>
<tr>
<td>11</td>
<td>Displays when set band width for main channel</td>
</tr>
<tr>
<td>12</td>
<td>Displays when main channel set CTCSS/DCS</td>
</tr>
<tr>
<td>13</td>
<td>Displays when main channel reverse function is on</td>
</tr>
<tr>
<td>14</td>
<td>Displays when main channel offset function is on</td>
</tr>
<tr>
<td>15</td>
<td>Displays when main channel is in scan list</td>
</tr>
<tr>
<td>16</td>
<td>Displays main channel frequency or name</td>
</tr>
<tr>
<td>17</td>
<td>Displays sub channel number in channel mode</td>
</tr>
<tr>
<td>18</td>
<td>Displays when setting band width for sub channel</td>
</tr>
<tr>
<td>19</td>
<td>Displays when current sub channel set CTCSS/DCS</td>
</tr>
<tr>
<td>20</td>
<td>Displays when sub channel reverse function is ON</td>
</tr>
<tr>
<td>21</td>
<td>Displays when sub channel offset function is ON</td>
</tr>
<tr>
<td>22</td>
<td>Displays when sub channel receive a signal</td>
</tr>
<tr>
<td>23</td>
<td>Display sub channel frequency or name</td>
</tr>
<tr>
<td>24</td>
<td>Displays signal strength of sub channel</td>
</tr>
<tr>
<td>25</td>
<td>Display voltage and menu setting</td>
</tr>
</tbody>
</table>
## 4.4 Microphone

<table>
<thead>
<tr>
<th>NO.</th>
<th>Key</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>UP</td>
<td>Increase frequency, channel number or setting value</td>
</tr>
<tr>
<td>2</td>
<td>DOWN</td>
<td>Decrease frequency, channel number or setting value</td>
</tr>
<tr>
<td>3</td>
<td>PTT</td>
<td>Press the PTT (Push-To-Talk) key to transmit</td>
</tr>
<tr>
<td>4</td>
<td>Number Key</td>
<td>Input VFO frequency or DTMF dial out etc.</td>
</tr>
<tr>
<td>5</td>
<td>A/B band</td>
<td>Choose left band or right band as Main band</td>
</tr>
<tr>
<td>6</td>
<td>Band indicator</td>
<td>The indicator light on for Main band</td>
</tr>
<tr>
<td>7</td>
<td>TX/RX indicator</td>
<td>Light green while receiving, Light red while transmitting</td>
</tr>
<tr>
<td>8</td>
<td>MIC</td>
<td>Speak here during transmission</td>
</tr>
<tr>
<td>9</td>
<td>Speaker</td>
<td>When shut the speaker in the base, you can hear the calling by this speaker</td>
</tr>
<tr>
<td>10</td>
<td>Lock UP/DOWN</td>
<td>When this key is in up position, it is unlock UP/DOWN key, when this key is in down position, UP/DOWN key will be locked</td>
</tr>
</tbody>
</table>

### MIC Connector Diagram (in the front view of connector)

![MIC Connector Diagram](image-url)
5. DISPLAY MODE

LCD display mode.

A. Frequency+Channel mode: When set display as "FRQ", it enters into Frequency+Channel mode, new setting of channel operation and shortcut operation can be temporarily used by user. Once the radio is turned off or switched to another channel, the temporary setting will be erased and back to initial settings. (As pic 1)

B. Channel+Name Tag Mode: When set display as "NM", it enters into Channel +Name Tag mode. At this mode, it will display corresponding channel name when the current channel is edited with name. Otherwise, it will display frequency + channel. Its operations are same as frequency + channel mode. (As pic 2)

C. VFO Mode (Frequency mode): This mode shows only frequency on the display. Shortcut operation and Channel setting will be changed & stored as the latest value permanently. Once the radio is turned off or changed to new VFO frequency, the latest setting is remained until next change. (As pic 3)
6. BASIC OPERATIONS

6.1 Switching the Power On/Off

1. Power On: in power off state press [6], the LCD displays "WELCOME" then will displays current frequency or channel.
2. Power Off: in power on state, press [6] for 2 seconds, the LCD displays "CLOSING", then the LCD display disappears.

6.2 Adjusting the Volume

1. In standby mode, short press the [PX] key programmed as VOL control, the LCD display "VOL:XX", then turn the channel switch to adjust volume level.
2. In standby mode, short press [PX] to mute the speaker, the LCD display "AUDIO:MT", short press it again to return last volume level.

NOTE: During communication, volume level can be adjusted more accurate.

6.3 Adjusting Frequency

1. By channel knob: In VFO mode, turn channel knob can adjust frequency, push channel knob, the matching character will flash, then turn channel knob to adjust the frequency by step size 1K, 10K, 100K, 1Mz or 10MHz.

NOTE: The microphone [UP]/[DOWN] key can also adjust the frequency, each press move one step size, hold the [DOWN] key can decrease one step size. If the channel knob is programmed as VOL function, users need press the PX key which programmed as FRQ function, when the LCD displays "VFO FREQ", turn channel knob to adjust frequency.

2. By number key: In VFO mode, you can input wanted frequency by the microphone number key. For example if want 145.125Mhz, just press key 1, 4, 5, 1, 2, 5, if want 145Mhz, just press 1, 4, 5. The input is invalid if the frequency is over range.

6.4 Adjust Channel

1. Adjust channel by channel switch: In channel mode, turn channel knob to adjust the channel, the [UP]/[DOWN] key in the microphone can also adjust the main channel.

NOTE: If there is an empty channel, the radio will jump over it to next channel. If the channel knob is programmed as VOL function, users need press the PX key which programmed as CH function, when the LCD displays "CH XX ", turn channel knob to adjust channel.

2. By number key: In CH mode, you can input wanted channel by the microphone input 3 numbers (001-200). 001 stands for channel 1, 200 stands for channel 200, if input channel is an empty channel, the radio will report error and return to last channel.
6.5 Receiving
When the channel you are operating being called, the screen shows red RX and field strength in this way you can hear the calling.

**NOTE**
When the RX icon and field strength flashes, but can not hear the calling, it means current channel receive a matching carrier but unmatching signaling. Refer to CTCSS/ DCS CODE or Optional Signaling setup in Page 14.

6.6 Transmitting
Hold [PTT] and speak into microphone. the radio start transmit, the screen shows red TX and field strength. Hold the microphone approximately 2.5-5.0cm from your lips and speak to microphone in your normal speaking voice to get best timbre.

**NOTE**
Only available transmit on main channel.

6.7 Switch between Main Channel and Sub Channel
This radio work by single channel dual watch, in standby, the frequency in the upper side is main channel and down side is sub channel, the transmit is available only on main channel.
1. Short press [FUNC] to switch function group, choose the [PX] key defined as A/B function.
2. Short press [PX] key defined as A/B function, then repeatedly press this key or turn channel knob to switch main channel and sub channel, the LCD displays Main:XX.
3. Hold [PUSH] or [FUNC] key to store and exit, or wait 10 seconds the radio will store the setting and exit.

6.8 Switch between VFO and Channel Mode
1. Short press [FUNC] to switch function group, choose the [PX] key defined as V/M function.
2. Short press [PX] key defined as V/M function, then repeat press this key or turn channel knob to switch main channel and sub channel, the LCD displays V/M:XX.
3. Hold [PUSH] or [FUNC] key to store and exit, or wait 10 seconds the radio will store the setting and exit.

6.9 Channel Edit
1. In VFO mode, turn channel knob or the [UP]/[DOWN] key in microphone to adjust frequency.
2. Short press [FUNC] to switch function group, choose the [PX] key defined as CDT function. Press [PX] key defined as CDT function to set CTCSS/DCS code, turn channel knob or the [UP]/[DOWN] key in microphone to choose CTCSS/DCS code.
3. Long press [FUNC] key to enter channel setting menu, to choose wanted setting.
4. Short press [FUNC] key to switch function group, hold the [PX] key defined as V/M function until the channel number flashes, if the channel number is red means current channel is valid, if the channel number is green, means current channel is empty.
5. Turn the channel knob or microphone [UP]/[DOWN] key to choose the channel number to be stored.
6. Hold the [PX] key defined as V/M function to confirm and store the channel, the channel number stop flash and radio emits a beep sound, the channel is stored successfully.
6.10 Channel Delete
1. In channel mode, turn the channel knob or microphone [UP]/[DOWN] key to choose an unwanted channel.
2. Short press [FUNC] key to switch function group, choose the [PX] key defined as V/M function, press this key together with [FUNC] key for 2 seconds, current channel is deleted and automatical jump to next channel.

6.11 CTCSS/DCS Encode and Decode Setup
1. Short press [FUNC] to switch function group, choose the [PX] key defined as CDT function.
2. Short press PX defined as CDT function, then repeatedly short press this key set the currently channel if use CTCSS/DCS encode and decode.
3. When the LCD displays: RCDT:XXX, turn channel knob or press microphone [UP]/[DOWN] key to choose if add CTCSS/DCS decode signaling to current channel. Press [PUSH] button then turn channel knob or press microphone [UP]/[DOWN] key to choose wanted CTCSS/DCS decode signaling.
4. When the LCD displays: TCDT:XXX, turn channel knob or press microphone [UP]/[DOWN] key to choose if add CTCSS/DCS encode signaling to current channel. Press [PUSH] button then turn channel knob or press microphone [UP]/[DOWN] key to choose wanted CTCSS/DCS encode signaling.
5. CTCSS: 62.5-254.1Hz plus one self define group. total 52 groups.
   DCS: 000N-777I total1024 groups.
   N is positive code, I is inverse code.
   Press FUNC key can choose positive or inverse code.
6. Hold [PUSH] or [FUNC] key to store and exit, or wait 10 seconds the radio will automatically store the setting and exit.

Note: Under channel mode this operation can be temporarily used by user. Once the radio is turned off or switched to another channel, the temporary setting will be erased. If the channel setting programmed for valid, the temporary setting will keep valid until next change. turn off radio or switch to another channel, the temporary setting will not changed.

6.12 CTCSS Scan
In channel or VFO mode, short press [FUNC] to switch function group, choose the [PX] key defined as CDT function. short press this key to enter CTCSS code setting, when the LCD displays CTC, long press this key to enter CTCSS scan, turn channel knob or press microphone [UP]/[DOWN] key can change scan direction. Once finding a matching CTCSS signaling, it will stop 5 seconds then scan again, short press any key to exit CTCSS scan.

6.13 DCS Scan
In channel or VFO mode, short press [FUNC] to switch function group, choose the [PX] key defined as CDT function. short press this key to enter DCS code setting. When the LCD displays DCS, long press this key to enter DCS scan, turn channel knob or press microphone [UP]/[DOWN] key can change scan direction. Once finding a matching DCS signaling, it will stop 5 seconds then scan again, press any key to exit DCS scan.
6.14 Frequency/Channel Scan

Frequency Scan
In frequency (VFO) mode, this function is designed to monitor signal of all frequency points under each step size.

1. In VFO mode, short press [FUNC] key to switch function group, choose the [PX] key defined as SCN function.
2. Short press the [PX] key defined as SCN function to start frequency scan, the LCD displays "S".
3. Turn channel knob or press microphone [UP][DOWN] key can change scan direction.
4. Turn channel knob or press any key except microphone [UP][DOWN] key to exit.

Channel Scan
In channel mode, this function is designed to monitor signal of all channel.

1. In channel mode, press [FUNC] key to switch function group, choose the [PX] key defined as SCN function.
2. Short press the [PX] key defined as SCN function to start channel scan, the LCD displays: S.
3. Turn channel knob or press microphone [UP][DOWN] key can change scan direction.
4. Turn channel knob or press any key except microphone [UP][DOWN] key to exit.

6.15 Scan Skip
In channel mode, press [FUNC] key to switch function group, choose the [PX] key defined as SCN function. Hold this key to add into or delete from scan list.

1. When LCD displays: S, the current channel is in scan list.
2. When LCD not displays: S, the current channel is not in scan list.

6.16 Squelch off/ Squelch off Momentary
The [PX] key defined as MON function, can monitor the weak signal.

1. Press [FUNC] key to switch function group, choose the [PX] key defined as MON function.
2. Short press the [PX] key defined as MON function to turn squelch off / squelch off momentarily, the LCD displays red "RX" icon.

Squelch off: press the [PX] key defined as MON to disable squelch, press [MON] key to resume squelch.
Squelch off momentarily: hold the [PX] key defined as MON to disable squelch, release [MON] key to resume squelch.

6.17 KEYPAD LOCKOUT
Avoiding unintentional operation, this function will lock the keys except [PTT], [PUSH], ( ) Keys.

1. Long press [PUSH] button, the downside of the LCD displays Key Lock, means the keypad is locked.
2. Long press [PUSH] button again, the downside LCD displays : Key Unlock, means the keypad is unlocked.

NOTE: When keypad lockout, except ( ) key, [PUSH] button and [PTT] key is available, other keys are invalid.
6.18 Transmit DTMF/5 Tone Signaling
If the current channel is with DTMF/5TONE signaling, hold PTT and [UP] key will transmit selected Pre-programmed signaling.

6.19 Transmit Tone burst frequency
Hold PTT and [DOWN] key will transmit selected Pre-programmed tone burst frequency.

6.20 Transmit DTMF by Microphone Keypad
Hold PTT, then input DTMF signaling by the microphone keypad.

7. FUNCTION MENU
1. Hold [FUNC] key to enter SELECT MENU interface.
3. Press [PUSH] button to enter FUNC MENU setting.
4. Short press [P4], [P6] key or turn channel knob to choose wanted setting.

7.1 Beep
1. Enter FUNCTION MENU list, choose No.01 function.
2. Press [PUSH] button, the menu value in LCD turns to green color.
3. Turn channel knob to choose wanted setting.
   - Off~5: 6 levels available.
   - Off: Turn off BEEP function.

7.2 FREQUENCY STEP SIZE SETUP
1. Enter FUNCTION MENU list, choose No.02 function
2. Press [PUSH] button, the menu value in LCD turns to green color.
3. Turn channel knob to choose wanted setting.
   - Total 9 Channel step size available: 2.5K, 5K, 6.25K, 10K, 12.5K, 20K, 25K, 30K and 50K.
7.3 Display mode setup
This radio has 3 different display: Frequency+Channel and Channel name Tag mode.
1. Enter FUNCTION MENU list, choose No.03 function.
2. Press [PUSH] button, the menu value in LCD turns to green color.
3. Turn channel knob to choose wanted setting.
   - FRQ: Frequency+Channel mode(Amateur transceiver mode)
   - CH: Channel mode(professional transceiver mode)
   - NM: Channel+name mode+ Channel mode(Amateur transceiver mode), if channel not named, it display Frequency + Channel mode, otherwise displays the channel name(Amateur transceiver mode).

7.4 Squelch level Setup
This function use for setting RX signal strength, the calling will be heard only when reach setted level, otherwise the radio will keep mute.
1. Enter FUNCTION MENU list, choose No.04 function
2. Press [PUSH] button, the menu value in LCD turns to green color.
3. Turn channel knob to choose wanted setting
   - Off-9: Total 10 levels, OFF is lowest level, squelch is off

7.5 Volume level setting
1. Enter FUNCTION MENU list, choose No.05 function
2. Press [PUSH] button, the menu value in LCD turns to green color.
3. Turn channel knob to choose wanted setting
   - 1-36: total 36 levels available
4. Press [PUSH] button or [P3] key to store setting and exit

7.6 Password setting
After enable this function, must be input correct password then can turn on the transceiver.
1. Enter FUNCTION MENU list, choose No.06 function
2. Press [PUSH] button, the menu value in LCD turns to green color.
3. Turn channel knob to choose wanted setting
   - ON: Turn on password function.
   - OFF: Turn off password function.
4. Press [PUSH] button or [P3] key to store setting and exit

7.7 Scan Dwell Time Setup
1. Enter FUNCTION MENU list, choose No.07 function.
2. Press [PUSH] button, the menu value in LCD turns to green color.
3. Turn channel knob to choose wanted setting.
1. Enter FUNCTION MENU list, choose No.08 function
2. Press [PUSH] button, the menu value in LCD turns to green color.
3. Turn channel knob to choose wanted setting
   - 5S: It pauses 5s once scanning a matching signal, then resume scan
   - 10S: It pauses 10s once scanning a matching signal, then resume scan
   - 15S: It pauses 15s once scanning a matching signal, then resume scan

#### 7.8 Scan Pause Time Setup

1. Enter FUNCTION MENU list, choose No.08 function
2. Press [PUSH] button, the menu value in LCD turns to green color.
3. Turn channel knob to choose wanted setting
   - TO: It pause for preset pause time when scanning a matching signal, then resume scan.
   - CO: It pauses once scanning a matching signal, and resume scan when signal disappears.
   - SE: It stops once scanning a matching signal.

#### 7.9 AOP (Automatic power on setup)

When turn off AOP, the radio need press [9] key to power on when connect with the power supply.
1. Enter FUNCTION MENU list, choose No.09 function.
2. Press [PUSH] button, the menu value in LCD turns to green color.
3. Turn channel knob to choose wanted setting
   - ON: Enable AOP function
   - OFF: Power off by manual

#### 7.10 Dual Watch setup

1. Enter FUNCTION MENU list, choose No.10 function
2. Press [PUSH] button, the menu value in LCD turns to green color.
3. Turn channel knob to choose wanted setting
   - ON: Enable Dual Watch function
   - OFF: Disable Dual Watch function

#### 7.11 Backlight Brightness Setup

1. Enter FUNCTION MENU list, choose No.11 function
2. Press [PUSH] button, the menu value in LCD turns to green color.
3. Turn channel knob to choose brightness level, 1-3 level available.
7.12 TOT (Time Out Timer)
The time-out timer limits continuous transmitting time. When transmit time last over programmed value, the transmitting will stop and emit a prompt.
1. Enter FUNCTION MENU list, choose No.12 function
2. Press [PUSH] button, the menu value in LCD turns to green color
3. Turn channel knob to choose wanted setting.
   1-30: 1-30 minutes range available by 1 minute/step
   OFF: Turn off TOT function

7.13 APO (Automatic Power OFF)
Once APO is activated, the transceiver will be automatically switched off when the pre-set timer running out.
1. Enter FUNCTION MENU list, choose No.13 function
2. Press [PUSH] button, the menu value in LCD turns to green color.
3. Turn channel knob to choose wanted setting
   30Min: Automatic power off after 30 minutes.
   60Min: Automatic power off after 60 minutes.
   120Min: Automatic power off after 120 minutes
   OFF: Automatic power off function is off
4. Press [PUSH] button or [P3] key to store setting and exit

7.14 Pilot Frequency
This function uses to start repeater. It needs a certain intensity Pilot Frequency to start dormant repeater. As usual, no need to send pilot frequency again once repeater started.
1. Enter FUNCTION MENU list, choose No.14 function
2. Press [PUSH] button, the menu value in LCD turns to green color.
3. Turn channel knob to choose wanted setting
   1000Hz: Pilot frequency 1000Hz
   1450Hz: Pilot frequency 1450Hz
   1750Hz: Pilot frequency 1750Hz
   2100Hz: Pilot frequency 2100Hz
4. Press [PUSH] button or [P3] key to store setting and exit

7.15 DIR (LCD display direction setup)
1. Enter FUNCTION MENU list, choose No.15 function
2. Press [PUSH] button, the menu value in LCD turns to green color.
3. Turn channel knob to choose wanted setting
   FAIL: Revers display
   STAN: normal display
7.16 Microphone Speaker
1. Enter FUNCTION MENU list, choose No.16 function
2. Press [PUSH] button, the menu value in LCD turns to green color
3. Turn channel knob to choose wanted setting.
   - M&H: Turn on Main speaker and microphone speaker.
   - MAIN: Turn on Main speaker.
   - HAND: Turn on microphone speaker
4. Press [PUSH] button or [P3] key to store setting and exit

7.17 RTDF (RX/TX dissimilar frequency Setup)
This radio has dissimilar frequency function, when this function is on the frequency in upside of LCD is RX frequency, and the downside frequency is TX frequency. You can revise the RX frequency by numeric key in microphone, you can revise TX frequency by the A/B key in microphone or the PX key defined as A/B function.
1. Enter FUNCTION MENU list, choose No.17 function.
2. Press [PUSH] button, the menu value in LCD turns to green color.
3. Turn channel knob to choose wanted setting
   - ON: Turn on RTDF function.
   - OFF: Turn off RTDF function

<NOTE> Only can turn on RTDF function in VFO mode.

7.18 Reset Factory Default
If you radio seems to be malfunctioning because of wrong operation or setup, this function will be able to resume all setup and channels to factory default.
1. Enter FUNCTION MENU list, choose No.18 function
2. Press [PUSH] button, the menu value in LCD turns to green color.
3. Turn channel knob to choose wanted setting
   - ALL: All channel, signaling function setup resume factory default.
   - OPT: All function menu setup resume factory default except CHAN MENU.
4. Press [PUSH] button or [P3] key to store setting and exit
8. CHANNEL MENU

1. Hold [FUNC] key to enter SELECT MENU interface.
3. Press [PUSH] button to enter CHAN MENU list
4. Short press [P4],[P6] key or turn channel knob to choose wanted setting

8.1 RCDT (CTCSS/DCS Decode Setup)

1. Enter CHAN MENU, choose No.1 function
2. Press [PUSH] button, the menu value in LCD turns to green color.
3. Turn channel knob to choose wanted setting
   OFF: Turn off CTCSS/DCS decode.
   CTCSS: Choose CTCSS decode.
   DCS: Choose DCS decode.
4. When choose CTCSS/DCS decode, press [PUSH] button to enter CTCSS/DCS decode setup, then turn channel knob to choose wanted CTCSS/DCS decode.
   CTCSS: 62.5-254.1Hz, and one self-define group, total 52 groups
   DCS: 000N-777I, total 1024 groups
   N is positive code, I is inverse code.
   Press [FUNC] key can choose positive or inverse code
5. Press [PUSH] button or [P3] key to store setting and exit

^ The working of CTCSS/DCS decode shall be work associated with the squelch mode setup. (Refer to Signaling Combination setup in page 21).

8.2 CTCSS/DCS Encode Setup

1. Enter CHAN MENU, choose No.2 function
2. Press [PUSH] button, the menu value in LCD turns to green color.
3. Turn channel knob to choose wanted setting.
   OFF: Turn off CTCSS/DCS encode.
   CTCSS: Choose CTCSS encode.
   DCS: Choose DCS encode.
4. When choose CTCSS/DCS encode, press (PUSH) button to enter CTCSS/DCS encode setup, then turn channel knob to choose wanted CTCSS/DCS encode.
   CTCSS: 62.5-254.1Hz, and one self-define group, total 52 groups
   DCS: 000N-777I, total 1024 groups
   N is positive code, I is inverse code.
5. Press [PUSH] button or [P3] key to store setting and exit.

8.3 HIGH/MID/LOW Power Selection

1. Enter CHAN MENU, choose No.3 function
2. Press [PUSH] button, the menu value in LCD turns to green color
3. Turn channel knob to choose wanted setting
   HI: Choose high power level.
   MI: Choose middle power level.
   LO: Choose low power level.
4. Press [PUSH] button or [P3] key to store setting and exit

8.4 5TENC (5TONE ENCODE SELECT)
1. Enter CHAN MENU, choose No.4 function;
2. Press [PUSH] button, the menu value in LCD turns to green color.
3. Turn channel knob to choose wanted setting.
   0~99: Total 100 groups 5Tone encode for selection.

   NOTE: 5Tone group name and connect shall be programmed by PC software. If the
   choose 5Tone encode has a group name, the LCD will display group name only.

8.5 T-DEC (Add Optional Signaling)
This transceiver has 2 optional signaling: DTMF/5Tone/. those signaling function similar
   to CTCSS/DCS signaling. When the receiver adds an optional signaling, the caller
   shall transmit matching signaling. DTMF and 5Tone signaling can be applied for other
   advanced features such as ANI, PTT ID, group call, select call, remotely stun, remotely
   kill waken…etc.
1. Enter CHAN MENU, choose No.4 function
2. Press [PUSH] button, the menu value in LCD turns to green color.
3. Turn channel knob to choose wanted setting
   DT: means DTMF signaling is added.
   5T: means DTMF signaling is added.
   OFF: Turn off optional signaling.

   NOTE: The working of optional signaling shall be work associated with the squelch mode
   setup. (Refer to Squelch Mode setup in page XX.)

8.6 Signaling Combination Setup
This function can improve the level of blocking irregular signals.
1. Enter CHAN MENU, choose No.6 function.
2. Press [PUSH] button, the menu value in LCD turns to green color.
3. Turn channel knob to choose wanted setting.
   SQ: You can hear the calling when receive a matching carrier.
   CDT: You can hear the calling when receive a matching carrier and CTCSS or DCS
   signaling.
   TONE: You can hear the calling when receives matching carrier + optional signaling.
   C&T: You can hear the calling when receives matching carrier + CTCSS/DCS + optional
   signaling.
8.7 Band-width Selection
Select suitable bandwidth in accordance with different local conditions
1. Enter CHAN MENU list, choose No.7 function
2. Press [PUSH] button, the menu value in LCD turns to green color.
3. Turn channel knob to choose wanted setting.
   WID: band width is 25k(Wide band)
   MID: band width is 20k(Middle band)
   NAR: band width is 12.5k(Narrow band)

8.8 Frequency Reverse
With this function on, the transceiver will be able to communicate with a transceiver in the same network without through a repeater.
1. Enter CHAN MENU list, choose No.8 function
2. Press [PUSH] button, the menu value in LCD turns to green color.
3. Turn channel knob to choose wanted setting.
   ON: Turn on reverse function
   OFF: Turn off reverse function
4. Press [PUSH] button or [P3] key to store setting and exit

8.9 Talk Around
1. Enter CHAN MENU list, choose No.9 function
2. Press [PUSH] button, the menu value in LCD turns to green color.
3. Turn channel knob to choose wanted setting
   ON: Turn on talk around function
   OFF: Turn off talk around function
4. Press PUSH button or P3 key to store setting and exit.

8.10 Offset Frequeuncy And Direction Setup
1. Enter CHAN MENU list, choose No.10 function
2. Press [PUSH] button, the menu value in LCD turns to green color.
3. Turn channel knob to choose wanted setting, press [FUNC] key to set the offset direction.

C/T: You can hear the calling when receives any matching carrier or CTCSS/DCS or optional signaling.

Example: This setting is valid only when CTCSS/DCS signaling added.

Example: Frequency reverse is turn on, the TX and RX frequency will be exchanged, the CTCSS or DCS signaling also will be exchanged if existed in current channel.

Example: This function is hide when RTDF function is on.
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AT-778UV UHF/VHF Two Way Radio

8.11 Editing Channel Name
After edit a name for a channel, if the display mode is channel name, the radio will display the name edited in this menu. Otherwise it will display the frequency.

1. Enter CHAN MENU list, choose No.11 function
2. Press [PUSH] button, the menu value in LCD turns to green color.
3. Turn channel knob to choose wanted setting. Press [PUSH] to confirm and enter editing for next character.

NOTE: OFFSET frequency is adjusted according to step size setup. This function is hide when RTDF function is on.

8.12 Busy Channel Lockout
Busy channel lockout is disable transmitting, once the channel is busy and you press [PTT], the radio will beep as warning and get back to receiving.

1. Enter CHAN MENU list, choose No.12 function
2. Press [PUSH] button, the menu value in LCD turns to green color.
3. Turn channel knob to choose wanted setting.
   BU: Signaling busy lockout, transmitting is inhibited when current channel receives a matching carrier.
   RL: Signaling busy lockout, transmitting is inhibited when current channel receives a matching carrier but dis-matching CTCSS/DCS code.
   OFF: Busy channel lockout is disabled. Transmitting is allowed in any receiving status

NOTE: In Frequency (VFO) mode or RTDF function is on, this function will be auto-hidden.

8.13 TX OFF
ON: TX allowed, press [PTT] to transmit
OFF: TX not allowed, only work in RX mode, press [PTT] will emit a beep.

1. Enter CHAN MENU list, choose No.13 function
2. Press [PUSH] button, the menu value in LCD turns to green color.
3. Turn channel knob to choose wanted setting.
4. Press [PUSH] button or [P3] key to store setting and exit

8.14 OWNID (SELF ID ENQUIRY)
1. Enter CHAN MENU list, choose No.14 function;
2. The LCD will display current channel DTMF ID or 5Tone ID.

*: Minus offset, means transmitting frequency lower than receiving frequency.
+: Plus offset, means transmitting frequency higher than receiving frequency.
OFF: OFFSET is turn off.
VHF: 0 - 38 Mhz frequency available.
UHF: 0 - 90 Mhz frequency available.

9. KEYPAD MENU SETUP

9.1 Main unit keypad menu setup
1. Hold [FUNC] key to enter SELECT MENU interface.
3. Press [PUSH] button to enter MINI KEY menu list.
4. Turn channel knob to choose wanted setting.
5. Short press [PUSH] button to choose wanted keypad group.
7. Press [FUNC] to confirm and exit.

9.2 H-DIM Microphone keypad backlight setup
1. Hold [FUNC] key to enter SELECT MENU interface.
3. Press [PUSH] button to enter HANDY KEY menu list.

9.3 Microphone keypad backlight brightness Setup
1. Hold [FUNC] key to enter SELECT MENU interface.
3. Press [PUSH] button to enter HANDY KEY menu list. Choose No.1 function, press [PUSH] key to enter value setting, the menu value in LCD turns to green color.
4. Turn channel knob to choose wanted setting, the microphone keypad has OFF-31, total 32 brightness levels. OFF means turn off backlight brightness.
5. Press [PUSH] button or [P3] key to store setting and exit.

9.4 H-PA H-PD Microphone self-define keypad setup
1. Hold [FUNC] key to enter SELECT MENU interface
3. Press [PUSH] button to enter HANDY KEY menu list. Choose NO.2-5 function, then press [PUSH] button to enter value setting, the menu value in LCD turns to green color.
4. Turn channel knob to choose wanted setting.
5. Press [PUSH] button or [P3] key to store setting and exit.
10. DTMF SETTTING

10.1 DTMF Encode group setting
1. Enter DTMF menu, choose No.1 function
2. Press [PUSH] button, the menu value in LCD turns to green color.
3. Turn channel knob to choose wanted setting.
   1-16 total 16 groups DTMF encode for selection.
4. If choosed group is empty, Press PUSH to edit DTMF code, the LCD displays “= = = = =”.
5. Turn channel knob to choose wanted character, press PUSH to confirm and move to next character selection.

10.1 DTMF Encode Transmitting Time
1. Enter DTMF menu, choose No.2 function
2. Press [PUSH] button, the menu value in LCD turns to green color.
3. Turn channel knob to choose wanted setting.
   50MS: The time for transmit a single DTMF encode and the interval is 50MS,
   100MS: The time for transmit a single DTMF encode and the interval is 100MS,
   200MS: The time for transmit a single DTMF encode and the interval is 200MS,
   300MS: The time for transmit a single DTMF encode and the interval is 300MS,
   500MS: The time for transmit a single DTMF encode and the interval is 500MS.
11. PROGRAMMING SOFTWARE
INSTALLING AND STARTING SOFTWARE

Install USB Cable Driver Programme

1. Click start menu in computer, under “ALL PROGRAMS” menu, choose and click “USB To Com port” in AT-778UV program, install “USB To Com port” driver by indication.
2. Connect the optional PC51 USB Programming cable to USB port in PC with transceiver.
3. Double click AT-778UV shortcut or click AT-778UV in procedure index of start menu, choose serial com port as indicated then click OK to start programming software.
4. According to instruction, select correct “COM Port”, then click “OK” to start programming software.

NOTE: Even in same computer, the selective COM Port is different when USB cable connects with different USB port.

You shall install software before connecting the USB cable line. Switch on transceiver before writing frequency. You had better not switch on or off the power supply of transceiver when it is connected with computer, otherwise, it will make transceiver unable to read or write frequency. In this case, you have to turn off programming software, pull out USB cable, then reinsert USB cable and open software, then rechoose COM Port, it will turn into normal operation. Therefore, please connect transceiver with computer after switching on the transceiver. Don’t restart transceiver power when it is connected with computer.

When programming the radio, read the factory initial data first, then rewrite the frequency and signaling etc., otherwise errors may occur because of different frequency band etc.
You can choose the preset power, Rx / Tx Band, bandwidth, etc.
12. MAINTENANCE

12.1 Default Setting after Resetting

<table>
<thead>
<tr>
<th>Frequency band</th>
<th>VHF</th>
<th>UHF</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFO frequency</td>
<td>145.150MHz</td>
<td>431.150MHz</td>
</tr>
<tr>
<td>Memory channel</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Offset direction</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Offset frequency</td>
<td>600KHz</td>
<td>5MHz</td>
</tr>
<tr>
<td>Channel step</td>
<td>10KHz</td>
<td>10KHz</td>
</tr>
<tr>
<td>CTCSS encode and decode</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>CTCSS tone frequency</td>
<td>88.5Hz</td>
<td>88.5Hz</td>
</tr>
<tr>
<td>DCS encode and decode</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>DCS Code</td>
<td>000N</td>
<td>000N</td>
</tr>
<tr>
<td>Output power</td>
<td>HI</td>
<td>HI</td>
</tr>
<tr>
<td>TOT</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>APO</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>VOL</td>
<td>28</td>
<td>28</td>
</tr>
<tr>
<td>Squelch Level</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

12.2 Trouble Shooting

**Problem** | **Possible Causes and Potential Solutions**
--- | ---
(1) Power is on, nothing appears on Display | + and - polarities of power connection are reversed. Connect red lead to plus terminal and black lead to minus terminal of DC power supply.
(2) Fuse is blown | Check and solve problem resulting in blown fuse and replace fuse with new fuse.
(4) No sound comes from speaker | Squelch is muted. Decrease squelch level. Tone or CTCSS/DCS squelch is active. Turn CTCSS or DCS squelch off.
(5) Key and Dial do not function | Key-lock function is activated. Cancel Key-lock function.
(6) No Scan | Did not list the channel in the scan when programmed.
The whole band with noise after programmed | The squelch has opened during programmed.
Communication range was short, bad sensitivity | a. Check the antenna is well or not, and check the antenna port whether well connected.
b. Antenna connector has debris or damaged. Whether set Low power.
Can not talk with other members within the group | a. Frequency/channel different, pls modify.
b. CTCSS/DCS different, pls reset.
c. Out of the communication range.
## 13. SPECIFICATIONS

### GENERAL

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency Range</td>
<td>EU Version: VHF: 144-146MHz UHF: 430-440MHz</td>
</tr>
<tr>
<td></td>
<td>USA Version: VHF: 136-174MHz UHF: 400-490MHz(RX)</td>
</tr>
<tr>
<td></td>
<td>VHF: 144-148MHz UHF: 420-450MHz(TX)</td>
</tr>
<tr>
<td>Number of Channels</td>
<td>200 channels</td>
</tr>
<tr>
<td>Channel Spacing</td>
<td>25K (Wide Band) 20K(Middle Band) 12.5K (Narrow band)</td>
</tr>
<tr>
<td>Phase-locked Step</td>
<td>2.5KHz, 5KHz, 6.25KHz, 10KHz, 12.5KHz, 20KHz, 30KHz, 50KHz</td>
</tr>
<tr>
<td>Operating Voltage</td>
<td>13.8V DC ±15%</td>
</tr>
<tr>
<td>Squelch</td>
<td>Carrier/CTCSS/DCS</td>
</tr>
<tr>
<td>Frequency Stability</td>
<td>±2.5 ppm</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-20°C~+60°C</td>
</tr>
<tr>
<td>Dimensions(mm)</td>
<td>124 (W) x 163(D) x 39 (H)</td>
</tr>
<tr>
<td>Weight</td>
<td>about 0.64Kg</td>
</tr>
</tbody>
</table>

Specifications are subject to change without notice due to advancements in technology.

### RECEIVER

<table>
<thead>
<tr>
<th>Specification</th>
<th>Wide band</th>
<th>Narrow band</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity (12dB Sinad)</td>
<td>≤0.25µV</td>
<td>≤0.35µV</td>
</tr>
<tr>
<td>Adjacent Channel Selectivity</td>
<td>≥60dB</td>
<td>≥60dB</td>
</tr>
<tr>
<td>Audio Response</td>
<td>+1<del>3dB(0.3</del>3KHz)</td>
<td>+1<del>3dB(0.3</del>2.55KHz)</td>
</tr>
<tr>
<td>Hum &amp; Noise</td>
<td>≥45dB</td>
<td>≥40dB</td>
</tr>
<tr>
<td>Audio distortion</td>
<td>≤5%</td>
<td></td>
</tr>
<tr>
<td>Audio power output</td>
<td>&gt;2W@8</td>
<td></td>
</tr>
</tbody>
</table>

### TRANSMITTER

<table>
<thead>
<tr>
<th>Specification</th>
<th>Wide band</th>
<th>Narrow band</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Output</td>
<td>25W / 15W / 5W</td>
<td></td>
</tr>
<tr>
<td>Modulation</td>
<td>16KΦF3E</td>
<td>11KΦF3E</td>
</tr>
<tr>
<td>Adjacent Channel Power</td>
<td>≥70dB</td>
<td>≥60dB</td>
</tr>
<tr>
<td>Hum &amp; Noise</td>
<td>≥40dB</td>
<td>≥36dB</td>
</tr>
<tr>
<td>Spurious Emission</td>
<td>≥60dB</td>
<td>≥60dB</td>
</tr>
<tr>
<td>Audio Response</td>
<td>+1<del>3dB(0.3</del>3KHz)</td>
<td>+1<del>3dB(0.3</del>2.55KHz)</td>
</tr>
<tr>
<td>Audio Distortion</td>
<td>≤5%</td>
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### 14. ATTACHED CHART

52 groups CTCSS Tone Frequency(Hz)

<table>
<thead>
<tr>
<th>No.</th>
<th>Freq.(Hz)</th>
<th>No.</th>
<th>Freq.(Hz)</th>
<th>No.</th>
<th>Freq.(Hz)</th>
<th>No.</th>
<th>Freq.(Hz)</th>
<th>No.</th>
<th>Freq.(Hz)</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>62.5</td>
<td>12</td>
<td>94.8</td>
<td>23</td>
<td>136.5</td>
<td>34</td>
<td>177.3</td>
<td>45</td>
<td>218.1</td>
</tr>
<tr>
<td>2</td>
<td>67.0</td>
<td>13</td>
<td>97.4</td>
<td>24</td>
<td>141.3</td>
<td>35</td>
<td>179.9</td>
<td>46</td>
<td>225.7</td>
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<tr>
<td>3</td>
<td>69.3</td>
<td>14</td>
<td>100.0</td>
<td>25</td>
<td>146.2</td>
<td>36</td>
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