



HF/CB/50MHz/70MHz/VHF/UHF Full-mode SDR radio PMR-171

User Manual V2.1



Chongqing Guohe Electronic Technology Co. Ltd
+8615023182729
15F, Unit 1, Building 12, No.2 Gangan 2nd Road, Jiangbei District, Chongqing
www.guohedz.com

Content

Overview	2
Prompt	4
Panel control and operation	4
Front panel.....	4
Radio button function	4
Digital hand-microphone button function	6
Encoder	7
Radio Physical Layout.....	8
Rear panel connector	9
Interface definition	10
Band selection operation	11
Band selection operation	11
AF audio settings.....	11
RF settings	12
USB sound card data output format settings.....	12
Transmit and receive frequency offset settings.....	12
Sending and receiving mode settings	12
Antenna Tuner operation.....	13
A/B frequency operation.....	13
NR/NB noise suppression settings	13
Spectrum and waterfall chart display settings.....	13
Spectrum parameter display settings	14
Digital filter operation.....	14
Application menu actions.....	14
Receive advanced actions	17
Launch operation (factory locked).....	18
SSB communication.....	20
CW communication.....	20
FM communication	21
Relay operations	21
FM communication	21
Relay operations	22
Customize the number pattern.....	22
Channel storage	22
Channel programming	23
Firmware upgrade instructions	24
After-sales	26
Appendix 1: Input Methods	27
Appendix 2: PMR-171 Control Protocol.....	29
Appendix 2-1	39
Note:.....	40

Overview

The PMR-171 is an ultra-portable full-range, full-mode SDR carrier radio with a receiving frequency of 100kHz~2GHz and an amateur transmission coverage of 160m ~70cm bands. This ultra-wide frequency range has resulted in an exceptionally versatile radio that covers all commonly used frequency bands. The PMR-171's optional 5AH clip-on external battery compartment is ideal for field use. Additional replaceable battery compartments are available and enable an operator to easily swap between battery units when desired. The ultra-low receiving current of the PMR-171 results in an ultra-long battery life. The radio is also provided with a DC power interface, which can also be used for fixed or vehicle stations. The radio can be powered by any standard power supply with a supported voltage range of 9VDC~18VDC and includes reverse polarity protection.

The radio comes with an encoder to quickly select parameters from the comprehensive operating menus. The PMR-171's operating modes include FT8, USB, LSB, CW, AM, FM, RTTY, DMR (optional), and WFM (receive only).

The display adopts a high-brightness high-resolution LCD display, with adjustable backlight brightness, which can also be clearly displayed outdoors. The panel adopts a full keyboard design to facilitate various operations. The illuminated keyboard backlight is adjustable to operate the station in dark environments. The encoder can quickly adjust the parameters you need, while the hand microphone with numeric keypad can control most functions of the station.

The QRadioBLE mobile app can control the radio station wirelessly through Bluetooth, making the radio operation more convenient and faster. The built-in Bluetooth module, supports Bluetooth wireless FT8, effectively eliminating the need for a wired connection. The radio features a USB interface that integrates a sound card and serial port, so you can control the station with a single USB cable. All popular amateur radio software is supported.

The PMR-171 has many advanced features normally only found in large base station radios. The radio has dual VFO mode, split-frequency operation support, intermediate frequency offset adjustment, receive frequency fine-tuning, intermediate frequency noise suppression, AGC speed selection, RF gain adjustment, squelch control, signal attenuator, AM broadcast reception, built-in CW keyer and memories and decoder, built-in CTCSS analog sub-tone, automatic sleep function, transmit timeout function (TOT); Computer connection and computer-aided control functions, and data copying functions, etc.

In addition, PMR-171 also has a wealth of options for selection, GPS module can achieve global positioning, timing positioning can also output positioning and timing data to other devices. The electronic compass module can be used to measure its own altitude and direction of travel.

PMR-171 has the following features:

1. Real-time spectrum.
2. Waterfall chart.
3. Doppler frequency tracking.
4. Using software-defined radio technology (SDR), full-band support FT8, USB, LSB, CW, RTTY, AM, FM, DMR (optional), WFM (Receive Only).
5. Dual frequency conversion circuit structure.
6. The IF width and IF displacement hardware and software can be modified to provide powerful IF interference suppression.
7. DSP digital noise reduction.
8. Built-in (160~4) m high-speed automatic antenna tuner.
9. Built-in electronic key controller
10. Built-in sound card with IQ and audio output.
11. External battery compartment design.
12. USB TYPEC3.1 to connect to the computer
13. High-precision TXCO $\pm 0.5\text{ppm}$ (-10°C~60°C).
14. Ultra-wide working voltage range: 9~18VDC.
15. Power supply anti-reverse polarity protection.
16. Optional GPS/Beidou, electronic compass

(acceleration, angle sensor).

17. Optional GPS timing (GPS module required).

18. RTC clock.

19. Voltage display.

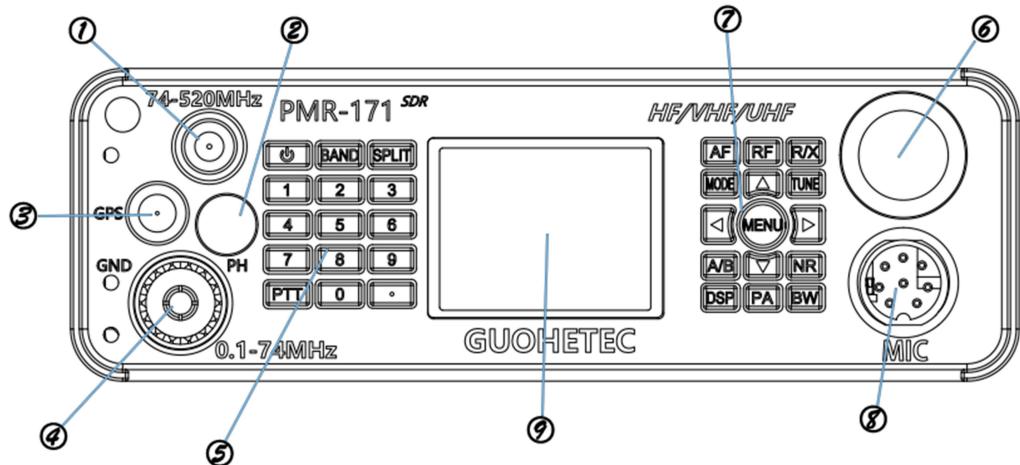
20. Ultra-light weight: $\leq 2\text{kg}$.

21. Bluetooth wireless control, Bluetooth FT8.

Prompt

Please read this manual carefully before using the radio. Damage caused by incorrect operation is not covered by the warranty.

Panel control and operation



Front panel

- (1) VHF/UHF antenna interface, frequency from 74~520MHz.
- (2) Tactical headphone interface.
- (3) GPS antenna interface for connecting external GPS active antennas.
- (4) HF antenna interface, frequency from 100k~74MHz.
- (5) Digital button area.
- (6) Encoder.
- (7) Function button area.
- (8) Microphone interface.
- (9) LCD screen.

Radio button function

Keystroke	Short press (0.5S)	Long press (2S)
Power supply	Toggle SWR, ALC, MIC Audio display	Power on/ off
BAND	Band selection	CW settings
SPLIT	Offset-frequency	FM CTSS settings

AF	Volume, MIC gain, compression, bass, treble	Toggle frequency mode, channel memory
RF	RF gain, IF gain, AGC, SQL, Pre-amp	USB data output format selection
R/X	RIT receive frequency bias, XIT transmit RF bias	Transceiver frequency bias switch
MODE	Mode settings	USB/LSB, NFM/WFM, CWR/CWL switching
TUNE	Enable/disable tuner	Tuning start/stop
A/B	A or B frequency	A=B frequency
NR	Noise Blanker or Noise Reduction selection	Select spectrum / waterfall display option
DSP	NR, NB, PEAK threshold settings	Turn off NR or NB
PA	Power adjustment	High and low power switching L/H
BW	Digital filter selection	Spectrum bandwidth settings, spectrum reference level settings, spectrum refresh rate settings
.	DMR settings (when module DMR module installed)	5W On CW long tone emission for debugging antenna standing wave, in DMR mode, BS/MS mode switch
D-pad left	Left-select or "disable" menu operation	*
D-pad right	Right-select or "enable" menu operation	*
D-pad	Up selection	Fast frequency increment
D-pad down	Down selection	Fast frequency decrement
MENU	Confirm	Application interface, back
Digital keys 0~9	In frequency mode, direct frequency input. In input method mode, reference key input method.	<ol style="list-style-type: none"> 1. For CW automatic call content 1 2. For CW Auto Call Content 2 3. For CW Auto Call Content 3 4. For CW automatic call content 4

Digital hand-microphone button function



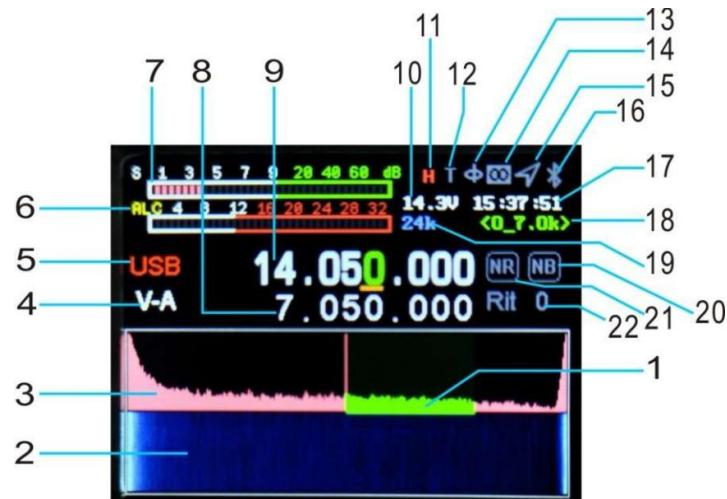
Digital key hand

keystroke	Short press (0.5S)	Long press (2S)
A	Band selection	CW settings
B	Mode settings	USB/LSB, NFM/WFM, CWR/CWL switching
C	Volume, MIC gain, compression, bass, treble	Toggle frequency mode, channel memory
D	RF gain, IF gain, AGC, SQL, Pre-amp	USB data output format selection
P1	Digital filter selection	Spectrum bandwidth setting, spectrum reference level setting Set and set the spectrum refresh rate
P2	Confirm	Application interface, back
P3	Left-select or "disable" menu operation	*
P4	Right-select or "enable" menu operation	*
UP	Up selection	Fast frequency addition
DWN	Down selection	Fast frequency reduction
*	Enable/disable tuner	Tuning start/stop
#	NB or NR selection	Show spectrum only, waterfall chart only, spectrum Display and turn off spectrum at the same time as the waterfall chart
Digital keys 0~9	In frequency mode, direct frequency input. In input method mode, reference key input method.	<ol style="list-style-type: none"> 1. For CW automatic call content 1 2. For CW Auto Call Content 2 3. For CW Auto Call Content 3 4. For CW automatic call content 4

Encoder

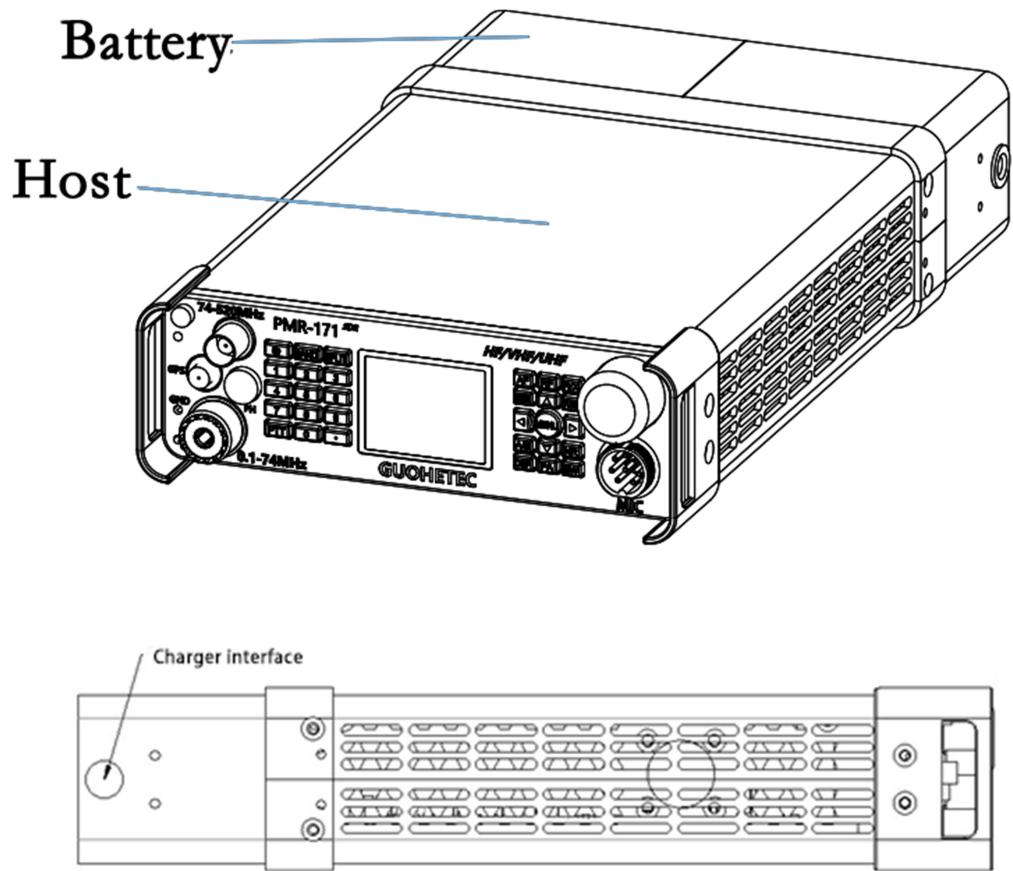
Encoder		
Left Rotation	Left or disable item	Same as arrow keys down
Right Rotation	Right or enable item	Same as arrow keys up
Short press	Select menu item	
Long press	Enter or escape menu	

SDR main interface



1. Digital filter.
2. Waterfall chart.
3. Spectrum.
4. VFO A/B indication.
5. Mode display.
6. SWR, AUD, ALC meter display.
7. S meter (transmit power meter).
8. Secondary frequency
9. Main frequency display
10. Voltage display.
11. Power levels (high power H, low power L).
12. Tuner enabled display
13. Electronic compass.
14. LORA display.
15. GPS display.
16. Bluetooth display.
17. Time.
18. Digital filter bandwidth indication
19. Spectrum bandwidth.
- 20\21, NR, NB indication.
22. RIT/XIT frequency offset.

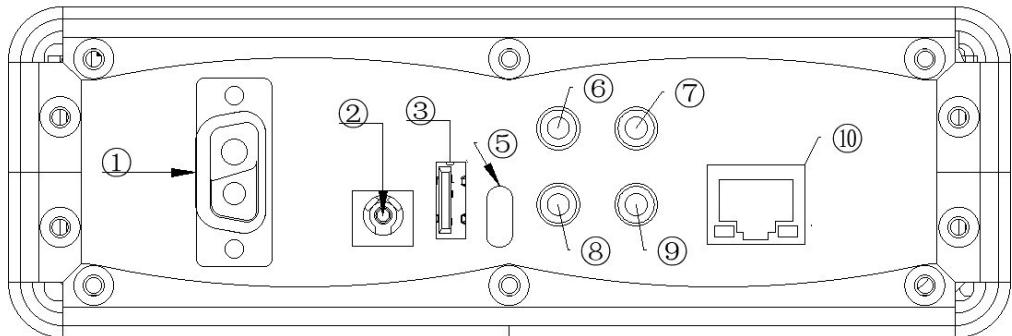
Radio Physical Layout



Charging port

The charging interface needs to be charged with the original charger, the charging voltage cannot be higher than 16.8V, and the charging current is 3A. non-reversible. The charging interface connector specification is 5.5*2.5mm DC interface.

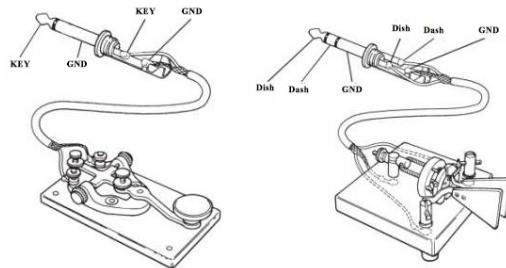
Rear panel connector



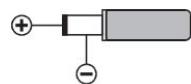
1	Battery compartment connector interface (PMR-171 batteries only).
2	DC power connector(+ \ominus \ominus). Radio power interface, specification is 5.5*2.5. Use the standard DC power cord to connect to a regulated power supply or battery. The power supply must be able to supply 6A (13.8V~15V) for full power output; 13.8V is recommended.
3	USB port for firmware upgrades and connecting peripheral smart devices, such as external encoder wheels, keyboards, USB sticks. Note: cannot be used to charge external devices.
5	USB port for computer operation/audio soundcard output digital interface.
6	Headphone audio output interface. Demodulated audio output for connecting external audio devices.
7	ACC interface - PTT control signal output for controlling external amplifiers and other equipment.
8	RS232 serial port.
9	CW key interfaces. This interface is a 3.5mm three-core connector for connecting electronic autokeyer, paddle or normal hand keys
10	Network port, reserved, non-functional.

Interface definition

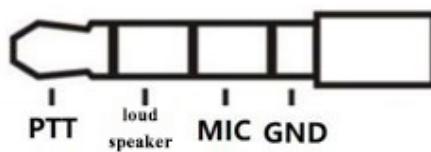
Electric keys



Power/charging interface



Tactical headset interface definition diagram



Band selection operation

Press the BAND button briefly to pop up the band selection interface, press the arrow keys to select the frequency band, and press the MENU key to confirm.



Band selection operation

Press [SPLIT] briefly to display the frequency, then press off the frequency, press the left and right arrow keys to select the frequency bits, and press the up and down arrow keys to add or subtract the frequency. The upper row of frequencies is the receiving frequency, the lower row is the transmit frequency, switch and press the [A/B] button.



AF audio settings

Press the [AF] button to enter the AF interface, select the setting item with the left and right arrow keys, and press the keys up and down to set the value.

SVOL: Speaker volume.

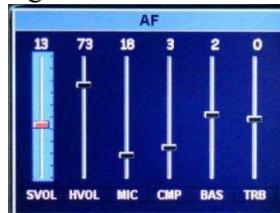
HVOL: Front panel handset volume

MIC: MIC gain.

CMP: MIC compression ratio.

BAS: Bass.

TRB: Treble



To set the transmission audio settings you need to hold down the PTT key when the AF menu is open. A good option is to check your transmission using a remote kiwisdr station to evaluate how your transmission sounds. You can find a list of stations here: kiwisdr.com/public/

RF settings

Press the [RF] button to enter the RF parameter setting interface. The left and right arrow keys select the setting item, and the up and down keys are pressed to set the value.

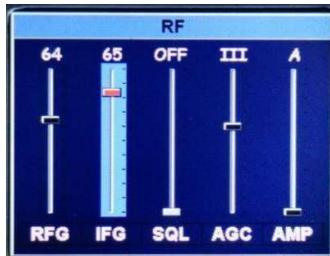
RFG: RF Gain.

IFG: IF gain.

AGC: Automatic gain adjustment speed.

SQL: Squelch level (FM mode).

AMP: Pre-amplification.



Note: RFG and IFG parameters are very important for reception, these two parameters together with NR, the filter can achieve very good reception results. The RFG does not need to be set too large, generally no more than 50.

RFG and IFG factory default value is 50.

USB sound card data output format settings.

Long press the [RF] button to enter the USB sound card data output selection interface, and select the output mode with up and down keys. Press and hold again to exit.

USB: Select this for FT8/HRD/N1MM/LOG32/RTTY and using software such as WSJTX etc.

SDR: Select this when using software such as CNSDR/HDSDR.



Transmit and receive frequency offset settings

Long press [R/X] to open the transmission and reception frequency offset setting interface, and then press and hold to exit. Short press to select the receive frequency bias RIT, and then short press to set the RF bias XIT. The left and right arrow keys set the frequency offset frequency. **Offset frequency = button display value * 20Hz.**

Sending and receiving mode

Press the [MODE] button to select the FM mode: long press to select NFM/WFM.

SSB mode: Press and hold to select

CW mode: long press to select CWL/CWR

Short press to cycle through AM, FM, USB (LSB), CW, RTTY, DMR, FT8.

Note: When there is no FT8 mode, select the sound card output data to USB.



settings

mode.

USB/LSB.

Antenna Tuner operation

1. Press the [Power] button to switch to SWR standing wave meter.
2. Press and hold the [TUNE] button, PMR-171 will automatically enter the tuning mode, and the machine will make a short clicking sound. The T word on the display interface turns green when tuning has been successful. If the tuner fails to make an appropriate match, the T is gray. You can turn off the tuner by briefly pressing the [TUNE] button.
3. A Long press of the [.] button will cause the PMR-171 send a the 5W CW long tone transmission, enabling you to activate an external tuner or to directly observe the antenna standing wave SWR value. Long press the [.] key to stop the transmission.

A/B frequency operation

Short press the [A/B] button to switch the A/B frequency, and long press A frequency = B frequency.



NR/NB noise suppression settings

Short press the [NR] button to enable the noise blower or noise reduction feature. Once enabled you can toggle between the two by pressing the [NR] button. Note that you cannot have NB and NR active at the same time. It is generally recommended to use NR.

Short press the [BW] key to open the digital filter (green display) to adjust the left and right arrow keys to adjust the bandwidth $\leq 4.8K$. If NR or NB is enabled, a long press

DSP key to turn off noise mitigation features.

Press DSP briefly to adjust the NR, NB thresholds.



Spectrum and waterfall chart display settings

Long press the [NR] button to select toggle display → waterfall chart → spectrum → waterfall chart and spectrum display at the same time → waterfall chart and spectrum are turned off.



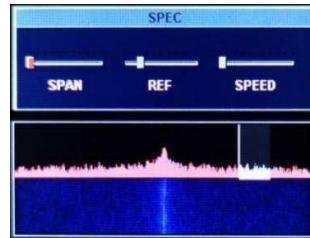
Spectrum parameter display settings

Long press the [BW] button to set the spectrum bandwidth, reference level, refresh rate, direction up and down buttons to select the setting item, direction left and right buttons to set the value.

SPAN: Spectral bandwidth.

REF: Spectral reference level.

SPEED: The spectrum refresh rate.



Digital filter operation

Press the [BW] key to select the digital filter (green is selected in the figure below), select the filter bandwidth in the direction left and right buttons, and press the [BW] button to withdraw the filter bandwidth adjustment (the green part turns white).



Application menu actions

Long press the [MENU] key to enter the menu interface, long press the [MENU] key to exit the menu interface, press the left and right, up and down keys to select the application, and short press the [MENU] key to select the



application.

1. DMR setting (optional)

Call type: Call type, left and right button selection.

Single: Single call

GROUP: Group Call

ALL: All Call

SLOT: Time slot, left and right button selection

0: Dual time slot, 1: time slot 1, 2: Time slot 2

TX_CC: Transmit color code, left and right keys to select

RX_CC: receive color code, left and right key to select

CALL_ID: Call ID, input method input

OWN_ID: Native ID

CH_TYPE: Signal Type, DMR Digital Voice Mode, DFM Analog FM Mode, Left and Right Keys to Select

RX_CTCSS: Receive Sub-tone

TX_CTCSS: Transmit sub-tones

RXGAIN: Receive IF gain, recommended value of 3

SQL: Receive squelch, currently fixed value, tuning does not work

ENCRY: encryption enabled, PMR-171 does not support encryption

SEED: Encryption key, PMR-171 does not support encryption



2. A-CALL CW/RTTY automatic keyer settings

The contents of the auto-call settings are used for both CW auto-call and RTTY auto-call.

2.1 KEY1~KEY4: Automatic call content, up and down keys to select input items, short press [MENU] to select. Please use the radio numeric keypad or use an external USB keyboard to enter the values you require. Refer to the appendix for input methods

2.2 COUNT the number of consecutive calls, up and down keys to select inputs, left and right keys to adjust the number of times.

2.3 DELAY Automatic call interval, in seconds. The up and down keys select the input item, and the left and right keys adjust the interval.

2.4 In CW or RTTY mode, press and hold the number button 1~4 to automatically call the corresponding



KEY1~KEY4 content.

3. GPS, electronic compass operation DIR (optional)



Enter the menu to directly display the UTC time, latitude and longitude, speed, direction, altitude, etc. received by the GPS module.

4. Q-CHAT (customized)

5. Frequency hopping HFSS

Frequency hopping requires an optional GPS module and a satellite sync signal

Synchronization, frequency hopping will not begin until a valid sync signal is received.

The channel is used for frequency hopping channels, and the frequency of 10 channels needs to be set to the same frequency band, otherwise the filter is switched frequently.

Frequency Hopping: Frequency hopping is enabled, left and right button selection

Hop Count: hop hops per second, currently a fixed hop number of 10 hops per second

Encryption: encryption switch, left and right button selection, PMR-171 does not support encryption



6. TEXT MESSAGE*MESSAGE (RESERVED)

7. Music player *MUSIC.

The phone searches for the radio Bluetooth connection and uses the mobile phone music player to play audio.

8, VSWR standing wave scanning (long press MENU to exit)

8.1 Direction left and right arrow selection BABD Marker START,

Press the MENU key briefly to confirm.

8.2 BAND selects the scan band.

8.3 After the Marker is selected, press the direction left and right keys to see the band

Frequency standing wave value.

8.4 START, Start scanning the antenna standing wave



9,APRS (retain)

10. Settings *SET

10-0 KEY-LED keyboard backlight on/off

- 10-1. OUT-BAND-EN OFF Locks the band key pool data
- 10-2. TX-EN transmitter switch (ON needs to be turned on to enable transmit after new machine activation)
- 10-3. KEY-VOLUME keyboard key volume
- 10-4. BACKLIGHT LCD BRIGHTNESS
- 10-5. LED_BRIGHTNESS Transceiver button brightness adjustment
- 10-6. HOUR Time setting: hours
- 10-7. MINUTE Time setting: minutes
- 10-8. SECOND Time setting: seconds
- 10-9. FAN-EN-TEMP fan temperature control
- 10-10. FAN-AUTO Automatic temperature control
- 10-11. VSWR-THRESHOLD Standing wave protection threshold OFF is an unlimited standing wave size
- 10-12. VSWR-TUNER The SWR cutoff threshold for tuning. This represents the SWR at which the tuner will consider the circuit “matched”.
- 10-13. TOT-TIMER Limit transmission time
- 10-14. AUTO-SLEEP time at which the backlight will turn off.
- 10-15. VOX_EN USB port data voice on/off
- 10-16. VOX_THRESHOLD USB port data voice control threshold
- 10-17. EX_SQL Full mode squelch on/off
- 10-18. DBM_EN signal DBM shows on the front display on/off
- 10-19. GPS_TRANS Satellite data synchronization output, which can be used to synchronize the clock of external devices such as computers
- 10-20. FW-VERSION hardware version number

11. ABOUT

11-1. CALLSIGN call sign input (boot is displayed on the boot screen), press the MENU button on the about page to enter the input page, and press MENU to confirm the exit after entering the call sign. Press and hold MENU to exit the about page. Call sign input method: Refer to Appendix 1 Input Method.

- 11-2. MODEL machine model
- 11-3. SN machine serial number
- 11-4. HW hardware version number
- 11-5. SW software version number

Receive advanced actions

The PMR-171 is in the receiving state when it is powered on. The following instructions step through some of the settings to enhance your listening experience.

1. Select the desired frequency and mode for example: 14.270MHz\USB.
2. Press the [AF] button to bring up the VOL volume adjustment, adjust the volume up and down arrow keys, adjust the appropriate volume,
- 2-2. MIC gain, if this gain is turned on too high, it will cause a large increase in pickup sensitivity, causing MIC overload, manifested as the radio press the hand microphone does not speak the transmission power out, and there is noise, so to press the hand microphone radio in the SSB no power out is just right. The recommended MIC gain is 70 and CMP is 0. The CMP must be turned off during AM mode transmission, otherwise no modulation will occur. Press the [AF] button again to save and exit.
3. Press the [RF] button to bring up the RF parameter setting interface. Select the left and right arrow keys to select the setting item, press the up and down keys to set the value, and briefly press the [RF] button again to save and exit.

3-1 RFG: RF gain.

3-2 IFG: intermediate frequency gain.

Through the combination of RFG and IFG to achieve the highest sensitivity and lowest noise level of the receiver, usually you need to turn up these two parameters to hear very weak signals, but the noise also increases, and achieving a balanced state requires careful adjustment. In general, the IF gain can be turned on a little higher than the RF gain.

3-3 AMP pre-stage power amplifier, divided into A/B two stages.

4. Long press the [BW] button to set the spectrum bandwidth, reference level, refresh rate, up and down buttons to select the setting item, left and right buttons to set the value, and long press again, [BW] key to exit. Other signals within the bandwidth can be seen through the spectrum display.

4-1 SPAN: spectrum bandwidth, 1.5K, 3K, 6K, 12K, 24K, 48K width, respectively.

4-2 REF: spectral reference level.

4-3 SPEED: spectrum refresh rate.

5. Spectrum and waterfall chart display settings.

Long press the NR key to select to display the waterfall chart, long press to select the spectrometer, long press the tile chart and the waterfall chart to display at the same time.

6. Digital filter operation, PMR-171 provides powerful digital filter.

Press the BW key short to select the digital filter, after selecting the digital filter, the original white horizontal line on the spectrometer is displayed in green, the left and right buttons select the filter bandwidth, and press the BW button again to determine the filter bandwidth exit. Different bandwidth widths can effectively avoid interference signals to achieve excellent listening results.

7. NR/NB noise suppression setting, usually this option must be combined with the digital filter to achieve excellent results.

7-1. Press the [NR] button to turn on, and short press to switch NR/NB. Press and hold the DSP key to turn off NR/NB. Press [DSP] to set the NR/NB/PEAK threshold, select the NR/NB/PEAK setting item with the up and down keys, set the value with the left and right keys, and briefly press [DSP] again to exit.

7-2 find the required signal, turn on NR, usually the effect of NR is more obvious, and then press [BW] operation to open the digital filter to the maximum bandwidth, and then adjust the digital filter bandwidth little by little, adjust to 4.8K when you will find that the noise will be greatly suppressed, at this time you can also adjust the previous RFG and IFG combination to achieve the optimal reception effect.

Launch operation (factory locked)

Transmission is disabled by default from the factory for shipping purposes. Your dealer is likely to have enabled transmission for you before you receive it. TX opening method: Long press MENU - arrow keys to select SET - tap MENU - find TX-EN - left arrow key to select ON - long press MENU to exit - long press MENU again to exit the menu interface.

Turn PMR-171 on and off

1. If you want to turn on the radio, just press and hold the power button for 3 seconds.
2. If you want to turn off the radio, just press the power button for 3 seconds.
3. PMR-171 has the function of saving power off data, for example, you were operating on 7.050Mhz LSB and then power off the radio, this is the frequency and mode that the radio will return to when its powered back on..

Band selection

1. The frequency range of PMR-171 is very wide, press the [BAND] button to bring up the band menu.
2. Press the arrow keys to select, and press [MENU] to confirm the frequency band.



Frequency selection

1. Press the left and right arrow keys to select the position of the cursor and short press.

The up-arrow keys adjust the required frequency, and long press goes up and down key to quickly select the desired frequency.



2. Direct numeric keypad input required frequency.

For example, if you want to enter 14.270Mhz, press 014270000 or 14.270000 on the numeric keypad respectively, and then press the menu key [MENU] to confirm.

Mode selection

1. PMR-171 supports FT8, LSB, USB, CW, FM, RTTY. short press the [MODE] button to select, LSB and USB need to long press the [mode] key to switch, and CW and CCR long press the [mode] key to switch. WFM and NFM need to long press [MODE] to switch.

Transmit power selection

1. Press [PA] briefly to enter the transmission power adjustment, and adjust the value with the up and down arrow keys.
2. Long press [PA] to quickly select 5W and 20W segments, and each segment can be finely adjusted by the up and down arrow keys.

Receive volume, MIC gain

1. Press the [AF] button to enter the AF interface, select the setting items with the left and right arrow keys, and press the keys up and down to set the value.

SVOL: volume;

HVOL: The volume of the headphones for the front handset plug (labelled PH).

MIC: MIC gain

CMP: MIC compression to width ratio.

BAS: Bass.

TRB: Treble.

Handset settings

1. When using the PMR handset/headphone accessory, insert it directly into the front panel MIC port.
2. When the handset is connected to the radio, the MIC gain should be reduced, if the wired hand device PTT is pressed under SSB without speaking or environmental noise and the radio power meter has an output, the handset gain is too large, and it needs to be reduced to press the handset microphone in a quiet situation without any power output.

After the simple setup is completed, you can now communicate happily, usually LSB mode below 7Mhz, USB mode above 14Mhz, and FM mode above 28Mhz. Please check your radio license before launching, comply with local laws and regulations,

FT8 communication

1. Press the [MODE] key, select FT8 mode, use USB cable to connect to the computer, open FT8 software, select CAT protocol device as PMR-171 audio device as PMR-171, other parameters default.
2. When using Bluetooth for wireless FT8, you first need to connect the radio station like a Bluetooth headset, use the mobile phone to scan the Bluetooth device, connect this device when the headset icon name is PMR-171-BT, and then open the FT8CN software, select Bluetooth in the software and select PMR-171-BT. Refer to the Software Usage Instructions for use of the Software. Bluetooth FT8 is the recommended way to completely avoid common-mode RF interference.

SSB communication

1. Press the [MODE] button to select one of the SSB (LSB or USB) modes. If you are operating in the 7MHz band or below, select LSB mode. If you are operating in the 14MHz band or above, select USB mode.
2. Press the [Power] button shortly, and the screen switches to ALC, SWR, AUD instrument display.
3. Press the PTT button on the microphone to speak with the normal voice microphone while observing the ALC instrument display. When the microphone inputs the actual voice level, the corresponding amplitude will be displayed on the ALC meter. Release the PTT button to return to receive mode. If you find that the voice is distorted, you can turn off the CMP and adjust the MIC gain to about 70.
4. If the ALC meter display is too high or too low, you can reset the gain value of the microphone as follows: long press the [AF] button for one second, enter the selection mode, select the MIC item in the left and right directions, set the value with the up-arrow key, and press and hold the [AF] key again to exit. The microphone speaks until the ALC is displayed when your voice peaks

CW communication

When using straight keys, auto-keys, semi-automatic keys, external electronic keyers, or computer-generated keyboard devices, follow these steps:

1. Insert your 3.5mm plug into the KEY jack on the back panel.
2. Short press [MODE] to select a CW mode (CW or CWR), "CW" mode uses the carrier input on the USB side, and CWR (reverse) mode uses the input on the LSB side.
3. Long press the [BAND] button to enter the CW setting. The keyboard up and down arrow keys select options, and the left and right arrow keys adjust the settings within the options.

3-1, KEY MODE Left and right arrow key selection content: manual electric key Automatic electric key

3-2, KEY SPEED Automatic key words per minute.

3-3, TX-RX CW transmit and receive transition time, the larger the value, the greater the delay.

3-4, STF CW side-tone audio.

3-5, STG CW side-tone volume.

1. TRAINING practice mode, do not enable transmissions

2. DECODE CW, RTTY decoding display switch.

3-6, THRESHOLD CW decoding threshold.

4. CW automatic call, long press the [MENU] key to enter the menu, select A-CALL with the arrow keys, short press the [MENU] key to select A-CALL, and use the numeric keypad or USB keyboard to enter the automatic call content. Press and hold the [MENU] key continuously to exit the main interface, set the electric key mode to the hand key KEY mode, and long press the numeric keypad 1~4 corresponding to the 4 pieces of content entered.



FM communication

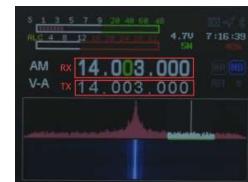
PMR-171 supports full-band FM mode transmission and reception, usually used for FM communication above 28Mhz in shortwave communication,

1. Press the [MODE] button to find the FM mode and long press the [MODE] button to switch WFM mode and NFM mode.
2. PMR-171 contains UV segment FM, you can communicate with ordinary walkie-talkie, you can also go to the local repeater.
3. Press the [RF] key shortly, select SQL and squelch options with left and right arrow keys, and set the squelch level with up and down arrow keys.

Relay operations

1. Set the required frequency, such as repeater parameters (downlink 145.670Mhz, uplink 144.130Mhz, uplink analog mute 88.5) set as follows

1-1, press [SPLIT] to display the frequency of the off-course, and then press to turn off the off-frequency frequency, the frequency in the upper row is the receiving frequency, that is,



the relay downstream, press the left and right arrow keys to select the frequency bit, press the up and down arrow

keys to add and subtract the frequency, or directly enter the numeric keypad: 14567000, the frequency in the lower row is displayed as the transmit frequency, that is, the relay upstream frequency, you need to press the A/B key to switch to the upper row, directly enter 14413000 on the keyboard, and then press the A/B key to switch to the lower row.

1-2. Dumb setting method, long press [SPLIT], up and down keys to select setting items, left and right keys to select parameters.

T-CTSS transmits sub-tones

R-CTSS receives sub-tones

L-Voice preamble rate:

L-Time preamble duration

FM communication

PMR-171 supports full-band FM mode transmission and reception, usually used for FM communication above 28Mhz in shortwave communication, 29.6Mhz is called the magic band by the HAM community, and it will be opened for a short time in the summer of the year, which is a very challenging communication.

1. Press the [MODE] button to find the FM mode, and long press the [MODE] button to switch WFM mode and NFM mode.
2. PMR-171 contains UV segment FM, you can communicate with ordinary walkie-talkie, you can also go to the local repeater.
3. Press the [RF] key shortly, select SQL and squelch options with left and right arrow keys, and set the squelch level with up and down arrow keys.

Relay operations

1. Set the required frequency, such as repeater parameters (downlink 145.670Mhz, uplink 144.130Mhz, uplink analog mute 88.5) set as follows:

1-1, press SPLI to display the frequency of the off-course, and then press to turn off the off-frequency frequency, the frequency in the upper row is the receiving frequency, that is, the relay downstream,

press the left and right arrow keys to select the frequency bit, press the up and down arrow keys to add and subtract the frequency, or directly enter the numeric keypad: 14567000, the frequency in the lower row is displayed as the transmit frequency, that is, the relay upstream frequency, you need to press the A/B key to switch to the upper row, directly enter 14413000 on the keyboard, and then press the A/B key to switch to the lower row.



1-2. Dumb setting method, long press [SPLIT], up and down keys to select setting items, left and right keys to select parameters.

T-CTSS transmits sub-tones

R-CTSS receives sub-tones

L-Voice preamble rate

L-Time preamble duration Select [USB] digital mode.

1-3. At this time, you can search on the frequency. If there is a RTTY signal, the relevant computer software can decode it.

2. Radio independent RTTY communication:

1. SHORT PRESS THE [MODE] BUTTON TO SELECT RTTY MODE.

2. Press and hold the [BAND] button to turn on the DECODE decoding display.

3. Connect the USB keyboard to the HUSB port, press the keyboard TAB key to launch, the keyboard can enter characters to launch, press the TAB key to stop the launch.

3. RTTY automatic call.

Press the [MODE] button to select RTTY mode. Long press the [MENU] key to enter the MENU menu, select A-CALL with the arrow keys, short press the [MENU] key to select A-CALL, and use the numeric keypad or USB keypad to enter the automatic call content. Press and hold the [MENU] key continuously to exit the main interface and long press the numeric keypad 1~5 corresponding to the 5 pieces of content entered.

Customize the number pattern

PMR-171 works with the mobile APP software HAM-BOX to realize a custom digital communication mode, which requires the same settings on both sides of the communication.

1. Find the Bluetooth of the mobile phone to search for PMR-171 and pair it to connect.

2. Open the mobile phone APP software HAM-BOX and set the relevant communication mode (both communication parties need to be the same). Then the phone operation sends text, pictures, coordinates, etc.

The software is provided separately with the PMR-171 instructions and can be removed from the Q group.

Channel storage

1. Press and hold [AF] to enter channel mode

2. Long press the left and right arrow keys to make the number (channel number) next to CH turn red, short press MENU to turn green, and press the up and down arrow keys to operate the channel mode when the channel number is green.

3. In channel mode, press the up and down arrow keys to save the channel (or the existing channel is covered again) At this time, there is the word RENAME. Long press the right arrow key RENAME to turn red, and press MENU to come out of the channel name input box.

3-1. Input method: At present, only letter and number symbol input is supported, and Chinese input post-production.

3-2. Long press the number 1 key to switch uppercase letters, lowercase letters, numbers and symbol input, and short press the MODE delete key.

3-3. In the symbol,..? Next, press the decimal point on the left key disk, press once, and press twice..... The characters are [,.?! :;

"" () < > [] { } \$ % @ * + - = ~] and so on, remember that Jane presses continuously, if the press is wrong, click MODE to delete the last input.

3-4. In the letter state, the number key 2 short press 1 time is A, short press 2 times is B, 3 times is C, the lowercase is the same.

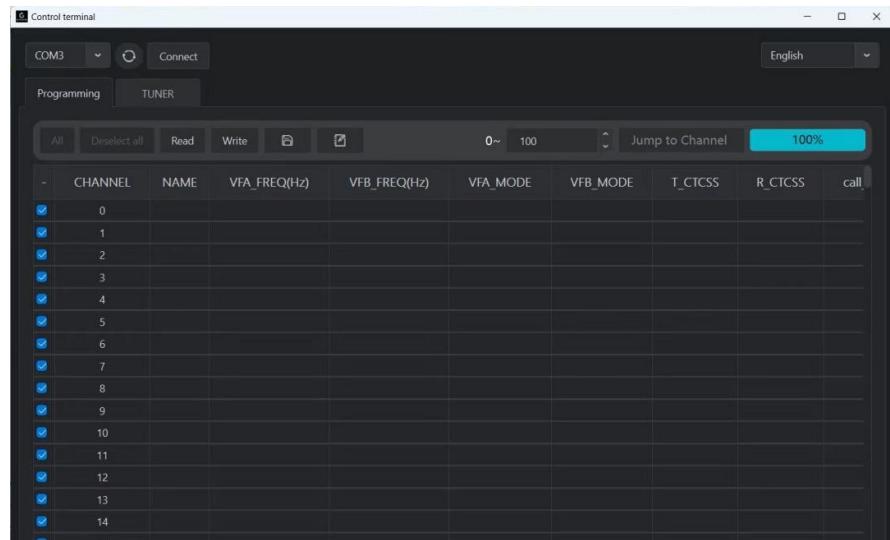
2=ABC 3=DEF 4=GHI 5=JKL 6=MNO 7=PQRS 8=TUV 9=WXYZ

3-5. In the digital state, correspond to the corresponding numbers. After the input is completed, press MENU to confirm, at this time, adjust the frequency, mode, and other corresponding parameters on the interface, and automatically save the shutdown.

4. Enter the next set of channels to repeat the above operation.

Channel programming

The PMR-171 supports programming of radio channels using PC-side software.



Select the serial port number of PMR - 171 from port selection box, then click "Connect". After that, you can either click "Read all channels of the radio" or check the specific channel data.

After the reading is completed, edit the channels that need to be edited. Note that the frequency unit is Hz, and you must fill in the full number of digits. Refer to other parts of the user manual for explanations of other parameters.

After editing the channels, click "Write" to write the channels to the radio. Click "File icon" to save the edited channels as a file, which can be directly copied to other radios. Click "Open" to open the saved channel file.

CAT control

PMR-171 compatible with CAT protocol:

The PMR-171 has a CAT system, so you can control the walkie-talkie from a personal computer. Multiple control operations can be performed fully automatically with a mouse click, and third-party software packages (e.g. radio log software for matches) are also supported, eliminating the need for (additional) operators to communicate with the PMR-171. CAT protocol is compatible with PMR-171 so select PMR-171 radio model when controlling CAT, usually only need to determine the corresponding COM port number on the computer side, stop bit, baud rate does not need to be set.

CAT control can be connected to the computer using a TYPE-C USB CABLE, and the serial port driver is only suitable for WINDOWS 10 SYSTEMS. The USB cable also integrates the sound card function, and only one USB is required to realize CAT control and data transmission. Due to the variety of various computers, operating systems, and various application software, GUOHETEC does not develop system control software. However, the PMR-171 widely supports a variety of third-party control software packages.

PMR-171 CAT protocol:

PMR-171 supports independent own protocol, all interface of the protocol is open, can be freely developed, and can provide technical support. The agreement is set out in appendix 2.

Firmware upgrade instructions

Firmware upgrade instructions

Illustrate:

Copy the application FW-NEW. bin to a USB stick and insert it into the HUSB port behind the radio to update the application. Bootloader file name and application file name naming rules:

Application file naming convention: Fixed file name FW-NEWW.bin.

Note: The file name of the application cannot be changed or the boot loader will not recognize it.

BootLoader file name and application storage method: Application FW-NEW.bin can only be stored on a USB stick used for firmware upgrades.

The size of the USB flash drive needs to be less than or equal to 8G, and the BootLoader cannot recognize the USB flash drive beyond 8G.

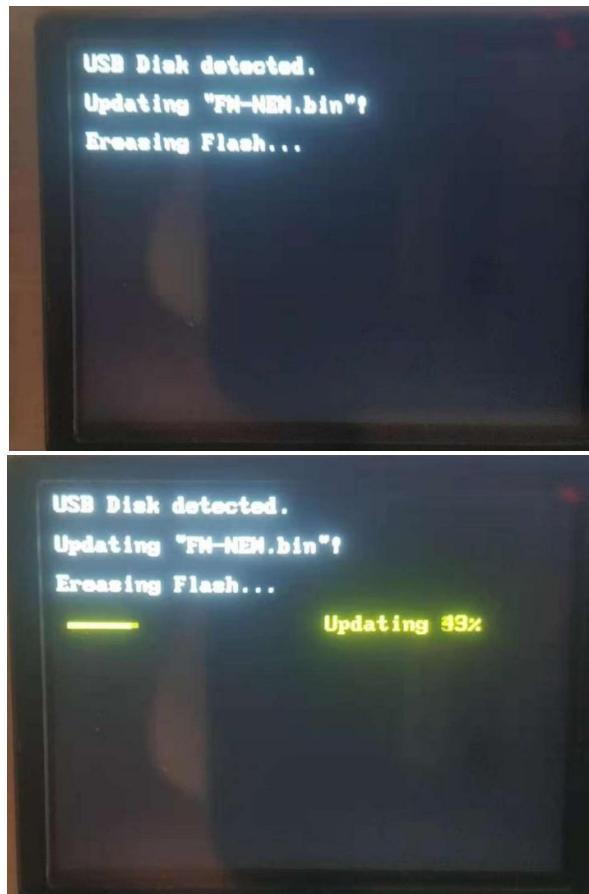
Document reading instructions: The items listed in this document are important items and must be carefully read and paid attention to. All operations need to be read and mastered before operation. This document comes with how-to videos, please review the documentation and videos carefully.

Radio updates the app.

Insert the USB flash drive of the storage application FW-NEW. bin into the HUSB port of the radio, press and hold the power button, and the Bootloader of the radio will automatically recognize the application to the USB flash drive and update it automatically. The radio screen will indicate the progress of the update, and when the update 100% is displayed, remove USB drive to reboot, the automatic update is complete. Unplug the USB flash drive, press and hold the power button to turn on the computer, and you will automatically enter the main interface of the station. If the update fails, the radio screen prompts you with an error code and failure information. Check whether the USB flash drive capacity or FW-NEW.bin file name is correct, or copy the FW-NEW.bin to the USB flash drive to re-update the application after replacing the USB flash drive.

Note:

1. After the update is completed, you cannot insert the USB flash drive again, otherwise the application will be updated again.





Complete the application upgrade.

After-sales

1. After product activation, no reason return is supported.
2. If there is a quality problem within 15 days of the product, the appearance is not damaged or scratched, and the same model can be replaced. It needs to be sent within 3 days from the date when the manufacturer is clearly informed, and it will be deemed invalid if it expires! Courier fees are borne separately.
3. Product packaging, cables, documents and gifts and other accessories are not covered by the warranty.
4. The product will be repaired free of charge within 12 months from the date of sale, (except for man-made or improper operation damage), and the battery, accessories and LCD warranty will be 1 month. Courier fees are borne separately.
5. After the product exceeds the warranty period, if the product is paid for maintenance, the same problem will enjoy free maintenance within 1 month from the date of repair, please keep your maintenance voucher. The courier fee is borne by the buyer.
6. The products purchased and sold by the distributor are guaranteed by us, please keep the sales certificate of the distributor so that we can check.
7. We do not assume the responsibility and obligation of other commitments made by the distributor to you beyond the scope of this warranty.
8. Accessories: battery, hand meter, LCD warranty period 1 month. Pay special attention to:

We will not provide free repair service for the following cases:

1. The customer disassembles the machine to change the circuit function and performance.
2. Disassembled and repaired equipment.
3. Equipment that has been struck by lightning.
4. Equipment damaged by external voltages far beyond the allowable working voltage range of the equipment.
5. Equipment with serious falls and within the warranty period.
6. Equipment that has fallen into water or been eroded or soaked by other corrosive gases, liquids, etc.

After-sales service charging standard:

1. non-artificial damage repair fee during the warranty period: free
2. The maintenance cost after the insurance is released shall be verified according to the actual situation.
3. Updating the firmware is free, and the return postage is borne by the buyer.
4. Express delivery is not supported. After sales process:
 1. Contact GUOHETEC after there is a problem with the product, and we will communicate with you after seeing it.
 2. If you want to return to the factory after communication, please fill in the after-sales form first and send it back with the machine, no damaged accessories are needed.
 3. After we receive the test to confirm the reason, we will inform the processing method and cycle.
 4. After-sales time is Monday to Friday, and weekends and national holidays are postponed.

After-sales contact:

Contact: Chen Yongliang

Chongqing Guohe Electronic Technology Co. Ltd

+8615023182729

15-storey www.guohedz.com, Unit 1, Building 12, No. 2, Gang'an 2nd Road, Jiangbei District, Chongqing

Appendix 1: Input Methods

1. Radio keyboard input method

keystroke	Short press	Long press
MO DE	Delete key	*
.	Symbol input	*
0	space	*
1	*	Switch between case and capitalization, numbers, and symbols for subtitles
2	ABC	
3	DEF	
4	RECORD	
5	JKL	
6	TOO	
7	PQRS	
8	TUV	
9	WXYZ	

2. USB Keyboard input method

keystroke	Short press	Corresponds to the key value of the station
F1	Power control	PA
F2	Band selection	BAND
F3	Filter bandwidth selection	BW short press
F4	RF parameter settings	RF-RFG
F5	RF parameter settings	RF-IFG
F6	Mode selection	MODE
F7	Spectrum settings	BW press and hold
F8	Audio parameter settings	OF
F9	Select Confirm, Return	MENU Short press
F10	Select Confirm, Return	MENU long press
ENTER	Select Confirm	MENU Short press
TAB	RTTY transceiver control	PTT in RTTY mode
ALT+ F1	Automatic call content 1	Number key 1 long press
ALT+ F2	Automatic call content 2	Number key 2 long press

ALT+ F3	Automatic call content 3	The number key 3 is pressed and held
ALT+ F4	Automatic call content 4	Number key 4 long press
ALT+ F5	Automatic call content 5	Number key 5 long press
D-pad	Plus or on the selection	D-pad
D-pad down	Minus or select Down	D-pad down
D-pad left	Minus or Left Select	D-pad left
D-pad right	Plus or right-select	D-pad right
Other not listed go out	Conforms to keyboard definition rules	

Appendix 2: PMR-171 Control Protocol

PMR-171 Control Protocol V1.5

1. Data communication is transmitted through PMR-171 built-in sound card, which can transmit, read and write data through sound card. Modulation data is transmitted when the station is set to USB mode, and IQ data is transmitted when the station is set to SDR mode.
2. The control protocol data can be controlled by Bluetooth SPP, BLE, RS232, USB interface, and the protocol follows the serial port standard.

Note: BLE

V1.0 hardware

Service UUID: 0000FFF0-0000-1000-8000-00805F9B34FB

Write features: 0000FFF2-0000-1000-8000-00805F9B34FB

Notification features: 0000FFF1-0000-1000 8000-00805F9B34FB

V2.0 hardware

UUIDs List of

Service UUID: FFE0

Feature UUID: FFE1 (for serial port transmission, attributes notify, write)

Feature UUID: FFE2 (for audio Bluetooth or SD card music playback control, property Write)

Protocol format:

0XA5	0XA5	0XA5	0XA5	Package length	The command type	DATA	CRC high	CRC low
------	------	------	------	----------------	------------------	------	----------	---------

Baotou: Use four 0XA5 as the header.

0XA5	0XA5	0XA5	0XA5	0XA5
------	------	------	------	------

Packet length: One byte (BYTE), which represents the length of bytes from the next byte in the packet length to the end of the packet. Command type: See protocol content

DATA: See the content of the agreement.

Verification: Using CRC verification mode, from the packet length to the first byte of the CRC high byte, the algorithm is shown in Appendix 1.

1. PTT command, used to control the station

PTT press release. APP Send:

0XA5	0XA5	0XA5	0XA5	Package length	07	PTT	CRC high	CRC low
------	------	------	------	----------------	----	-----	----------	---------

PTT:0X00, Press PTT.0X01,PTT loosen.

Radio Reply:

0XA5	0XA5	0XA5	0XA5	Package length	07	PTT	CRC high	CRC low
------	------	------	------	----------------	----	-----	----------	---------

2. Frequency setting command, used to set the radio frequency Send:

0XA5	0XA5	0XA5	0XA5	Package length	09	VFOA frequency	VFOB frequency	CRC high	CRC low
------	------	------	------	----------------	----	----------------	----------------	----------	---------

3. Frequency: Maximum decimal 2000000000, four-byte length. Radio replies:

0XA5	0XA5	0XA5	0XA5	Package length	09	VFOA frequency	VFOB frequency	CRC high	CRC low
------	------	------	------	----------------	----	----------------	----------------	----------	---------

4. The mode setting command, which sets the radio mode. APP Send:

0XA5	0XA5	0XA5	0XA5	Package	0X0A	VFOA mode	VFOB mode	CRC	CRC
------	------	------	------	---------	------	-----------	-----------	-----	-----

				length				high	low
--	--	--	--	--------	--	--	--	------	-----

mode: 0 USB

1:LSB 2:CWR 3:CWL 4:AM 5:WFM 6:NFM 7: DIGI 8: PKT

Radio Reply:

0XA5	0XA5	0XA5	0XA5	Package length	0X0A	mode	CRC high	CRC low	
------	------	------	------	----------------	------	------	----------	---------	--

4

Spectrum data. APP sends:

0XA5	0XA5	0XA5	0XA5	Package length	0X39	CRC high	CRC low	
------	------	------	------	----------------	------	----------	---------	--

Radio sends:

0X7e	0X7e	0X7e	0X7e	Spectrum data					
------	------	------	------	---------------	--	--	--	--	--

V1.0 hardware

Spectral packets are 256 bytes long, no headers and no check sums,

V2.0 hardware

Spectrum packets 80 bytes long, no headers and no verification, spectrogram:

The size represents the y-axis height and the position represents the x-position plot. Waterfall chart:

The size represents the color (blue + current value) and the position represents the x-position plot.

5. Status synchronization command. APP sends:

0XA5	0XA5	0XA5	0XA5	Package length	0X0B		CRC high	CRC low	
------	------	------	------	----------------	------	--	----------	---------	--

Radio Reply:

0XA5	0XA5	0XA5	0X A5	Packa ge length	0X 0B	Sendin g and receivi ng letters state	VFOA mode	VFOB mode	VFO A frequ ency	VFOB frequency	A/B	NR/NB
RXT	XIT	Filter bandwidth	Spectrum bandwidth	voltage	UTC time	Status bar status	S/PO table values	SWR/AUD/ALC	CRC high	CRC low		

Sending and receiving status: one byte

0: Receive status

1: Transmit status

VFOA mode: one byte

0:USB 1:LSB 2:CWR 3:CWL 4:AM 5:WFM 6:NFM 7: DIGI 8: PKT

VFOB Mode: One byte

0:USB 1:LSB 2:CWR 3:CWL 4:AM 5:WFM 6:NFM 7: DIGI 8: PKT

VFOA frequency: maximum decimal 20000000000, four-byte length.

VFOB frequency: maximum decimal 2000000000, four-byte length.

A/B: One byte

0: A

1: B

NR/NB:

0: NR/NB off

1: NR on

2: NB Open RIT: 0~120 per byte

XIT: 0~120 per byte

Filter bandwidth: one byte

0~50 (see the attached table for the filter corresponding to the serial number)

Spectral bandwidth: one byte

0: 48K 1: 24K 2: 12K 3: 6K 4: 3K 5: 1.5K

Voltage: one byte

Decimal value/10.

UTC time: 3 bytes:

Hour: 0~24

Minutes: 0~60 Seconds:0~60

Status bar: One byte

Bit0: 1 Bluetooth connection successful	0 Bluetooth disconnects
Bit1: 1 The GPS module is online	0 GPS module disconnection
Bit2: 1 LORA module online	0 LORA module disconnected
Bit3: 1 electronic compass module online	0 electronic compass module disconnected
Bit4: 1 day tone on 0 day tone off	
Bit5: 1 High Power	0 Low Power

S Table/PO Table Value: One byte

S table when receiving status: 0~34 (S table when BIT7 is 0)

Transmit as PO table: 0~34 (PO table when BIT7 is 1) SWR/AUD/ALC: one byte

SWR: 0~34 (SWR table when BIT7, BIT6 is

00) ADU: 0~34 (BIT7, ALC table when BIT6

is 01) ALC: 0~34 (ADU table when BIT7,

BIT6 is10)

6. Shutdown command to turn off the station.

APP Send:

0XA5	0XA5	0XA5	0XA5	Package length	0X0C	0	CRC high	CRC low
------	------	------	------	----------------	------	---	----------	---------

0: Power off

1: Power on

AF Menu:

7. Speaker volume adjustment command .

APP Send:

0XA5	0XA5	0XA5	0XA5	Package length	0X0D	volume	CRC high	CRC low
------	------	------	------	----------------	------	--------	----------	---------

Volume: 0~30

8. Headphone volume adjustment command.

APP Send:

0XA5	0XA5	0XA5	0XA5	Package length	0X0E	Headphone volume	CRC high	CRC low
------	------	------	------	----------------	------	------------------	----------	---------

Headphone volume: 0~80

9. MIC gain adjustment command.

APP Send:

0XA5	0XA5	0XA5	0XA5	Package length	0X0F	MIC gain	CRC high	CRC low
------	------	------	------	----------------	------	----------	----------	---------

MIC gain: 0~100

10. Voice pressure spread ratio adjustment command.

APP Send:

0XA5	0XA5	0XA5	0XA5	Package length	0X10	Compression ratio	CRC high	CRC low
------	------	------	------	----------------	------	-------------------	----------	---------

Compression ratio: 0~14

11. Bass EQ adjustment command.

APP Send:

0XA5	0XA5	0XA5	0XA5	Package length	0X11	bass EQ	CRC high	CRC low
------	------	------	------	----------------	------	---------	----------	---------

Bass EQ: 0~40

12. Treble EQ adjustment command. APP Send:

0XA5	0XA5	0XA5	0XA5	Package length	0X12	treble EQ	CRC high	CRC low
------	------	------	------	----------------	------	-----------	----------	---------

Treble EQ: 0~40

RF menu:

13. Radio frequency gain (RFG) adjustment command. APP Send:

0XA5	0XA5	0XA5	0XA5	Package length	0X13	RF gain	CRC high	CRC low
------	------	------	------	----------------	------	---------	----------	---------

RF gain: 0~100

14. Intermediate frequency gain (IFG) adjustment command.

APP Send:

0XA5	0XA5	0XA5	0XA5	Package length	0X14	IF gain	CRC high	CRC low
------	------	------	------	----------------	------	---------	----------	---------

IF gain: 0~80

15. Noise Neutralization (SQL) adjustment command.

APP Send:

0XA5	0XA5	0XA5	0XA5	Package length	0X15	Noise suppression	CRC high	CRC low
------	------	------	------	----------------	------	-------------------	----------	---------

Noise suppression: 0~20

16. Automatic gain control (AGC) command.

APP Send:

0XA5	0XA5	0XA5	0XA5	Package length	0X16	Automatic gain	CRC high	CRC low
------	------	------	------	----------------	------	----------------	----------	---------

Automatic gain : 0~5

17. Pre-amplifier (AMP) command.

APP Send:

0XA5	0XA5	0XA5	0XA5	Package length	0X17	Preamplifier	CRC high	CRC low
------	------	------	------	----------------	------	--------------	----------	---------

Pre-amplifier: 0: AMPA 1: AMPB

18. Filter command.

APP Send:

0XA5	0XA5	0XA5	0XA5	Package length	0X18	Send	CRC high	CRC low
------	------	------	------	----------------	------	------	----------	---------

filter:

FM mode

1-<7.2k>	2-<10.0k>	3-<12.0k>
----------	-----------	-----------

CW/SSB mode

4-<250_550>	5-<250_575>	6-<300_600>	7-<325_625>	8-<350_650>
9-<375_675>	10-<400_700>	11-<425_725>	12-<450_750>	13-<475_775>
14-<275_775>	15-<325_825>	16-<375_875>	16-<375_875>	17-<425_925>
18-<475_975>	19-<0_1.4k>	20-<370_1.7k>	21-<0_1.6k>	21-<0_1.6k>
23-<500_2.3k>	24-<600_2.4K>	25-<700_2.5k>	26-<800_2.6k>	26-<800_2.6k>
28-<0_1.8k>	29-<0_2.1k>	30-<500_2.6k>	31-<600_2.9k>	31-<600_2.9k>
33-<800_3.1k>	34-<900_3.2k>	35-<0_2.3k>	36-<0_2.5k>	

SSB mode

37-<650_3.2k>	37-<650_3.2k>	39-<700_3.4k>	40-<0_2.9k>	41-<800_3.7K>
42-<0_3.2k>	43-<900_4.1k>	44-<0_3.4k>	45-<900_4.3k>	46-<0_3.6k>

47-<1.0k_4.6k>	48-<0_3.8K>	49-<1.1k_4.9k>	50-<0_4.0k>	51-<0_4.2k>
52-<0_4.4K>	53-<0_4.6k>	54-<0_4.8k>	55-<0_5.0k>	56-<0_5.5k>
57-<0_6.0k>	58-<0_6.5k>	59-<0_7.0k>	60-<0_7.5k>	61-<0_8.0k>
62-<0_8.5k>	63-<0_9.0k>	64-<0_9.5k>	65-<0_10.0k>	

AM mode

66-<1.4k>	67-<1.6k>	68-<1.8k>	69-<2.0k>	70-<2.3k>
71-<2.5k>	72-<2.7k>	73-<2.8k>	74-<3.2k>	75-<3.4k>
76-<3.6k>	77-<3.8k>	78-<4.0k>	79-<4.2k>	80-<4.4k>
81-<4.6k>	82-<4.8k>	83-<5.0k>	84-<6.0k>	85-<7.5K>
86-<10.0k>				

Filters: 0x01 – 0x55 85 total filters Classified by mode 4-36 are filters that can be used in both CW mode and SSB mode

19. NR command. APP Send:

0XA5	0XA5	0XA5	0XA5	Package length	0X19	NR	CRC high	CRC low
------	------	------	------	----------------	------	----	----------	---------

NR: 0: NRclose 1: NR open

20. NB Command.

APP Send:

0XA5	0XA5	0XA5	0XA5	Package length	0X1A	NB	CRC high	CRC low
------	------	------	------	----------------	------	----	----------	---------

NR: 0: NB off 1: NB on

21. AB frequency command.

APP sends:

0XA5	0XA5	0XA5	0XA5	Package length	0X1B	AB	CRC high	CRC low
------	------	------	------	----------------	------	----	----------	---------

AB: 0: A frequently 1: B frequently 2:A=B frequently

22. Off-frequency commands.

APP send:

0XA5	0XA5	0XA5	0XA	Package length	0X1C	SPLIT	CRC high	CRC low
------	------	------	-----	----------------	------	-------	----------	---------

SPLIT: 0: Off-frequency off 1: Off-frequency on

23. Band selection command.

APP Send:

0XA5	0XA5	0XA5	0XA5	Package	0X1D	Band	CRC high	CRC low
------	------	------	------	---------	------	------	----------	---------

				length				
--	--	--	--	--------	--	--	--	--

Band:

1.8	3. 5	5	7	10	14	18
21	24	28	50	144	430	

24. NR threshold setting command. APP Send:

0XA5	0XA5	0XA5	0XA5	Package length	0X1E	NR Threshold	CRC high	CRC low
------	------	------	------	----------------	------	--------------	----------	---------

NR Threshold: 1~200

25. NB Threshold setting command.

APP send:

0XA5	0XA5	0XA5	0XA5	Package length	0X1F	NR Threshold	CRC high	CRC low
------	------	------	------	----------------	------	--------------	----------	---------

NR Threshold: 0~15

26. PEAK Threshold setting command. APP Send:

0XA5	0XA5	0XA5	0XA5	Package length	0X20	NR Threshold	CRC high	CRC low
------	------	------	------	----------------	------	--------------	----------	---------

NR Threshold: 0~20

27. Sky tuning setting command. APP Send:

0XA5	0XA5	0XA5	0XA5	Package length	0X21	Heavenly tune	CRC high	CRC low
------	------	------	------	----------------	------	---------------	----------	---------

Sky tune: 0: Sky tone off 1: Sky tone on 2: Start tuning

28. Spectrum bandwidth command. APP Send:

0XA5	0XA5	0XA5	0XA5	Package length	0X22	SPAN	CRC high	CRC low
------	------	------	------	----------------	------	------	----------	---------

SPAN: 0~5

29. Spectral reference level command. APP Send:

0XA5	0XA5	0XA5	0XA5	Package length	0X23	REF	CRC high	CRC low
------	------	------	------	----------------	------	-----	----------	---------

REF: 1~20

30. Spectrum refresh rate command. APP Send:

0XA5	0XA5	0XA5	0XA5	Package length	0X24	SPEED	CRC high	CRC low
------	------	------	------	----------------	------	-------	----------	---------

SPEED: 1~30

31. Spectrum display mode command. APP Send:

0XA5	0XA5	0XA5	0XA5	Package length	0X25	Spectrum display mode command	CRC high	CRC low
------	------	------	------	----------------	------	-------------------------------	----------	---------

Filters: 0x01 – 0x55 85 total filters Classified by mode 4-36 are filters that can be used in both CW mode and SSB mode

32. Analog sub-tones. APP Send:

0XA5	0XA5	0XA5	0XA5	Package length	0X26	Transmit	Sub-tones Receive	Sub-tones Preamble	CRC high	CRC low
------	------	------	------	----------------	------	----------	-------------------	--------------------	----------	---------

TX CTCSS:

0	67.0	69.3	71.9	74.4	77.0	79.7
82.5	85.4	88.5	91.5	94.8	97.4	100.0
103.5	107.2	110.9	114.8	118.8	123.0	127.3

131.8	136.5	141.3	146.2	150.0	151.4	156.7
159.8	162.2	165.5	167.9	171.3	173.8	177.3
179.9	183.5	186.2	189.9	192.8	196.6	199.5
203.5	206.5	210.7	213.8	218.1	221.3	225.7
229.1	233.6	237.1	241.8	245.5	250.3	254.1

RX CTCSS:

0	67.0	69.3	71.9	74.4	77.0	79.7
82.5	85.4	88.5	91.5	94.8	97.4	100.0
103.5	107.2	110.9	114.8	118.8	123.0	127.3
131.8	136.5	141.3	146.2	150.0	151.4	156.7
159.8	162.2	165.5	167.9	171.3	173.8	177.3
179.9	183.5	186.2	189.9	192.8	196.6	199.5
203.5	206.5	210.7	213.8	218.1	221.3	225.7
229.1	233.6	237.1	241.8	245.5	250.3	254.1

Leading Tone:

0	1750	2135	
---	------	------	--

33. Equipment Type Recognition Command

APP Send:

0XA5	0XA5	0XA5	0XA5	Package length	0X27	Device type	CRC high	CRC low
------	------	------	------	----------------	------	-------------	----------	---------

Radio reply:

0XA5	0XA5	0XA5	0XA5	Package length	0X27	Device type	CRC high	CRC low
------	------	------	------	----------------	------	-------------	----------	---------

Power level: 0~100

Radio reply:

0XA5	0XA5	0XA5	0XA5	Package length	0X28	Power class	CRC high	CRC low
------	------	------	------	----------------	------	-------------	----------	---------

35. Receive frequency offset setting command.

APP Send:

0XA5	0XA5	0XA5	0XA5	Package length	0X29	RIT	CRC high	CRC low
------	------	------	------	----------------	------	-----	----------	---------

RIT:0~120

0XA5	0XA5	0XA5	0XA5	Package length	0X29	RIT	CRC high	CRC low
------	------	------	------	----------------	------	-----	----------	---------

36. Transmit frequency offset setting command

APP Send:

0XA5	0XA5	0XA5	0XA5	Package length	0X2A	XIT	CRC high	CRC low
------	------	------	------	----------------	------	-----	----------	---------

XIT:0~120

0XA5	0XA5	0XA5	0XA5	Package length	0X2A	XIT	CRC high	CRC low
------	------	------	------	----------------	------	-----	----------	---------

37. Setting the leading tone transmitting duration command.

APP Send:

0XA5	0XA5	0XA5	0XA5	Package length	0X2B	L-TIME	CRC high	CRC low
------	------	------	------	----------------	------	--------	----------	---------

L-TIME:50- 300

Radio reply:

0XA5	0XA5	0XA5	0XA5	Package length	0X2B	L-TIME	CRC high	CRC low
------	------	------	------	----------------	------	--------	----------	---------

38. Command for setting high and low power levels.

APP Send:

0XA5	0XA5	0XA5	0XA5	Package length	0X2C	Power Level	CRC high	CRC low
------	------	------	------	----------------	------	-------------	----------	---------

Power level:

0: Low power

1: High power

Radio reply

0XA5	0XA5	0XA5	0XA5	Package length	0X2C	L-TIME	CRC high	CRC low
------	------	------	------	----------------	------	--------	----------	---------

39. Standing wave meter, S meter, ALC meter, transmit power meter synchronization command (control side polling).

APP send:APP Send:

0XA5	0XA5	0XA5	0XA5	Package length	0X2D	CRC high	CRC low
------	------	------	------	----------------	------	----------	---------

Radio send:

0XA5	0XA5	0XA5	0XA5	Package length	0X2D	TX PWR S-Meter	SWR/AUD/ALC	CRC high	CRC low
------	------	------	------	----------------	------	----------------	-------------	----------	---------

Table S: 0-34 (table S when BIT7 is 0)

Transmit Power: 0-34 (PO table when BIT7 is 1)

SWR/AUD/ALC one byte

SWR: 0 ~ 34 (SWR table when BIT7 and BIT6 are 00)

ADU: 0 ~ 34 (ALC table when BIT7 and BIT6 are 01)

ALC: 0 ~ 34 (ADU table when BIT7 and BIT6 are 10)

40. Parameter synchronization command (timing polling implements synchronization).

APP Send:

0XA5	0XA5	0XA5	0XA5	Package length	0X2E	Data Packet	CRC high	CRC low
------	------	------	------	----------------	------	-------------	----------	---------

Radio reply

0XA5	0XA5	0XA5	0XA5	Package length	0X2E	SVOL	HVOL	MIC	CMP	BAS	TRB	RFG	IFG
------	------	------	------	----------------	------	------	------	-----	-----	-----	-----	-----	-----

SQL	AGC	AMP	NR	NB	PEAK	SPAN	REF	SPEED	T-CTSS	R-CTSS
-----	-----	-----	----	----	------	------	-----	-------	--------	--------

L-VOICE	L-TIME	KEY_MODE	TX_RX	TRANING	STF	STG	KEY_SPEED
---------	--------	----------	-------	---------	-----	-----	-----------

DECODE	THRESHOLD	data format	CRC high	CRC low
--------	-----------	-------------	----------	---------

Radio transmission:

41. Key type setting command.APP transmit by radio:

0XA5	0XA5	0XA5	0XA5	Package length	0X2F	Type of key	CRC high	CRC low
------	------	------	------	----------------	------	-------------	----------	---------

Type of key: 0: AUTO-L 1: AUTO-R

2:KEY Radio send:

0XA5	0XA5	0XA5	0XA5	Package length	0X2F	Type of key	CRC high	CRC low
------	------	------	------	----------------	------	-------------	----------	---------

Side-tone volume setting command. APP transmit by radio:

0XA5	0XA5	0XA5	0XA5	Package length	0X30	Side sound volume	CRC high	CRC low
------	------	------	------	----------------	------	-------------------	----------	---------

Side sound volume: 0~15 step 1 station send:

0XA5	0XA5	0XA5	0XA5	Package length	0X30	Side sound volume	CRC high	CRC low
------	------	------	------	----------------	------	-------------------	----------	---------

42. Side-tone frequency setting command. APP transmit by radio:

0XA5	0XA5	0XA5	0XA5	Package length	0X31	Side audio rate	CRC high	CRC low
------	------	------	------	----------------	------	-----------------	----------	---------

Side-tone volume: 40~20 Step

2 Radio send:

0XA5	0XA5	0XA5	0XA5	Package length	0X31	Side audio rate	CRC high	CRC low
------	------	------	------	----------------	------	-----------------	----------	---------

Once received, the station needs to multiply by 10.

43. Send and receive conversion time setting command. APP Send:

0XA5	0XA5	0XA5	0XA5	Package length	0X32	Conversion time	CRC high	CRC low
------	------	------	------	----------------	------	-----------------	----------	---------

44. Side tone volume: 0~50 Step 1 Radio send:

0XA5	0XA5	0XA5	0XA5	Package length	0X32	Conversion time	CRC high	CRC low
------	------	------	------	----------------	------	-----------------	----------	---------

Once the station receives it, it needs to be multiplied.

45. USB data formatting command. APP Send:

0XA5	0XA5	0XA5	0XA5	Package length	0X33	data format	CRC high	CRC low
------	------	------	------	----------------	------	-------------	----------	---------

Side tone volume: 0~50 Step 1

Radio Send:

0XA5	0XA5	0XA5	0XA5	Package length	0X33	data format	CRC high	CRC low
------	------	------	------	----------------	------	-------------	----------	---------

46. CW Practice Mode Setup command. APP Send:

0XA5	0XA5	0XA5	0XA5	Package length	0X34	TRAINING	CRC high	CRC low
------	------	------	------	----------------	------	----------	----------	---------

Practice mode: 0: Off 1: Radio on send:

0XA5	0XA5	0XA5	0XA5	Package length	0X34	TRAINING	CRC high	CRC low
------	------	------	------	----------------	------	----------	----------	---------

47. CW automatic key speed setting command. AP Send:

0XA5	0XA5	0XA5	0XA5	Package length	0X35	KEY_SPEED	CRC high	CRC low
------	------	------	------	----------------	------	-----------	----------	---------

Auto key speed: 5~48 Step 1

Radio Send:

0XA5	0XA5	0XA5	0XA5	Package length	0X35	KEY_SPEED	CRC high	CRC low
------	------	------	------	----------------	------	-----------	----------	---------

48. CW decode setup command APP Send:

0XA5	0XA5	0XA5	0XA5	Package length	0X36	DECODE	CRC high	CRC low
------	------	------	------	----------------	------	--------	----------	---------

Decoding switch: 0: Off 1: Turn on

Radio Send:

0XA5	0XA5	0XA5	0XA5	Package length	0X36	DECODE	CRC high	CRC low
------	------	------	------	----------------	------	--------	----------	---------

49. CW decoding threshold setting command.

APP Send:

0XA5	0XA5	0XA5	0XA5	Package length	0X37	THERSHOLD	CRC high	CRC low
------	------	------	------	----------------	------	-----------	----------	---------

CW Decoding threshold: 1~50

step 1: Radio Send:

0XA5	0XA5	0XA5	0XA5	Package length	0X37	THERSHOLD	CRC high	CRC low
------	------	------	------	----------------	------	-----------	----------	---------

50. MESH Telemetry communication (support LORA, 2FSK,4FSK) .

APP Send:

0XA5	0XA5	0XA5	0XA5	Package length	0X38	Packets	C	CRC low
------	------	------	------	----------------	------	---------	---	---------

Packets:

0x7e	0x7e	Source address	Destination address	MESH Number of hops	Total number of packages	Packet number	data	Forward error correction	
------	------	----------------	---------------------	---------------------	--------------------------	---------------	------	--------------------------	--

Source Address: 2 bytes

Destination Address: 2 bytes

MESH Hops: 1-byte

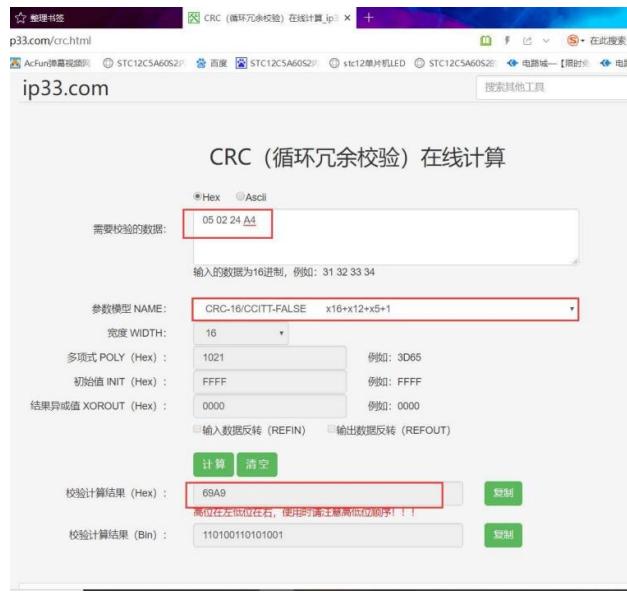
Total packets: 1 byte

Package number: 1 byte

Data: Fixed 225 bytes

Appendix 2-1

10.CRC Verification algorithm the result verification URL <http://www.ip33.com/crc.html>



```
/*
** Function name: CRC16Check
** Input: buf The data to verify;
**         len The length of the data to verify
** Output: Check value
** Function description: CRC16 cyclic redundancy check
** Note: The check mode is CRC16/CCITT-FALSE, pay attention to the variable type
*/
unsigned int CRC16Check(unsigned char *buf, unsigned char len)
{
    unsigned char i, j;
    unsigned int uncrcReg = 0xFFFF;
    unsigned int uncur;
    for (i = 0; i < len; i++)
    {
        uncur = buf[i] << 8;
        for (j = 0; j < 8; j++)
        {
            if ((int)(uncrcReg ^ uncur) < 0)
            {
                uncrcReg = (uncrcReg << 1) ^ 0x1021;
            }
            else
            {
                uncrcReg <<= 1;
            }
            uncur <<= 1;
        }
    }
    return uncrcReg;
}
```

Change Notification:

1. Replace the content data of the fifth point agreement to the original data format:

ALC: 0~34 (ALC table for BIT7, 01 for BIT6)

ADU: 0~34 (ADU table for BIT7, ADU table for BIT6 10)

After change:

ADU: 0~34 (ALC table for BIT7, 01 for BIT6)

ALC: 0~34 (ADU table for BIT7, 10 for BIT6)

Note:

1. The standing wave higher than 1.5 transmission is prohibited in the full frequency band, especially in the UV segment, and the high standing wave emission is easy to damage the station. Confirm that the antenna standing wave is below 1.5 before transmission.
2. There is no high standing wave emission protection in the UV segment, and it is necessary to confirm that the antenna standing wave is lower than 1.5 before transmission.
3. The charger is only used for charging, not for direct power supply.
4. Charging requires the use of original chargers, and it is forbidden to use other brand chargers.
5. The maximum input voltage of the USB port is 5V.
6. The battery is forbidden to be exposed to the sun and used in a high temperature environment.
7. It is forbidden to discard the battery.
8. It is forbidden to throw the battery into the fire.
9. The battery is not used for a long time, and it needs to be fully charged every month, and if it is not charged for a long time, it will cause battery damage.



Chongqing Guohe Electronic Technology Co. Ltd

Statement: The copyright of the content of this agreement belongs to Chongqing Guohe Electronic Technology Co. Ltd., which can be disseminated at will, but the content of the agreement cannot be changed. This agreement provides technical support, you need to contact GUOHETEC. All interpretation rights of this manual belong to GUOHETEC.