AnyTone®

Qixiang Electron Science & Technology Co., Ltd.
www.qxdz.cn

AnyTone®

AT-D868

DMR DIGITAL TWO WAY RADIO

USER' MANUAL

FC CE ① √RoHS COMPLIANT

THANK YOU!

Thank you very much for choosing our *AnyTone* transceiver. *AnyTone* transceiver provides you with reliable, clear and efficient communication service.

The transceiver introduces innovative DMR digital processing system to achieve high-fidelity voice processing and with multiple groups communication encryption. It boasts novelty, best stability, great reliability, nice timbre and long distance communication as well as fashionable design and smooth exterior lines. AT-D868 is a cost-effective and multi-functional professional DMR digital transceiver . It is convinced that you will be satisfied with this transceiver's quality and functions. For your full comprehension of the various excellent functions and maintenance, please read the user manual before use.

> **NOTE:**
> **When programming the transceiver, read the factory initial data first, then rewrite the frequency and signaling etc., otherwise errors may occur because of different frequency band etc.**

User Manual Applied to: AT-D868 UHF FM Transceiver
                                          VHF FM Transceiver
Programming Software: QPSD868

SAFETY INFORMATION FOR USER

AnyTone transceiver is excellently designed with advanced technology. Please observe the following precautions to perform your obligation, prevent personal injury and ensure the safety of transceiver usage.

1. Keep the transceiver and accessories away from children.
2. Please do not try to open or modify the transceiver without permission, non-professionals process may also cause damage.
3. Please use assorted battery and charger to avoid damage.
4. Please use assorted antenna to ensure the communication distance.
5. Please do not expose the transceiver to long period of direct sunlight, nor place it close to heat appliances.
6. Please do not put the transceiver in excessively dusty or humid areas.
7. Do not use harsh chemicals, cleaning solvents to clean the transceiver.
8. Do not transmit without antenna.
9. When using this transceiver, we recommend transmitting for 1 minute then receiving for 4 minutes. Continuous transmitting for long time or working in high power will heat the back of the transceiver. Do not place the transceiver's hot back close to any surface of plastic.
10. If any abnormal odor or smoke detected coming from the transceiver, turn off the power and take off the battery pack and its case. Then contact local *AnyTone* dealers.

ATTENTION:

All tips above apply to accessories of your *AnyTone* transceiver. If any device can not work normally, please contact local *AnyTone* dealers.

If you use any accessories made by other companies, *AnyTone* Company does not guarantee the operability and safety of the transceiver.

◦ **CONTENTS**

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○ **UNPACKING**

Carefully unpack the transceiver. We recommend you to identify the items listed in the following table before discarding the packing material. If any items are missing or have been damaged during shipment, please contact dealers immediately.

(((**Supplied Accessories**

Item	Number	Quantity
Antenna	QA01V(136-174MHz) QA01V(350-390MHz) QA01U(400-480MHz) etc	1
Li-ion Battery Pack	QB-44L	1
Battery Charger	QBC-44L	1
AC Adaptor	QPS-01	1
Belt Clip	BC09	1
Instruction Manual		1
Qualification		

(((**Standard Accessories**

Antenna*[1]
QA01V (136-174MHz)
QA01V (350-390MHz)
QA01U (400-480MHz) etc.

Li-ion Battery Pack
QB-44L

Charger
QBC-44L

AC Adaptor
(12V/500mA) QPS-01

Belt Clip
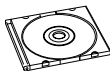BC09

Hand Strap
GS01

Instruction
Manual

* Note: For frequency band of antenna, please refer to label indicated in the bottom of the antenna.
* Note: Car Charger and QBC−44L Charger should be used together.

(((**Optional Accessories**

USB Programming
Cable

Programming Software
QPSD868

Earphone

Car Charger CPL01*[2]

◦ **BATTERY INFORMATION**

(((**Charging Operation**

The battery pack is not charged at the factory; please charge it before use.

Charging the battery pack for the first time after purchase or extended storage (more than 2 moths) may not bring the battery pack to its normal operating capacity. After fully charging/ discharging cycle for two or three times, the operating capacity will reach its best performance. The battery pack life is over when its operating time decreases even though it is fully and correctly charged. Replace the battery pack.

(((**Charger Applied**

Please use the specific charger appointed by our company. Other models may cause explosion and personal injury. After installing the battery pack, if the radio displays low battery with red flashing lamp or voice prompt, please charge the battery.

(((**Notice for Charging Battery**

▼ Do not short the battery terminals or throw the battery into fire. Never attempt to remove the casing from the battery pack, we show no responsibility on any results caused by modifying freely without permission of our factory.

▼ The ambient temperature should be between 5°C and 40°C while charging is in progress. Charging outside this range may not fully charge the battery.

▼ Always switch OFF the transceiver equipped with a battery pack before charging. Otherwise, it will interfere with correct charging.

▼ To avoid interfering the charging, please do not cut off the power or take out the battery during charging.

▼ Do not recharge the battery pack if it is already fully charged. This may shorten the life of the battery pack or damage the battery pack.

▼ Do not charge the battery or transceiver if it is damp. Dry it before charging to avoid danger.

WARNING:
When keys, ornamental chain or other electric metals contact with the battery terminal, the battery may cause damage or hurt bodies. If the battery terminal short circuit it will generate a lot of heat. Take care when carrying and using the battery. Remember to put the battery or radio into insulated container.Do not put it into metal container.

(((**How to Charge**

1. Plug the AC adaptor into the AC outlet, and then plug the cable of the AC adaptor into the DC jack located on the back of the Charger. The Indicator lights orange (1s) and then goes out----waits to charge.

2. Plug the battery or transceiver into the charger. Make sure that the battery terminals are in contact with charging terminals well. The Indicator turns into twinkling red-----Pre-charging begins.

3. After pre-charging for about 5 minutes, the indicator will stop twinkling----charging begins.

Ac Input

4. It takes approximately 4 hours to fully charge the battery. When the lamp lights green, the charging is finished. Remove the battery or the transceiver equipped with battery from socket.
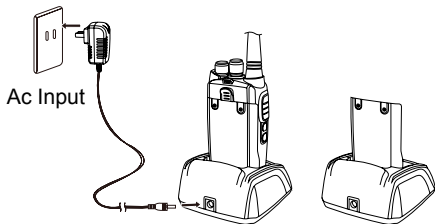
○ **BATTERY INFORMATION**

NOTE: when charging a power−on transceiver equipped with battery, the indicating lamp will not turn into green to show the fully charged status. Only when the transceiver is switched off, can the lamp indicate normally. The transceiver consumes energy when it is power−on, and the charger can not detect the voltage when the battery has been fully charged. So the charger will charge battery in constant voltage and fail to indicate correctly whether the battery has been charged fully.

5. Charging Process

Charging Status	Indicator Status
Standby (Self-examine lights orange 1second when power on) ———	None
Pre-charging (Pre-charging stage) ———————————	Red light twinkles for about 5 minutes
Charging (Charge in a constant current) ———————	Lights red for about 4 hours
Fully charged (Charge in a constant voltage) ———————	Lights green

6. LED Indicator:

STATUS	Self-Examine When Power on	No Battery	Pre-charging	Charge Normally	Fully Charged	Trouble
LED	Orange (for 1 second)	None	Red Light Twinkles for 5 Minutes	Red	Green	Red twinkles for a long time

NOTE: Trouble means battery heating, battery short−circuit or charger short−circuit.

(((Normal Charging Tips

1. Self- Examination: When charging, orange light twinkles for 1 second and goes out, which means the charger has passed its self-examination and it can charge the battery normally. If the light remains orange or the red light twinkles, it means the charger can not pass its self-examination or charge the battery.

2. Trickle Pre-Charging: If red light twinkles when battery is inserted into the charger, it means the remnant voltage is low and the charger is trickle-charging the battery (Pre-Charging Status). The charger will automatically turn into normal charging when the battery reaches a certain electric quantity, And if the red light stops twinkling, it means the remnant voltage meets a certain electric quantity, the charger will charge the battery normally.

NOTE:
Trickle charging (Pre−Charging Status) time can not beyond 30 minutes. If the indicating lamp still twinkles after 30−minute trickle−charging, it means that the charger can not charge the battery. Please check whether the battery or charger is damaged.

(((How to Store the Battery

1. If the battery needs to be stored, keep it in status of 50% discharged.
2. It should be kept in low temperature and dry environment.
3. Keep it away from hot places and direct sunlight.

○ BATTERY INFORMATION

WARNING:
- ▼ Do not short circuit battery terminals.
- ▼ Never attempt to remove the casing from the battery pack.
- ▼ Never assemble the battery in dangerous surroundings, spark may cause explosion.
- ▼ Do not put the battery in hot environment or throw it into fire, it may cause explosion.

(((**Installing / Removing the Battery**

1. Match the two grooves of the battery pack with the corresponding guides on the back of the transceiver, and then push it.
2. Press the battery pack until the release latch on the top of the transceiver locks. After hearing a "click" sounds, the battery has been locked.
3. To remove the battery pack, slide up the release latch and remove the pack away from the transceiver.
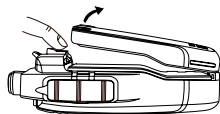
(((**Installing / Removing the Antenna**

■ Installing the Antenna:

Screw the antenna into the connector on the top of the transceiver by holding the antenna at its base and turning it clockwise until secure.

■ Removing the Antenna:

Turn the antenna anticlockwise to remove it.
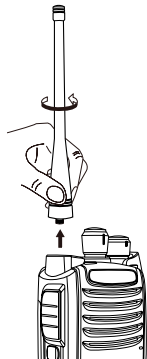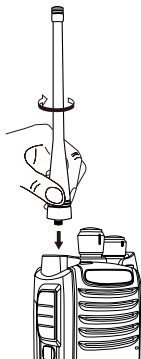
○ **PREPARATION**

(((**Installing / Removing the Belt Clip**

■ Installing the Belt Clip:

Place the belt clip to the corresponding grooves on the back of the transceiver, and then clockwise screw it.

■ Removing the Belt Clip:

Anticlockwise turn the screws to remove the belt clip.

(((**Installing the Additional Speaker/ Microphone (Optional)**

Unveil the MIC-SP jack cover and then insert the Speaker/Microphone plug into MIC-SP jack.

(((Installing/ Removing the Hand Strap

Slide the loop of the hand strap through the eyelet on the upper rear of the transceiver, then pull the entire hand strap through the loop to secure the hands strap in place and lastly tighten the hands strap.
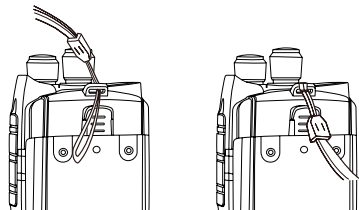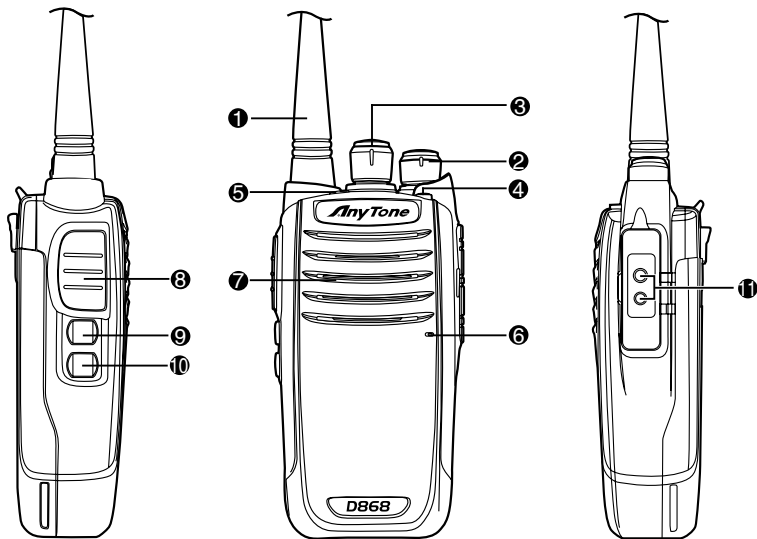
❶ Antenna

❷ POWER / VOLUME Switch:

Turn clockwise to switch on the transceiver, and turn anticlockwise till hearing "Click" to switch off the transceiver. After switching on the transceiver, turn clockwise to increase the volume and anticlockwise to decrease the volume.

❸ Channel Selector Knob

Turn the selector knob to select desired channel. Turn clockwise to increase channel, anticlockwise to decrease channel.

❹ Indicator

Indicate different working status

❺ Top Key

It can realize different functions by programming.

❻ MIC

❼ Speaker

❽ PTT Key

When you are making a call, please press and hold this key to speak into the microphone. Release the key to receive.

❾ PF1 Key

It can realize different functions by programming.

❿ PF2 Key

It can realize different functions by programming.

⓫ Additional Microphone / Speaker Jack, PC program Jack

◦ **BASIC OPERATIONS**

(((**Switch on / off Transceiver**

Switch on Transceiver: Under power-off state, turn POWER / VOLUME clockwise till hearing "**Click**" to switch on the transceiver. The transceiver will announce "**Power on**" and prompt current channel number.

Switch off Transceiver: Under power-off state, turn POWER / VOLUME anticlockwise till hearing "**Click**" to switch off the transceiver.

(((**Adjusting Volume**

Under power-on state, turn POWER / VOLUME switch to adjust the volume. Turn clockwise to increase the volume, and anticlockwise to decrease the volume. If current communication channel is with Analogue mode, you can press the programmed " Monitor" key to monitor current volume.

NOTE: It will be more accurately to adjust the desired volume when in communication status.

(((**Channels Selection**

Under the standby condition, turn channel selector knob to choose the desired channel, and the transceiver will announce the channel number. Turn clockwise to increase the channel, anticlockwise to decrease the channel.

NOTE: The transceiver will emit a voice prompt when current channel is blank.

(((Group Selection

There are 32 channels in total which are divided into 2 groups with 16 channels in each group.
Under the standby condition, press programmed "Group Switch" key, the transceiver will emit reminding tone, and then announce current channel number after group switch.

> **NOTE: Program the channels in PC software and assign the channel to desired group. Press programmed "Group Switch" key to switch between Group 1 and Group 2, transceiver emits "DU DU" beep means Group 2, "DU" beep means Group 1.**

(((Receiving

You can hear the transmitting party's calling when the channel you are operating is called and the LED light turns green. User can adjust the call volume accurately by turn the channels selector knob.

> **NOTE:You may not receive the calling if you set a high squelch level of the transceiver. If current channel has been programmed with signaling or ID, you can only hear the call from a same signaling or code, other calls can not be heard.**

(((Transmitting

Press the [**PTT**] key and speak into microphone. Please keep around 2.5-5cm distance between microphone and your lip. And please speak in normal tone to make the receiver obtain best tone quality.

○ BASIC OPERATIONS

NOTE:If your transceiver has programmed "communcation with announce", the transceiver will announce after press [PTT] key, you can communicate after the announce, it can avoid the user to communicate at once when press the [PTT] key that cause receiver can not receive the audio completed.

(((Digital Communication Mode

Each channel of this transceiver can be setup as digital communication by programming software, digital communication has single call, group call and all call and etc.. Before use it please set each channel to desired calling mode and receiving mode.

Single Call: Single call means one transceiver call the other one. It can be set as below two call modes by program software.

(1) Call Directly: Press PTT key, the transceiver will enter transmitting status.

(2) Confirm Call: If the transceiver has programmed " single call confirm" , only the transceiver power on and in the communication range with set corresponding ID, color code and encryption, then it can transmit normally when transmitter press PTT key. If the receiver is power off or out of communication range(i.e the receiver is not able to receive the signal), the PTT key is invalid, transceiver will back to standby status and announce error after the red LED twinkles two times. It can avoid interfere other transceivers.

NOTE:The desired call ID and call mode (single call , group call and full call) must be preset by the program software.

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We only do best radio!

RECEIVEING SINGLE CALL:
Turn the channel knob to select desired receiving channel, you can hear the call when transceiver receive signal with matched ID and setup (color code, secret key), otherwise the transceiver will keep mute.

> **NOTE: If your transceiver has programmed " free channel alert tone", the transceiver will announce after the other party release the PTT key, it means current channel is empty.**

GROUP CALL: Group call is one transceiver send a call to a group of transceivers, all transceivers in a same group can hear the call when the transmitter send the call. Operation as below:
Turn the channel selector knob to select desired channel, press PTT key, the transceiver will enter transmitting status directly.

> **NOTE: Only the receiver has programmed desired group call list that can receive the group call from the transmitter.**

ALL CALL: All call is a transceiver to call all transceivers of same frequency and all call code. It is used to announce important information which need all pay attention. Operation as below:
Turn the channel selector knob to select desired channel call, press PTT key, the transceiver will enter transmit status.

> **NOTE: The all call code and channel and related setup must be preset through the program software.**

(((**Scan List**

Each scan list respect one scan mode, this transceiver support 250 scan lists, each scan list can support 32 channels. The user can add desired scan list for this transceiver through program software, and distribute different scan list for each channel.

(((**The Mode To Start Scan**

This transceiver has below two modes to start scan:

(1) Start scan by manual: Under standby conditions, press programmed "scan on/off" key, the transceiver will start scan after the transceiver announce, the red LED and green LED will twinkle at same time. The transceiver will stay at current channel when it scans matching signal, the green LED will be lighting, then you can hear the call from transmitter, the transceiver will transmit at preprogrammed "specify transmit channel" when press PTT key. Under scan condition to press programmed "scan on/off" key, the transceiver will exit scan after it announce.

(2) Start scan automatically: Under standby conditions, turn the channel selector knob to programmed "Auto scan" channel, the transceiver will start scan, the red LED and green LED will twinkle at same time. The transceiver will stay at current channel when it scans matching signal, the green LED will be lighting, then you can hear the call from transmitter, the transceiver will transmit at preprogrammed "specify transmit channel" when press PTT key. Under scan condition to press programmed " scan on/off" key or turn the channel selector knob to other channels without "Auto Scan" setup, the transceiver will exit scan.

The [PF1] and [PF2] keys are programmable. They can realize the following functions by program software.

NOTE: The PF1 and PF2 keys can program as long press and short press.

(((**All Alert Tones On/Off**

Under standby condition, press programmed " All Alert Tons On/Off" key, it can switch Off/On all alter tones.

(((**Emergency On**

Under standby condition, press programmed " Emergency on" key, it can switch on alarm function, the transceiver will alarm by user programmed alarm mode.

NOTE: This function only be available when the digital channel has set alarm system.

(((**Emergency Off**

Under Emergency on conditions, press programmed " Emergency off" Key, it can switch off the emergency mode.

NOTE: When the emergency channel of the transceiver has programmed" Emergency alarm confirm", only when the receiver power on and within communication range, the Emergency ON and OFF key are valid, otherwise the transceiver will announce and back to standby condition.

◦ **ADVANCED OPERATIONS**

((◦ **Switch High/Low Power**

Under standby condition, press programmed "High/low power selector" key, it will switch the power of current channel to high/low power after the transceiver announce.

((◦ **Monitor**

Under standby condition, press programmed "Monitor" key,after the transceiver announce, the squelch circuit will not mute, you can hear the background noise. Repeat above operation, after the transceiver announce, it will keep mute status. This function can monitor the weak signal which can not squelch off.

NOTE: If the communication mode of current channel is digital, the Monitor key is invalid.

((◦ **Fast Access Key 1-6**

By using this function, you can make fast call to some important persons. In PC software, you can program the key as "One Touch Access" and setup desired calling code. Press programmed " one touch access" key to send DTMF code directly when the channel in analog mode. when the channel in digital mode, after press programmed " one touch access" key, the calling code will switch to preset calling code, press PTT key directly can call corresponding contact person.

NOTE: To enable fast access, you must preset one touch access code and contact person by program software.

(((**Repeater/ Talk Around**

When the channel in repeater state, press programmed "repeater/talk around" key, after the transceiver announce, the channel will switch to talk around status. Repeat above operation to switch the channel to repeater status.

(((**Scan On/Off**

Under standby condition, press programmed " Scan on/Off " key, after the transceiver announce, it will enter scan. Under scan condition, repeat above operation to exit scan function.

NOTE: Before enable this function, you must preset desired scan list for each channel by program software.

(((**Tight/ Normal Squelch**

Under standby condition, press programmed " Tight/Normal Squelch" key, the squelch will be set up to Deep squelch. Repeat above operation to set up the squelch as Normal squelch.

NOTE: It can protect strong interfere when the transceiver programmed as deep squelch,but it will effect the signal receive from far away. Please be careful to use the deep squelch.

(((**Encryption On/Off**

Under standby condition, press programmed "Encryption On/Off " key, it can switch the transceiver to encryption mode. Other transceivers of same frequency can not receive the call well. Repeater above same operation to turn off encryption function.

◦ **ADVANCED OPERATIONS**

NOTE: To enable this function, you need to preprogram desired secret key by program software, this transceiver can support 16 groups 4 byte secret key for optional. Only the transceivers with same secret key can communicate with each other. This operation only valid in digital communication.

(((**VOX On/Off**

Under the standby condition, press programmed " Vox on/off" key, it will enable vox function after the transceiver announce. With VOX on, you can enable transmit by voice.Repeat above operation to turn off VOX function.

(((**Battery Capacity Enquiry**

Under the standby condition, press programmed " Battery Capacity Enquiry" key, the transceiver will announce current battery capacity. When the transceiver announce one beep means the battery capacity is low. It means the battery capacity is full when it announce four beeps.

NOTE: It will announce low capacity once a minute when the battery with very low capacity.

(((**Lone Work**

Under the standby condition,press programmed " Lone Work" key, it will enable lone work after transceiver announce. The transceiver will send alarm signal to the receiver when the working time reach predetermined time. Power off the transceiver to exit lone work.

NOTE: Lone work mode and preset data must be setup by program software. This function is similar to Emergency alarm, please refer to emergency mode setup.

General	
Frequency Range	VHF: 136-174MHz UHF: 350-390MHz UHF: 400-480MHz UHF: 450-520MHz
Channel Capacity	32 channels
Channel Spacing	25KHz (Wide Band) 12.5KHz (Narrow Band)
Phase-locked Step	5KHz, 6.25KHz
Operating Voltage	7.4V DC ±20%
Battery Life	More than 14 Hours (1800mAh), by 5-5-90 work cycle
Frequency Stability	±2.5ppm
Operating Temperature	-20℃~ +55℃
Size	128×61×40mm (with battery pack)
Weight	264g (with battery pack, antenna)

Receiving Part		
	Wide band	Narrow band
Sensitivity(12dB SINAD)	≤0.25μV	≤0.35μV
Adjacent Channel Selectivity	≥70dB	≥60dB
Intermodulation	≥65dB	≥60dB
Spurious Rejection	≥70dB	≥70dB
Blocking	84db	
Hum & Noise	≥40dB	≥36dB
Audio Distortion	≤5%	
Audio Power Output	1000mW/10%	
Digital Sensitivity	0.3uV/-117.4dBm (BER 5%) 0.7uV/-110dBm (BER 1%)	

Transmitting Part		
	Wide band	Narrow band
Power Output	5W/1W	
Modulation	16KΦF3E	11KΦF3E
Adjacent Channel Power	≥70dB	≥65B
Hum & Noise	≥40dB	≥36dB
Spurious Emission	≤-36dB	≤-36dB
4FSK Digital Modulation	12.5KHz（data）7K60FXD 12.5KHz（data+voice）7K60FXE	
Audio Distortion	≤5%	
Error rate	≤3%	