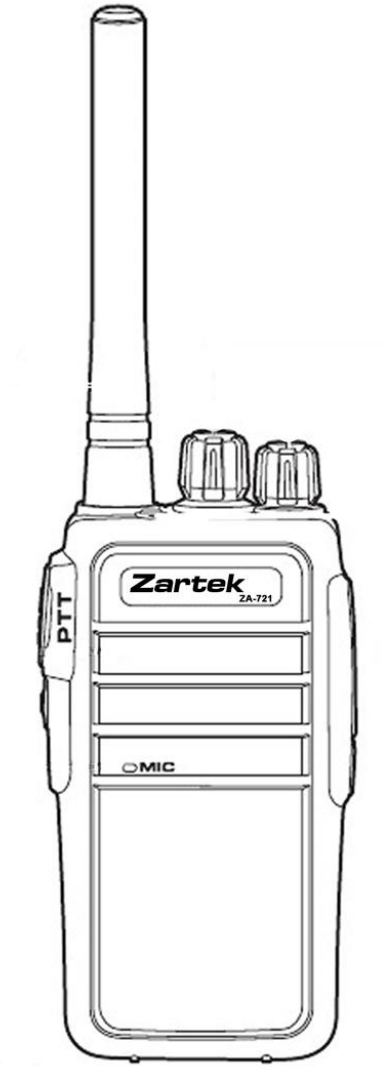


Zartek®

ZA-721

TWO-WAY RADIO

UHF HANDHELD FM TRANSCEIVER

USERS MANUAL

- Extra Long Range
- Robust & Durable
- Li-ion Battery
- Desktop USB Charger
- Loud Clear Audio
- 16 Channels

Thank you for purchasing the Zartek ZA-721 Portable Two Way Radio. This radio is easy to use and gives you reliable and clear communication. The ZA-721 UHF transceiver operates at 0.5W on both license-free bands namely 464 MHz consisting of 5 frequencies and 446MHz consisting of 8 frequencies. This transceiver is also approved by ICASA to operate on licensed bands from 400 – 470MHz on 2W of transmitting power.

Please read this manual carefully before using the radio. The information presented here will ensure that you get maximum performance and functionality from the radio. There are also important battery and charging maintenance procedures.

High strength materials and quality components have been used in the manufacture of this two-way radio to give many years of product use. It is designed for every day security or general use both indoors and outdoors. The ZA-721 radio is durable and easy to operate.

Warranty

There is a 12 month factory warranty on the unit. Warranty does not cover speakers, battery or accessories. The product must be used for the intended purpose and not subject to willful or accidental damage. If the product has been tampered with in any way, the warranty shall be considered null and void.

For any queries, please email info@zartek.co.za

Safety Information

- Study this manual carefully to understand your transceiver well.
- For safety reasons, it is important that the user is aware of and understands the potential hazards common to using any transceiver.
- To clean the radio, wipe with a soft cloth dampened with water. Never use solvents or cleaners on the radio, they can harm the body and leak inside, causing permanent damage.
- Your radio is low level splash proof but not waterproof. If the radio gets wet, turn it OFF and remove battery immediately. Dry the battery compartment to minimize potential water damage. Leave cover off battery compartment and do not use until completely dry.
- Handle the radio with care and never hold the radio by the antenna. Do not drop or impact the radio as it contains sensitive electronics.
- Do not operate the transceiver or replace/charge the battery in an explosive environment (dust, gas, fumes etc).
- Do not transmit without the correct antenna connected fully or the radio could get damaged.
- Switch the transceiver off whilst filling gas or when parked at a petrol station.
- Do not open or modify the transceiver in any way.
- Refer to a qualified technician for any service or repairs.
- Do not expose the transceiver to long periods of direct sunlight, extreme hot environments or surfaces.
- Do not place the transceiver in excessively dusty, humid, wet and/or unstable areas.
- Please turn off the radio when you are close to a blast area or detonator zone.
- Do not use any radio which has a damaged antenna. It may cause a minor burn when the damaged antenna touches your skin.
- To avoid the problems caused by EMI and EMC, turn off your radio where notices “Please turn off your radios” are posted, such as hospitals.
- Turn off your radio before boarding an aircraft. Any use of the radio must be in accordance with airline regulations or flight crew’s instructions.
- If a vehicle is fitted with an air bag, do not place the antenna of the radio within the air bag expand area.
- When the portable radio is transmitting, hold the radio in a vertical position and speak into the Microphone.
- If you carry a radio on your body, please keep the antenna away from your body by at least 2.5cm when transmitting.

Channel Factory Settings

This transceiver has been factory programmed and can be used immediately once purchased. All 16 channels have been activated with channels in the license free bands as per the table below and on the back of the box. There are 2 bands, PMR 446MHz band with 8 frequencies (1-8) and the 464MHz band with 5 frequencies (1a-5a). Select the same channel on any ZA-721 radio to communicate.

Compatibility:

The ZA-721 is factory programmed to be directly compatible with all 16 channels on the TX-8, ZA-720 and ZA-723 radios and channels 1 to 12 on the ZA-748, ZA-725 and ZA-758 and the first 8 channels on the ZA-708 if they are set to factory programming. You will need to reprogram your ZA-721 radio when there are other channels to be set. Both the frequency (1-8 or 1a-5a) and CTCSS sub tones (1-38) / DCS tone must be the same on all radios for full intercommunication. Should there be interference on a specific channel, select a different channel. Note that Channel 9, 10 & 11 are set on the open frequency without a sub tone and channels 13 to 16 have been set with a tone 20 for more privacy. A sub tone is used to privatise conversations when using the same frequency.

An optional programming cable is available to program different PMR 446MHz and 464MHz channels and sub tones on the ZA-721. Please email info@zartek.co.za for programming software. The programming cable is connected to the radio to the USB port on a PC. Other settings such as Squelch level, VOX or reassigning the side key for different functions can also be programmed. Licence free use of this transceiver limits the frequencies to the 446MHz and 464MHz bands and the power is restricted to 500mW. If an ICASA license is granted for use of other frequencies (400-470 MHz) and power (2W), special software is available from a registered two-way radio dealer. The supplier and manufacturer take no responsibility if a user operates the transceiver not in accordance with ICASA regulation.

ICASA type approval TA-2021/2184

Please refer to the sections in this manual for instructions on programming and the functions available.

Battery Information

Initial Use

New batteries are not charged fully in the factory. Please charge the battery for 4 hours at least before first use. This initial charge pre-conditions the battery for full capacity. Failure to charge fully may shorten the life span of the battery. Recharge the battery immediately once it goes flat as it could get damaged if left very flat for long periods. The maximum battery capacity and performance is achieved after three full charge-discharge cycles.

Battery Pack

Please only use a battery which is approved by the manufacturer. Unauthorized batteries may cause failure of protection circuitry and result in bodily injury and property damage.

Safety Information

1) Do not throw the battery into fire!
2) The battery should be recycled and disposed of correctly.
3) Never attempt to disassemble the battery pack.
4) Only charge the battery, when the ambient temperature is between 5℃- 40℃.
5) Please turn off the radio when the battery is charging. Using the radio during charging will affect normal charging of battery pack and will lengthen charge time.
6) During charging, do not plug in/pull out the power supply or the battery frequently, it would affect battery charging.
7) Do not charge when the battery or radio is wet. Please dry it with a soft cloth before charging.
8) Do not use the charger, cable or battery if damaged, cracked or frayed in any way.
9) The battery life is over when the operating time is obviously shorter than normal even if it's fully and correctly charged. Please then replace with a new battery.

To Prolong Battery Life

1) Battery performance will degrade when the current temperature is below 0℃. A spare battery may be necessary in cold weather. Please keep the cold batteries, as these batteries will work under room temperature.
2) If the battery contact is dusty, it may influence its normal use or normal charge.

Battery Storage

1) Fully charge a battery before storing for a long time, to avoid battery damage caused by over-discharge.
2) Recharge the Li-Ion battery after 6 months as the battery will lose small amounts of charge even when not in use. This regular maintenance will avoid the battery capacity reducing which is caused by over-discharging.
3) When storing your battery, keep it in a cool and dry place under room temperature.

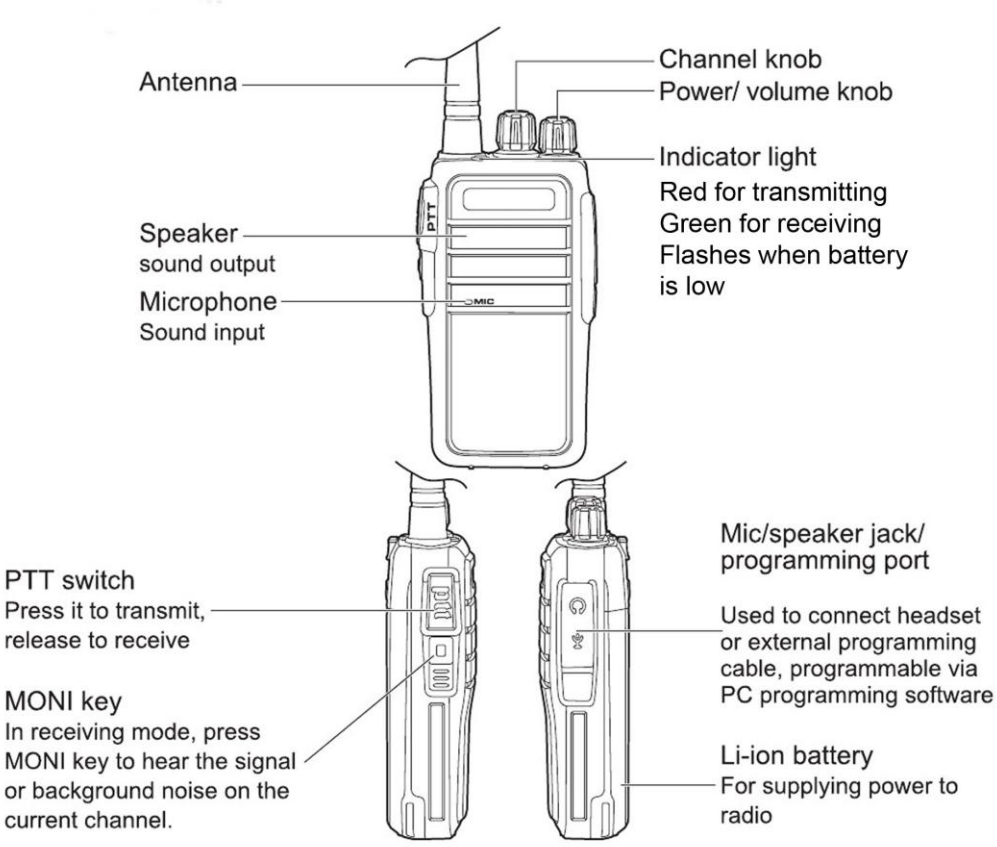
Included Items

Carefully unpack the transceiver. We recommend that you identify the items listed below before discarding the packing material. If any items are missing or have been damaged during shipment, contact the supplier immediately. For optional accessories, please visit our website www.zartek.co.za

INCLUDES

- **Handheld UHF FM Transceiver**
- **Detachable Antenna**
- **Desktop Charger**
- **Mains USB Adaptor**
- **Li-ion Battery Pack 1100mAH**
- **Belt Clip**
- **Users Manual**

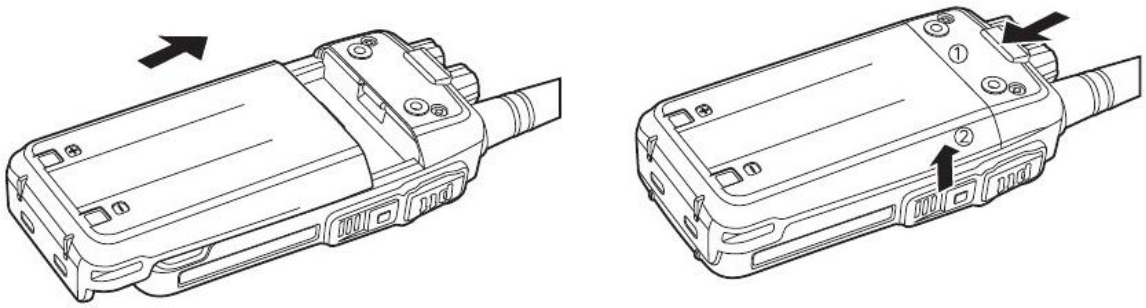
Radio Overview



Getting Started

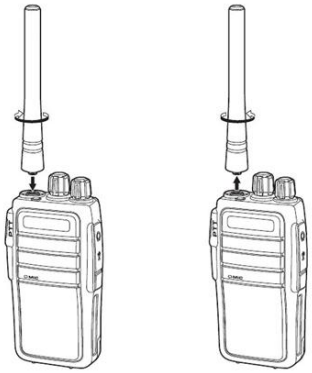
Install & Remove the Battery

Place the battery at the back of radio and slide battery closed until the latch clicks.
To remove the battery, press down the PUSH lever in and slide the battery off.



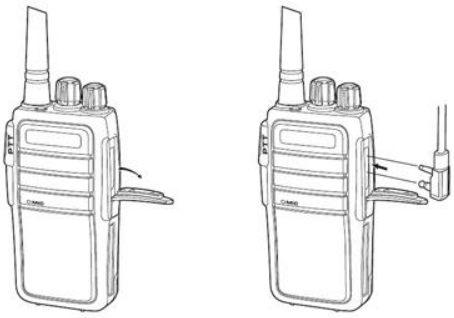
Install & Remove the Antenna

Connect the rubber antenna to the top antenna socket by inserting the plug and turning in a clockwise direction.
Make sure that the antenna is fully connected until tight.
Note that the radio requires the antenna to function.
Do not transmit without an antenna connected as this could damage the radio.



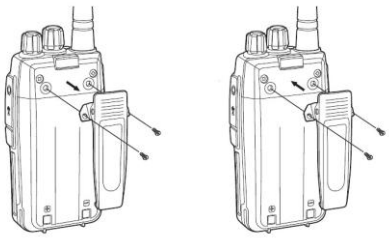
Install & Remove the headset / programming cable

Open the side headset speaker / mic port cover and then plug in the accessory firmly into the side jack.
If you want to remove the accessory, unplug it gently and close the cover.



Install & Remove the belt clip

Align holes of belt clip with holes at back of radio and attach both supplied screws. Unscrew to remove.



Charging the Battery

When the battery capacity runs low, the radio will announce “Please change the battery”

Desktop cradle:

- Connect the USB cable from desktop charger into the mains USB adaptor and plug into a wall socket.
- The desktop USB cradle can also be powered from a standard USB port rated at 5V and <500mA
- Insert radio in cradle so the two back side protrusions fit both grooves on battery. Charging contacts should make a good connection with the batteries contacts. Clean contacts if dirty or corroded.
- Light on the cradle will show RED when charging and GREEN when full. If the indicator blinks for longer than 30 minutes, the battery may be damaged, capacity is low or temperature is too high or too low.

Only use the supplied charging adaptors or those recommended to recharge the radio and battery.

Note that the battery can be recharged separately from the radio using the desktop charger.

CHARGE TIME is approximately 4 hours from flat to full.
OPERATING TIME is approximately 17 hours with a fully charged battery if used typically on a 5:5:90 duty cycle on 0.5W power with medium volume and battery save ON.

Note:
1. Make sure the radio is switched off during charging or the charging time will be longer and number of possible battery charge cycles reduced.
2. Li-ion batteries do not have memory so they can be recharged at any time. There are a limited number of charge cycles that the battery can handle, typically 500-700 times. To get the maximum use of the battery, only recharge when getting flat. If an almost full battery is recharged, the charging cycles are not optimized.

Basic Operation

Power On/Off

Turn the Power Knob clockwise to switch on the radio; you will hear a Ring sound and a voice message will indicate the current channel number. Turn counter-clockwise to switch off the radio.

Adjust the Volume

Hold in the side “Monitor” or “Squelch Off” button to listen the background noise, then turn the On/Off knob to increase or decrease the volume.

Select a Channel

Turn the Channel Selector Knob clockwise to change the channels from 1 to 16. Your radio will report the channel number.
Refer to the factory channel settings when linking your radio to other radios as it may be necessary to reprogram or adjust the frequency / sub tone to match.

Transmit

Keep pressing down the PTT key and speak directly into the microphone hole (MIC). Hold the radio about 2.5cm to 5cm from your mouth. The radio should be held so that the antenna is vertical. Speak slowly loud and clear into the radio for a good signal to be received.

Receive

Release the PTT key to receive a call and adjust the volume if needed.

Monitor

The squelch circuit in the transceiver mutes the speaker automatically, when no signals are present so you will not hear background noise. Hold in the side button to monitor a frequency by deactivating the squelch. This is useful when you want to adjust the volume level, or when you need to hear a weak signal.

Communication Range

Range will depend on the type of terrain that you are communicating across.
The ZA-721 uses the UHF (Ultra High Frequency) band and will be subject to similar obstacle interference as cellular phones. The radio works indoors as well as outdoors.
Typical rough estimate ranges for different terrains are:

- Indoors or Shopping centre 300m-1200m
- Building 5-30 stories,
- City centre & dense bush 500m-2km,
- Residential & over water 2-6km,
- Farmland 3-7km,
- Top of mountain or building (line-of-sight) 10-30km.

When you press the PTT talk button a signal is transmitted and the signal floods the area in all sideway directions. The signal travels in 3 different ways:
1**) Penetration**: The signal can go through materials such as wood, plastic, cement and fabric. The denser the material or more built up the environment the weaker the signal will become. The signal cannot go through solid metal or very large solid land structures such as a hill or mountain. Metal acts like a shield and that is why the performance from the inside of a vehicle will be less than from outside.
2**) Reflection**: The signal cannot go through metal or very large structures such as a hill or mountain, but it can bounce off (like a mirror), go around and reflect in other directions as well. This happens at the speed of light.
3)Line-of-sight: Line-of-sight is when there are no obstructions in the path between the communicating parties. The higher up you go the further you can see, so the larger the line-of-sight distances will be. Generally you can talk to wherever you can see, which is why the coverage in a valley is much less than the coverage from on top of a hill.

Ensure that there is nothing blocking the antenna. The less metal in close proximity (0-2m) the better the range. There may be external interference from electrical equipment (power lines or factories) or natural causes (moisture in the air or storms) that may vary depending on the location and the weather.

The ZA-721 is fitted with a detachable antenna which provides options for connecting an external antenna to improve signal clarity in vehicles and indoors.

Programming (optional)

A programming cable is needed to program different channels or functions on the ZA-721. The programming cable links the radio to USB port on a PC or laptop.

USB installation:
Plug in the cable to a USB port, the computer should locate the cable and configure it automatically if using window 10. For lower Windows versions, USB cable driver software can be downloaded from www.zartek.co.za or from the cable manufacturer website Prolific (driver for PL2303 USB-Serial cable). Check that the cable is working by locating it in DEVICE MANGER > PORTS > PROLIFIC USB – SERIAL COMM PORT

Software installation:
Programming software for the ZA-721 is available for free. Please email info@zartek.co.za to request the download link or check www.zartek.co.za downloads. Install the software on to a PC by following the installation steps. Once installation is finished, an icon called “ZA-721 User PC Software” will appear on the screen.

Connect the USB cable to the PC and plug-in the twin connector into the speaker/microphone jack on the side of the radio. Ensure that there is a charged battery connected to the radio and switch the radio on. Start the program and a window will appear. The software may automatically find the correct port of the programming cable. Check the Settings > Set COM to select the correct COM port.

Reading data:
Click on the “READ” icon and press “READ” to begin reading the data from the radio. Once loaded, the data can be edited to the appropriate channels and settings and then saved or printed for future reference. See below for instructions on each function.

Writing data:
After channel and optional feature data is entered, click the “WRITE” icon to program the radio. Press “WRITE” to begin writing the data to the radio. Once finished, switch the radio off and unplug the cable from the radio. Additional radios can be programmed by plugging in the cable to the radio, switching it on and following the “WRITE” procedure.

To change settings select Edit > Channel Information or > Function Setup or >Key Setting

Licence-free bands:
The **Frequency** column refers to the frequencies that can be selected on the radio. The 8 frequencies in the 446MHz band are represented by the 8 channel numbers, 1-8, in the table. These channels correspond to the channels on other 446MHz license free radios. The 5 frequencies in the 464MHz band are represented by the 5 channel numbers, 1a - 5a, in the second table. These channels correspond to the channels on other 464MHz license free radios.

Default Channel Programming

Channel	Frequency	Tone	Channel	Frequency	Tone
1	1	10	9	1	OFF
2	2	10	10	2	OFF
3	3	10	11	3	OFF
4	4	10	12	1a	15
5	5	10	13	2a	20
6	6	10	14	3a	20
7	7	10	15	4a	20
8	8	10	16	5a	20

446MHz Band

Channel	(MHz)
1	446.00625
2	446.01875
3	446.03125
4	446.04375
5	446.05625
6	446.06875
7	446.08125
8	446.09375

464MHz Band

Channel	(MHz)
1a	463.975
2a	464.125
3a	464.175
4a	464.325
5a	464.375

CTCSS standard tones 1 -38

Code #	(Hz)	Code #	(Hz)
1	67.0	20	131.8
2	71.9	21	136.5
3	74.4	22	141.3
4	77.0	23	146.2
5	79.7	24	151.4
6	82.5	25	156.7
7	85.4	26	162.2
8	88.5	27	167.9
9	91.5	28	173.8
10	94.8	29	179.9
11	97.4	30	186.2
12	100.0	31	192.8
13	103.5	32	203.5
14	107.2	33	210.7
15	110.9	34	218.1
16	114.8	35	225.7
17	118.8	36	233.6
18	123.0	37	241.8
19	127.3	38	250.3

Sub-tones:
The **Tone** column shows the sub tone assigned for each frequency. There are 50 QT (CTCSS quiet tones) and 232 DQT (digital quiet tones that can be selected. These tones are used to privatize conversations and reduce interference from other users on the same frequency. A CTCSS/QT/DQT tone is a sub-audible tone which allows you to ignore (not hear) calls from other parties who are using the same channel. When you receive a signal that has a tone different from the one set up in your transceiver, you will not hear the signal but only the LED will show frequency activity. Likewise, signals that you transmit will only be heard by parties whose CTCSS/QT/DQT tone matches the tone set up in your transceiver.

There are 38 CTCSS standard tones (1-38) plus 12 extra QT tones. The 38 tones are common on other 446 MHz radios such as the Zartek RX8, COM8 or PT8. If the tone is left “OFF”, the frequency is left “open” to receive communication from any tone, but your transmitter will not be decoded by a radio with a tone.

Battery Save Function
The Battery Save function decreases the amount of power used when a signal is not being received and no operations are being performed (no keys are being pressed, and no switches are being turned) thereby increasing standby time. While the channel is not busy and no operation is performed for 10 seconds, Battery Save turns ON. When a signal is received or an operation is performed, Battery Save turns OFF.
Factory programmed on Save On

Squelch
The squelch level is used to adjust the threshold at which signals will open the audio channel. A low level will allow weaker signals to be audible, although with more background noise. However, if weak signals are annoying, the level can be adjusted higher to open the channel only when stronger signals are received.
You can set up the squelch level from 0 to 9. The higher the squelch level, the less noisy is the signal as only stronger signal are accepted. The lower the squelch level the noisier the signal is, as weak signals are also allowed. As the communication range or obstructions between radios increase, the weaker the signal becomes. It is advised to use a lower squelch level to get further communication range. **Factory programmed on Squelch level 4**

Time-out Timer
The purpose of the Time-out Timer is to prevent any person jamming up a channel for a long time whilst transmitting. If the time that you continuously transmit exceeds the set Time-out time, the transceiver will stop transmitting and a tone “beep” will sound. To stop the tone, release the PTT switch. You can press the PTT switch again to resume transmitting.
Note: you can set up the time level: 15s, 30s, 60s, 90s …… 600s
Factory programmed on TOT 180s

VOX (Voice-operated Transmission)
The ZA-721 has a multi-level sensitivity built-in VOX function. You can enjoy talking and listening without pressing PTT key as transmit is automatically activated by sound. This turns your radio into hands-free “walk & talk” when used with a headset. Voice activation is used to operate the radio in hands-free mode or as a noise / baby monitor. The radio will begin transmitting when a noise or voice is heard. There are many headset options (see optional accessories below) which can be used in VOX mode allowing for full hands-free communication.
Note that VOX can be only activated in software.

VOX level
The sensitivity level of the microphone can be adjusted to allow different volumes of sounds to make the radio begin and remain transmitting. There are 1 - 9 levels with 1 **being the highest and most sensitive** to lower volumes of sound. If the radio is used in a very noisy environment it is recommended to use a low sensitivity level to avoid the radio transmitting unnecessarily, such as level 8. At low sensitivity level it will be required to speak loudly into the microphone to activate the radio. At high sensitivity, a soft voice is all that is required which enable the radio to be placed at a further distance from the noise source (typically 30cm max).

Scan:
A scan function is useful when you want to find other people on similar frequencies or to monitor communication within your group. If an active channel is found the scan will stop and lock on to that channel. You can now transmit and receive on this frequency. When the signal is gone for 5 seconds, scanning will resume. LED flashes when scanning.
Note that the side Function Key will need to be set to SCAN and specific scan channels added using the Programming Software.

Scan Add/Delete
In the Channel Information You can add a channel to the scan group or delete it from group. **Add:** choose Yes in the channel row under the Scan Add column to add the channel. **Del:** choose No in the channel row under the Scan Add column to remove the channel.

Scramble:
The scramble function is used to achieve more privacy whereby other unwanted uses hear a distorted signal. There are 8 scramble levels with 8 being the most distorted. Set the same scramble level on all radios in a group for communication to be clear within the group.

Low Battery Alert
When the battery capacity is getting low, the radio will alert you with a message “please charge the battery” unless the radio is recharged.

Announce Voice Channel
As the channels are changed, a voice announces the specific channel. This is useful when using the radio at night.

Power Selection (only in dealer license version)
Maximum communication range is achieved when the transceiver is set to high power mode, whilst lower power settings will save battery life. The power can be set on low (500mW) or High (2W).
Factory programmed on low 500mW

Programmable Side Function Key

You can program specific functions for the bottom side key via software.

Local & Remote Alarm: A very loud continuous emergency siren is sounded and transmitted. Alarm rings for 20 seconds and then off for 10 seconds. This cycle is repeated. Press PTT to stop Alarm.

Monitor: Hold in the side button to monitor a frequency by deactivating the squelch. This is useful when you want to adjust the volume level, or when you need to hear a weak signal.

Scan: Switch the channel scan mode ON / OFF to search selected channels added to the scan.

Scramble: Switch the scramble mode ON / OFF to privatize communication.

Optional Accessories

HEADSETS (use with PTT or VOX)
GE-252 Earphone speaker with in-line PTT microphone
GE-259 Lapel speaker microphone for vehicle & security use
GE-266 Acoustic eartube speaker with microphone for discrete communication
GE-272 Single Muff Earpiece Boom microphone with PTT
GE-273 Heavy Duty D-Cup high volume speaker with mic. & in-line PTT
GE-274 Heavy Duty D-cup high volume speaker with **boom** mic. & in-line PTT
GE-276 Throat Microphone with lapel & **finger PTT** for motorbike & high wind/noise

GE-214 Spare Battery (3.7V 1100mAH)
GE-254 PC Programming cable USB
GE-265 Magnetic External Antenna Mount with 3m cable

Troubleshooting

Problem	Solution
No power.	● The battery pack may be dead. Recharge or replace the battery pack ● The battery pack may not be installed correctly. Remove the battery pack and install it again.
Battery power dies shortly after charging.	● The battery pack life is finished. Replace the battery pack with a new one.
Cannot talk to or hear other members in your group.	● Check that the Antenna is fitted correctly ● Make sure you are using the same frequency and QT/DQT as the other members in your group. ● Other group members may be too far away. Make sure you are within range of the other transceivers.
Other voices (besides group members) are present on the channels.	● Change the QT/DQT. Be sure to change the tone on all transceivers in your group.
The transceiver continuously rings	● Channel programming is empty.

Specification

GENERAL	
Frequency Range	446MHz & 464MHz / 400-470MHz
Channel Capacity	16
Frequency Spacing	12.5kHz
Working Voltage	3.7V
Frequency Stability	±5ppm
Operating Temperature Range	-10℃~ +50℃
Antenna Impedance	50Ω
Dimension excl Antenna (L×W×H)	124mm×61mm×33mm
Weight (including Antenna and Battery)	200g
Battery Capacity	1100mAH
Battery Operating Time Average	17 hours on 5:5:90 duty cycle, battery save, med vol

TRANSMITTER	
Output power	500mW / 2W
Modulation Mode	16KFΦF3E
Maximum Frequency Deviation	≤±5kHz
Audio Distortion	≤5%
Spurious Radiation	<7.5uW
Modulation Noise	<-40dB
Current max	<700mA / <2300mA
Audio response (300-3000Hz)	+6.5~-14dB
Adjacent Channel Power	>60dB
Intermediation sensitivity	8~12mV
RECEIVER	
Receiving Sensitivity	≤0.22uV
Selectivity	≥65dB
Intermediation	≥55dB
Occupied Bandwidth	≤16kHz
Current max	<80mA (standby) <220mA (receive)
Audio Output Power	1W
Audio Distortion	≤5%
Audio Response	+7~-12.5dB

Specifications may be revised without notice due to technical improvements.