

Zartek®

TWO-WAY RADIO

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	15
6	6	10	14	3a	15
7	7	10	15	4a	15
8	8	10	16	5a	15

* Tone is used to add privacy. Always match channels exactly when linking to other radios. Different channels and functions can be programmable by PC.

446 MHz BAND

Channel	(MHz)
1	446.00625
2	446.01875
3	446.03125
4	446.04375
5	446.05625
6	446.06825
7	446.08125
8	446.09375

464 MHz BAND

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



UHF 446 & 464MHz on 0.5W (License Free)
400 - 470MHz on 2W (License required)

www.zartek.co.za

USER'S MANUAL

Zartek®

TWO-WAY RADIO



UHF HANDHELD FM TRANSCIVER

Operates on:
446 & 464 MHz Licence-free band (500mW)
or full UHF 400 - 470 MHz licensed band (2W)

Preface

Thank you for purchasing The Zartek ZA-748 Portable Two Way Radio. This radio is easy to use and gives you reliable and clear communication. The ZA-748 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 rugged outdoor and industrial use to excel in tough environments. The ZA-748 radio is ultra small and compact for easy handling. Li-ion battery technology and VOX (voice activation) are included amongst many features that enhance performance yet keep the transceiver easy to operate. A detachable antenna enables external car or house antennas to be used with the radio to extend communication range.

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.

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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 not splash proof or 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).
- 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.

PROGRAMMING NOTICE!

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. 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-748 radio to communicate.

CH	Freq number	Tone number
1	1	10
2	2	10
3	3	10
4	4	10
5	5	10
6	6	10
7	7	10
8	8	10
9	1	OFF
10	2	OFF
11	3	OFF
12	1a	15
13	2a	15
14	3a	15
15	4a	15
16	5a	15

Table of programmed channels

Compatibility:

The ZA-748 is factory programmed to be directly compatible with all 16 channels on the ZA-725, ZA-758 and ZA-705 and the first 8 channels on the ZA-708 if they are set to factory programming. You will need to reprogram your ZA-748 radio when there is other programming to be set. If you require communications with other radios using the 446MHz band, such as the Zartek Pro8 or COM8, or those using the 464MHz band, such as the Zartek ZA200 or Pro5, you can change the channels to correspond with the ZA-748. Both the frequency (1-8 or 1a-5a) and CTCSS sub tones (1-38) must be the same on all radios. 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. 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-748. Software is available for free download from www.zartek.co.za. The special single pin programming cable is connected to the radio to the USB port on a PC. Other settings such as Scrambler, Squelch level 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 (403-470 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.

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 5 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.

Notices

- 1) Only charge the battery, when the ambient temperature is between 5°C - 40°C.
- 2) Please turn off the radio when the battery is charging. Using the radio during charging will affect the normal charging of the battery pack and will lengthen the charge time.
- 3) During charging, do not plug in/pull out the power supply or the battery frequently, it would affect battery charging.
- 4) Do not charge when the battery or radio is wet. Please dry it with a soft cloth before charging.
- 5) Do not use the charger, cable or battery if it is damaged, cracked or frayed in any way.
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

To Prolong Battery Life

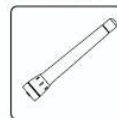
- 1) Battery performance will degrade when the current temperature is below 0°C. A spare battery may be necessary in cold weather. Please keep the cold batteries, as these batteries will work under room temperature.
- 2) If the battery contact is dusty or corroded, it may influence its normal use or 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.
- 4) Disconnect battery from radio when storing for long periods.

STANDARD ACCESSORIES

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



Antenna



Li-ion Battery Pack



Belt Clip & Screws



User Manual



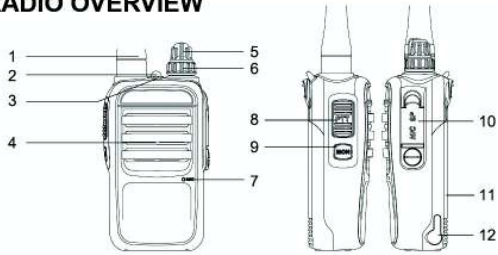
AC Adaptor



Hand Strap

o.	Items	QTY	No.	Items	QTY
1	Main Unit	1	5	Belt Clip	1
2	AC Adaptor	1	6	Screws	2
3	Li-ion Battery Pack	1	7	Hand-Strap	1
4	Antenna	1	8	User Manual	1

Note: Pictures are only for your references; please take the real objects as standard!

RADIO OVERVIEW

No.	Unit	Remarks
1	Antenna	Transmit/Receive signals, Detachable for optional external antenna
2	LED Flashlight	Lighting function. Hold in small side key for 2.5s to turn On/Off
3	LED Indicator	Receiving: Green Light bright; Transmitting: Red Light bright
4	Speaker	
5	Power / Volume Knob	1. Turn clockwise to switch on the radio, and turn counter-clockwise until a "click" is heard to switch off the radio. 2. After switch on radio, turn the knob clockwise to increase the volume, and turn counter-clockwise to decrease the volume.
6	Channel Selector	Turn the selector to select the channels from 1-16.
7	MIC	Microphone
8	PTT (Push-To-Talk) Key	Press and hold the PTT key to transmit, and release it to receive.
9	Side Key	Short press (0.5S) or long press (2.5S) side key to enable a specific function. Various function can be programmed via software. Press key to activate function (you will hear 1 Beep sound) and press again to quit (you can hear 2 Beep sound). Factory set on short press CALL RING, long press LAMP
10	SP/MIC Jack	Dustproof and Rainproof
11	Battery Pack	
12	Battery's DC Jack	For Battery charge directly, 5V only

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GETTING STARTED**Install & Remove the Battery****Installing Battery Pack**

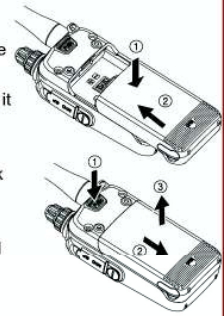
Align the battery pack with the grooves on the back chassis of the radio.

Slide the battery pack along the chassis until it fits into the top groove with a "Click".

Removing Battery Pack

Push the battery pack latch inwards to unlock and release the battery.

When the battery pack is released from the groove, push the battery pack downward and remove it.

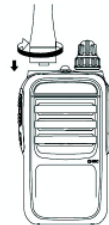
**Install & Remove the Antenna****Install the Antenna**

1. Switch off the radio; insert the threaded end of the antenna into the antenna connector on the top of the radio.

2. Screw down the antenna clockwise until it is secure.

Remove the Antenna

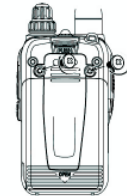
Switch off the radio then turn the antenna counter-clockwise to remove.

**Install & Remove the Belt Clip****Install the Belt Clip**

Remove the battery off the radio. Line up the holes of the belt clip with those on the radio and insert both screws. Tighten clockwise using a screwdriver until secure.

Remove the Belt Clip

Unscrew both screws from the holes and remove belt clip.

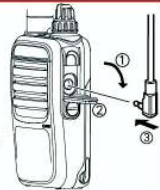


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Install & Remove the headset / programming cable (Single Pin Only)

Open the SP / MIC 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 SP/MIC cover.

**Charging the Battery**

Only use the supplied or approved charging adaptor to charge the battery. The charger's LED indicator will indicate the charging status. The battery can be charged by itself or when connected to the radio.

CHARGE TIME is approximately 5 hours from flat to full.

OPERATING TIME is approximately 35 hours with a fully charged battery if used typically on a 5:5:90 duty cycle.

1. Plug in the mains adaptor to a wall socket.
2. Connect the adaptor's output plug into battery's side charging jack located at the bottom side of the battery itself. Lift and swivel the small rubber jack cover to reveal charge socket.
3. The adaptor's LED will light RED indicating that the battery has started charging.
4. The LED will change to GREEN when the battery is full charged.
5. Pull out the adaptor plug from battery DC jack and unplug from the wall socket.

Note:

1. Make sure the radio is switched off during charging or the charging time will be longer.
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.
3. When the battery charge goes flat, the radio's LED will flash a red light and the radio will keep reporting "Please charge the battery".

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BASIC OPERATION**Power On/Off**

Turn the Power knob (also called Volume knob) clockwise to switch on the radio; you will hear a "di" sound and a voice message will indicate the current channel number. Turn counter-clockwise to switch off the radio. (see Figure 1)

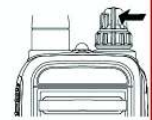


Figure 1

Adjust the Volume

Turn the Power knob (also called Volume knob) to increase or decrease the volume. (see Figure 2)

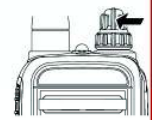


Figure 2

Select a Channel

Turn the Channel Selector knob to select your desired channel. If the Voice announcement function is enable, your radio will automatically report the channel No. where the knob is located. (see Figure 3). 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.

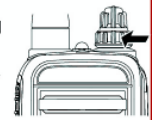


Figure 3

Transmit

Keep pressing down the PTT key and speak directly into the microphone (MIC). Hold the radio about 2.5cm to 5cm from your mouth. (see Figure 4). The radio should be held so that the antenna is vertical.



Figure 4

Receive

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

Communication Range

Range will depend on the type of terrain that you are communicating across.

The ZA-748 uses the UHF (Ultra High Frequency) band and will be subject to similar obstacle interference as cellular phones. The radio

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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 (car or 4x4) will be less than outside and an external car antenna kit is recommended to improve communication.
- 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.

PROGRAMMING (OPTIONAL)

A programming cable is needed to program different channels or functions on the ZA-748. The programming cable links the radio to USB port on a PC or laptop.

USB installation:

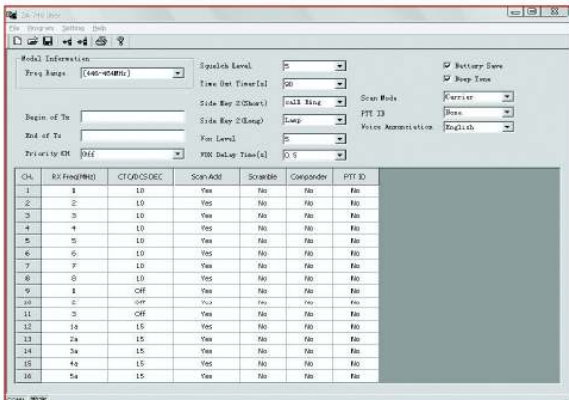
USB cable driver software for your computer operating system is available for free downloading from www.zartek.co.za or from the cable manufacturer website Prolific (driver for PL2303 USB-Serial cable). Install the correct software and plug-in the cable to the PC. The computer should locate the cable and configure it automatically. You can 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-748 is available for free download from www.zartek.co.za . Install the software on to a PC by following the installation steps. Once installation is finished, an icon called "ZA-748 User PC Software" will appear on the screen. Connect the USB cable to the PC and plug-in the single pin connector into the speaker/microphone jack on the side of the ZA-748 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 automatically finds the correct port of the programming cable.

Reading data:

Click on the "READ" left icon (arrow away from radio) and press "OK" to begin reading the data from the radio. The RED LED on the radio will flash as data is being read. 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 data is entered, click the "WRITE" right icon (arrow towards radio) to program the radio. Press "OK" to begin writing the data to the radio. The GREEN LED on the radio will flash as data is being written. 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.

Licence-free bands:

The RX Freq. (MHz) 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, such as the Zartek Pro8. 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, such as the Zartek Pro5 or ZA200 (model# 21-1860-AF).

Ch	Freq. (MHz)	Ch	Freq. (MHz)	Code #	(Hz)	Code #	(Hz)	Code #	(Hz)
1	446.00625	1a	463.975	1	67.0	14	107.2	27	167.9
2	446.01875	2a	464.125	2	71.9	15	110.9	28	173.8
3	446.03125	3a	464.175	3	74.4	16	114.8	29	179.9
4	446.04375	4a	464.325	4	77.0	17	118.8	30	186.2
5	446.05625	5a	464.375	5	79.7	18	123.0	31	192.8
6	446.06875	Table of Frequency band (464MHz)		6	82.5	19	127.3	32	203.5
7	446.08125	Frequency band (446MHz)		7	85.4	20	131.8	33	210.7
8	446.09375			8	88.5	21	136.5	34	218.1
Table of Frequency band (446MHz)				9	91.5	22	141.3	35	225.7
				10	94.8	23	146.2	36	233.6
				11	97.4	24	151.4	37	241.8
				12	100.0	25	156.7	38	250.3
				13	103.5	26	162.2		

Table of 38 quiet tones

Sub-tones:

The CTC/DCS DEC column shows the sub tone assigned for each frequency. There are 50 QT (CTCSS quiet tones) and 104 DQT (digital quiet tones) that can be selected. This effectively gives the user 2002 ((8+5)x(50+104)) channels to communicate on. These tones are used to privatize conversations and reduce interference from other users on the same frequency. There are 38 CTCSS standard tones (1-38) plus 12 extra QT tones and 104 digital codes. The 38 tones are common on other 446 & 464MHz radios such as the Zartek Pro8 or Pro5. 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.

PROGRAMMABLE SIDE KEY

You can program specific functions for the side key via software. Press the key to activate/deactivate the function. A single beep sound "di" will indicate that the function is active and a double beep sound "di di" will indicate that the function is deactivated. Two functions can be programmed in with short or long press of side key.

The functions can be programmed as follows:

No.	Items	Remarks
1	OFF	No function
2	Monitor Momentary	The radio will monitor all activity on the frequency and accept weak or coded (QT/DQT) signals.
3	Scan	Start Scan.
4	VOX	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.
5	Show Battery	Indicates the level of charge remaining in the battery.
6	Call Ring	Sends a loud 3 second ring tone to alert other radios. Side key is Factory programmed on Call Ring, short press once to activate.
7	Emergency Alert	Sends a very loud continuous emergency siren to alert other radios.
8	Channel Announcement	Announces the channel number.
9	LAMP	Switches On or Off the LED light at the top of radio. Side key is Factory programmed on LAMP, long press for 2.5s to activate.
10	Squelch Level	Indicates the current Squelch Level.
11	Compander	Enables or disables the receiver compression/expansion technology which reduces communication noise and amplifies voice signals.
12	Scrambler	Enables or disables the scrambler / descrambler technology where signals are coded for extra privacy.

AUXILIARY FUNCTIONS

The functions below can be programmed in software. Some of the functions have been switched off before leaving the factory and may need to be programmed if required.

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). While the channel is not busy and no operation is performed for 12 seconds, Battery Save turns ON. When a signal is received or an operation is performed, Battery Save turns OFF. Factory programmed on Save On.

Beep Tone

A beep tone is sounded when the radio is switched on or the side buttons presses to activate / deactivate function. If the beep tone is unselected there will be no beep when switching on or pressing side keys. Factory programmed on Beep enabled

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. Level 0 will disable the squelch function and the radio will receive all background noise on that frequency at all times. You can set up the appropriate squelch level via software according to the current communication environment and requirements. Factory programmed on Squelch level 5

Squelch Level Checking

Either side key can be programmed to enable this function. When you press the side key to check the squelch level, the radio will indicate the level 1-9. There will be no indication if the squelch is at level 0 as it is disabled.

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: OFF, 30s, 60s, 90s 300s
Factory programmed on TOT 90s

Tones

Some channels may have pre-programmed CTCSS/QT/DQT tones. 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. 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 standard CTCSS tones (see table for allocated tones), 12 QT and 104 DQT which can be selected per channel.

Note: Although using channels set up with CTCSS/QT/DQT tones relieves you from listening to unwanted calls; it does not mean your calls will be totally private.

Scan

Either side key can be programmed to activate / deactivate this function. The 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. The radio will announce which channel of the possible 16 programmed channels has been received. This is very useful when monitoring a large number of channels and responding to the correct channel.

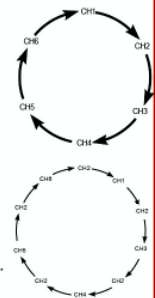
Priority Scan

Normal scan will sequence through all the channels in order until a signal is detected. Priority scan allows one channel to be checked more often which is useful when there is one main or more busy channel.

For example: If CH2 is set as a priority channel. So the scan method will be:

Normal scan is CH1, CH2, CH3, CH4.....According to the sequential scan.

Priority scan is CH1, CH2, CH3, CH2, CH4, CH2..... checks same channel in between others.



Scan Modes

There are two modes of scanning depending on the user's type of communication.

Carrier: Scan will stop and lock when a signal is received and continue scanning after the signal has gone for 5 seconds.

Time: Scan will stop when a signal is received and continue scanning 5 seconds later.

Scan Add/Delete

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.

Password Protecting Programming

The programming of the radio can be protected using a 6 digit software password. Once a password is programmed and written to a radio, the user must enter the password in the software before being able to read

the radio. If the password is forgotten, you must contact your dealer to reset it. It is still possible to overwrite the programming as normal as no password is required when writing only when reading.

Monitor Momentary

The squelch circuit on the transceiver mutes the speaker automatically, when no signals are present. So you will not hear background noise. Press the Monitor key to deactivate the squelch manually. This is useful when you want to adjust the volume level, or when you need to hear a weak signal. Monitor Momentary will remove squelch so all background noise will be heard and all tones (QT/DQT) accepted on the same frequency.

The LED indicator lights green while the radio is in Monitor mode.

VOX (Voice-operated Transmission)

The ZA-748 has innovative state-of-the-art technology not seen in other two-way radios with its 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. Ensure that you speak directly into the microphone of the radio at a distance of less than 5cm. There are many headset options (see optional accessories below) which can be used in VOX mode allowing for full hands-free communication.

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 9 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. 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.

VOX Delay time

Once the radio senses a voice and begins transmitting it is possible that the volume of the voice is lowered or there are pauses in the message which may cause the radio to stop sending. A VOX Delay time (0.5-3S) will keep the microphone active for the set time before returning to receiving mode. This delay time can be chosen to suit your style of speaking and avoid the message breaking up.

Battery Capacity Indication

Either side key can be programmed to enable this function. The remaining charge on the battery will be voice indicated using a number 1-4. This is useful in determining when to charge the radio.

4 – Half to Full	100-40%
3 – Medium	39-30%
2 – Semi-low	29-20%
1 – Low	19-0%

Low Battery Alert

When the battery capacity is getting low and indicates a level of "1", the radio will alert you with a message "please charge the battery" every 5 seconds unless the radio is recharged.

Note: If the Voice Announcement function is disabled, the radio will sound a double beep "di di" sound when going flat.

Call Ring

The side key can be set to transmit a loud 3 second call ring tone to alert other radios.

Side Key is Factory programmed on Call Ring, short press once to activate.

Emergency Alarm

Either side key can be programmed with a siren alert as an emergency notification. When pressed, the siren will be sounded on both the sending and receiving radios. The siren will stop once the side key is pressed again, the sending radio is switched of or the time-out timer limit is reached.

Announce Voice Channel

As the channels are changed, a voice announces the specific channel.

This is useful when using the radio at night. Either side key can be programmed to activate / deactivate this function.

Factory programmed on English

PTT ID

Each radio can be allocated with a 15 digit ID consisting of digits 0-9 or A,B,C or D. The PTT ID recognition signal can be set per channel or the side key can be programmed to activate / deactivate it. The radio can be programmed to send the ID either at the beginning and/or end of a transmission. The PTT ID or automatic number identification (ANI) is used to connect with a repeater or telephone system, or for a control centre's communication management to identify this caller's ID using other radios equipped with a DTMF Decode function.

Begin of Tx: The radio will send out the ID first before allowing voice communication once the PTT key is pressed.

End of Tx: The radio will send out the ID at the end of a communication once the PTT key is released.

Both: The radio will send out the ID first before and after the PTT key is pressed.

LAMP

There is an LED light at the top of radio which is useful for reading pages or maps.

Side Key is Factory programmed on LAMP, long press to switch On or Off.

Scrambler

Scrambler can be set per channel or the side key can be programmed to activate / deactivate it. Scrambling technology use a coded algorithm to invert the audio signal and make it unintelligible unless the other radio also has the same descramble function. This function is used to achieve extra privacy on the same channel.

Compander

A compander can be set per channel or the side key can be programmed to activate / deactivate it. The compander will make communication more clear by improving the 'Signal to Noise Ratio' using compression and amplification technology and decrease the noise when receiving a signal.

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

Busy Channel lock out (only in dealer license version)

The transceiver can be programmed with channel lock-out. When set, this function will disable the PTT button from transmitting if there is any activity on the same frequency with a different QT/DQT tone. This prevents interference in community repeater systems.

Factory programmed on BCLO off

OPTIONAL ACCESSORIES

EXTERNAL ANTENNA KIT

A main feature on the ZA-748 radio is the detachable antenna. An external antenna can be connected to the radio and improve radio clarity and range when using the radio in a vehicle or building. Radio signal strength is reduced by metal and concrete enclosures. When the antenna is placed outside the signal propagation and clarity improves significantly. Communication range is approximately doubled when using the car external antenna. Also note that, the higher the antenna is placed, the further the range.

GE-290 car kit consists of a magnetic mount rain-proof antenna with cable and car charger.

GE-263 house kit for buildings includes an "L" bracket antenna mount with 8m cable

HEADSETS (use with PTT or VOX)

GE-291 Earphone speaker with in-line PTT microphone (single pin)

GE-220 Lapel speaker microphone for vehicle & security use (single pin)

GE-293 Spare Battery (3.7V 1250mAH)

GE-292 PC Programming cable USB (single pin)

GE-279 Vehicle DC adaptor (5V output)

LM-512 Mains adaptor (5V output)

TROUBLESHOOTING

Problem	Solution
No power.	<ul style="list-style-type: none"> 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.	<ul style="list-style-type: none"> The battery pack life is finished. Replace the battery pack with a new one.
Cannot talk to or hear other members in your group.	<ul style="list-style-type: none"> 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.	<ul style="list-style-type: none"> Change the QT/DQT. Be sure to change the tone on all transceivers in your group.
The transceiver continuously rings	<ul style="list-style-type: none"> Channel programming is empty.

SPECIFICATION

GENERAL	
Frequency Range	446MHz & 464MHz license-free, (400-470MHz licensed)
Channel Capacity	16
Frequency Spacing	25kHz/12.5kHz
Working Voltage	3.8V
Frequency Stability	±2.5ppm
Operating Temperature Range	-25°C ~ +55°C
Antenna Impedance	50Ω
Dimension excl Antenna (L×W×H)	102mm×52.5mm×32mm
Weight (including Antenna and Battery)	140g
Battery Capacity	1250mAH
Battery Operating Time Average	35 hours on 5:5:90 duty cycle
TRANSMITTER	
Output power	500mW license-free, (2W licensed)
Modulation Mode	16kΦF3E/8kΦF3E
Maximum Frequency Deviation	±5kHz/±2.5kHz
Audio Distortion	≤5%
Residual frequency modulation	-40dB /-35dB
Adjacent Channel Power	-70dB /-60dB
Spurious and Harmonic Wave	-36dBm<1GHz -30dBm>1GHz
RECEIVER	
Receiving Sensitivity	≤0.18uV/0.22uV
Adjacent Channels Selectivity	≥70dB/60dB
Intermediation	≥60dB
Spurious Response	≥70dB
SNR	≥45/40dB
Audio Output Power	0.5W
Audio Distortion	≤5%

QT FREQUENCY TABLE (50)

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

DQT CODES TABLE (104)

D023 N/I	D114 N/I	D174 N/I	D266 N/I	D411 N/I	D516 N/I	D703 N/I
D025 N/I	D115 N/I	D205 N/I	D271 N/I	D412 N/I	D523 N/I	D712 N/I
D026 N/I	D116 N/I	D212 N/I	D274 N/I	D413 N/I	D526 N/I	D723 N/I
D031 N/I	D122 N/I	D223 N/I	D306 N/I	D423 N/I	D532 N/I	D731 N/I
D032 N/I	D125 N/I	D225 N/I	D311 N/I	D431 N/I	D546 N/I	D732 N/I
D036 N/I	D131 N/I	D226 N/I	D315 N/I	D432 N/I	D565 N/I	D734 N/I
D043 N/I	D132 N/I	D243 N/I	D325 N/I	D445 N/I	D606 N/I	D743 N/I
D047 N/I	D134 N/I	D244 N/I	D331 N/I	D446 N/I	D612 N/I	D754N/I
D051 N/I	D143 N/I	D245 N/I	D332 N/I	D452 N/I	D624 N/I	
D053 N/I	D145 N/I	D246 N/I	D343 N/I	D454 N/I	D627 N/I	
D054 N/I	D152 N/I	D251 N/I	D346 N/I	D462 N/I	D631 N/I	
D065 N/I	D155 N/I	D252 N/I	D351 N/I	D464 N/I	D632 N/I	
D071 N/I	D156 N/I	D255 N/I	D356 N/I	D465 N/I	D645 N/I	
D072 N/I	D162 N/I	D261 N/I	D364 N/I	D466 N/I	D654 N/I	
D073 N/I	D165 N/I	D263 N/I	D365 N/I	D503 N/I	D662 N/I	
D074 N/I	D172 N/I	D265 N/I	D371 N/I	D506 N/I	D664 N/I	