

14x12.5cm

MD-680D

## **TO CUSTOMERS**

Thank you very much for using our Digital DMR Transceiver. This product has a newly developed, structure reasonable beautiful design and feature stable. Small appearance design for user convenience operate. Please reading carefully before you using.

Company:TYT Electronics Co.,Ltd

Address:Block 39-1,Optoelectronics-information industry base,  
Nan'an, Quanzhou, Fujian, China

# Welcome to use our company two way radio

Digital DMR Transceiver

## Main Function

Monitor

Battery save/low voltage alert

Lone work

End tone emilination

Low power prompt

PC program

Talkround

198channels

Operate in both Digital/ananalog mode

Encryption

High /Low power selectable

TOT

Chinese/English voice prompt

Busy lock

Feature Updated

QT

DQT

Single / group call

IP67 Waterproof

2time slot direct mode

2Tone/5tone signaling operation

Scrambler

Compander

Scan

CTCSS/DCS

Remote stun/active

Man down



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User's Manual

MD-680D

Using tips

Unpacking and checking equipment

Using the battery

Digital DMR Transceiver

## Using tips

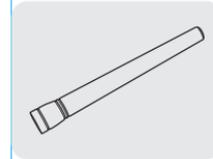
Please read the following brief instructions, non-compliance with these rules may cause danger or violate the law.

- Obey the local government regulation before using this radio, improper use may violate the law and be punished.
- Turn off the radio before entering flammable or explosive areas.
- Do not charge or change the battery in flammable or explosive areas.
- Turn off the radio before getting close to the blasting zone or detonator areas.
- Do not use radio whose antenna is damaged, touching of damaged antenna will cause heat injury.
- Do not attempt to open the radio; the maintenance work should be done by technical expert only.
- To avoid troubles caused by electromagnetic interference or electromagnetic compatibility, please turn off the radio in places where have the banner “Do not use wireless equipment”, such as hospital and other healthcare places.
- In the car with an airbag, do not put the radio within the scope of the airbag deployment.
- Do not store the radio under the direct sunshine or in hot areas.
- When you transmit with the radio, do keep away from its antenna for 5cm at least.
- If the radio appears smelly or smoke, please shut off its power immediately and contact with your local dealer.
- Do not transmit too long, for the radio may heat and hurt the user.

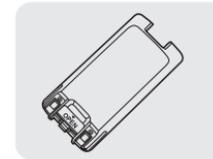
## Unpacking and checking equipment

Carefully unpack the radio. We recommend you check the items listed in the following table before discarding the package. If any items is missing or has been damaged during shipment. Please contact us immediately.

### Supplied Accessories



Antenna(1)



Li-ion battery(1)



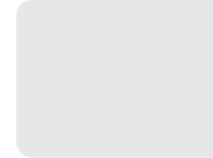
Belt clip(1)



Charger(1)



Adapter(1)



Users manual(1)



Verification(1)

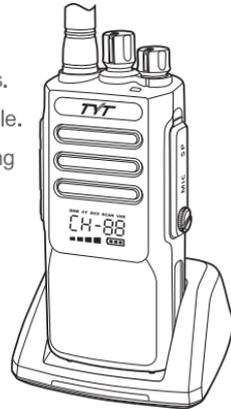
## Charging operations

Charge the battery as follow:

- Use the 110V/230V AC for charging plug.
- Insert the battery or radio with battery vertically in a charger.
- Make sure the battery and charger terminal is in good contact, when the charging indicator light turns red. Its starts charging.
- Charging around 4hours , Charging finished when the light turn green.battery or the radio will battery can be use normal .

Note:

- Before inserting the battery, it is abnormal if the charging indicator blinks.
- To change the battery for charging, please wait until the indicator is stable.
- When the battery is well inserted, the indicator turns red and the charging is on the process, If the indicator blinks. Then the battery is damaged or the temperature is too high or too low .
- Do not hold the antenna or micphone.
- Please cover the earphone jack when turn off the radio.
- Please use neutral wash solution for radio while use radios long time.



## Charging precautions

The battery is not fully charged in factory, please charge before using it . Charge and discharge the battery for two or three times. The battery capacity will reach the best condition. When the battery capacity is low , please charge or change the battery.The battery lasts shortly even If it is fully charged. The battery is exhausted, please contact your local dealer to buy a new authentic battery .

## Battery Type

Please use the factory assigned battery for charger.it maybe explode and harm to human body if use others battery .Please do not short-circuit the battery terminal or expose of in fire. Do not dissemble the battery by yourself.Charge the battery between temperature 0-45. the battery can not be fully charged beyond this temperature range.Please turn off the power when you charge the radio with battery, transmit with the radio in charge will affect its correct charge.

Do not unplug the power or battery when its charged.The operating time becomes short even the battery is fully charged, the battery is exhausted, please replace battery. Please do not charge when the battery or the radio is wet. Please dry it with a cloth before charging to avoid any danger.

## Warning

When the conductive metals such as jewelry, key or decorative chains touch the battery terminals, all the batteries are likely to cause damage to the items or personal injury. These conductive metals may from a short circuit and generates much heat.Do deal with any battery carefully, especially whenput it into pocket.wallet or other metallic containers.

# Install and uninstalling of the accessory Getting Acquainted

Digital DMR Transceiver

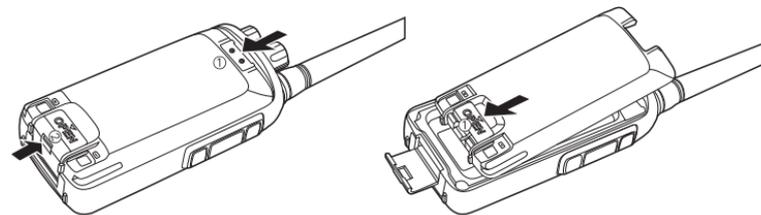
## Install and uninstalling of the accessory

### Installing / removing the battery

Align the two way radio grooves of battery and the guide rail on the back of aluminum shell.

Ensuring full contact and in parallel, then push the battery up to the radio base along the rail on the back of aluminum shell, until the battery latch locks up .

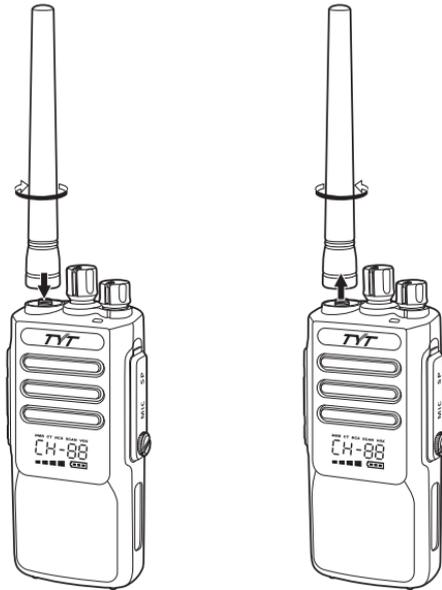
To remove the battery, please make sure the radio is closed, puch the battery latch down, and make sure the radio and battery is on the releasing state, and then puch the battery out from the radio .



## Installing and removing the antenna

Align the threaded end of antenna and the threaded hole at the top of radio. Rotate the antenna clockwise until it is tight .

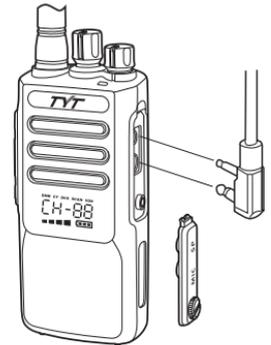
To remove the antenna, rotate it counter-clockwise until the antenna spirals out .



## Installing external headset

Reveal the mic/speaker jack cover , insert the headset into the mic/speaker jack.

Note: Please contact with your local dealer for PC programming software.



## Installing and removing the belt clip

### Installing belt clip

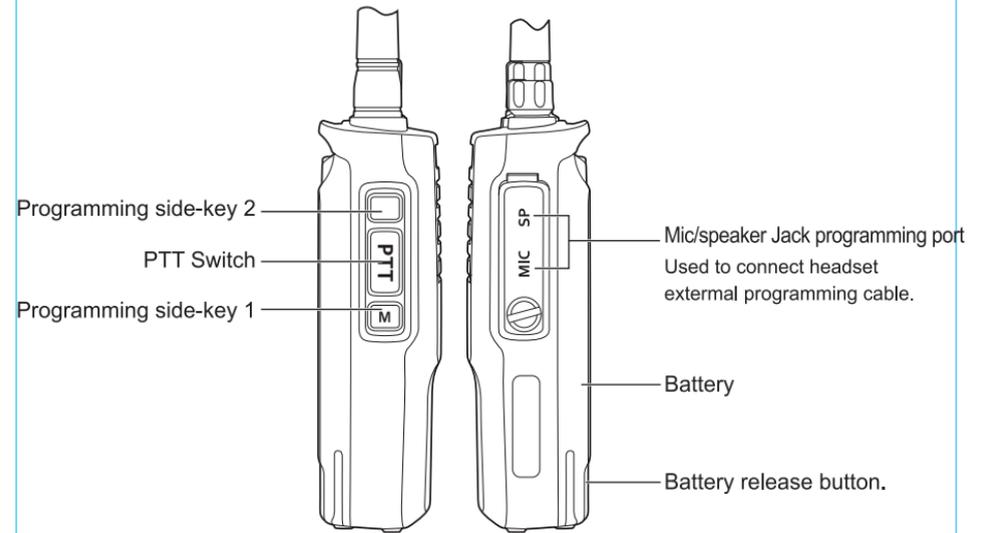
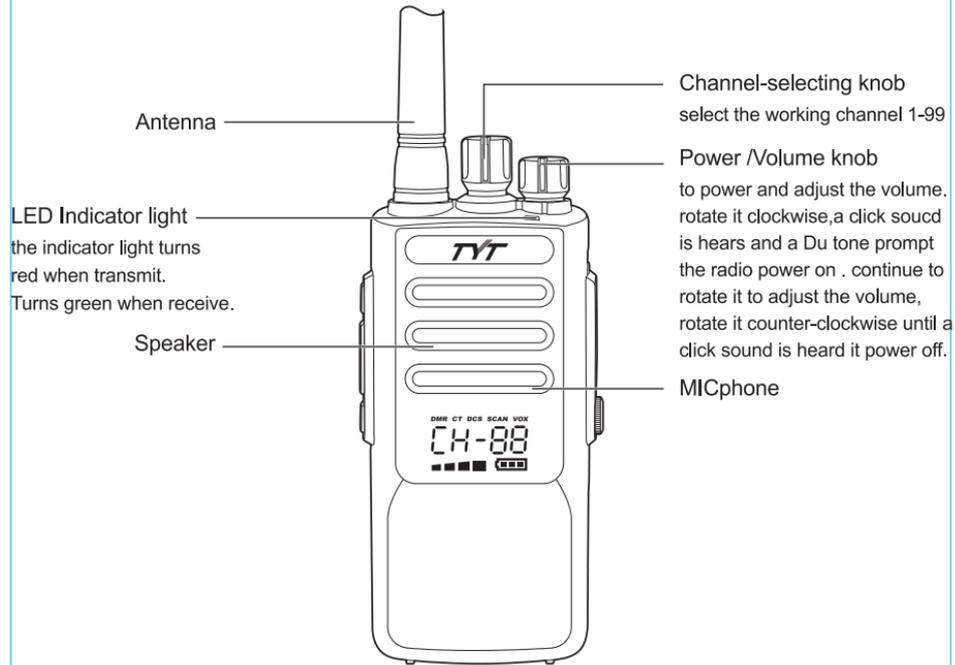
1. Remove the battery
2. Align the two holes of belt clip and the two holes of the radio, fix them with the supplied screw.

### Removing the belt clip

1. Remove the battery
2. Loosen the screw set to remove the belt clip .



## Getting Acquainted



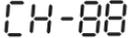
Note: Push the side key -1 and side key -2 can open the emergency call function while in emergency. But need programming the DMR radio software before using radios.

Digital Tube Character Function  
Assignment Keys  
Remote Kill/stun feature  
Font feature LED Display  
Radio Setting

Digital DMR Transceiver

Digital Tube Character Function



<b>DMR</b>	When the icon is bright, the current channel is digital channel; When the icon is not bright, the current channel is analog channel.
<b>CT</b>	When the icon is bright, the current channel is analog channel which has set the CTCSS signal.
<b>DCS</b>	When the icon is bright, the current channel is analog channel which has set the CTCSS signal.
<b>SCAN</b>	When the icon is bright, the Scan function is opened.
<b>VOX</b>	When the icon is bright, the VOX function is opened.
	The icon is means the current channel.
	Receiving radio shows 4 levels when the signal is strong; and shows 2 levels when the signal is weak.
	When the battery needs charged, the icon will flashes.

## Assignment Keys

Users can set one of the following functions into the side key 1/side key 2

1. No set
2. High/low power
3. Scan
4. Repeater/Talkaround
5. Switch Zone
6. One key 1
7. One key 2
8. One key 3
9. One key 4
10. One Key 5
11. One key 6
12. VOX
13. TX digital deviation
14. Analog Monitor
15. 1750

## Monitor

Press the side key that be programmed to the monitor, the radio will issue a squelch voice. This function can check the current channel is occupied or not before transmit. It can release anti-interference code (CTCSS/DCS) temporarily, also can receive the weak signal by this function, release the key to exit this function. (Notice: This function is invalid in digital channel.)

## One Key

Touch the side key that be programmed to the One key 1/2/3/4/5/ can transmit the correspond calling.

## VOX

Press the side key that be programmed to the VOX can choose open or close the VOX function. Speak to the microphone, it will open the transmitting and send the voice automatically; when stop speaking, the radio will stop transmitting and waiting for receiving automatically when your radio is opened the VOX function.

## Switch Zone

Press the side key that be programmed to switch zone, you can choose the different zones set by programming software, the sound of “Di” means enter the Zone 2; the sound of “Di Di” means exit the Zone 2 and enter the Zone 1.

## TX Digital Deviation

Press the side key which is programmed to radio activate to transmit detection code to detect the radio which open the detection decode.

## High/Low Power Selection

Press the side key which is programmed to high/low power can switch the high/low power.

## Repeater/Talkaround

Press the side key which is programmed repeater/talkaround can switch the repeater/talkaround. Talkaround, when use the talkaround function to communicate with handheld radio or correspond groups without repeater, the TX frequency will same as the RX frequency, the TX signal will same as RX signal.

## 1750

Please set the frequency or channel which you want to communicate with other radios by repeater, then long press the side key which is programmed 1750 to send the 1750Hz signal. Then release the side key, according to the normal way (press/release PTT key) to communication.

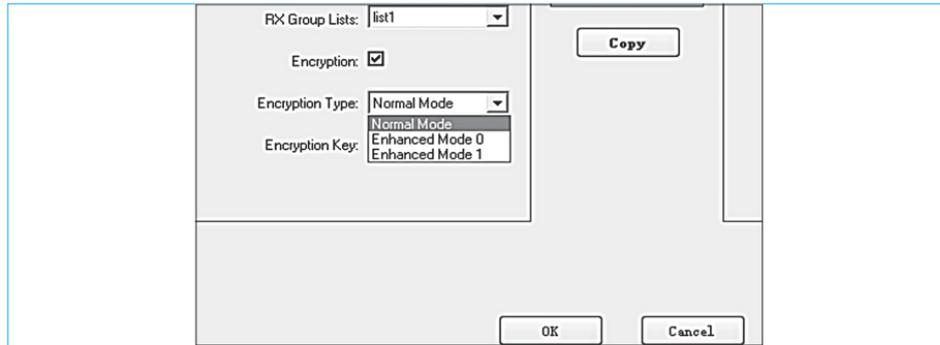
## Encryption

If you enable the feature, which is beneficial to prevent other users on the channel by using the method of software encryption for unauthorized eavesdropping, the launch of signaling and user identification part unencrypted. Your radio must be enabled on the channel encryption function. Can send encrypted even if the receiving transmission is not must request to do so.

## Basic Encryption

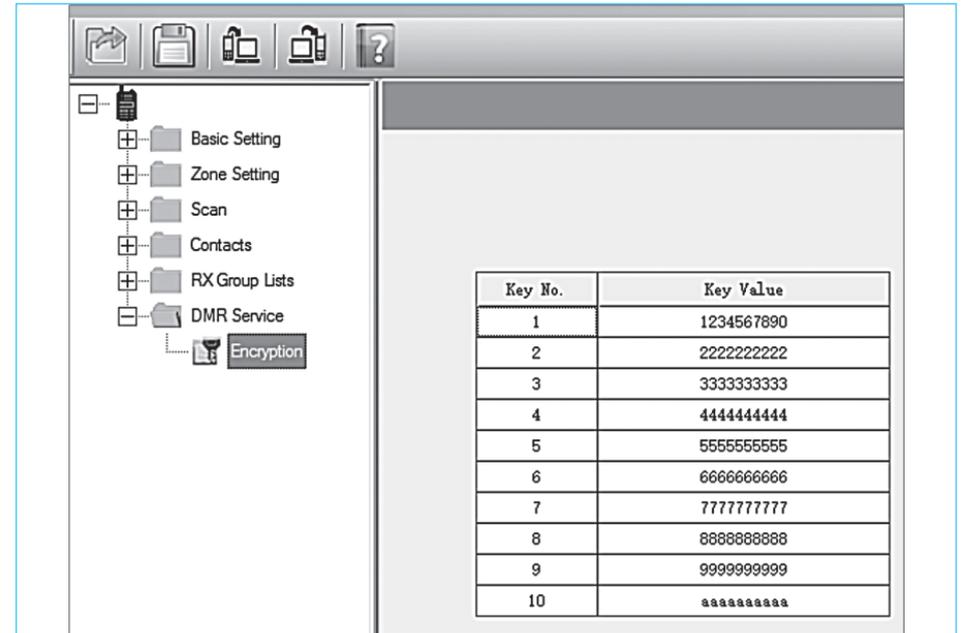
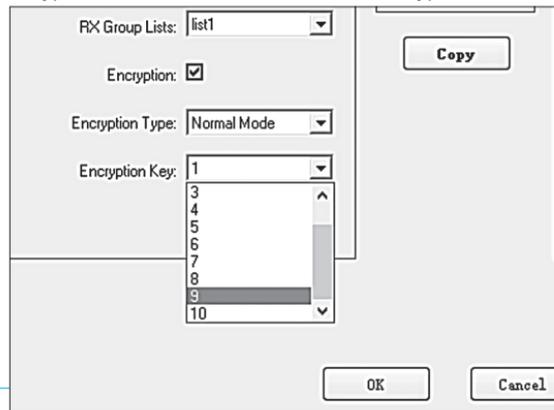
Two way radio can only be assigned more than one type of encryption, if users call for encryption or decryption of data transmission, must make to be preprogrammed walkie talkie and launch radio has the same encryption keys.

If your radio to receive different encryption keys or key values and key encryption call ID.



Press the preliminary programming encryption keys on or off.

Encryption type: If the common way can not Fit your encryption requirements, we also added two groups "enhanced encryption mode 0" and "enhance the encryption mode 1".



Encryption has 10 groups selectable, each group has top setting 10bit.

## 2-tone part

Step 1: edit the fast call list via programming software , radio can store up to 10group last calling list in total .

Step2: Input the encoding -requested A-tone , B tone and the gsp time between Atone and Btone.

The default setting is 100s.

In encoding,A tone will sound 1s while b tone will sound 3s ..but when there is only A tone in the call list as group call tone. A tone will sound 5s.Encoding only input Atone is available.Decoding group call code must same as Atone.

Step3: set the optional signal of the **DCS** to be 2 tone.

Enter programming software optional channel signaling , click the {more} after every frequency you edit. And save it to your radio.

### Make 2 tone call with the transceiver

Power on LCD display show **DCS** it will be 2tone.Then setting it on side key .Choose optional signaling setting the 2tone code , Mean send the current signal.

### 5-tone part

Click in sequence: Program - optional feature -5 tone to program 5-tone ID and 5-tone international standard group.

Edit the optional signaling be 5tone in channel edit. Auto response switch on/off.

This radio has 8groups 5-tone encoder and decoder to support the different channels.

### call/ transmit 5-tone operate

Lcd display show, choose optional signaling setting the 5 tone channel.

Setting it on side key. Choose optional signaling setting the 2 tone code, mean send the current signal.

## Remote Kill/stun feature

Remote Kill: When the radio is kill , walkie-talkie cannot receive and cannot Transmit; can not be active If you want to make it activate only can via programming software(activation method: first read the data from radio, then choose "normal" in remote kill selectable, Then write the data to the radio and click save.

Remote skun: radio only can receive but not transmit while radio remote stun. Can be active.

Using remote remote skill or stun: please make the channel optional signaling be 5 tone .

## Remote skill/stun for 2 tone And 5 tone version

A: Edit your skill code and stun code to your radio via programming software.

Skill code and stun code must be 7 bit number.

B: PTT ID has two transmit way : Transmit start, transmit finish, Push PTT start transmit. But you need Input the PTT ID code in programming software.

For example: Remote skun code: 1234567, remote skill code: 7654321, activate code: 234567. If you want to remote kill this radio, please write the PTT ID code to the programming software.Encoding the corresponding code.Choose both transmit way are available. Send 1234567 skill the radio. send the 234567 to the radio be activate. sending 7654321 to stun the radio.

## Scrambler

Edit scrambler function on every able channel via software. Scrambler is one of the method for message encrypted.Scrambler realize the transmission spectrum through cepstrum change, the purpose of the transmitter reduction after receiving signals, so as to achieve a secret.

You can choose open or close this function from side key via programming software.

## Componder

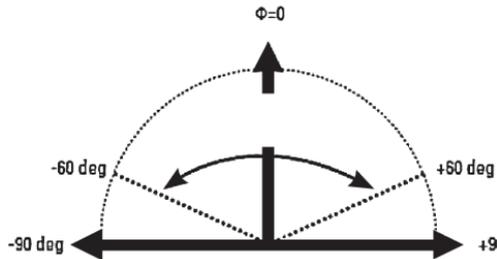
Edit compander function on every able channel via software. Voice compander technology mean that transmit the signal to receiver compander. Improve the voice quality and reduce the squelch.

Note: Only has this feature radio can be activate on communication,, Getting the high quality communicate voice.

You can choose open or close this function from side key via programming software.

## Man down

One of feature for radio. Open this function via software and save. For example (picture) while radio tilt. As - + 60degree or - + 90degree. The radio will alert and ask others user or control center for help .



## Font feature LED Display



**DMR** Light : Digital mode; close, analog mode

**CT** Light : With CTCSS/DCS in analog channels.

**DCS** Light : Means this channel has open encryption in digital mode. Open the 2/5tone, scrambler, compander in analog mode .

**SCAN** Light : Open scan feature.

**VOX** Light : Open VOX feature.

**CH-88** Light : Current Channel.

■■■■ Transceiver show: signal strong while Full. Signal weak show 2 or less bar. Also mean transceiver high output power while full. low output power will be 2 or less bar.

🔋 Please charging battery ehile this icon flash.

## Radio Setting

### QT/DQT

1. If users set the QT/DQT signal in the channel, it can ignore other radio's transmitting in the same channel.
2. If one channel has set the QT/DQT, it will open the squelch when the radio received the same QT/DQT signal. Meanwhile, other radio can receive your transmit when the radio has set QT/DQT signal same as yours.
3. This radio has 50 groups of QT and 105 groups DQT for your selection.

### Battery Save Function

When the radio do not have any operations and not receive any useful data or detect any useful carrier in a period time, the radio will enter the battery save mode. Receiving circuit and DSP enter a low power state in cycle to extend the use time of radio. Every time the radio is transmitting, according to the battery save mode settings, will send some pre carrier wave or voice head, in order to ensure that the sleep mode of the radio can be normally received. We call this time "Battery save mode delay time", which can be programmed by the programming software, ranging from 1s to 600s, the default value is 50s, users can choose whether to open the battery save mode.

### Low Battery Alarm

When the voltage is lower than 5.8V, the radio is always in a low battery state, the red light flashed every 2s, and the radio makes the "low power" alarm, remind the end user to charger or replace the battery in time.

## Communication Setting

### Analog communication

Click "Zone 1" to add the analog channel

Enter the channel setting.

channel bandwidth: 12.5K

Set the TX and RX frequency

Set the TX and RX QT/DQT

Set the RX squelch

### Set the power

Set the TX authority

Click "Zone 1" to add the digital channel

Enter the channel setting, to set the color code, only the same color code can call on digital channel.

Set TX Frequency and RX Frequency

Set the RX group list (correspond to TX Contacts)

Set the TX Contacts (Users can set the Call type: Individual Call/Group Call/All Call)

Set the TX Authority: Impolite

Set the Contact

## Contacts

Contacts only support for digital mode

Write click “ Digital Contacts”, and set the Call Type

Edit the corresponding ID

TX radio is able to select call the corresponding contacts

## RX Group Lists

RX Group Lists only support digital mode

Select the contacts from RX Group Lists for group call (For communicating with TX radio)

## Encryption

Select encryption type: Normal Mode/Enhanced Mode 0/Enhanced Mode 1

Set the key value of the corresponding key NO.

Enter the [Zone1], select digital channel, enter [RX Setting], click the Encryption

Select one encryption key

Only the same encryption ket can communication

Frequency table  
Specifications  
Troubleshooting guide  
Guarantee

CTCSS

CTCSS			
1-67.0	14-103.5	27-159.8	40-199.5
2-69.3	15-107.2	28-162.2	41-203.5
3-71.9	16-110.9	29-165.5	42-206.5
4-74.4	17-114.8	30-167.9	43-210.7
6-79.7	19-123.0	32-173.8	45-225.7
7-82.5	20-127.3	33-177.3	46-229.1
8-85.4	21-131.8	34-179.9	47-233.6
9-88.5	22-136.5	35-183.5	48-241.8
10-91.5	23-141.5	36-186.2	49-250.3
11-94.8	24-146.2	37-189.9	50-254.1
12-97.4	25-151.4	38-192.8	
13-100.0	26-156.7	39-196.6	

DCS

DCS								
023	071	143	225	266	356	452	532	664
025	072	145	226	271	364	454	546	703
026	073	152	243	274	365	455	565	712
031	074	155	244	306	371	462	606	723
032	114	156	245	311	411	464	612	731
036	115	162	246	315	412	465	624	732
043	116	165	251	325	413	466	627	734
047	122	172	252	331	423	503	631	743
051	125	174	255	332	431	506	632	754
053	131	205	261	343	432	516	645	
054	132	212	263	346	445	523	654	
065	134	223	265	351	446	526	662	

## Specifications

### Main technical indicators

Frequency range	400-480MHZ
Channel	198
Operating Voltage	7.4v
Operating Temperature	-30°C+40°C
Antenna Impedence	50Ω
Store temperature	-40°C+65°C

### Receiver

Analog sensibility	0.35uV/-116dbm(20db SINDA) 0.22uv/-120dbm(type)
Digital Sensibility	0.3uV/-117.4dbm(BER5%) 0.22uv/-110dbm(BER1%)
Channel spacing	12.5KHz
Frequency stability	+/-1.0ppm
intermodulation	TIA603C:65DB ETSI65DB
Adjacent channel selectivity	TIA603C:60DB@12.5KHZ ETSI60DB@12.5KHZ
Co-channel Rejection	12DB@12.5KHZ
Spurious response	TIA603C:70DB ETSI70DB MAIL TO 60DB@12.5KHZ

Spurious Radiation	<-57DBM@1GHZ >-47DBM@1GHZ
Block	84db
Audio power	1w
Audio response	+1db - - 3db
Rated audio distortion	<=3%

### Transmitter

Channel spacing	12.5KHZ
Frequency stability	+/-1.5PPM
Output power	Low: 4 w high : 10w
Hum and Noise	-40DB@12.5KHZ
Receive Spurious Radiation	<-36DBM@1GHZ >-30DBM@1GHZ
Adjacent channel power	-60DBM@12.5KHZ
FM Modulation Mode	12.5KHZ:11F0F3E
4FSK Digital Mode	12.5KHZ(DATE ONLY):7K60FXD 12.5KHZ(DATE +VOICE):7K60FXE
Modulation Maximum Deviation	2.5KHZ@12.5KH
Audio response	+1DB - -3DB
Modilation BER	<=3%
Digital protocol	ETSI TS 102 361-1-2-3
Vocoder type	AMBE+2TM

Note: specifications will be revised without notice due to technical improvement. Thank you !

## Trouble shooting guide

Troubles	Solution
No Electrical Source	<ul style="list-style-type: none"> <li>● The battery has been exhausted. Replace or recharge the battery.</li> <li>● The battery is installed incorrectly. Remove it and install again.</li> </ul>
The operating time becomes short, even the battery is fully charged.	<ul style="list-style-type: none"> <li>● Replace the battery.</li> </ul>
Not able to communicate with the transceivers of the same group.	<ul style="list-style-type: none"> <li>● Confirm the QT/DQT is the same. The distance is outside of range.</li> </ul>
The voice of another group can be heard.	<ul style="list-style-type: none"> <li>● Change all QT/DQT of the group.</li> </ul>
Other radios can not receive the TX signals or receive signals in a low volume.	<ul style="list-style-type: none"> <li>● Switch the volume knob to the highest level</li> <li>● The microphone may be damaged, send it to the local dealer for check.</li> </ul>
Noise is always heard.	<ul style="list-style-type: none"> <li>● The distance is outside of range. Turn on the radio in nearer range and try again.</li> </ul>

## Warranty card

### Note:

1. This warranty card is only applicable to two-way radio of the above-listed model and serial number.
2. The warranty card is an important document for the end-user to enjoy warranty service, please keep it well.
3. The warranty card shall be filled and chopped by the dealer, or it is invalid.

Customer's name: \_\_\_\_\_

Gender: \_\_\_\_\_

Add and postal code: \_\_\_\_\_

Customer's Tel: \_\_\_\_\_

Model: \_\_\_\_\_

Serial number: \_\_\_\_\_

Purchasing date: \_\_\_\_\_

Invoice No.: \_\_\_\_\_

Dealer: \_\_\_\_\_

Stamp: \_\_\_\_\_

Add and postal code of the dealer: \_\_\_\_\_

Contact Tel: \_\_\_\_\_

Handling people: \_\_\_\_\_

Thank you for buying two-way radios, we will do our best to provide you with a stable, clear and efficient wireless communication services. In order for you to enjoy a better quality warranty service, please focus on the following information:

The products warranty period begins from the purchasing date, if product failure under normal use within warranty period occurs, according to the contents of this warranty, (the radio is guaranteed for 12 months, accessories 6 months), please carry the warranty card originals and purchase invoice to designated authorized warranty repair station for warranty service.

The following situations occur during warranty period will be implemented in paid service:

- (1) Failure to produce the warranty card
- (2) The card has altered traces or inconsistent with the product
- (3) Defect or damage caused by abnormal or non-normal use
- (4) Defect or damage caused by misuse, accident, water or negligence
- (5) Defect or damage caused by improper testing, operation, maintenance, installation, disassembly or adjustment
- (6) Defect or damage caused by unauthorized repair or disassembly
- (7) Defect or damage caused by force majeure
- (8) Wear and tear under normal use

When you are in need of repair, please send the radio, warranty card and purchase invoice together by post or take directly to designated authorized service stations, shipping costs should be borne by the user.

## Maintenance record

Carry-in date			
Completion date			
Fault description			
Maintenance staff numbers			
Maintenance personnel No.			
Signature			

This warranty card to be kept by the user, no replenishment if lost

## SAFETY TRAINING INFORMATION



our TYT Electronics Co., Ltd. radio generators RF electromagnetic during transmit mode. This radio is designed for and classified as "Occupational Use Only", meaning it must be used only during the course of employment by individuals aware of the hazards, and the ways To Minimize Such hazards. This radio is NOT intended for use by the "General Population" in an uncontrolled environment. This radio has been tested and complies with the FCC RF exposure limits for "Occupational Use Only". In addition, our TYT Electronics Co., Ltd radio complies with the following Standards and Guidelines with regard to RF energy and electromagnetic energy levels and evaluation of such levels for exposure to humans:

- IEEE Std. 1528:2013 and KDB447498, Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields.
- American National Standards Institute (C95.1-1992), IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.
- American National Standards Institute (C95.3-1992), IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields- RF and Microwave.



The information listed above provides the user with the information needed to make him or her aware of RF exposure, and what to do to assure that this radio operates with the FCC RF exposure limits of this radio.

## Electromagnetic Interference/Compatibility

During transmissions, TYT Electronics Co., Ltd. radio generates RF energy that can possibly cause interference with other devices or systems. To avoid such interference, turn off the radio in areas where signs are posted to do so. DO NOT operate the transmitter in areas that are sensitive to electromagnetic radiation such as hospitals, aircraft, and blasting sites.

## Occupational/Controlled Use

The radio transmitter is used in situations in which persons are exposed as consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure.

## Attention:

This radio complies with IEEE and ICNIRP exposure limits for occupational/controlled RF exposure environment at operating duty factors of up to 50% and is authorized by the FCC for occupational use only. An appropriate warning label is affixed to all units. In order to comply with RF exposure requirements, a minimum distance of 2.5cm must be maintained when held-to-face, and body-worn operations are restricted to the approved original accessories (belt clip). Do not use this device when antenna shows obvious damages

This product is compliance to FCC RF Exposure requirements and refers to FCC website <https://apps.fcc.gov/oetcf/eas/reports/GenericSearch.cfm> search for (Model:MD-680 &MD-680D FCC ID: POD-DMR5 ) to gain further information include SAR Values.

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