Contents

Content

- **1 transceiver**
- **1 antenna**
- **1 battery pack**
- **1 belt clip**
- **1 fast desktop charger**
- **User manual**

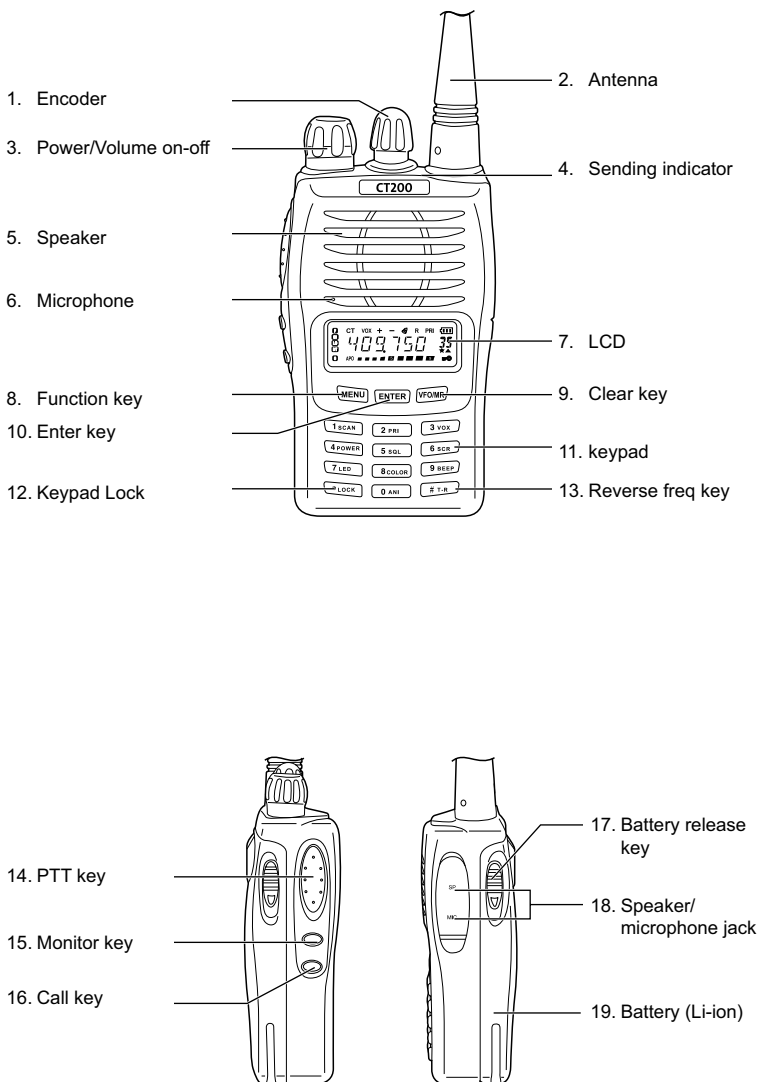If any items are missing, contact your dealer.

Maintenance

Your Two Way Radio is an electronic product of exact design and should be treated with care .The suggestions below will help you to fulfill any warranty obligations and to enjoy this product for many years.
- Do not attempt to open the unit. Non-expert handling of the unit may damage it.
- When using regulated power supply, take notice of power voltage that must be between 6V and 8V to avoid damaging the unit.
- Do not store the Radio under the sunshine or in hot areas.
- High temperatures can shorten the life of electronic devices, and warp or melt certain plastics.
- Do not store the radio in dusty, dirty areas
- Keep the Radio dry. Rainwater or damp will corrode electronic circuits.
- If it appears that the Radio diffuses peculiar smell or smoke, please shut off its power immediately and take off the charger or battery from the Radio.
- Do not transmit without antenna.

Features

- 4W Output power (VHF/UHF)
- 128 groups of memory channels
- 25KHz/12.5KHz Channel spacing compatible
- Automatic Numbering Identification (ANI) code
- Built-in VOX function
- All channels scan and priority channel scan
- Scrambler
- LCD backlight adjustable in 3 different colours
- Emergency alarm
- 50 CTCSS and 104 DCS Normal/Inverted selectable
- Time-out Timer (TOT)
- Busy channel lockout

Main indicators/controls

1. Encoder

3. Power/Volume on-off

5. Speaker

6. Microphone

8. Function key

10. Enter key

12. Keypad Lock

2. Antenna

4. Sending indicator

7. LCD

9. Clear key

11. keypad

13. Reverse freq key

14. PTT key

15. Monitor key

16. Call key

17. Battery release key

18. Speaker/ microphone jack

19. Battery (Li-ion)

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Main indicators/controls - description

Power/volume on-off	To turn on/off the radio and adjust the volume level.
Sending indicator	Press the **PTT** is pressed, it glows to indicate the transmitting status.
Busy indicator	When the channel is busy, the display shows ▬▬▬◢⑤■■■ ⑨
PTT key	When pressed, it enables the transmission.
MONI (monitor) key	Hold down this key in receiving mode: the channel in use will be monitored. The busy channel indicator will glow.
Call key	To call your partner
VFO/MR	To exit the menu and to switch from VFO to Memory mode.

Socket and connector

SMA Connector	For connecting the supplied antenna
Speaker/microphone jack	If you want to use a speaker or a microphone, connect them to this socket. If not, prevent water from dropping into it.

LCD display

Many icons are shown on the display when the radio is on. The following table can help you to identify each of them.
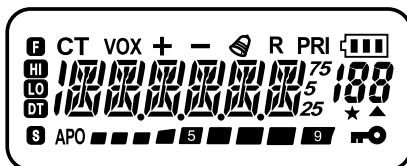
🔋	Battery level indicator
+/-	Shows the TX offset direction in relation to the RX frequency
HI / LO	Power level indicator (HI=High/LO=Low)
S	Frequency scanning indication
⚷	Keypad lock
DT	Displays when DCS is turned on
CT	CTCSS turned on
VOX	VOX turned on
✍	Call Function
R	Display reverse frequency
PRI	Priority scan activated
▪▪▪▪▪5▪▪▪▪9	Received signal strength and TX power
频频频频频	Frequency in use
188	Function menu
▲	The scan finds a signal(open squelch)

Basic operations

Supplied antenna
Insert the base of the supplied antenna into the SMA connector and rotate it clockwise. Make sure the antenna has set down. Take out the antenna from the base by rotating it counter-clockwise rotation.

Turn on and off the power
If you want to turn on the power, rotate the **PWR/VOL** knob clockwise until a beep is heard. All icons and frequencies appear on the screen. You can adjust your desired volume by turning the knob.
To turn off the power, rotate the **PWR/VOL** knob counter-clockwise rotation. All the icons on the display will disappear and the radio is off.

Adjusting volume
After turning on the radio, rotate the **PWR/VOL** knob clockwise to increase the volume and counter -clockwise to decrease.

Transmitting/Receiving
Firstly, hold down briefly the **MONI** button to make sure that the frequency is not busy and then press the **PTT**. Speak 4/10cm far from the unit.
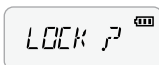The TX indicator lights up.
Release the **PTT** key to receive.

Emergency Alarm
Hold down the **CALL** key for 1 second and press **MONI**: the radio will switch to emergency alarm.

Repeater tone
When you press any key, a note at 1750Hz is generated.
It gives the possibility to link to repeaters.

LOCK ♪

UNLOCK

Keypad Lock
To Lock or unlock the buttons.
In channel/Frequency mode, press and hold down the ✱LOCK key for two seconds. The keypad will lock. Repeat the same procedure to unlock it.

Setting Reverse Frequency Function

This function is possible only when you are linked to a repeater: it permits to invert the TX frequency with the RX frequency. In Channel/Frequency mode, hold down `# T-R` for two seconds until *"R"* appears on the display. Repeat the same procedure to return to the previous frequency setting.
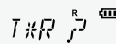
Scanning

The Scan version is very useful to monitor the channels before transmitting.

1. Scan all the channels

In Channel/Frequency status, press `MENU`, `1 SCAN`, `ENTER` and `1 SCAN`, `ENTER`: the radio will scan from the channel in use through all the channels. Whenever any activity is detected, the radio will suspend the scan for 5 seconds. It will then continue to scan unless you press **PTT** or `ENTER` key to end scanning.

2. Priority channel scan

In Frequency Mode, press `MENU`, `1 SCAN`, `ENTER` and `2 PRI` `ENTER`. The radio will scan from the current frequency through all the frequency range within 1MHz. Whenever any activity is detected, the radio will suspend the scan for 5 seconds. It will then continue to scan unless you press the **PTT** or `ENTER` key to end scanning.

Select scan type

In Frequency mode, press `MENU` and rotate the **Encoder** until the display shows "*SCAN 13*". Press `ENTER` and turn the **Encoder** knob again to select the scan type (TO/CO/SE). Confirm your selection with `ENTER` and exit by pressing `VFO/MR` twice.

TO: Time-operated scan

Even though the radio stops on a busy channel, it will continue scanning the other channels.

CO: Carrier-operated scan

The radio stops on a busy channel until there is no activity, and then radio begins scanning the other channels.
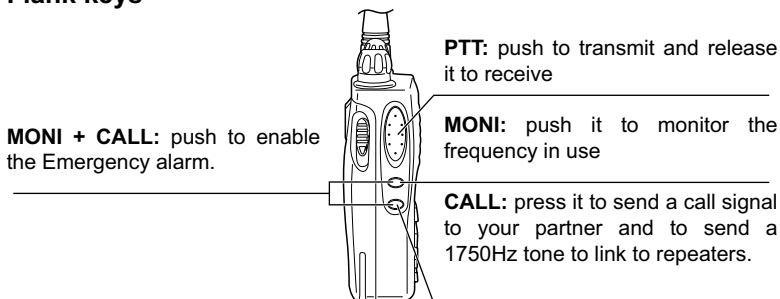
SE: Search scan

The radio stops on a busy channel and exits the Scan mode.

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DTMF Code
In Channel/Frequency mode, press **PTT** and digit a number on the keypad.

MENU ➝ A   VFO/MR ➝ C

ENTER ➝ B   CALL ➝ D

Flank keys

MONI + CALL: push to enable the Emergency alarm.

PTT: push to transmit and release it to receive

MONI: push it to monitor the frequency in use

CALL: press it to send a call signal to your partner and to send a 1750Hz tone to link to repeaters.

Select Mode

Hold down ENTER and turn on the power: the radio can switch between the Channel and Frequency mode. Repeat the procedure to pass to the other mode.
In Frequency mode, press VFO/MR to switch between the Frequency mode and Channel+Frequency mode.

To store a frequency

To store a frequency and its settings (CTCSS,DCS, SHIFT REPEATERS etc) follow the procedure below:
1. at first, choose all the settings to store,
2. press the MENU button,
3. then, push VFO/MR,
4. rotate the **Encoder** knob and select the memory number where you want to store the frequency and its settings.
5. confirm your selection by pressing VFO/MR.
(**note:** a triangle displayed underneath the channel number indicates that it has already been stored).

Delete a memory

1.Delete one stored channel

In [VFO/MR] Mode turn off the power.

Hold down the [VFO/MR] key and turn on the unit. *"DEL?"* and the stored channel number will be displayed. Turn the **Encoder** knob or select the channel to delete. Push [ENTER] until *"YES?"* appears on the display; push it again to confirm.

2. Reset (Delete all the settings in Frequency mode)

Hold down the [MENU] button and turn on the unit until *"RESET?"* is displayed. Press [ENTER] until *"VFO?"* is shown on the display; push it again for confirmation.

3. Delete all settings

Hold down [MENU] and turn on the unit until *"VFO?"* is shown on the display. Turn the Encoder knob to select *"FULL?"*, then press [ENTER] to delete all the settings in Frequency and VFO modes.

`VOXOFF`

Advanced Operations

Selecting the VOX sensitivity level

The VOX function is deactivated by default. To activate it follow the procedure here below:
1. press the **MENU** button;
2. turn the **Encoder** knob until the display shows **'VOX'** (menu 03);
3. push the **ENTER** key;
4. turn again the **Encoder** knob and select the desired VOX level (you can choose amongst 9 different levels);
5. push the **ENTER** key again;
6. to exit, press twice **VFO/MR**.

To activate and select rapidly the VOX function, you can do it also by operating on the fast menu: press the **MENU** key and then **3 VOX** and follow the procedure above described starting from point 3.
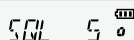
Setting the transmission power

`POW  L`

To select the desired power level:
1. press the **MENU** button;
2. turn the **Encoder** knob until **'POW'** (menu 04) is displayed
3. push **ENTER**;
4. turn the **Encoder** knob and select the desired power level (you can choose between 2 levels: **'H'** ed **'L'**);

`POW  H`

5. press **ENTER**;
6. press twice the **VFO/MR** knob to exit.

To activate and select rapidly the power level, you can also use the fast menu: press the **MENU** key and then **4 POWER** and follow the procedure above described starting from point 3.

Setting squelch

`SQL  5`

To select the squelch level:
1. press the **MENU** button;
2. turn the **Encoder** knob until **'SQL'** (menu 05) is displayed
3. push **ENTER**;
4. turn the **Encoder** knob and select the desired squelch level (9 different levels are available);
5. press **ENTER**;
6. press twice the **VFO/MR** knob to exit.

To activate and select rapidly the squelch level, you can also use the fast menu: press the **MENU** key and then **5 SQL** and follow the procedure above described starting from point 3.

Scrambler on/off
To activate the scrambler, follow this procedure:
1. press the **MENU** button;
2. turn the **Encoder** knob until *'SCRM'* (menu 06) is displayed
3. push **ENTER**;
4. turn the **Encoder** knob and activate/deactivate the scrambler (ON = activated; OFF = deactivated);
5. press **ENTER**;
6. press twice the **VFO/MR** knob to exit.

To activate/deactivate rapidly this function, you can also use the fast menu: press the **MENU** key and then **6 SCR** and follow the procedure above described starting from point 3.

Backlight on/off
To select the LCD backlight:
1. press the **MENU** button;
2. turn the **Encoder** knob until *'LED'* (menu 07) is displayed
3. push **ENTER**;
4. turn the **Encoder** knob and activate/deactivate the function: 3 different options are available (AUTO, ON, OFF);
5. press **ENTER**;
6. press twice the **VFO/MR** knob to exit.

To activate/deactivate rapidly the backlight, you can also use the fast menu: press the **MENU** key and then **7 LED** and follow the procedure above described starting from point 3.

Select the backlight colour
To select the backlight colour:
1. press the **MENU** button;
2. turn the **Encoder** knob until *'LIGHT'* (menu 08) is displayed
3. push **ENTER**;
4. turn the **Encoder** knob and choose the desired colour (3 different colours are available);
5. press **ENTER**;
6. press twice the **VFO/MR** knob to exit.

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To select it rapidly, you can also use the fast menu: press the **MENU** key and then **8 COLOR** and follow the procedure above described starting from point 3.

Beep on/off

The keypad beep is activated by default. To deactivate it:

1. press the **MENU** button;
2. turn the **Encoder** knob until *'BEEP'* (menu 09) is displayed
3. push **ENTER**;
4. turn the **Encoder** knob and activate/deactivate the beep (ON = beep enabled; OFF = beep disabled);
5. press **ENTER**;
6. press twice the **VFO/MR** knob to exit.
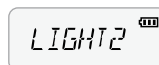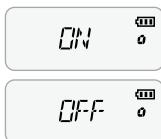
To activate/deactivate the keypad beep, you can use the fast menu: press the **MENU** key and then **9 BEEP** and follow the procedure above described starting from point 3.

Automatic Numbering Identification (ANI) on/off

You can set an automatic number identifier visible from the radio's display of your partner each time you send a call signal. To activate this function:

1. press the **MENU** button;
2. turn the **Encoder** knob until *'ANI'* (menu 10) is displayed;
3. press **ENTER**;
4. rotate the **Encoder** knob and activate/deactivate the function. ON = activated, OFF = deactivated;
5. push **ENTER** again;
6. press twice **VFO/MR** to exit.

To activate/deactivate the keypad beep, you can also use the fast menu: press the **MENU** key and then **0 ANI** and follow the procedure above described starting from point 3.

Repeater shift (for communications through repeaters)

To select this function, follow these steps:

1. press the **MENU** button;
2. rotate the **Encoder** knob until *'S-D'* (menu 19) is displayed;
3. press **ENTER**;
4. turn the **Encoder** knob and select the repeater shift. You can choose amongst the following options **+, - and 0**;
5. press **ENTER** again;

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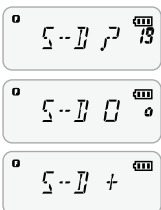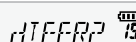
6. press twice [VFO/MR] to exit

To select the repeater shift you can use the fast menu: press the [MENU] key and then [*LOCK] and follow the procedure above described starting from point 3.
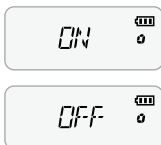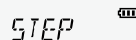
Repeater shift adjustment
(for communications through repeaters)

1. press the [MENU] button;
2. turn the **Encoder** knob until *'DIFFR'* (menu 15) is displayed
3. push [ENTER];
4. turn the **Encoder** knob and select the repeater shift. You can also enable it by digiting the frequency directly on the keypad.
5. press [ENTER];

dIFFR? 15

Select the frequency step

1. press the [MENU] button;
2. turn the **Encoder** knob until *'STEP'* (menu 20) is displayed
3. push [ENTER];
4. turn the **Encoder** knob and select the desired frequency step. You can choose amongst: 5 KHz, 10 KHz, 6.25 KHz, 12.5 KHz and 25 KHz;
5. press twice the [VFO/MR] knob to exit

STEP

Select the CTCSS and DCS tones

To select a CTCSS tone

1. press the [MENU] button;
2. turn the **Encoder** knob until *'C-CDC'* (menu 16) is displayed
3. push [ENTER];
4. turn the **Encoder** knob and select the desired subaudio tone;
5. press [ENTER] to confirm.

To select a DCS tone:

1. select *'C-CDC'* (menu 16) either with the **Encoder** knob or with the fast access;
2. Press [ENTER]
3. Press the [*LOCK] button;
4. turn the **Encoder** knob and select the desired DCS level;

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5. press ENTER again for confirmation.

While selecting the DCS codes, if you press # T·R, you will select the normal (N) or inverted (I) DCS codes.

Voice function (only in English)

With this function, you activate a voice that informs about any operation/selection you are doing. To activate it, follow these steps:

`VOICE? 14`
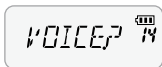
1. press the MENU button;
2. turn the **Encoder** knob until *'VOICE'* (menu 14) is displayed;
3. push ENTER;
4. turn the **Encoder** knob and activate/deactivate the function. (ON = enabled; OFF = disabled);
5. Push ENTER again;
6. press twice the VFO/MR knob to exit.

Menu Operation

To operate with all the parts/settings of the menu, you have to follow these general steps:

1 Press the **MENU** button.
2 Turn the **Encoder** knob to select the desired menu.
3 Press **ENTER** and turn the **Encoder** knob to choose the desired setting.
4 Press **ENTER** to confirm.

Voice	Menu		Selection	Operation
scanning all the channels	SCAN? 01	ENTER	Scan entire channel	Press **ENTER** to exit scan Press any key to return
scanning within 1 MHz	PRI? 02	ENTER	Priority channel scan	SAME AS ABOVE
VOX activation and sensitivity	VOX? 03	ENTER	OFF-9	Turn encoder to select Press **ENTER** to confirm Press **VFO/MR** to exit
power level selection	POW? 04	ENTER	H/L	SAME AS ABOVE
squelch selection	SQL? 05	ENTER	0-9	SAME AS ABOVE
scrambler activation/ deactivation	SCRM? 06	ENTER	ON/OFF	SAME AS ABOVE
Backlight	LED? 07	ENTER	ON/OFF/AUTO	SAME AS ABOVE
colour of the LCD backlight	LIGHT? 08	ENTER	1/2/3	SAME AS ABOVE
keypad beep	BEEP? 09	ENTER	ON/OFF	SAME AS ABOVE
automatic number identifier	ANI? 10	ENTER	ON/OFF	SAME AS ABOVE
keypad lock	KEYBO? 11	ENTER	MANUAL/AUT	SAME AS ABOVE

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time out transmission	TOT? 12	ENTER	OFF-270	SAME AS ABOVE Turn encoder to select
type of scanning	SCANS?13	ENTER	TO/CO/SE	Press ENTER to confirm Press twice VFO/MR to exit
voice function activation	VOICE?14	ENTER	ON/OFF	Turn encoder to select Press ENTER to confirm Press VFO/MR to exit
shift repeater	DIFFR? 15	ENTER	0-70.995	Input frequency or turn encoder Press ENTER to confirm Press VFO/MR to exit
ctcss/dcs rx/tx	C-CDC? 16	ENTER	See CTCSS chart	SAME AS ABOVE
ctcss/dcs only rx	R-CDC? 17	ENTER	See CTCSS chart	Turn Encoder to select Press ENTER to confirm
ctcss/dcs only rx	T-CDC? 18	ENTER	See CTCSS chart	SAME AS ABOVE
+ / - shift	S-d? 19	ENTER	+/-/cancel	Turn encoder to select Press ENTER to confirm Press VFO/MR to exit
frequency step selection	STEP? 20	ENTER	5k/10k/6.25k/ 12.5k/25k	SAME AS ABOVE
wide/narrow band selection	N/W ? 21	ENTER	Wide Narrow	SAME AS ABOVE
Exit	VFO/MR			

Note: parts from 16 to 21 are available only in Frequency mode.
In Channel mode only parts from 1 to 15 are active.
To pass rapidly from Frequency to Channel mode or vice versa, switch on the unit
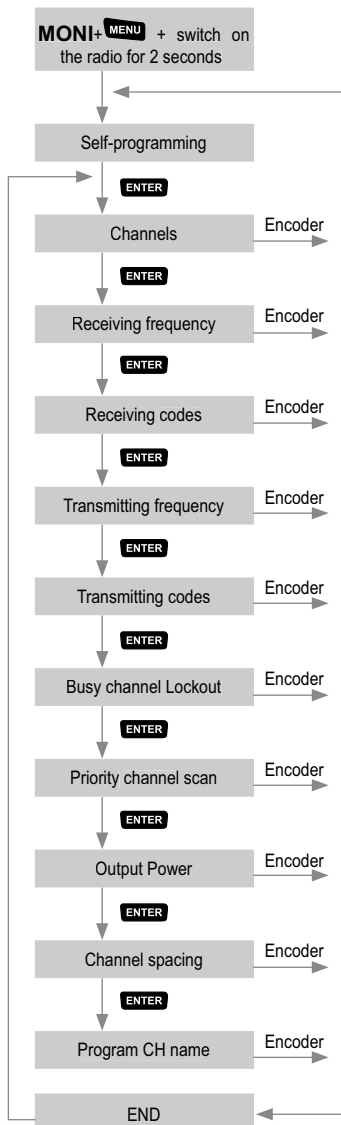and hold down the ENTER button.

NAME	ON/OFF	Turn encoder to select Press ENTER to confirm Press VFO/MR to exit

Self-Programming mode

To enter in Self-Programming mode, follow these steps:

1. while turning on the unit, hold down 'MONI' and MENU until 'SELF' is displayed;
2. press ENTER;
3. turn the Encoder knob and select the memory number to program;
4. push ENTER again;
5. digit the desired rx frequency;
6. press ENTER;
7. press *LOCK and with the Encoder knob select the desired CTCSS in RX (if you press it again, you can select a DCS code);
8. press ENTER;
9. digit the desired tx frequency;
10. push ENTER;
11. press *LOCK and with the Encoder knob select the desired CTCSS in TX (if you press it again, you can select a DCS code);
12. press ENTER;
13. with the Encoder knob, enable/disable the busy channel lockout (you can choose: OFF, 1 carrier, 2 CTCSS/DCS);
14. press ENTER;
15. by turning the Encoder knob, you can enable/disable the priority channel scanning;
16. press ENTER;
17. turn the Encoder knob and select the power level in tx H (high) or L (low);
18. press ENTER;
19. turn the Encoder knob and select the transmission mode: WIDE or NARROW;
20. push ENTER;
21. rotate the Encoder knob and select the first letter for the name of the programmed channel. To switch to the next channel, push the # T-R button and turn the Encoder knob;
22. press ENTER;
23. switch off the unit to finish the programming procedure and return to the standard modality.

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Self-programming chart

MONI+ **MENU** + switch on
the radio for 2 seconds

Display example

Self-programming

```
SELF          [▭]
```

ENTER

Channels | Encoder

```
CH--001   1
```
Select channel 1 to 128

ENTER

Receiving frequency | Encoder

```
450000   2
```
Select receiving frequency

ENTER

Receiving codes | Encoder

```
. . . .   2
```
Select CTCSS / DCS
Press *LOCK to switch

ENTER

Transmitting frequency | Encoder

```
450000   4
```
Select transmitting frequency

ENTER

Transmitting codes | Encoder

```
CT
   670   3
```
Select CTCSS / DCS
Press *LOCK to switch

ENTER

Busy channel Lockout | Encoder

```
CT
   OFF   3
```
OFF: close
1. Carrier
2.CTCSS/DCS

ENTER

Priority channel scan | Encoder

```
Add   7
```
Add: Add priority - Channel scan
Del: Delete priority
Channel scan

ENTER

Output Power | Encoder

```
H   8
```
H: High power
L: Low power

ENTER

Channel spacing | Encoder

```
N  W   9
```
WIDE: 25KHz
NARROW: 12.5KHz

ENTER

Program CH name | Encoder

```
ABC 123  10
```
Press **ENTER** to confirm and switch
to the next channel

END

Technical specifications

General

Frequency Range	CT200: 144-146MHz; CT400: 430-440MHz
Working Temperate	-20°-+50°
Operating Voltage	DC 7.4V
Operate Mode	Simplex or Semi-duplex
Dimension	100mm×58mm×33mm (Antenna excluded)
Weight	203g (Including battery)
Antenna impedance	50Ω
Duty cycle	5/5/90

Transmitter

Frequency Stability	±2.5PPM
Output Power	≤4W
Max Frequency Deviation	≥5KHz
Audio Distortion	≤3%
Adjacent Channel Power	Within European legal terms
Spurious Radiation	Within European legal terms
Occupied Bandwidth	Within European legal terms

Receiver

RF Sensitivity	<0.2μV
Audio Distortion	≤3%
Audio Response	300Hz ÷ 3KHz
Adjacent Channel Selectivity	Within European legal terms
Intermodulation Rejection	Within European legal terms
Spurious Response	Within European legal terms
Blocking	Within European legal terms

Troubleshooting guide

Problem	Solution
No Power	The battery pack may be dead. Recharge or replace it.
	The battery pack may not be installed correctly. Remove it 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	Make sure you are using the same frequency and CTCSS/DCS tone as the other members in your group.
	Other group members may be too far away. Make sure you are within the range of the other radios.
Other voices (besides group members) are present on the channel.	Change the CTCSS/DCS tone.
	Be sure to change the tone on all radios in your group.