



OPERATING GUIDE

PMR446 TRANSCEIVER

IC-U20SR

INTRODUCTION

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2 BASIC OPERATION

3 ADVANCED OPERATION

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5 OTHER FUNCTION

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INTRODUCTION

Thank you for choosing this Icom product. This product was designed and built with Icom's state of the art technology and craftsmanship. With proper care, this product should provide you with years of trouble-free operation.

IMPORTANT

FIRST, CAREFULLY READ INSTRUCTIONS that is provided with the transceiver.

READ ALL INSTRUCTIONS carefully and completely before using the transceiver.

SAVE THIS OPERATING GUIDE— This operating guide contains additional important operating instructions for the IC-U20SR.

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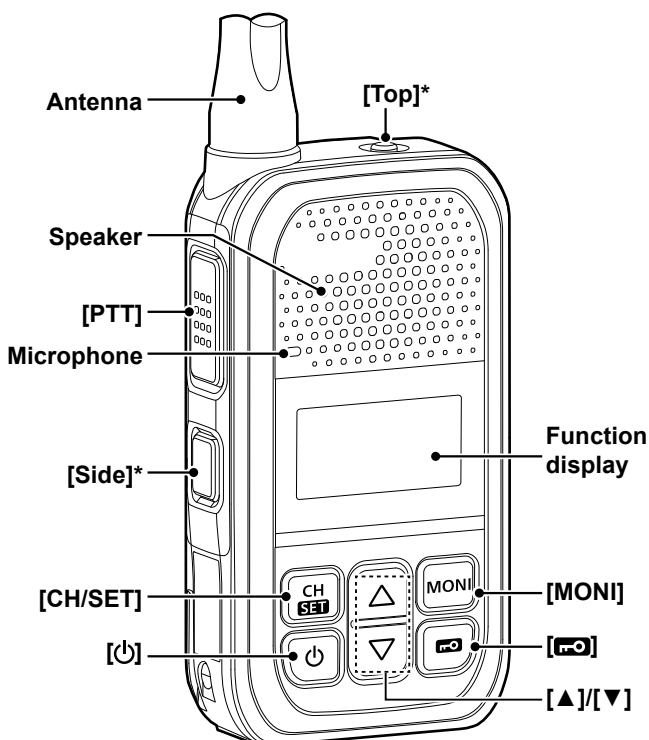
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- The use of Icom transceivers with any equipment that is not manufactured or approved by Icom.

Section 1 PANEL DESCRIPTION

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Front, top and left side panels



* Dealer assignable.

◇ Operating keys

[PTT] switch

Hold down to transmit, release to receive.

[Power] key

- Hold down for 1 second to turn ON the transceiver.
- Hold down for 2 seconds to turn OFF the transceiver.

[CH/SET] key

- On the Standby screen, push to enter or exit the Channel Select mode.
- On the Standby screen, hold down for 1 second to enter the Set mode.
- In the Set mode, push to move between the setting items, and hold down for 1 second to return to the Standby screen.

[▲]/[▼] key

- On the Standby screen, push to adjust the audio level.
- In the Set mode and the Channel Select mode, push to select a value.

[MONI] key

While holding down this key, the Monitor function is ON in the Standby screen.

[Lock] key

On the Standby screen, hold down for 1 second to turn the Lock function ON or OFF.

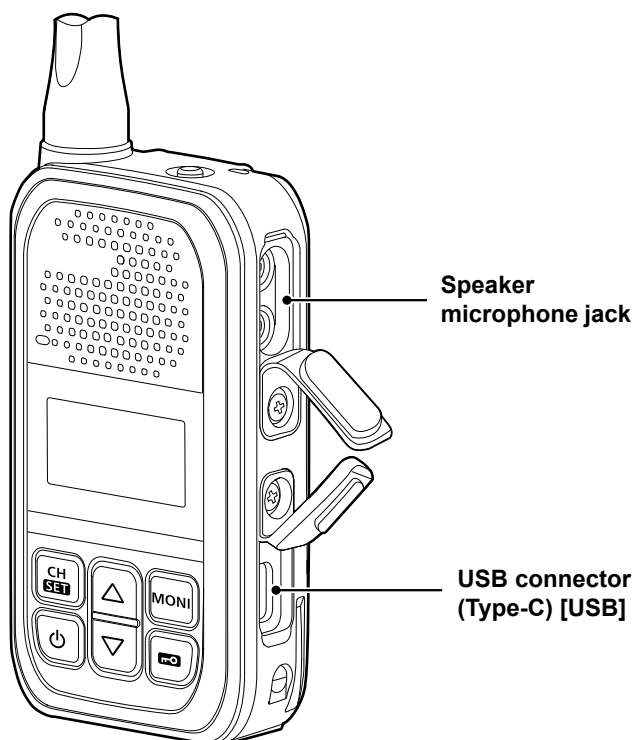
◇ About the Software Key functions

The [Top] and [Side] key functions are dealer assignable. See page 1-4 for details.

The following Software keys are assigned by default:

Key	Assigned Software
[Top]	Emergency
[Side]	S-Ring/C-Ring

Right side panel



◇ Connectors

SPEAKER MICROPHONE JACK

To connect an optional speaker microphone or headset.

USB CONNECTOR (Type-C) [USB]

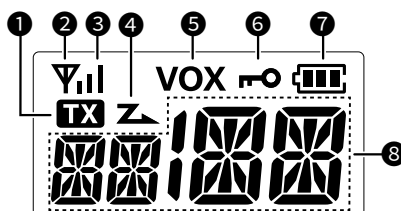
For only charging the battery.

① The USB connector does not support USB Power Delivery (USB PD) or data communication.

CAUTION: DO NOT use the transceiver without the connector covers or the optional equipment attached.

The transceiver meets IP54 requirements for dust-tight and splash resistance only when the connector covers or the optional HM-183LS SPEAKER MICROPHONE is attached.

Function display



① TX ICON TX

Displayed while transmitting.

② ANTENNA ICON ∇

- Displayed while the channel is busy (receiving).
- Blinks while the monitor function is turned ON.

③ SIGNAL STRENGTH INDICATOR

Displays the relative receive signal strength level.

④ SCAN ICON Z

- Displayed when the channel is selected as a scan target channel.
- Blinks while scanning.

⑤ VOX ICON vox

Displayed when the VOX function is ON.

⑥ KEY LOCK ICON ↯

Displayed when the Key Lock function is ON.

⑦ BATTERY INDICATOR

- Blinks while charging.
- Displays the remaining battery charge.

Indication				
Battery Status	Full	Mid	Charging required	Battery exhausted

*Blinks when the battery charge decreases to a set level.

⑧ ALPHANUMERIC READOUT

Displays messages such as channel number.

Assignable Software Key functions

Null

No function.

Emergency

1. Hold down during the Emer SW ON Timer period to enter the Emergency mode.
2. After the Reminder Timer period has passed, an Alert-Ring call is automatically transmitted once or repeatedly.

NOTE: Set the related settings using the programming software.

- ① Hold down during the Emer SW OFF Timer period to cancel the Emergency function before transmitting an Alert-Ring call.

S-Ring/C-Ring

- Push to make a Smart-Ring call.
- Hold down to make a Call-Ring call.

Scan Start/Stop

- Push to start or cancel a scan.
- When the scan starts with the Power ON Scan function, push to pause the scan. The paused scan resumes after the period time entered in the Auto Reset Timer has passed.
- Hold down this key while a scan pauses by detecting a signal on a channel, and then the channel is removed from the scan group. The removed channel is automatically added to the scan group after the scan is canceled.

Surveillance

Push to turn the Surveillance function ON or OFF. When this function is turned ON, the beep does not sound, and the backlight does not light, even when a signal is received, or a key is pushed.

Section 2 BASIC OPERATION

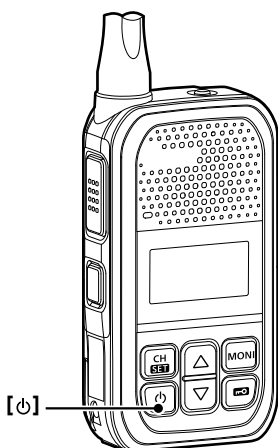
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Turning ON the transceiver

◇ Turning ON the transceiver

NOTE: Before using the transceiver for the first time, the battery pack must be fully charged for optimum life and operation. See the BASIC MANUAL for details.

- Hold down [⏻] for 1 second to turn ON the transceiver.
- Hold down [⏻] for 2 seconds to turn OFF the transceiver.



◇ Adjusting the audio level

- On the Standby screen, push [▲] or [▼] to adjust the audio volume.
 - ① The volume can be adjusted between 0 and 32.

Selecting a channel

◇ Selecting an operating channel

1. On the Standby screen, push [CH/SET].
 - Enters the Channel Select mode, and the channel number blinks.
2. Push [▲] or [▼] to select a channel, and then push [CH/SET] to apply the setting.
 - Returns to the Standby screen.

<Power ON Scan operation>

Depending on the presetting, when the user turns ON the transceiver, a scan automatically starts. The scan stops when a call is received.

Receiving and transmitting

◇ Receiving

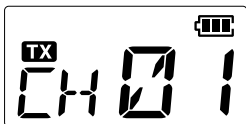
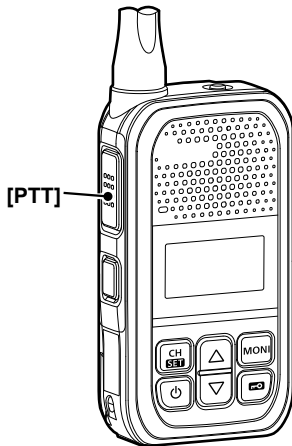
When a call is received, the antenna icon is displayed.

- Push [▲] or [▼] to adjust the audio output level to a comfortable listening level.



◇ Transmitting

- While holding down [PTT], speak at your normal voice level.
 - The "TX" icon is displayed while [PTT] is held down.



IMPORTANT:

To maximize the readability of your signal:

1. After pushing [PTT], pause briefly before you start speaking.
2. Hold the microphone 5 ~ 10 cm from your mouth, then speak at your normal voice level.

◇ Transmitting notes

Transmit inhibit function

The transceiver has several inhibit functions which restrict transmission under the following conditions:

- The channel is busy. However, depending on the presetting, you can transmit when a call is received that includes a non-matching (or matching) CTCSS (DTCS).
- The selected channel is a 'receive only' channel.

Time-Out Timer

If continuous transmission exceeds the preset Time-Out Timer time, the transmission is cut off.

Penalty timer

After the Time-Out Timer cuts off the transmission, the transmission is further inhibited for a preset penalty period of time.

Call-Ring operation

This function sends the preset ringer to your group members.

- Hold down [S-Ring/C-Ring] for at least 1 second to send the preset ringer.
 - The “TX” icon is displayed.
 - The ringer may sound while holding down [S-Ring/C-Ring], depending on the setting.
 - The same ringer sounds from your group members’ speakers.

NOTE: To use this function, the operating channel and CTCSS tone or DTCS code must be the same on all of your group’s transceivers.

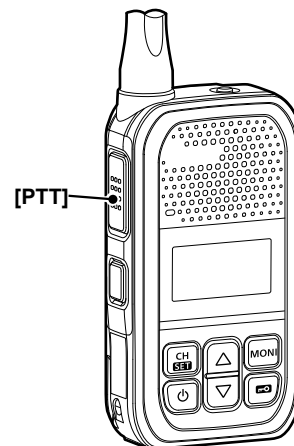
Smart-Ring operation

This function can judge whether the other station is within range or out of range. A transceiver that receives a Smart-Ring call from another transceiver sounds the Ringer melody. The called transceivers automatically send an answer back call to your transceiver.

1. Push [S-Ring/C-Ring] to make a Smart-Ring call.
 - The “TX” icon is displayed.
 - When an answer back call is received, the transceiver sounds the Ringer melody and displays “SR OK”.
 - When no answer back call is received, the transceiver sounds three short failure beeps and displays “SR NG”.



2. Push any key to stop the Ringer melody.
3. Push [PTT] to transmit, if necessary.



NOTE:

- To use this function, the operating channel and CTCSS tone must be the same on all of your group’s transceivers.
- This function can be operated for channels which CTCSS tone is set for.

Section 3

ADVANCED OPERATION

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Emergency function

IMPORTANT: It is recommended that the dealer sets up an Emergency channel to provide a reliable Emergency Alert-Ring call operation.

NOTE: Depending on the presetting, the following functions may be automatically activated.

Auto RX function

After transmitting an Alert-Ring call, the transceiver stands by in the Audible mode for a preset period of time.

◇ Transmitting an Alert-Ring call

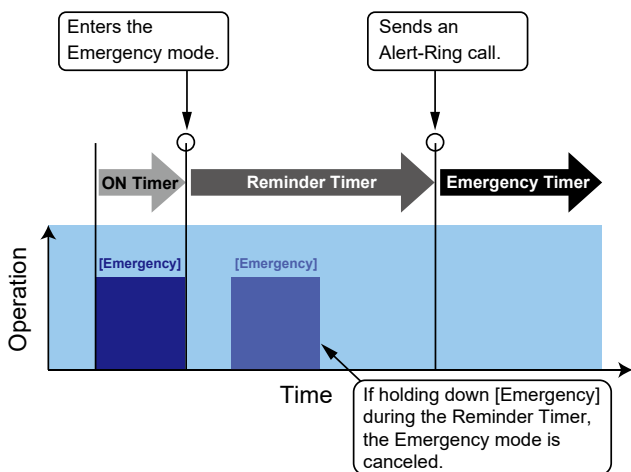
- When the transceiver enters the Emergency mode, a countdown starts. The transceiver counts down during the Reminder Timer set time.
- Before the Reminder Timer set time expires, the transceiver transmits an Alert-Ring call once, or repeatedly*, on the specified Emergency channel.
- * Depending on the presetting.
 - ① If no Emergency channel is specified, the Alert-Ring call is made on the previously selected channel.
 - ① If the Own ID is set up, you can send the PTT ID with the Alert-Ring call on the MDC 1200 system to know who is calling.
 - ① If the transceiver is set for the Silent operation, it transmits an Alert-Ring call without a beep sounding.
- The transceiver automatically transmits a repeat Alert-Ring call until the user turns OFF the transceiver.

The transceiver enters the Emergency mode through the following functions:

The [Emergency] key

When a user holds down [Emergency] for the Emer SW ON Timer preset time.

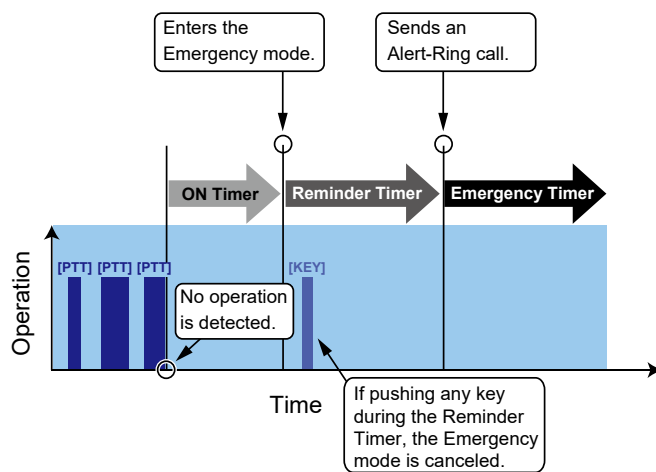
- ① If a user holds down [Emergency] for the Emer SW OFF Timer set time before the Reminder Timer expires, the Emergency mode is canceled.



The Lone Worker function

When no operation occurs for the ON Timer preset time.

- ① If a user pushes any key before the Reminder Timer set time expires, the Emergency mode is canceled.



Section 4 USER SET MODE

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◇ Ringer type of Smart Ringer.....	4-4

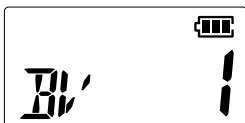
User Set mode description

The user can enter the “User Set Mode” to customize certain transceiver setting.

◇ Operation in the User Set mode

Example: Changing the Beep level 1 to 4.

1. Hold down [CH/SET] for 1 second to enter the Set mode.
2. Push [CH/SET] to select an item.
(Example: Selecting Beep level (BV))



3. Push [▲] or [▼] to select an option.
(Example: Selecting Level 4)



4. Hold down [CH/SET] for 1 second to return to the Standby screen.

User Set mode items

Item	Display
Backlight	BL
Beep	BE
Beep Level	BV
Ringer Level	RV
Announce	AN
SQL Level (Squelch Level)	SQ
Mic Gain (Microphone Gain)	MG
VOX	VX*
VOX Gain	VG*
Call-Ring Pattern	CR
Smart-Ring Pattern	SR

*Displayed when the optional headset is connected with the OPC-2006LS PLUG ADAPTER CABLE.

Backlight

Sets the Backlight status.

- OFF: Turns OFF the backlight.
- Auto: When pushing any key (except [PTT]), the backlight automatically turns ON for 5 seconds.
- ON: The backlight turns ON all the time.

Beep

Turns the key-touch beeps and the Channel Announce function ON or OFF.

Beep Level

Sets the beep and announce output level.

- Range: 1 ~ 4

Ringer Level

Sets the ringer level.

- Range: 1 ~ 4

Announce

Turn the Channel Announce function ON or OFF. When the Channel Announce function is ON, the transceiver announces the selected channel number.
① When the Beep function is OFF, the Announce function is automatically OFF.

SQL Level (Squelch Level)

Sets the squelch level to high or low.

Mic Gain (Microphone Gain)

Sets the microphone sensitivity. Higher values make the microphone more sensitive to the user's voice.

- Range: 1 (low sensitivity) ~ 4 (high sensitivity)

4 USER SET MODE

User Set mode items

VOX

Turns the VOX function ON or OFF.

When the VOX function is ON, receiving and transmitting are automatically switched by detecting sounds.

NOTE: To use the function, a headset and the optional OPC-2006LS PLUG ADAPTER CABLE are required (purchase separately).

VOX Gain

Sets the VOX gain.

Higher values make the VOX function more sensitive to sounds.

- Range: 1 ~ 10

Call-Ring Pattern

Sets the Call-Ring Pattern to call by placing a melody on the transmission modulation.

- ① The Call-Ring Pattern function is available 16 types of Melody patterns for use with the Call-Ring function.

Smart-Ring Pattern

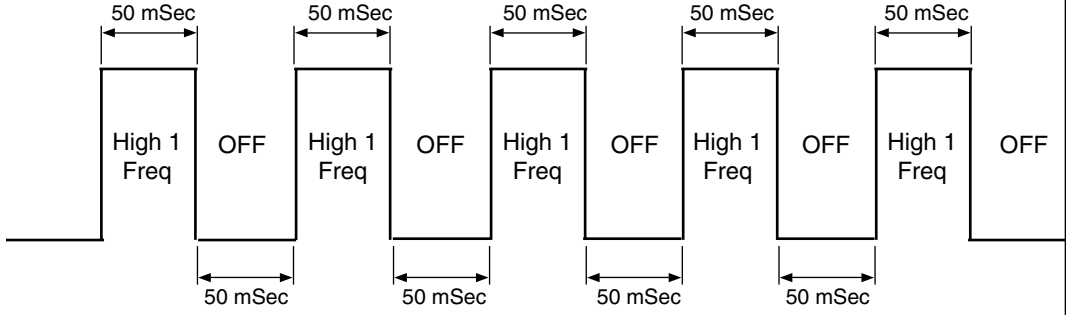
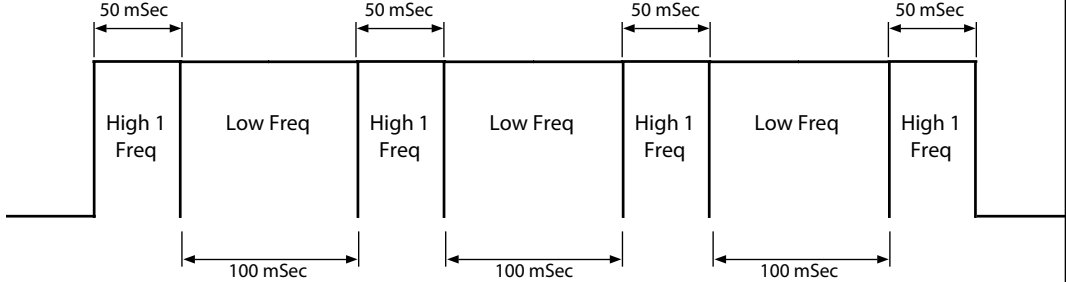
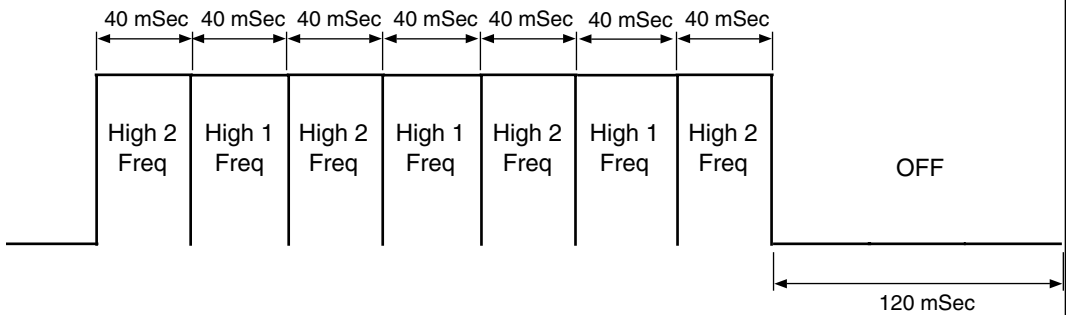
Sets the ringer type that sounds when a Smart Ringer is received.

- ① See page 4-4 for details of Ringer Type.

4 USER SET MODE

User Set mode items

◇ Ringer type of Smart Ringer

Options	Ringer type	Description
NU	Null	The state of the ringer does not change.
OF	OFF	Turns OFF the ringer.
1	Pi	One high ring sounds once.
2	PiPi	Two high rings sound once.
3	Pi-	One high long ring sounds once.
4	PiPiPiPiPi	Five high rings sound once. 
5	PiRo1	The following ringer pattern sounds only once. 
6	PiRo2	The following ringer pattern sounds twice. 
1R	Pi/R	One high ring repeatedly sounds during the ringer repeat timer period.
2R	PiPi/R	Two high rings repeatedly sound during the ringer repeat timer period.
3R	Pi-/R	One high long ring sounds during the ringer repeat timer period.
4R	PiPiPiPiPi/R	Five high rings sound during the ringer repeat timer period.
5R	PiRo1/R	One high and one low rings repeatedly sound during the ringer repeat timer period.
6R	PiRo2/R	One high and one low rings rapidly and repeatedly sound during the ringer repeat timer period.

Section 5 OTHER FUNCTIONS

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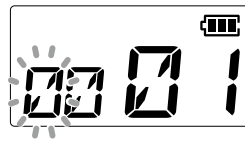
ID Set mode operation

PTT ID function on the MDC 1200 system can send an Own ID with an Alert-Ring call to identify the callers. (p. 3-2)
You can rewrite the Own ID with the transceiver.

1. Turn OFF the transceiver.
2. Hold down [MONI], [MONI], and [POWER] to enter the ID Set mode.
 - "ID ST", and then the current Own ID is displayed.



3. Push [CH/SET] to edit the Own ID.
 - The first digit of the current Own ID blinks.



4. Push [▲] or [▼] to select a number.
5. Push [CH/SET] to move to the right.



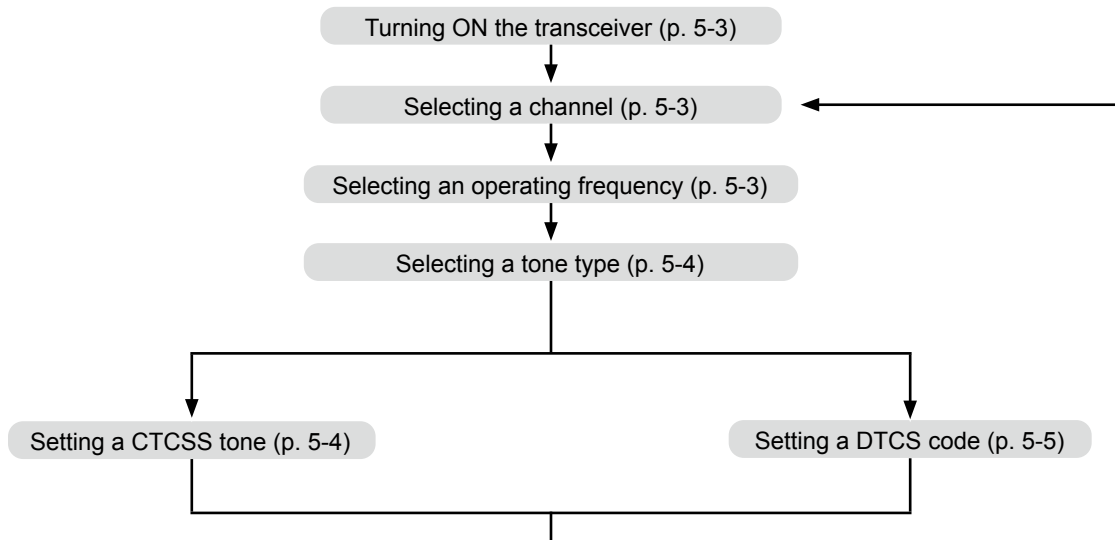
6. Repeat step 4 and step 5 to enter all 4 digits.
7. Hold down [POWER] for 2 seconds to turn OFF the transceiver to exit the ID Set mode.

Channel Set mode operation

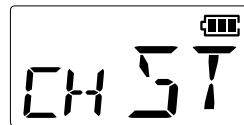
This function is convenient to rewrite Frequency, CTCSS tone, and DTCS code which are not assigned to the memory channel.

① The Frequency can be changed from 16 channels.

● **Procedures**



1. Turn OFF the transceiver.
2. Hold down [Side], [M], and [P] to turn ON the transceiver and enter the Channel Set mode.
 - “CH ST,” and then channel number is displayed.

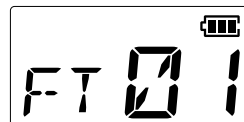


1. Selecting a channel

3. Push [▲] or [▼] to select a desired channel.
4. Push [CH/SET] to set the channel.

2. Selecting an operating frequency

5. Push [▲] or [▼] to select a desired frequency number.
 - “FT” and the currently selected frequency number are displayed.
6. Push [CH/SET] to set the number.



• **Frequency number list**

Number	Frequency (MHz)	Number	Frequency (MHz)
1	446.006250	9	446.106250
2	446.018750	10	446.118750
3	446.031250	11	446.131250
4	446.043750	12	446.143750
5	446.056250	13	446.156250
6	446.068750	14	446.168750
7	446.081250	15	446.181250
8	446.093750	16	446.193750

5 OTHER FUNCTIONS

Channel Set mode operation

3. Selecting a tone type

7. Push [▲] or [▼] to select a desired tone type.
8. Push [CH/SET] to set the tone type.

When you select the CTCSS tone:

- The current CTCSS tone number is displayed.
- ➔Go to '4. Setting a CTCSS tone' below.

When you select the DTCS code:

- The current DTCS code number is displayed.
- ➔Go to '5. Setting a DTCS code' on the next page.

4. Setting a CTCSS tone

9. Push [▲] or [▼] to select the desired CTCSS tone number.
10. Push [CH/SET] to set the number.

• CTCSS tone number list (Hz)

No.	Freq.	No.	Freq.	No.	Freq.	No.	Freq.	No.	Freq.
01	67.0	11	94.8	21	131.8	31	171.3	41	203.5
02	69.3	12	97.4	22	136.5	32	173.8	42	206.5
03	71.9	13	100.0	23	141.3	33	177.3	43	210.7
04	74.4	14	103.5	24	146.2	34	179.9	44	218.1
05	77.0	15	107.2	25	151.4	35	183.5	45	225.7
06	79.7	16	110.9	26	156.7	36	186.2	46	229.1
07	82.5	17	114.8	27	159.8	37	189.9	47	233.6
08	85.4	18	118.8	28	162.2	38	192.8	48	241.8
09	88.5	19	123.0	29	165.5	39	196.6	49	250.3
10	91.5	20	127.3	30	167.9	40	199.5	50	254.1
								OF	OFF

Recommended CTCSS frequencies (Hz)

67.0	79.7	94.8	110.9	131.8	156.7	186.2	225.7
69.3	82.5	97.4	114.8	136.5	162.2	192.8	233.6
71.9	85.4	100.0	118.8	141.3	167.9	203.5	241.8
74.4	88.5	103.5	123.0	146.2	173.8	210.7	250.3
77.0	91.5	107.2	127.3	151.4	179.9	218.1	

5 OTHER FUNCTIONS

Channel Set mode operation

5. Setting a DTCS code

11. Push [▲] or [▼] to select the desired DTCS code number.
12. Push [CH/SET] to set the number.

• DTCS code number list

No.	Code	No.	Code	No.	Code	No.	Code	No.	Code
01/101	023	21/121	132	41/141	271	61/161	466	81/181	732
02/102	025	22/122	134	42/142	306	62/162	503	82/182	734
03/103	026	23/123	143	43/143	311	63/163	506	83/183	743
04/104	031	24/124	152	44/144	315	64/164	516	84/184	754
05/105	032	25/125	155	45/145	331	65/165	532	OF	OFF
06/106	036	26/126	156	46/146	343	66/166	546		
07/107	043	27/127	162	47/147	346	67/167	565		
08/108	047	28/128	165	48/148	351	68/168	606		
09/109	051	29/129	172	49/149	364	69/169	612		
10/110	054	30/130	174	50/150	365	70/170	624		
11/111	065	31/131	205	51/151	371	71/171	627		
12/112	071	32/132	223	52/152	411	72/172	631		
13/113	072	33/133	226	53/153	412	73/173	632		
14/114	073	34/134	243	54/154	413	74/174	654		
15/115	074	35/135	244	55/155	423	75/175	662		
16/116	114	36/136	245	56/156	431	76/176	664		
17/117	115	37/137	251	57/157	432	77/177	703		
18/118	116	38/138	261	58/158	445	78/178	712		
19/119	125	39/139	263	59/159	464	79/179	723		
20/120	131	40/140	265	60/160	465	80/180	731		

- ① When you select No. 01-84, the code polarity is Normal.
When you select No. 101-184, the code polarity is Inverse.

Recommended DTCS codes

023	054	116	156	243	306	365	445	546	654	734
025	065	125	162	244	311	371	464	565	662	743
026	071	131	165	245	315	411	465	606	664	754
031	072	132	172	251	331	412	466	612	703	
032	073	134	174	261	343	413	503	624	712	
043	074	143	205	263	346	423	506	627	723	
047	114	152	223	265	351	431	516	631	731	
051	115	155	226	271	364	432	532	632	732	

When you want to change another channel setting:

➔ Go to '1. Selecting a channel' on page 5-3.

When you want to exit the Channel Set mode:

➔ Go to '6. Exiting the Channel Set mode' below.

6. Exiting the Channel Set mode

13. Hold down [⏻] for 2 seconds to turn OFF the transceiver, save the settings, and exit the Channel Set mode.

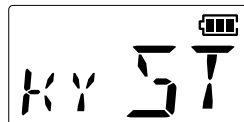
TIP: You can check your current channel information by following the steps.

1. Turn OFF the transceiver.
2. Push [▲] and [⏻] to enter Channel Information mode.
 - Displays the current CTCSS tone number, the DTCS code number and frequency number.

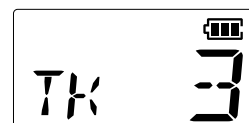
Reassigning a key function

You can reassign another function to the [Side] and [Top] programmable function keys.

1. Turn OFF the transceiver.
2. Hold down [M], [Top], and [P] to enter the Key Assignment mode.
 - “KY ST” is displayed.
3. Push [Side] or [Top] to select the key that you want to reassign.
4. Push [▲] or [▼] to select a desired key function.
 - Options
 - 1: Null
 - 2: Emergency
 - 3: Scan Start/Stop
 - 4: Surveillance
 - 5: S-Ring/C-Ring
5. Hold down [P] for 2 seconds to turn OFF the transceiver to exit the Key Assignment mode.



When the surveillance function is assigned to [Side]



When the scan function is assigned to [Top]

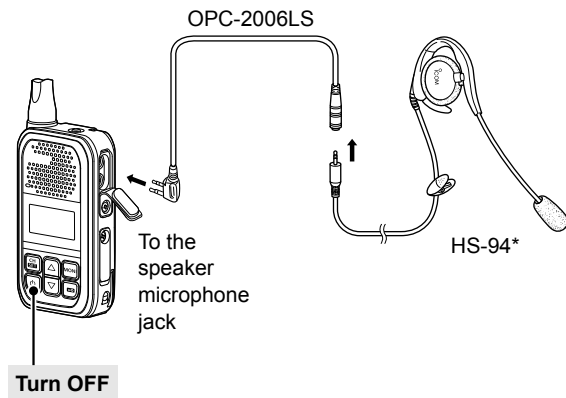
VOX function

The VOX function toggles the transceiver between transmit and receive by your voice. This function provides hands-free operation.

To use the VOX function, the optional OPC-2006LS PLUG ADAPTER CABLE and an optional headset (HS-94, HS-95, or HS-97) are required.

◆ Optional unit connection

1. Turn OFF the transceiver.
2. Connect an optional headset and OPC-2006LS as shown to the right.



*You can also use this function with the optional HS-95 or HS-97.

◆ Turning the VOX function ON or OFF

You can turn the VOX function ON or OFF in the Set mode.
See page 4-3 for details.

① When the VOX function is ON, **vox** is displayed on the Standby screen.

Section 6 OPTIONS

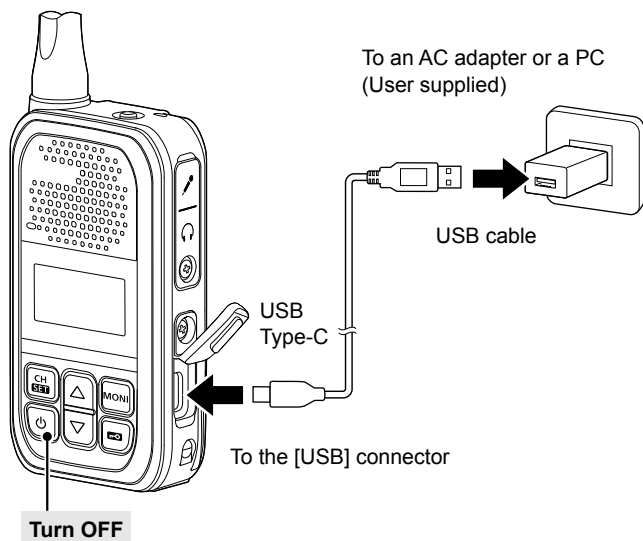
Battery charging	6-2
◇ Battery charging	6-2
◇ Charging directly	6-2
◇ Charging on the cradle	6-2
◇ Rapid charging the battery pack	6-3

Battery charging

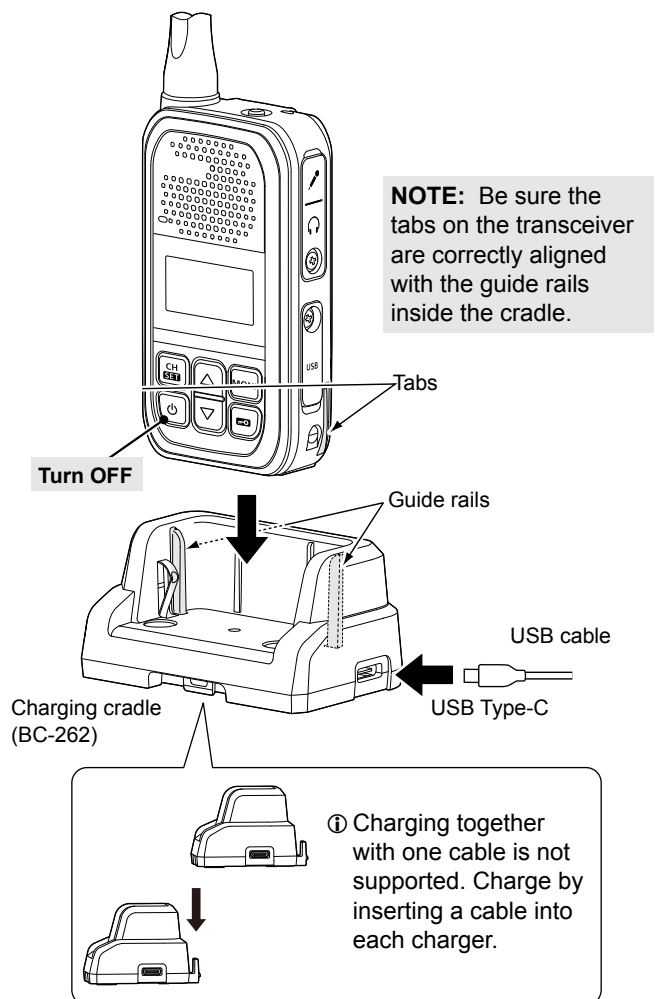
◇ Battery charging

- Fully charge the transceiver before using it for the first time, or if it has not been used for more than 2 months. The charger automatically restarts charging when the battery voltage drops.
- Disconnect the AC adapter from the outlet when not charging the battery.
- Use the supplied USB cable.
- The battery icon on the function display blinks while charging and lights when the charging has been completed.

◇ Charging directly



◇ Charging on the cradle



Charging time: Approximately 5.5 hours with 5 V/1 A input

NOTE for charging with a USB cable:

- Use a 5 V/1 A output AC adapter.
- USB Power Delivery (USB PD) is not supported.
- The charging time may differ, depending on the current. When you use a lower than 1 A output AC adapter or PC, it may take longer to charge, or the battery may not be charged.
- Before using the AC adapter, thoroughly read its instructions.

NOTE: If “Q ER” is displayed, a charging error has occurred.

- Disconnect the USB cable or AC adapter, and then connect properly.
- Properly install the battery pack to the transceiver.
- Properly insert the transceiver into the charging cradle.
- Charge the battery pack within the specified temperature range: 15°C ~ 40°C.

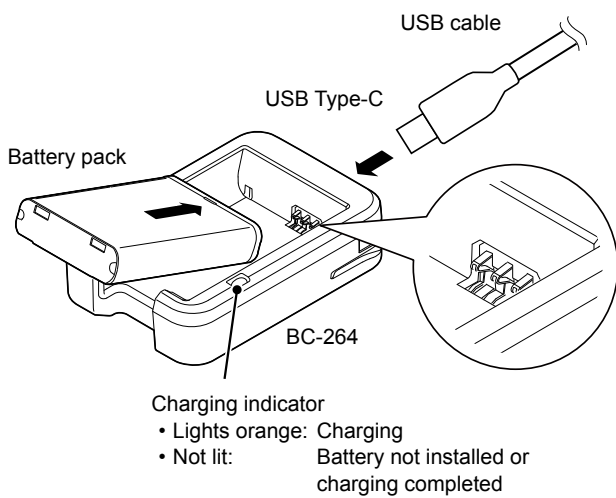
Battery charging

◇ Rapid charging the battery pack

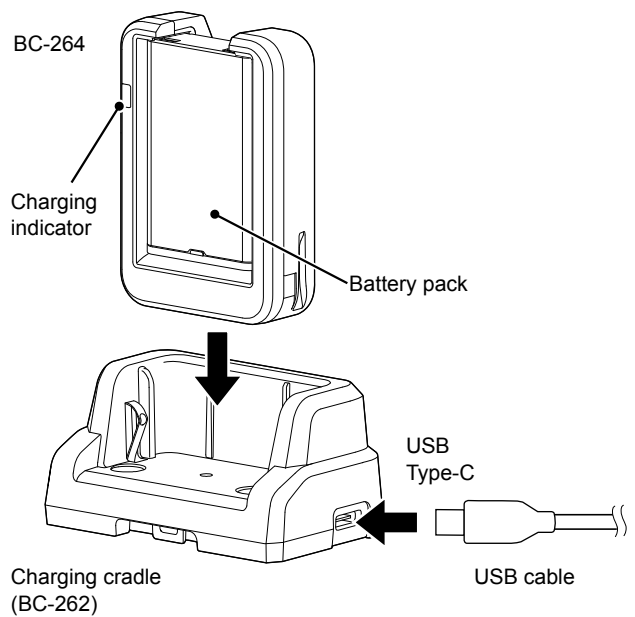
You can charge the battery pack with the optional BC-264 BATTERY CHARGER. Install the supplied battery pack so that the terminals of the battery pack and the battery charger meet.

Charging time: Approximately 3.8 hours with 5 V/1 A input

NOTE: Charging time will be longer in extremely hot or cold environments. We recommend charging between 15°C ~ 40°C.



① The battery pack can be charged by the charging with BC-262 inserted.



NOTE for charging with a USB cable:

- Use a 5 V/1 A output AC adapter.
- USB Power Delivery (USB PD) is not supported.
- The charging time may differ, depending on the current. When you use a lower than 1 A output AC adapter or PC, it may take longer to charge, or the battery may not be charged.
- Before using the AC adapter, thoroughly read its instructions.

TIP: To remove the battery pack, slide the battery pack and lift it up in the direction of the arrow.

