

**maxon**

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## SP-7000 Series User Manual

"Professional Radio Products"



**maxon**

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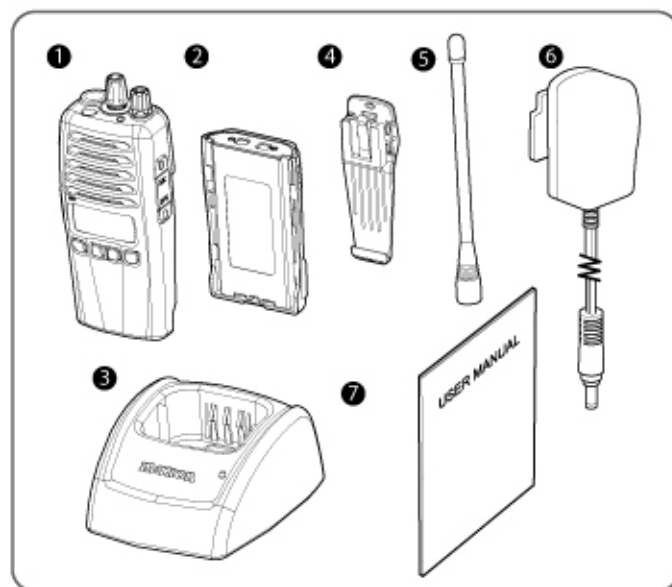
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## 1. Unpacking Information

Remove and carefully inspect the contents of your package(s) for the following items:

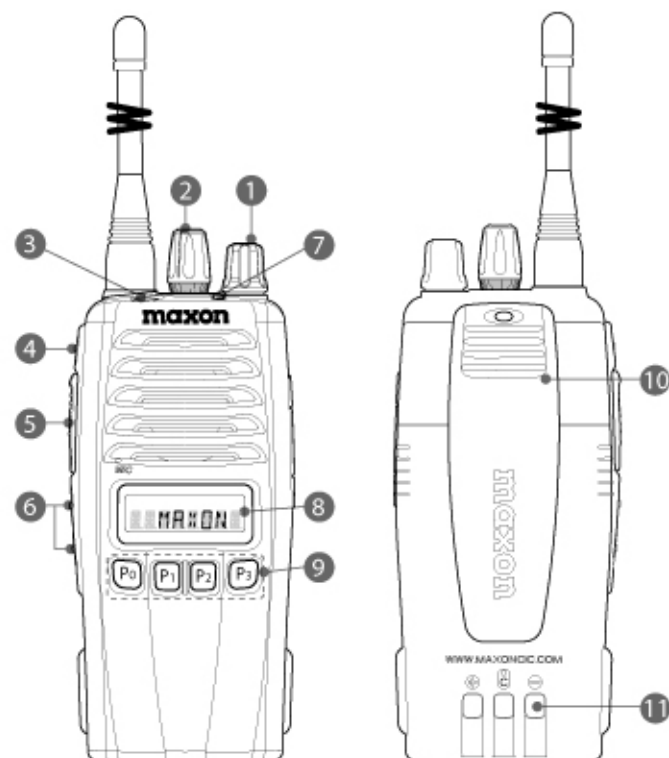
- ❶ Radio
- ❷ Battery Pack
- ❸ Battery Charger
- ❹ Belt Clip
- ❺ Antenna
- ❻ Battery Charger Power Supply
- ❼ User Manual

\* If any items are missing, please contact your Dealer or Maxon.



## 2. Panel Description

### (1) Front Panel



#### ► Description

- ❶ Power On/Off, Volume Control S/W
- ❷ Rotary Selector
- ❸ Emergency Button
- ❹ Monitor Button
- ❺ PTT Key

- ❻ Up/Down Button
- ❼ LED Indicator
- ❽ LCD Display
- ❾ Default Programmable Keys
- ❿ Belt Clip
- ⓫ Battery Charge Contacts

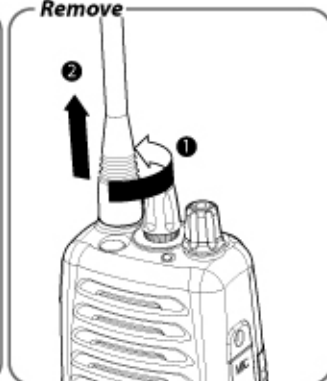
## (2) Antenna Installation

Fasten the antenna to the radio by turning the antenna clockwise into the receptacle on top of the radio

### Install



### Remove



### CAUTION

- **NEVER HOLD** by the antenna when carrying the transceiver.
- Transmitting without an antenna may damage the transceiver.

## (3) Installing and Removing the Battery Pack

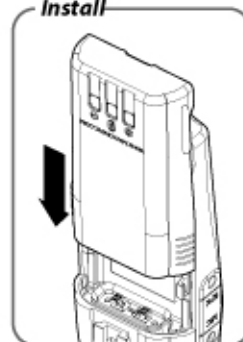
### 1) To Install:

- Slide the battery into the rear of the transceiver until a click is heard.

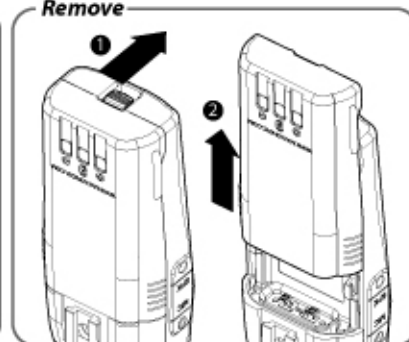
### 2) To Remove:

- Pull the battery latch button on the bottom and then slip the battery upward when the radio is upside down.

### Install



### Remove



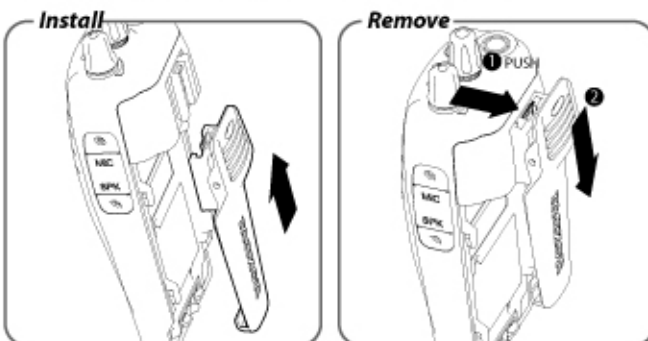
#### (4) Attaching and Removing the Belt Clip

##### 1) To Install:

- Slide the Belt Clip upward until a click is heard.

##### 2) To Remove:

- Pinch the inside clip and then slide the belt clip downward.



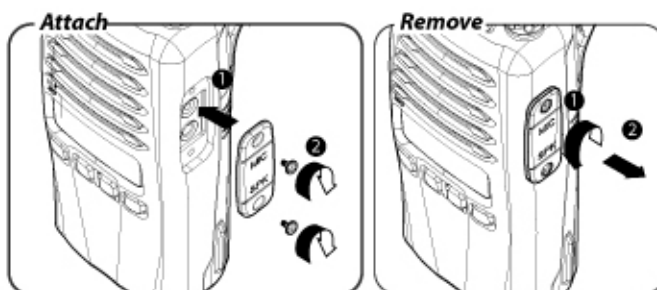
#### (5) Attaching and Removing the Jack Cover

##### 1) To attach:

- Affix the jack cover by screws until the screws are fully tightened.

##### 2) To Remove:

- Loosen the screws until the jack cover is detached from the radio in order to use any accessory for SP-7000.

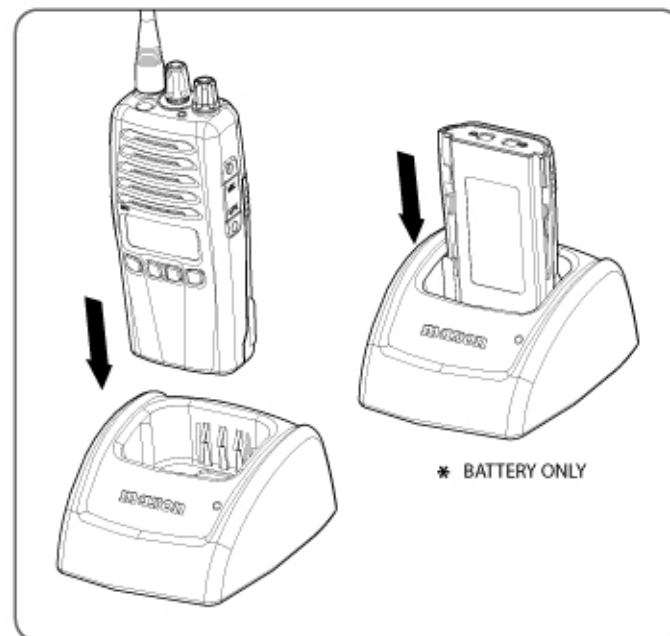


#### (6) Battery Charging and Care

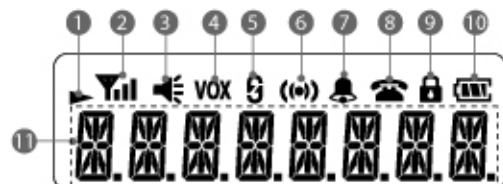
- To ensure peak performance from your radio, the battery pack must be fully charged. Proper care and charging will allow maximum performance and life of your battery pack.

CHQ-700L Desktop Charger will charge one radio and spare battery in approximately 2 hours.

Before using your **SP- 7000 Series** for the first time, a full two hour charge will be required for the best performance.

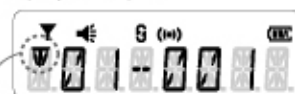


## (7) LCD Display



- ① Scroll Indicator
- ② TX Power High or Low / RSSI Indicator
- ③ Monitor Indicator
- ④ VOX On/Off Indicator
- ⑤ Scrambler On/Off Indicator
- ⑥ Compander On/Off Indicator
- ⑦ Bell Indicator (2-Tone, 5-Tone)
- ⑧ Call Indicator(DTMF)
- ⑨ Key Lock On/Off Indicator
- ⑩ Battery Gauge
- ⑪ CH, Group, Name, Message etc. Display

### Display Example)



Ex) Group-Channel Display

Priority Channel Indicator



Ex) Channel Display

Lookback Channel Indicator



Ex) Channel Name Display



Ex) Scroll Function

## (8) Display Option

### 1) Display Type

#### - Channel Name

- Display the programmed channel name only.
- Display the group number for one second when group is changed.
- Scroll when the name is more than 7 characters



#### - Channel Number

- Display channel number only.
- Display the group number for a second when group is changed.



#### - Group / Channel Number

- Display group & channel number.



#### - Group / Channel Name

- Display group & channel name.
- Display '/' between group and channel name as a descriptor.
- Scroll when the name is more than 7 characters.



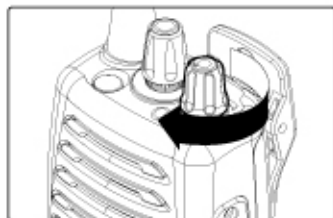
### 3. Basic Functions

#### (1) Power On/Off & Volume Control

##### 1) Power On/Off

To turn on the transceiver, rotate the volume knob clockwise beyond detent.

To turn off the transceiver, rotate the volume knob the most counter-clockwise beyond detent.



##### 2) Power On Sequence

###### - Initialization & Self Test.

Initialization and self test are performed when the transceiver is turned on.

Error message will be displayed if errors occur.



Ex) EEPROM Error

###### - Power On Beep Generation (Option)

Beep sounds after initialization and self test.  
(Depends on Beep Option)

###### Display Start Logo (Option)

Display the start logo for one second. If there is no programmed start logo, all digits and icons will be displayed as below.



Ex1) Start Logo



Ex2) Non Start Logo

###### - Password Check (Option)

Password Check is the function that the user who knows the password can only use the transceiver. (It depends on password option)  
Password is consisted of 4 numerical digits. \*

In case of the transceiver with 10-keypad, you can use 10-keypad to input the password.

\* Usage of keys for inputting password

[P0] : Confirm (Enter)

[P1] : Digit Value Change

[P2] : Next Digit

[P3] : Delete

#### (2) Receiving and Transmitting

##### 1) Receiving

###### - Channel & Group Selection

###### • Group Selection

###### ① Rotary Selector

You can use rotary selector to select groups up to 16.

If blank group (there is no channel) is selected, the transceiver keeps the last used channel.

###### ② Programmable Key

To change the group, you can use 'Group Up' or 'Group Down' function.

If there are blank groups, the groups are skipped over automatically when group is changed.

###### • Channel Selection

###### ① Rotary Selector

You can use rotary selector to select channels up to 16.

If blank channel is selected, the transceiver keeps last used channel.

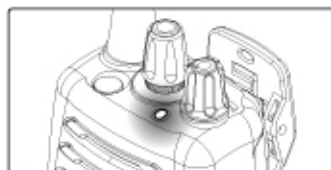
###### ② Programmable Key

To change the channel, you can use 'Channel Up' or 'Channel Down' function.

If there are blank channels, the channels are skipped over automatically when channel is changed.

- Busy

Busy Status: Amber color LED turns on while receiving a call.



Ex) LED Display

- Correct Call

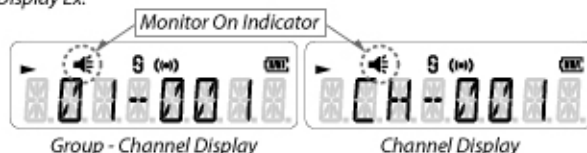
Correct Call Status: Green color LED turns on when the received sub-audio tone(CTCSS, DCS, IDCS) equals with the current channel's option.

- Monitor Operating

Release squelch and tone option to check whether you can use current channel.

Mode	Description
Push Mode	Push and hold the key in short time to enter monitor push mode. Squelch and tone option are released while push and hold the key. To return to normal mode, release the monitor key.
Hold Mode	Push and hold the key in long time to enter monitor hold mode. After the transceiver sounds a confirm beep, monitor operation is held even if the key is released. To return to normal mode, push and release the monitor key once more.

Display Ex.



Group - Channel Display

Channel Display

- RSSI (Received Signal Strength Indication)

Indicate the received signal strength.

Display Ex.



- Receiving Option

• Squelch Level Control

Squelch level is adjustable 1 to 9 levels through programmer or User Set Mode.

• Sub-Audio Tone

① CTCSS

The transceiver has a CTCSS tone squelch function which consists of 38 standard tones and 12 non-standard tones.

No.	Freq.	No.	Freq.	No.	Freq.	No.	Freq.
1	67.0	14	107.2	27	167.9	40	159.8
2	71.9	15	110.9	28	173.8	41	165.5
3	74.4	16	114.8	29	179.9	42	171.3
4	77.0	17	118.8	30	186.2	43	177.3
5	79.7	18	123.0	31	192.8	44	183.5
6	82.5	19	127.3	32	203.5	45	189.9
7	85.4	20	131.8	33	210.7	46	196.6
8	88.5	21	136.5	34	218.1	47	199.5
9	91.5	22	141.3	35	225.7	48	206.5
10	94.8	23	146.2	36	233.6	49	229.1
11	97.3	24	151.4	37	241.8	50	254.1
12	100.0	25	156.7	38	250.3		
13	103.5	26	162.2	39	69.4		



## ② DCS (IDCS)

The transceiver also has a digital coded squelch function which consists of 104 codes.

No.	Code	No.	Code	No.	Code	No.	Code
1	023	27	152	53	311	79	466
2	025	28	155	54	315	80	503
3	026	29	156	55	325	81	506
4	031	30	162	56	331	82	516
5	032	31	165	57	332	83	523
6	036	32	172	58	343	84	526
7	043	33	174	59	346	85	532
8	047	34	205	60	351	86	546
9	051	35	212	61	356	87	565
10	053	36	223	62	364	88	606
11	054	37	225	63	365	89	612
12	065	38	226	64	371	90	624
13	071	39	243	65	411	91	627
14	072	40	244	66	412	92	631
15	073	41	245	67	413	93	632
16	074	42	246	68	423	94	654
17	122	43	251	69	431	95	662
18	114	44	252	70	432	96	664
19	115	45	255	71	445	97	703
20	116	46	261	72	446	98	712
21	125	47	263	73	452	99	723
22	131	48	265	74	454	100	731
23	132	49	266	75	455	101	732
24	134	50	271	76	462	102	734
25	143	51	274	77	464	103	743
26	145	52	306	78	465	104	754

### • Signalling (2-Tone, 5-Tone, DTMF)

→ There are three type audio tone signaling.  
Refer to Signaling section.

### • Tone Squelch Option

#### ① Tone Squelch 1 (On/Off)

## All Tone Squelch On/Off (Sub-Audio, 2-Tone, 5-Tone, DTMF)



Display Ex.) Display tone squelch status for a second when the status is changed.

#### ② Tone Squelch 2 (On/Off)

Only audio-band tone squelch(2-Tone, 5-Tone, DTMF Squelch)  
On/Off



Display Ex.) Display the tone squelch status for a second when the status is changed.

### 2) Transmitting

#### • PTT Key

Push the PTT (Push To Talk) key to transmit.

#### • VOX function (Voice Operated Transmit)

This function is to transmit by voice without pressing the PTT key.  
The transceiver can transmit by voice levels in accordance with  
VOX level 1 to 4.

#### - Transmit Option

#### • PTT ID

When the transceiver transmits, PTT ID which consists of DTMF or  
5-tone(It depends on system and signaling option) can be  
transmitted.

#### • TX Power High/Low Control

You can set TX power (low or high) for each channel.

Display Ex.)



- **TOT (Time Out Timer)**

*This function is to prevent continuous transmitting over than specified time. You can set this option through programmer.*

- **BCLO (Busy Channel Lock-Out)**

*This function is to prevent transmitting when current channel is in busy status.*

- **Marked Idle**

*This option allows transmitting when current channel is in correct call status even if BCLO option is applied.*

- **TX Delay**

*This function is to eliminate the squelch tail on leaving transmission. The transceiver transmits the turn off code (or tone) and return to receive mode after the PTT key is released.*

- **Roger Beep**

*When this option is on, the transceiver transmits beep sound after the PTT key is released.*

- **Clear to Talk**

*This function is to inform that voice can be transmitted without a loss. If PTT key is pushed and 'clear time' elapsed, alert beep sounds. You can't transmit audio before this alert beep sounds.*

- **Talk Around**

- *This function allows communicating directly with other transceivers without the using of a repeater.*

- *The receiving frequency is used for both transmitting and receiving.*

- *This function will be canceled automatically when the channel is changed.*

*Display Ex.)*



### 3) Power Save

*If this function is activated, the power save function will decrease the amount of using power when current channel is not busy and no operations are being performed.*

### (3) User Set Mode

1) This mode is to set internal settings that normally do not change.

2) Setting

- Push the User set Mode key (contact your dealer for key assignment) to enter the User Set Mode.

- To select item: User Set Mode Key

- To change value of the item: Up/Down Key

- Exit without Save: Monitor Key (or there is no key input within 10 secs)

- Save & Exit: PTT Key

- Item List

- Beep

- LCD Back Light

- VOX Sensitivity Level

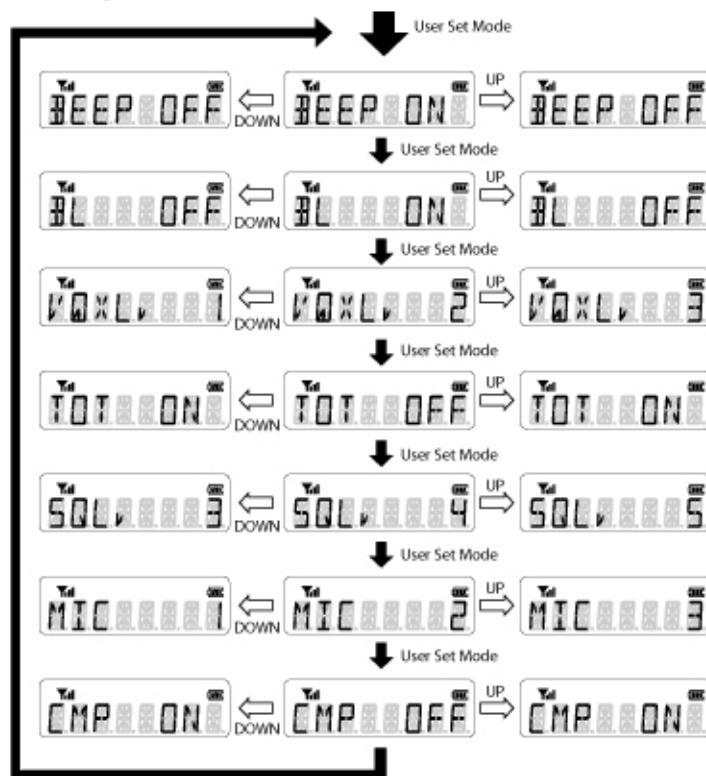
- TOT

- Squelch Level

- MIC Sense

- Compander On/Off

### 3) Setting Ex.



## 4. Emergency Function

### (1) To transmit Emergency Call

Push and hold the emergency key for a full second to transmit emergency call (Push and hold the emergency key once more to stop this function).

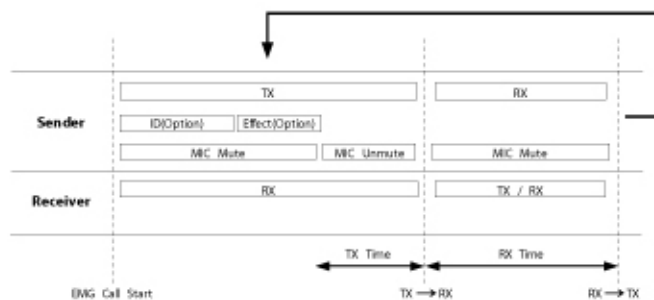
### (2) Effect

Alert Tone  
Backlight Blinking (one second interval)

### (3) Emergency ID

You can set DTMF code. The transceiver transmits this code each cycle.

### (4) Formation of the Emergency Call



### (5) Emergency Call Options

- 1) Cycle: The number of emergency call repetition
- 2) The number of repetition of Alert Tone
- 3) RX Time: The duration of receiving
- 4) TX Time: The duration of transmitting
- 5) Channel Type: Fixed Channel / Current Channel

## 5. Scan Function

### (1) Description

This function is to monitor channels that are defined in the scan list.

(Note: If the transceiver is turned off during scan, it will start scan when the transceiver resets)

### (2) Scan Type

- 1) Normal Scan: If there isn't priority channel, Normal Scan will work.
- 2) Priority Scan: If the transceiver has a priority channel, Priority Scan will operate. Priority channel is checked every five normal channel scanning.
- 3) Power On Scan: If the transceiver turns off during scan, scan is enabled when the transceiver turns on.
- 4) Look Back Scan: The transceiver changes the current channel to the priority channel while the current channel keeps busy status in lookback time.
- 5) A call is received on the lookback channel. If the priority channel is not correct call status, return to lookback channel. After lookback time, the transceiver will repeat the above operation.
  - When the priority channel is correct call status, look back scan will be stopped.

### (3) Nuisance Delete

This function is to delete a channel temporarily from the scan list.

- 1) How to use: If a specific channel is busy, the transceiver pauses scan. You can push the monitor key to skip over this channel and resume scan.
- 1) Note: The original scan list is recovered when the transceiver resets.

### (4) Scan List Edit

- 1) You can use the Scan List Edit Key to add the current channel to scan list or delete.

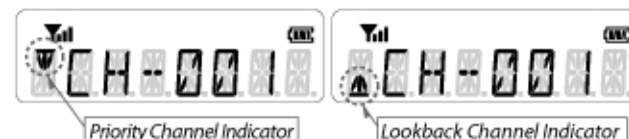
Display Ex.)



### (5) Priority Channel / Lookback Channel Setting

- 1) You can set Priority Channel / Lookback Channel using a programmable key.

Display Ex.)



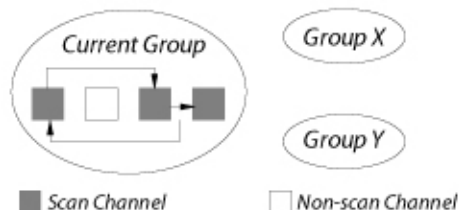
### (6) TX Channel on Scan

Transmission channel during scan

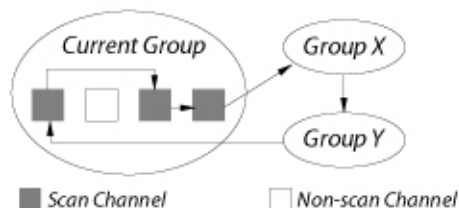
Scan Type	TX Option	Busy	No Busy
Priority Scan	Priority Scan TX	Current Ch.	Priority Ch.
	Priority Only TX	Priority Ch.	Priority Ch.
Normal Scan	Normal Scan TX	Current Ch	TX Inhibition
	RX Only TX	TX Inhibition	TX Inhibition

## (7) Scan Operation Diagram

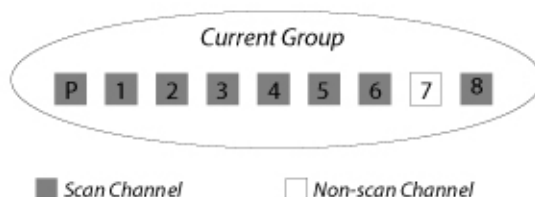
### \* Normal Scan - Current Group Scan



### \* Normal Scan - All Group Scan



### \* Priority Scan - Current Group Scan



Scan Order: P → 1 → 2 → 3 → 4 → 5 → P → 6 → 8 → ...

## 6. Signaling Function

- You can choose signalling type of each channel. In case of 5-tone, you can select the format of the tone (ex: ZVEI1, PZVEI, EEA, CCIR1, etc.).
- You can choose a code in the TX Code List which depends on the signaling type of each channel.
- In case of DTMF, push the PTT key to send after choosing the code.
- In case of 2-Tone and 5-Tone, push the Call key to send after choosing the code. (Note: The Call function must be assigned in programmable keys)

### (1) Signaling Type & Transmission

#### 1) DTMF

##### - Transmission

- Manual Dial: To send the DTMF codes, press the numerical key or programmable key pressing the PTT key.

- ① **P0** 'A' tone
- ② **P1** 'B' tone
- ③ **P2** 'C' tone
- ④ **P3** 'D' tone

- Store and Send: Push the PTT key after editing DTMF codes.

- ① PTT: Code Save & Send
- ② Monitor: Cancel (Exit without Save)
- ③ **\*#**: Special Tone Selection Mode

- I. **P0** 'A' tone
- II. **P1** 'B' tone
- III. **P2** 'C' tone
- IV. **P3** 'D' tone

- TX Code Select & Enter

- ① PTT: Code Save & Send
- ② Monitor: Cancel (Exit without Save)
- ③ Up / Down: Code Selection

- Redial

- ① Redial Key: Display the last DTMF code
- ② PTT: Send
- ③ Monitor: Cancel (Exit)

Note: Error beep sounds if there is no Redial Code.

## 2) 5-Tone

### - Transmission

- TX Code Select Mode

- ① TX Code Select & Enter Key: Enter TX Code Select Mode
- ② Up / Down Key: Choose the code
- ③ Call Key: Send the code

- TX Code Enter Mode

- ① TX Code Select & Enter Key (In TX Code Select Mode): Enter to the TX Code Enter Mode
- ② Up / Down Key: Edit the code digit
- ③ Code Select & Enter Key (In TX Code Enter Mode): Edit the code
- ④ To return to the TX Code Select Mode, push the TX Code Select & Enter Key after editing the last code.

- PTT Key: Save & Exit

- Monitor Key: Cancel (Exit without Save)

- Up / Down

- ① Code Select Mode: Code Selection
- ② Code Enter Mode: Digit Code Edit

## 3) 2-Tone

### - Transmission

- TX Code Select & Enter

- ① PTT: Code Save & Send
- ② Monitor: Cancel (Exit without Save)
- ③ Up / Down: Code Selection

## (2) Signaling Functions and Receiving

### 1) ANI (DTMF & 5-Tone)

- Display the received code on the LCD.
- Display the alias text if the received code matches with one of the code in the RX Code List.
- Display time is 10 seconds.

### 2) Selcall (DTMF & 5-Tone)

- The transceiver will do the correspondent action if the received code matches with current channel ID.

#### - Action

- LED: LED (Amber Color) Blink Effect
- ICON: Icon Blink Effect
- Alert Tone: Alert Beep Effect
- Squelch: Squelch Effect

### 3) Code Match Operation

- The transceiver will do the correspondent action if the received code matches with one of the code in the RX Code List.

- LED: LED (Amber Color) Blink Effect
- ICON: Icon Blink Effect
- Alert Tone: Alert Beep Effect
- Squelch: Squelch Effect
- Stun

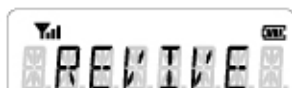
- ① 'STUN' is displayed if the transceiver receives Stun Code.



- ② All keys are disabled except the EMG key. (Only Emergency Call and receiving are possible.)
- ③ Error beep sounds if any key (except EMG) is pressed.

- Revive

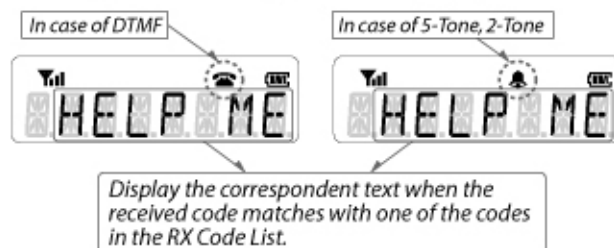
- ① The transceiver returns to normal mode if it receives Revive Code.
- ② Cancel beep sounds and the 'REVIVE' will be displayed on the LCD.



- Text: The text correspondent with the received code will be displayed.

#### 4) Optional Functions

- Transponder: This function is to send the Alert Tone automatically when the received code matches with current channel ID.
- Auto Reset Time: This timer mutes the receiver automatically after a valid call has been received. A valid call is when the received code matches the current channel ID, or one of the codes in the RX Code List. The timer duration is dealer programmable.
- Push the monitor key to return to call standby status before Auto Reset Time is elapsed.
- Remind Time: After a valid call has been received and there are no key presses from the user, one of the two icons will blink. See below. The timer duration is dealer programmable."
  - Push any key to stop the icon blinking.
  - Receiving status will be displayed until any key input.



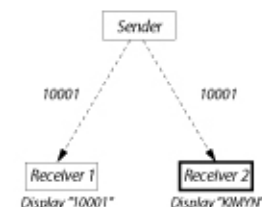
### (3) Signaling Operation Example

#### 1) DTMF

**ANt:** Displays the received DTMF code.

Receiver2's DTMF RX Code List

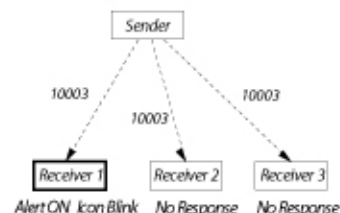
	Code	Name	Actions
1	10001	KIMYN	X
2	10002	RYUJG	SQL Open
3	10003	KIMY	Alert ON
4	10004	KIMCG	LED ON
5	00001	NOTHING	X
6	00002	BUSY	X
7	00003	READY	X
8	00004	COMEON	X



**Command:** Carries out designed actions if the transceiver receives a valid code.

Receiver1's DTMF RX Code List

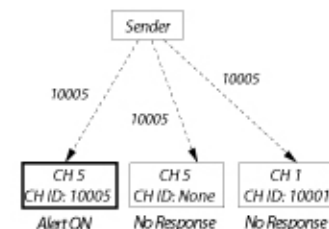
	Code	Name	Actions
1	10001	KIMYN	X
2	10002	RYUJG	SQL Open Icon Blink
3	10003	KIMY	Alert ON
4	10004	KIMCG	LED ON
5	00001	NOTHING	X
6	00002	BUSY	X
7	00003	READY	X
8	00004	COMEON	X



**Alert:** Beeps out if the received DTMF code and Ch. ID are the same.

Channel Data

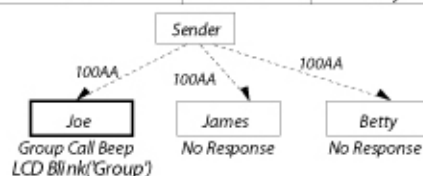
CH NO.	Signaling	CH ID	Name
CH 1	DTMF	10001	KIMYN
CH 2	DTMF	10002	RYUJG
CH 3	DTMF	10003	KIMY
CH 4	DTMF	10004	KIMCG
CH 5	DTMF	00005	TWR_SW
CH 6	DTMF	00006	TWR_HW
CH 7			
CH 8			



### 1) 5-Tone Group Call

Channel Data

No.	Signaling Type	CH ID	CH. Name	
1	5-Tone	10001	Joe	Group A
2	5-Tone	10002	Tony	
3	5-Tone	10003	Alex	
4	5-Tone	20001	James	Group B
5	5-Tone	20002	Jane	
6	5-Tone	20003	Alice	
7	5-Tone	30001	Betty	Group C



### (4) 5-Tone Table

Tone	ZVEI1	PZVEI	DZVEI	DDZVEI	PDZVEI	CCIR1	CCIR2	PCCIR	EEA	Euro signal	NATEL
0	2400	2400	2200	2400	2200	1981	1981	1981	1981	979.8	1633
1	1060	1060	970	1060	970	1124	1124	1124	1124	903.1	631
2	1160	1160	1060	1160	1060	1197	1197	1197	1197	832.5	697
3	1270	1270	1160	1270	1160	1275	1275	1275	1275	767.4	770
4	1400	1400	1270	1400	1270	1358	1358	1358	1358	707.4	852
5	1530	1530	1400	1530	1400	1446	1446	1446	1446	652.0	941
6	1670	1670	1530	1670	1530	1540	1540	1540	1540	601.0	1040
7	1830	1830	1670	1830	1670	1640	1640	1640	1640	554.0	1209
8	2000	2000	1830	2000	1830	1747	1747	1747	1747	510.7	1336
9	2200	2200	2000	2200	2000	1860	1860	1860	1860	470.8	1477
A	2800	970	825	885	825	2400	2400	1050	1055	---	1995
B	810	810	740	810	886	930	930	930	930		571
C	970	2800	2600	740	2600	2247	2247	2400	2400		2205
D	885	885	885	680	856	991	991	991	991		2437
E	2600	2600	2400	970	2400	2110	2110	2110	2110	1062.9	1805

#### Note

- Group Tone: A (\*)
- Repeat Tone: E
- Example: 11111 → 1E1E1



## 7. Other Functions

### (1) Memory Channel

#### 1) Description

- If you'd like to change a specific channel fast and easily, you can register the channel to Memory Channel. You can set memory channels up to 4 channels.

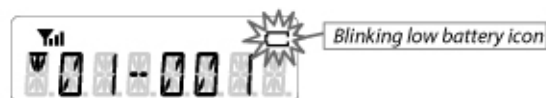
#### 2) Operation

- If you push the memory channel key, the current channel will be changed to correspondent memory channel.
- The rotary selector position would be different from the current memory channel information.

### (2) Battery Indication

- 1) The battery indicator shows the approximate battery charge remaining.

Display Ex.)



#### 3) Low Battery

- Battery Icon will be blinked and warning beep sounds when the transceiver turns to the low battery condition.

#### 4) Low Battery in Transmitting

- If the transceiver turns to the low battery condition during TX, the next TX will be inhibited.

### (3) Key Lock

- 1) All keys are locked except EMG, PTT and Rotary Selector.
  - To release the key lock status, push the lock key once more.
- 2) Display of the Key Lock Status



### (4) Transceiver Lock

- 1) This function is to prevent other users from using the transceiver.
  - Error beep sounds and 'NO PWD' will be displayed if the transceiver has no password.



### (5) Compander

- 1) This function is to reduce noise from the transmitted audio.
- 2) Display: The compander icon appears when the function is activated.



### (6) Scramble

- 1) This function is to prevent unauthorized users from listening to your call.  
Display Ex.) The scrambler icon appears when the scramble function is activated.



### (7) Man Down

→ Optional Function

### (8) Lone Worker

If there is no key input event within the specified time, warning beep sounds for 'warning duration'.

If there is no key input event within 'warning duration', emergency call is worked automatically.

## 8. Function List

<b>Value</b>	<b>Function</b>	<b>Remark</b>
0	None	
1	Backlight OFF / ON / AUTO	
2	Beep OFF / ON	Controls all
3	Call	
4	Channel Down	Long Key
5	Channel Up	Long Key
6	Compander OFF / ON	
7	Group Down	Long Key
8	Group Up	Long Key
9	Key Lock	
10	Lone Worker`	
11	Lookback Channel Setting	
12	Man Down OFF / ON	
13	Memory Channel 1	
14	Memory Channel 2	
15	Memory Channel 3	
16	Memory Channel 4	
17	Priority Channel Setting	
18	DTMF Redial	
19	Scan List Setting	
20	Scan Start / Stop	
21	Scrambler OFF / ON	
22	Talk Around	
23	Tone Squelch1	
24	Tone Squelch2	
25	Transceiver Lock	
26	TX Code Select & Enter	
27	TX Power High / Low	
28	User Set Mode	
29	VOX OFF / ON	
30		
31		
Reserved	Compander	MIC Sense
	Squelch Lv.	TOT
	VOX	Backlight
		BEEP