

► Table of Contents ◀

1. Introduction
2. Description of Unit
3. Technical Specifications
4. Theory of Operation
5. Circuit Descriptions



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

1. Introduction

EP400 has a compact size with a various features in the range of 403~520MHz. EP400

Has a various features shown as below.

EP400 constructed with a microprocessor controlled, temperature compensated Phase Locked Loop(PLL) frequency synthesizer. The radio features a double conversion receiver and a direct FM transmitter modulator. A special integrated circuit provides support to sub-audible signaling(CTCSS & DCS) and most of the receiving parts are switched off periodically in the power save mode to reduce battery current drain during standby.

2. Description of Unit

	Items	Model
Supplied Package	Radio	EP400
	Antenna	
	1700mAh Li-Ion battery pack	
	Desktop rapid charger	
	Adaptor	
	User manual	

	Items	Model
Accessories	External / Speaker Microphone	
	Earpiece Microphone	
	Earpiece VOX Microphone	
	VOX & PTT Headset	

3. Technical Specifications

3-1 General

- 1) Frequency range : 403 ~ 520 MHz
- 2) Channels : 255 Channels
- 3) Channel spacing : 12.5 kHz/25 kHz
- 4) Communication method : Simplex
- 5) Antenna Impedance : 50 ohm
- 6) Antenna : Helical Antenna
- 7) Power supply voltage : LI-1700mAh Li-Ion battery pack(Voltage: 7.4V DC)
- 8) Current Drain :

When Transmitting(5W)	-	< 2A
When Receiving(0.5W)	-	< 300mA
Transmit standby	-	< 60mA
Receiver standby(PSC MODE)	-	< 50mA
- 9) Microphone : Internal Condenser Microphone(External Speaker Microphone is available)
- 10) Operating temperature range: -30℃ ~ +60℃
- 11) Size : 55(W)x114(H)x30(D)
- 12) Weight : 300g

3-2 Transmitter

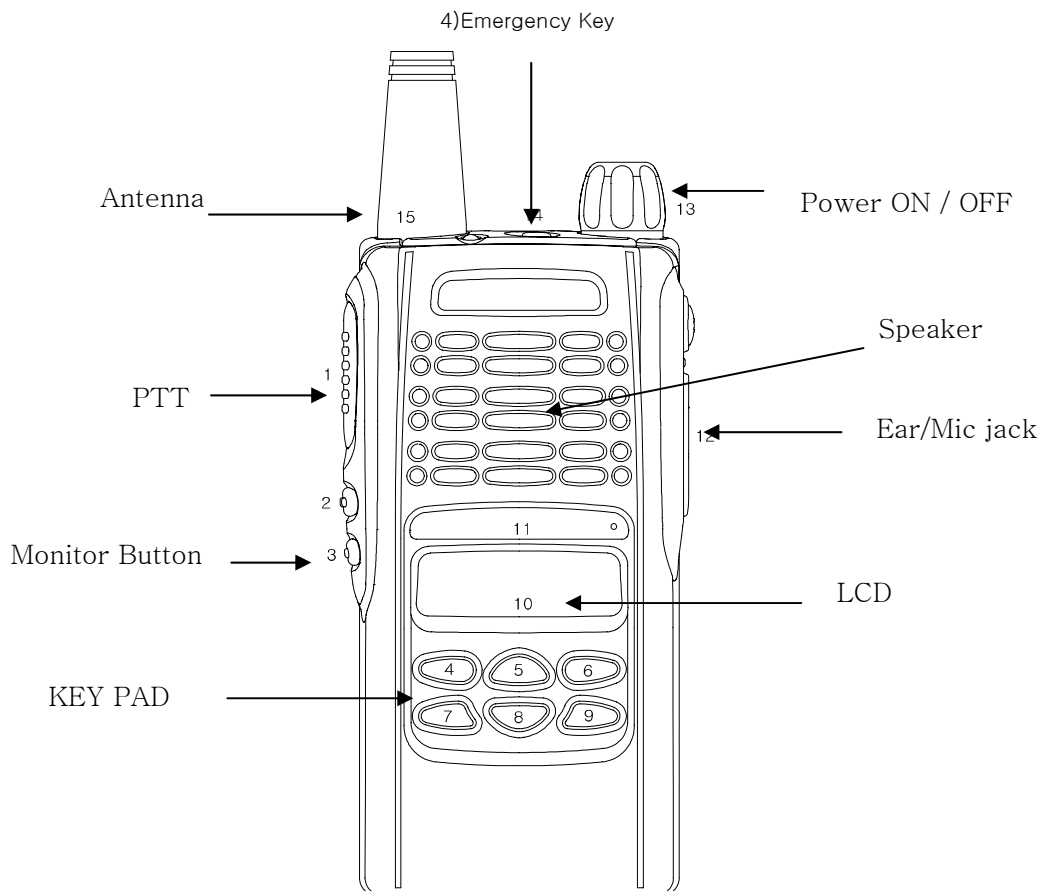
- 1) Power Output : HIGH – 4W, LOW - 1W
- 2) Modulation : 8K5OF3E/16KOF3E
- 3) Oscillator method : PLL
- 4) Frequency Stability : less than $\pm 0.00025\%$ (± 2.5 PPM)
- 5) Maximum frequency deviation: ± 2.5 kHz(Narrow)/ ± 5 kHz(Wide)
- 6) Audio Distortion : less than 5% (1 kHz 60%)
- 7) SPURIOUS Emission : -36 [dBm]
- 8) FM Hum & Noise : -40 [dB] (HP8920A 300Hz ~ 3kHz BPF)
- 9) BAND SPREAD : 117 [MHz]

3-3 Receiver

- | | | |
|----------------------------------|---|----------------------------------|
| 1) Receiver Type | : | Double Super Hetero type |
| 2) Sensitivity | : | -0.25uV e.m.f (12dB SINAD) |
| 3) Frequency Stability | : | $\pm 0.00025\%$ (± 2.5 PPM) |
| 4) SPURIOUS Rejection | : | -70 dB |
| 5) Adjacent Channel Selectivity: | | -60 dB (Narrow) , -70 dB (Wide) |
| 6) Distortion | : | 5% (1 kHz 60%) |
| 7) Hum & Noise | : | -40 dB(HP8920A 300Hz ~ 3kHz BPF) |
| 8) Audio output | : | 1000 mW |
| 9) BAND SPREAD | : | 117MHz |
| 10) Speaker size | : | 45 pi |

4. Theory of Operation

EXTERNAL VIEW



4-1 Features & Operation

1. Monitor

Press the Monitor key momentarily to disable the Tone squelch.

2. Radio Call

By using Various 5Tone, individual / Group call is available.

16 Receiving codes are available as well as open call.

3. Missed calls list

16 Missed calls can be listed. If a call remains unanswered, the call will be stored by the radio.

4. contact list

During a call, the contact list may be used to give access to up to 16 preprogrammed numbers accessed via the menu.

5. status list

A status is a code for transmitting prearranged messages, e.g. status "05" may indicate "launch". Status list contains up to 30 entries.

6. Channel : 255 channel

7. Scan ON/off

8. Power level : Power level is adjustable in each channel respectively.

9. Talkaround on/off

10. Emergency :

11. Lone Worker

12. Tx Tone select : In the menu, tx dcs /ctcss tone is adjustable.

13. Rx Tone select : In the menu, rx dcs /ctcss tone is adjustable.

14. Group : Defines group tone. You can select tone code for group, and it is used as a default value . 0~9 and a, b, c, d available. And "A" is used as a basic value..

15. BEEP ON/OFF : BEEP sound ON/OFF.

16. KEY LOCK : LOCK/UNLOCK Button KEY.

17. SQUELCH : Squelch level is adjustable

18. AUTO SQUELCH : Squelch level is adjustable automatically by surroundings.

19. DTMF ON/OFF : DTMF function is available.

20. VOX : VOX LEVEL is adjustable by pushing up and down button.

21. AUTO VOX : VOX level is adjustable automatically by surroundings.

22. P - SCAN : Priority Scan

23. POWER SAVE : Power save mode is available.

24. PASS WORD : This function is useful for security reason.

25. LOCATION INDICATE : Indicate where the radio is located by blinking green light every 7 seconds.

26. SCRMABLE : Internal Voice Scrambler is available.

27. STUN / UNSTUN : For added security and to avoid abuse of the radio system in which you operate a feature known as Stun/Unstun is included in your radio.

28. BACKLIGHT : Lamp is lighting when you check LCD status.

4-2 LCD Display and Icons



1. ANT GAZE ; Shows the received signal strength.
2. TX POWER HIGH: Indicate power level
3. KEY LOCK: Appears during key lock function is ON.
4. ALART(BEEP) ON/OFF: Appears when beep sound is turned ON.
5. Battery level indicator: Indicates reaming battery power.
6. VOX ON/OFF: Appears when VOX function is turned On.
7. SCAN: Appears when Scan function is activated.
8. SCRAMBLE: Appears while the voice scrambler function is activated.
9. TALK AROUND Indicator.

4-3 Features

1. Channel


This radio offers up to 255 channels

- 1). By using   button, you can select the desired channel.







2. Missed calls list

Up to 16 calls can be stored. If the same radio calls more than once, only the most recent call is stored. When fifteen calls have been stored by the radio, depending on the radio programming the sixteenth call received may overwrite the first or not be stored by the radio.


- 1).  to enter Menu Mode.

2) Display shows



- 3)  to select
- 4)  or  to scroll list
- 5)  to exit

3. Contact list

1)  to enter Menu Mode.

2)  or  to until 


3)  to select




4)  or  to scroll list

5)  to exit

4. Status call list

4-1. Making STATUS call

1)  to enter Menu Mode.


2)  or  to until 

3)  to select

4)  or  to scroll list

5) Push PTT KEY for sending message on the LCD.

4-2 Make STATUS Message

1)  to enter Menu Mode.



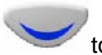




2)  or  to until 

3)  to select









4)  or  to scroll list

5)  to SELECT

5. Lone work









- 1).  to enter Menu Mode.
- 2).  or  to until 
- 3).  to select
- 4).  or  to select ON/OFF

6. Tx power

- 1).  to enter Menu Mode.
- 2).  or  to until 
- 3).  to select
- 4).  or  to select HIGH / LOW POWER
- 5).  to select









7. Tx Tone

Selecting Transmitting TONE(CTCSS/DCS).

- 1).  to enter Menu Mode.
- 2).  or  to until 
- 3).  to select
- 4).  or  to Select TONE을 either CTCSS or DCS.
 0= NON TONE
 1-38 CTCSS
 101 – 183 DCS TONE
- 5).  to select exit









8. Rx Tone

Changing Receiving TONE(CTCSS/DCS).









- 1)  to enter Menu Mode.
- 2)  or  to until 
- 3)  to select
- 4)  or  to select TONE either CTCSS or DCS.
 0= NON TONE
 1-38 CTCSS
 101 – 183 DCS TONE.
- 5)  to select exit

9. Group









Changing GROUP Tone.

- 1)  to enter Menu Mode.
- 2)  or  to until 
- 3)  to select
- 4)  or  to select scroll list
- 5)  to select exit

10. Beep on/off









- 1)  to enter Menu Mode.
- 2)  or  to until 
- 3)  to select
- 4)  or  to select on off .
- 5)  to select

11. Key lock









- 1)  to enter Menu Mode.
- 2)  or  to until 
- 3)  to select
- 4)  or  to select key lock /unlock.
- 5)  to select

12. Squelch level






16 level is available. 0 = terminate sq function

- 1)  to enter Menu Mode.
- 2)  or  to until 
- 3)  to select
- 4)  or  to the scroll list
- 5)  to select exit

13. Auto Squelch




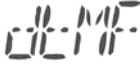




- 1)  to enter Menu Mode.
- 2)  or  to until 
- 3)  to select
- 4)  or  to select on /off .
- 5)  to select

14. Scan









- 1)  to enter Menu Mode.
- 2)  or  to until 
- 3)  to scan.

4) Push PTT for exit

15. DTMF









- 1).  to enter Menu Mode.
- 2).  or  to until 
- 3).  to select
- 4).  or  to select ON /OFF.
- 5).  to select

16. Vox on/off









- 1).  to enter Menu Mode.
- 2).  or  to until 
- 3).  to select
- 4).  or  to select ON /OFF.
- 5).  to select

17. Vox Level









16 level is available..

- 1).  to enter Menu Mode.
- 2).  or  to until 
- 3).  to select
- 4).  or  to scroll list
- 5).  to select for exit









18. Auto Vox

- 1).  to enter Menu Mode.
- 2).  or  to until 
- 3).  to select
- 4).  or  to select ON /OFF.
- 5).  to select


19. Priority Scan

- 1).  to enter Menu Mode.
- 2).  or  to until 
- 3).  to select
- 4).  or  to select ON /OFF.
- 5).  to select

20. Priority scan CH

- 1).  to enter Menu Mode.
- 2).  or  to until 
- 3).  to select
- 4).  or  to scroll list
- 5).  to select for exit

21. Power save

1).  to enter Menu Mode.


2).  or  to until 

3).  to select

4).  or  to select ON /OFF.

5).  to select

22. Talkaround

1).  to enter Menu Mode.


2).  or  to until 

3).  to select

4).  or  to select ON /OFF.

5).  to select

23. Password

1).  to enter Menu Mode.


2).  or  to until 

3).  to select

4).  or  to select ON /OFF.

5).  to select



24. Password CH


- 1).  to enter Menu Mode.

- 2).  or  to until 

- 3).  to select

- 4) ---- will display on the LCD(enter old password)


-  or  by pushing up and down KEY to change password.



-  by pushing enter KEY to change digit of password.

- 5) Enter new password by 4 digit.

25. Location

Indicate where the radio is located by blinking green light every 7 seconds.

- 1).  to enter Menu Mode.


- 2).  or  to until 

- 3).  to select

- 4).  or  to select ON /OFF.

- 5).  to select

26. Scramble

- 1).  to enter Menu Mode.


- 2).  or  to until 


- 3).  to select

- 4).  or  to select ON /OFF.

- 5).  to select

27. Status call Send

1).  to enter Menu Mode.

2).  or  to until 

3).  to select

4).  or  to select ON /OFF.

5).  to select