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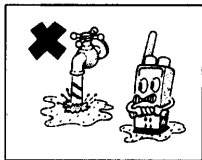
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Precautions.....

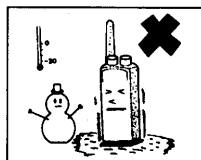
Attaching the Antenna.....

Battery Insertion and Removal.....

Precautions



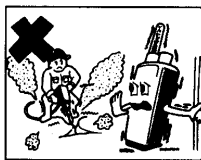
This Transceivers is water resistant. Avoid wet or humid places. If water is splashed on the Transceiver, wipe the moisture off with a dry cloth.



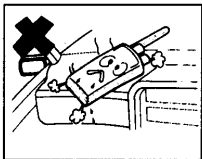
Avoid extremely cold places.



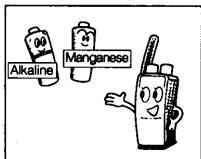
Never disassemble the Transceiver. Never touch the Transceiver's core. It is adjusted for optimum performance.



Avoid exposing the Transceiver to excessive vibrations. Avoid dusty places.



Avoid hot places and locations exposed to direct sunlight.

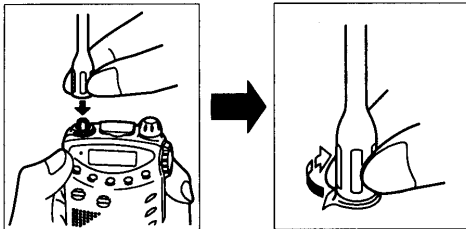


An applicable battery is either AA-size manganese/alkaline or nickel-cadmium battery pack CNB401.

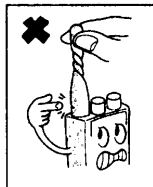
Never use any other batteries. This Transceiver requires 2.2 to 3.5 volts DC. Never use voltage out of this range. If a voltage out of this range is used, the Transceiver may be damaged.

Attaching the Antenna

- Attach the included antenna to the SMA antenna terminal. Place the antenna on the antenna terminal and turn the antenna base clockwise.



When attaching the antenna do not:



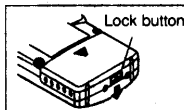
- ◆ Do not twist the top of antenna. Do not turn the antenna too fasten it.



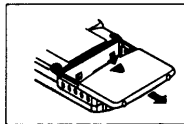
- ◆ Do not carry the Transceiver by the antenna, this may cause intermittent operation.

- ◆ Do not transmit without an antenna. This could cause permanent damage.

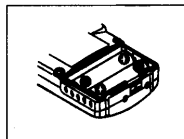
Battery Insertion and Removal




- 1** Turn the Transceiver off.
- 2** Slide the battery lock button down to release the battery cover



- 3** Slide the battery cover off.



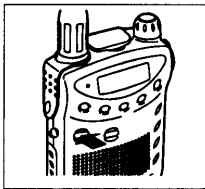
- 4** Confirm the location and polarity of the battery cells, and or replace when required.
- 5** To Close the battery cover. Slide the battery cover onto the Transceiver.

-  Never use an old battery cell and a new battery cell together.
- Never throw used batteries into a fire.
- When using the optional Ni-Cd battery pack CNB401 use only the CSA401A (120 VAC type) or CSA401E (220 to 240 VAC type) to charge.

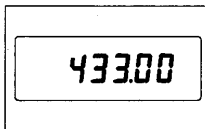
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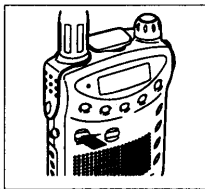
Turning the Transceiver On



- 1 Push the **[PWR]** key for 0.3 seconds or more.

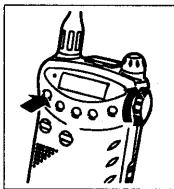


- 2 Power is confirmed by the display on the display panel and the power up sound. The initial frequencies as shown:

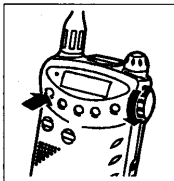


- 3 To turn off, press the **[PWR]** key for 0.3 seconds or more.

Adjusting the Volume



- 1 To increase the volume, press the **[MONI]** key and turn the VOL knob to up. (The VOL knob's numbers increase.)



- 2 To decrease the volume, press the **[MONI]** key and turn the VOL knob to down. (The VOL knob's numbers decrease.)



- ◆ Remember to reduce the volume before using the optional headset.



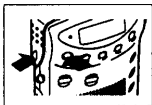
- ◆ Adjust the volume when sound is being emitted from the speaker

Turning the Squelch Off (Monitor)

- When the FM Transceiver is not receiving a signal, squelch noise will be heard. The squelch control is used to cancel this noise.



- Press the **[MONI]** key.



- To lock the Squelch off, hold down the **[E]** key and press the **[MONI]** key.
To cancel, press the **[MONI]** key.



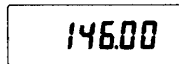
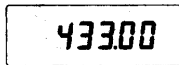
- The Squelch is turned off during the reception of a strong signal, and on after the signal has stopped.
- If the signal is weak, the squelch is not turned off. Upon reception of a weak signal press the **[MONI]** key. When this is doing, sound will be heard mixed with noise.
- When the **[MONI]** key is pressed, the squelch is turned off (opened). This state allows the user to monitor the signal.
- In repeater mode, press the **[MONI]** key, reverse the frequency and turn off the squelch.

Selecting the Band (Frequency Band)

- This Transceiver has VHF band and UHF band. They are switched as following:



- Press the **[BAND]** key.



- Confirm the band has switched. (The band is switched with each press of the **[BAND]** key.)




- The VHF band can receive and transmit 144.000 to 147.995 MHz.
The UHF band can receive and transmit 430.000 to 439.995 MHz (C508), 438.000 to 449.995 MHz (C508A).
- This Transceiver has a Band Setting function. When using this function, the band is switched to the next band by turning the Selector.

VFO State

- The VFO (Variable Frequency Oscillator) is the state in which frequencies can be changed with the rotary channel selector. This is the state of the Transceiver when shipped and immediately after resetting.

1 Confirm the Indicator (P 15)

-  2 If "M" is displayed (Memory mode), press the **[V/M]** key to return the VFO mode. (P 26)
 If "C" is displayed (CALL mode), press the **[V/M]** key to return the VFO mode. (P 19)
 If frequency is changed (Scan mode), press the **[V/M]** key to return the VFO mode. (P 32)
 If Set mode is selected, press the **[V/M]** key to return the VFO mode. (P 53)



- ◆ In Memory mode, the displayed frequency becomes the VFO frequency by holding down the **[E]** key and pressing the **[SC]** key.
- ◆ The CALL frequency becomes the VFO frequency by turning the Selector.

Receiving

- Receiving is the process of selecting a frequency to a desired channel and listening.

1 Set to the VFO, and select the band.



2 The frequency increases if the Selector is turned clockwise.



3 The frequency decreases if the Selector is turned counterclockwise.



- ◆ This Transceiver has a Quick Encoder, when the Selector is turned fast, the frequency changes accordingly.

Transmitting

By setting Transceivers to the same frequency and pressing the **[PTT]** switch, you can communicate directly with another party.

- 1 Set to the VFO and select the band.
- 2 Turn the **Selector** to set the desired frequency.
- 3 Before transmitting confirm, the frequency is not being used by other parties.
- 4 Hold down the **[PTT]** switch and speak into the microphone.



433.20

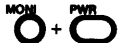


Resetting the VFO (VFO Reset)

- When this is done, the Transceiver is set to the VFO, and the Set mode is reset to its original state. The memory and CALL frequency can not be reset. If the original state is requested, use this function.

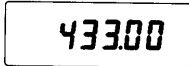


1 Press the **[PWR]** key to turn the power off.



2 Hold down the **[MONI]** key and press the **[PWR]** key.

3 Release the keys, and confirm the display is in its original state.



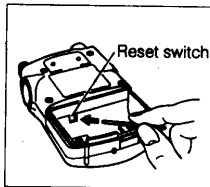
Resetting All Settings (All Reset)

- When this is done, the Transceiver is set to its original factory state. All contents of the VFO and the memories are erased.



1 Press the **[PWR]** key to turn the power off.

2 Remove the batteries.



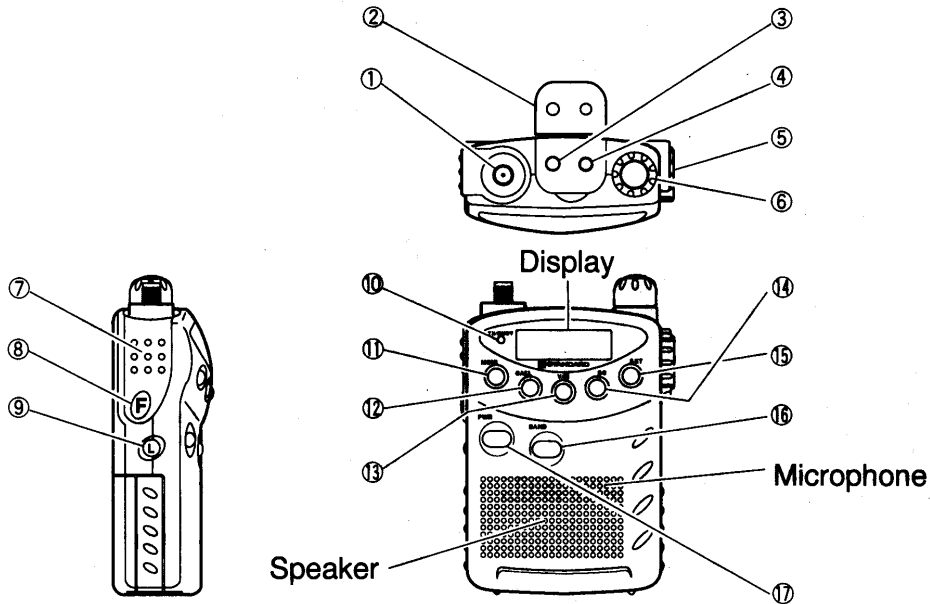
3 Press the reset switch



◆ When All Reset is completed, insert batteries and turn the Transceiver on, the power up beep is sounded.

◆ The All Reset uses the internal lithium battery. Use this function sparingly to save the battery life.

Operation and Function of Parts



BASIC OPERATIONS

① Antenna Connection Terminal (SMA type)

To attach the antenna.

② Microphone/Speaker Cap

Ensure this cap is in place when not using the terminals.

③ M

External microphone terminal.
To attach an optional microphone.

④ S

External speaker terminal.
To attach an optional speaker.

⑤ Volume Knob

This is used to adjust volume.

⑥ Rotary Channel Selector switch

This is used to change the transmission and reception frequency (D 10). It is also used to turn on and off or select various settings.

Its referred to as "Selector" in this manual.

⑦ PTT Switch

When pressed, switches between transmit and receive.

⑧ F key

Hold down this key to enter the function mode, used in combination with other keys, enables various functions.

⑨ L key

Press this key and the lamp lights the display for five seconds.

F: Lamp lock

⑩ TX BUSY Indicator

Is red during transmissions and green during reception or when the squelch is off.

⑪ MONI key

Press this key and the squelch is opened.

⑫ CALL key

Press this key to recall the CALL frequency.
Hold down the PTT switch and press this key to transmit a 1750 Hz tone burst.

⑬ V/M key

Press this key to switch between VFO and memory modes.

F: Sets storing the memory.

F: Changes the memory while in memory mode.

⑭ SC key

Starts and stops the scan.
Set the program scan while in CALL mode.

F: Starts or stops the all scan.

⑮ SET key

Recall and set the Set mode

F: Switch the set mode in My key.

(The frequency lock is originally set in the My key.)

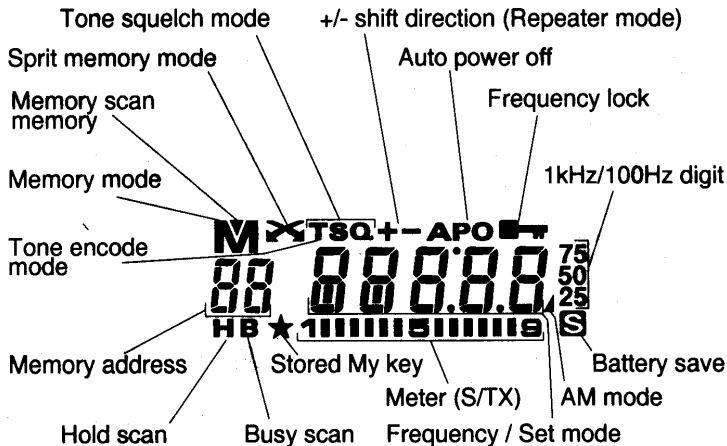
⑯ BAND key

Switch the band.

⑰ PWR key

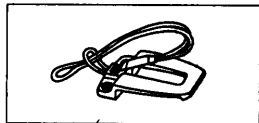
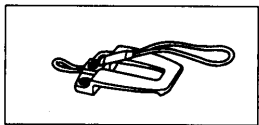
Press this key and the power supply is enabled or disabled.

Display Indications



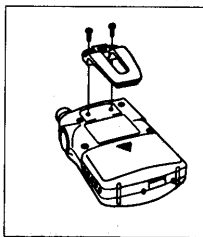
Tying the Hand-strap to the Belt-clip

- The hand-strap can be tied to belt-clip as follows:



Attaching the Belt-clip to the Transceiver

- The belt-clip can be attached to the Transceiver as follows:



- 1 Tie the hand-strap to Belt-clip
- 2 Attaching the belt-clip to the Transceiver.



- ◆ The belt-clip can only be attached the with supplied screws.
- ◆ Never attached screw to the transceiver without the belt-clip

ADVANCED OPERATION

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Changing the Frequency Step

- The factory settings are 5 kHz in the Set menu.

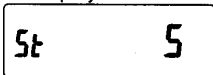
To change the frequency step:



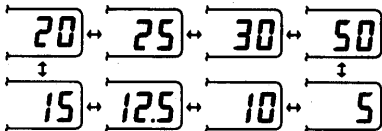
- 1 Press the **[SET]** key.



- 2 Turn the Selector to change the Set menu display to "St 5".



- 3 Hold down the **[F]** key and turn the Selector to change the frequency step.



- 4 To end, press the **[SET]** key.



- ◆ This function can be set for each band.

Changing the Frequency in 1 MHz, 100 kHz or 10 MHz Steps

- The frequency step can be changed by 1 MHz, 100 kHz or 10 MHz steps.

To change the frequency step by 1 MHz:



- 1 Hold down the **[F]** key and turn the Selector.

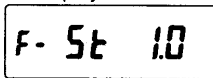
To change the frequency step by 100 kHz or 10 MHz:



- 1 Press the **[SET]** key.



- 2 Turn the Selector to change the Set menu display to "F-St 1.0".



- 3 Hold down the **[F]** key and turn the Selector to change the display from 1.0 to 0.1 or 10.0



- 4 Press the **[SET]** key.



- 5 Hold down the **[F]** key and turn the Selector to change the frequency.

Using the CALL Frequency

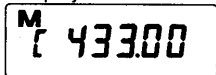
- When shipped, the CALL frequency is set at 146.00 MHz (C508), 146.52 (C508A) in the VHF band and 433.00 MHz (C508), 446.00 (C508A) in the UHF band.

1 Set to the VFO and select the band.



2 Press the **CALL** key.

3 Confirm that CALL frequency and "C" are displayed.



4 To return the VFO, press the **CALL** key.



- In step 3, CALL frequency becomes the VFO frequency by turning the Selector.
- In step 3, CALL frequency of each band can be called by pressing the **BAND** key.

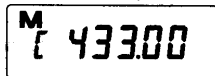
Changing the CALL Frequency (1)

- To change the CALL frequency

1 Set to the VFO and select the band.



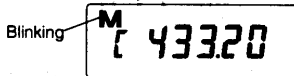
2 Press the **CALL** key.



3 Hold down the **F** key and press the **V/M** key. ("M" is blinking.)



4 Turn the Selector to set the new CALL frequency.



5 Hold down the **F** key and press the **V/M** key. (The new CALL frequency is set and "M" is lit.)



6 To return the VFO, press the **CALL** key.



- The CALL frequency can be changed temporary. This function is called **CALL Shift**. In step 4, the frequency can be changed by turning the Selector allowing transmission and reception. Press the **CALL** key to return the VFO.

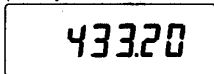
Changing the CALL Frequency (2)

- Using a second method change the CALL frequency:

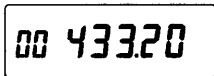
1 Set to the VFO and select the band.



2 Turn the Selector to set the new CALL frequency.



3 Hold down the **[F+]** key and press the **[V/M]** key.



4 Press the **[CALL]** key. (A high pitched beep is sounded and new CALL frequency is set.)



5 Press the **[CALL]** key to confirm the new CALL frequency is set.



6 Press the **[CALL]** key to return the VFO.



◆ In step 3, a low pitched beep is sounded when Transceiver has no empty memory addresses (M 26). To change the CALL frequency use "Changing the CALL Frequency (1)". (M 19)

Storing Associated Data with the CALL Frequency

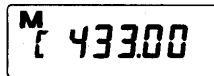
- Various settings can be stored with the CALL frequency. These include the Repeater mode, Tone Encode mode, Tone Squelch mode, offset frequency and tone frequency.

1 Set to the VFO and select the band.



2 Press the **[CALL]** key.

3 Confirm that CALL frequency and "C" are displayed.



4 To set the various setting, refer to the specific setting.

- Repeater mode (M 42)
- Offset frequency (M 43)
- Tone Encode mode (M 50)
- Tone Squelch mode (M 50)
- Tone frequency (M 50)



5 To return the VFO, press the **[CALL]** key.

Using the Frequency Lock



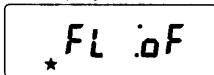
- This function locks the frequency to prevent accidental changes. The [PWR], [L], [SET] and [MONI] key are still active.



1 Press the [SET] key.



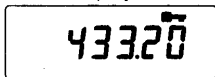
2 Turn the Selector to change the Set menu display to "FL :oF".



3 Hold down the [F] key and turn the Selector to change the display from "oF" to "on".



4 Press the [SET] key, confirm that the key symbol is displayed.



- To cancel this setting, change the display from "on" to "oF" in step 3.
- At initial state, this function is set My key (P 22). To change this function, hold down the [F] key and press the [SET] key.

Using the Selector in Frequency Lock Mode



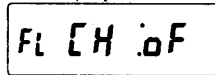
- The Selector cannot be used in the Frequency Lock mode, to enable the Selector while in the Frequency Lock mode perform the following steps:



1 Press the [SET] key.



2 Turn the Selector to change the Set menu display to "FLCH :oF".



3 Hold down the [F] key and turn the Selector to change the display from "oF" to "on".



4 To end, press the [SET] key.



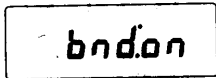
- To cancel this setting, change the display from "on" to "oF" in step 3.
- This function is not available when the Frequency Lock is activated.

Using the Selector beyond Band Limits (Band Setting)

- The Selector cannot be used to change the frequency beyond a band limits. When this function is activated, the Selector can be used to access all bands. When at the end of a bands limits, if the Selector is turned further the frequency changes to next band.



- 1 Press the **[SET]** key.
- 2 Turn the Selector to change the Set menu display to "bnd:on".



- 3 Hold down the **[F]** key and turn the Selector to change the display from "on" to "oF".
- 4 To end, press the **[SET]** key.



- To cancel this setting, change the display from "oF" to "on" in step 3.
- Press the **[BAND]** key, confirm the band has changed.
- Using this function and the All Scan, bands are scanned. When the end frequency of one band is reached, it starts at the first frequency of the next band.
- When using this function and the Program scan, programed different band frequencies can be used.

Changing the Set Mode Function (My Key)

- Certain Set mode functions as listed on page 53 can be stored as a personalized function, or "My key". The My key function indicates "★", when recall the Set mode menu. The Frequency Lock mode is stored initially stored.

Changing the Set mode function by My key

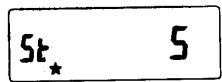


Hold down the **[F]** key and press the **[SET]** key.

Storing Set mode Into My (**[SET]**) key



- 1 Press the **[SET]** key.
- 2 Turn the Selector to select the Set mode to be stored.
- 3 Hold down the **[F]** key and press the **[SET]** key. (High pitched beep is sounded and "★" is lit.)



- 4 Press the **[SET]** key.



- Low pitched beep is sounded when the Set mode function is not set or same Set mode is set.
- The Frequency Lock is stored after done the All reset or VFO reset. (D12)

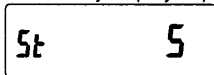
Quick Recall of Often Used Set Menus

- This function is used to select the two most frequently used set menus.

1 Press the **SET** key.

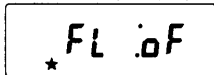


2 Confirm the last Set menu is displayed.
("St 5" is initially displayed.)



3 Hold down the **F** key and press the **CALL** key.

4 Confirm the Set menu is changed.
("FL: oF" is initially displayed.)



5 Confirm the Set mode menu is switched by holding down the **F** key and pressing the **CALL** key.



- ◆ In step 2 or 4, turn the Selector to chose the Set menus used most often.
- ◆ To change the Set menu functions, hold down the **F** key and turn the Selector.

Lighting the Display Lamp

- The lamp can be lit for five seconds, or locked in the on position. The lamp does not go out if the keys are being used.

Lighting the display lamp



Press the **L** key.

Locking the display lamp



1 Hold down the **F** key and press the **L** key.



2 To cancel this function, hold down the **F** key and press the **L** key.


MEMORY FUNCTIONS

The Memory Function	26
Storing the Memory	26
Recalling the Memory	27
Changing the Memory	27
Erasing the Memory	28
Storing Various Modes in a Memory	28
Setting the Split Memory	29
Displaying the Memory Address	30

The Memory Function

- Often used frequencies can be stored in Memory. Up to 60 channel frequencies can be stored for both bands.
- Memory mode: storing the memory, when recalling the memory or using the memory.
- The memory address is the location where a frequency is stored. The number of the memory address is used to recall the frequency stored at that location. Memory address numbers are 00 to 59.
- The various modes can be stored with each memory as following table shows. Some modes cannot be stored in the Split memory mode state.



Split memory state	dUP: oF	dUP: on
Reception Frequency	○	○
Transmission Frequency	X	○
Repeater Mode	○	X
Offset Frequency	○	X
Tone Encode Mode/Tone Squelch Mode	○	○
Optional Tones	○	○

- 
 • This Transceiver has an internal lithium battery for memory backup. If the lithium battery runs out, the display is set to the initial state and memory is erased when batteries are inserted. Contact your dealer to have the lithium battery replaced.


Storing the Memory




- Frequencies used most often can be memorized.

- 1 Set to the VFO, and select the band.
 - 2 Set the frequency to be stored.

43320
 -  + 
 3 Hold down the **[F]** key and press the **[VM]** key.

00 43320

Memory address
 - 
 4 Turn the Selector to select the memory address to be stored.

01 43320
 -  + 
 5 Hold down the **[F]** key and press the **[VM]** key. (The frequency is stored.)
 - 6 Confirm that the VFO is returned.
- 
 ♦ In step 2, the frequency is stored to empty memory address automatically when the **[F]** is held down key and the **[VM]** key is pressed twice.
 - ♦ The frequency cannot be changed until step 3 is completed and the VFO returned. Press the **[VM]** key to return the VFO.
 - ♦ In step 3, if the memory has no empty memory address, a low pitched beep is sounded, to change or erase old memory addresses refer to **D** 27 or **D** 28.
 - ♦ In step 3, when only one memory is available, only the empty memory address are displayed (step 4).

Recalling the Memory

• Recalling stored memory.

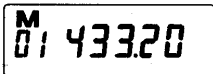
1 Set to the VFO, and select the band.



2 Press the **[V/M]** key.



3 Turn the Selector to select a memory address.



4 Press the **[V/M]** key to return to the original VFO. Hold down the **[F]** key and press the **[SC]** key to return the VFO as the displayed frequency.



- ◆ In step 2, if no frequency is stored in the memory address, a low pitched beep is sounded.
- ◆ In step 3, the memory address which stores the frequency is displayed.
- ◆ In step 3, the 10 digits in the memory address can be changed by holding down the **[F]** key and turning the Selector.
- ◆ The memory address can be displayed where frequency is displayed. (P 30)

Changing the Memory

• Stored memory can be erased.

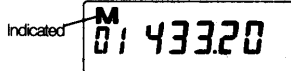


1 Set to the VFO, and select the band.

2 Press the **[V/M]** key.



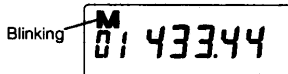
3 Turn the Selector to select the memory address to be changed.



4 Hold down the **[F]** key and press the **[V/M]** key.



5 Turn the Selector to set the new frequency.



6 Hold down the **[F]** key and press the **[V/M]** key. ("M" is lit and stops blinking, new frequency is stored.)



- ◆ The memorized frequency can be changed temporarily. This function is called "Memory Shift". In step 5, the memorized frequency can be changed temporarily by turning the Selector allowing for transmission and reception. Press the **[V/M]** key to return the VFO. Then, memorized frequency is not changed to new frequency.

Erasing the Memory



Stored memory can be erased.

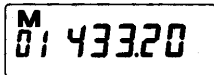
1 Set to the VFO, and select the band.



2 Press the **[VMM]** key.



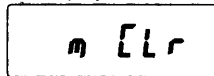
3 Turn the Selector to select the memory address to be erased.



4 Press the **[SET]** key.



5 Turn the Selector to change the Set menu display to "m CLr".



6 Hold down the **[F]** key and turn the Selector. (A high pitched beep is sounded and memory is erased.)

7 Confirm that the VFO is returned.



When step 6 is completed, the memory has been erased and cannot be retrieved. If you do not want to erase the memory, press the **[SET]** key before completing step 6.

Owner's Manual Correction

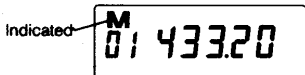
Page 28: Procedure and advice of "Storing Various Modes in a Memory"



1 Set to the VFO, and select the band.



2 Press the **[VMM]** key.
3 Turn the Selector to select the memory address where the various modes are to be stored.



4 Hold down the **[F]** key and press the **[VMM]** key.
5 Select various modes.

The modes are:
Repeater mode (D 42)
Offset frequency (D 43)
Tone Encode mode (D 50)
Tone Squelch mode (D 50)
Tone frequency (D 50)



6 Hold down the **[F]** key and press the **[VMM]** key. ("M" is lit and stops blinking, the selecting mode is stored in a memory.)



7 Press the **[VMM]** key to return to the original. Hold down the **[F]** key and press the **[SC]** key to return the VFO as the displayed frequency.



The memorized frequency can be changed temporarily in step 5. Press the **[VMM]** key to return the VFO. Then, memorized frequency is not changed.

Setting the Split Memory

Two different frequencies can be stored in one memory address. This function is used instead of the offset frequency in the Repeater mode. (P 42)



1 Set to the VFO, and select the band.



2 Press the **[V/M]** key.



3 Turn the Selector to select the memory address to store the receiving frequency.

M
01 433.20



4 Press the **[SET]** key.

5 Turn the Selector to change the Set menu display to "dUP:of".

dUP:of



6 Hold down the **[E]** key and turn the Selector to change the display from "of" to "on".

M
dUP:on



7 Turn the Selector counterclockwise to change display from "dUP:on" to "SP 433.20 (In step 3 the frequency is displayed.)".

SP 433.20



8 Hold down the **[E]** key and turn the Selector to store the transmission frequency.

SP 435.20



9 To end, press the **[SET]** key. (Reception frequency and transmission frequency are stored in the same memory address.)

M
01 433.20

10 Press the **[PTT]** switch to transmit memorized frequency.



- ◆ This function can set each memory address.
- ◆ In step 8, the band can be changed. If this is done, the frequencies are stored in the VHF and UHF.
- ◆ The transmission frequency is set to the reception frequency when this function is canceled.
- ◆ This function is canceled when the Repeater mode is used within the same memory address.
- ◆ Repeater mode is canceled when this function is set to the same memory address.
- ◆ In step 8, 1MHz/100kHz/10MHz steps are not available.

Displaying the Memory Address



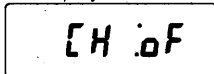
- The memory address can be displayed where the frequency is displayed.



1 Press the **[SET]** key.



2 Turn the Selector to change the Set menu display to "CH :oF".



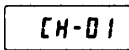
3 Hold down the **[E]** key and turn the Selector to change display from "oF" to "on".



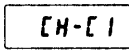
4 To end, press the **[SET]** key.



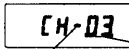
◆ Example



Memory address 01



CALL mode of UHF (C2 is displayed instead of C1 in VHF.)



Memory scan mode

blinking

Scanning

- ◆ To cancel this setting, change the display from "on" to "oF" in step 3.
- ◆ When this function is activated, the following functions are not available; "Changing the CALL Frequency (1)" (P 19) and "Changing the Memory Frequency" (P 27).

SCAN

Scan Function	32
Changing the Scan Type	33
Scan within 1 MHz (1 MHz Scan)	33
Scan the Entire Band Width (All Scan)	34
Scan a Specific Range (Program Scan)	34
Scan Frequencies in Memory (Memory Scan)	36
Scan Specific Memory Frequencies (Memory Scan Memory)	37
Scan a Block (Block Memory Scan)	38
Scan the Tone Frequency (Tone Squelch Scan)	39

Scan Function

- This function automatically scans frequencies and searching for a signal.
- This Transceiver has seven scanning methods. The following seven scan functions are available.

1 MHz Scan

Scans 1 MHz beyond the operating frequency.

All Scan

Scans the entire band.

Program Scan

Scans a specific range.

Memory Scan

Scans memorized frequencies.

Memory Scan Memory

Scans specific memory frequencies.

Block Memory Scan

Scans memories in a block. A block consists of 10 memory address.

Tone Squelch Scan

Scans tone frequencies in the tone squelch mode.

- There are three types of scan that can be selected within a scanning function.

Pause Scan

The scan stops when a signal is received. It resumes in five seconds.

Busy Scan

The scan stops while a signal is being received. It resumes 1.2 seconds after the signal ends.

Hold Scan

The scan stops when a signal is received. The frequency remains unchanged when the signal has stopped. The scan is restarted by turning the Selector.



- ◆ The 1 MHz scan, all scan and program scan uses a frequency step in scanning. If the scan frequency step is changed, so is the Transceivers frequency step. (D 18)
- ◆ The scan direction can be changed by turn the Selector.
- ◆ Turn the Selector to restart the scan when the scan is stopped.

Changing the Scan Type

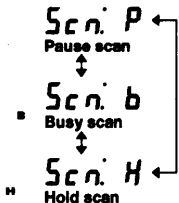


- The scan type can be changed.

- 1 Press the **SET** key.
- 2 Turn the Selector to change the Set menu display to "Scn: P".

Scn: P

- 3 Hold down the **MEMO** key and turn the Selector to select the scan type.



- 4 Press the **SET** key, to end.



- "B" is indicated for Busy scan, "H" is indicated for Hold scan, the Pause scan has no indicator.
- The same scanning type is set for each scan.

Scan within 1 MHz (1 MHz Scan)

- The scan goes 1 MHz beyond the operating frequency displayed.

- 1 Set to the VFO, and select the band.



- 2 Set the frequency where the scan is to start.

433.20



- 3 Press the **SC** key to start the scan.

- 4 Confirm the scan has started.

43328

Blinking Scanning



- 5 Press the **SC** key to stop the scan.




- The digits of the scanned MHz section can be changed by holding down the **MEMO** key and turning the Selector. The band cannot be changed if the Band Setting function is "oF". (P22)

Scan the Entire Band Width (All Scan)

- The entire bandwidth is scanned.

1 Set to the VFO, and select the band.


F +  2 Hold down the **F** key and press the **SC** key.


3 Confirm the scan has started.

43388

Blinking

Scanning

 4 Press the **SC** key, to end.


-  The digits of the scanned MHz section can be changed by holding down the **F** key and turning the Selector.
- The band can be changed during the Band Setting function is "oF".

Scan a Specific Range (Program Scan)

- The range is determined by the stored memory frequencies selected, the frequency range is scanned. 10 memory ranges can be selected.

To set the scan range


 1 Press the **CALL** key to set CALL mode.

 2 Press the **SC** key.

 3 Turn the Selector to set the program number to be stored.


Program number

PO oF

F +  4 Hold down the **F** key and press the **V/M** key.


Blinking


PO 00-00

 5 Turn the Selector to set the memory address to be started.

Blinking


PO 01-00


F +  6 Hold down the **F** key and press the **V/M** key.

 7 Turn the Selector to set the memory address to be ended.

PO 01-02

Blinking

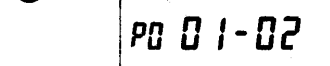
F +  8 Hold down the **F** key and press the **V/M** key.

 9 Press the **V/M** key to end.

To start the scan



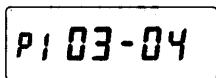
1 Press the **CALL** key to set CALL mode.



2 Press the **SC** key.



3 Turn the Selector to set the program number to be started.



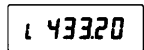
4 Press the **SC** key to start the scan.

5 Press the **VM** key to end.

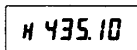


◆ The scan direction is from low frequency to high frequency.

◆ In step 2 and 3, the scanning range is confirmed during holding down the **FE** key and pressing the **SC** key. Start frequency and end frequency is displayed each press the keys.



Start frequency

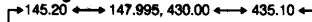


End frequency

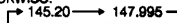
- ◆ The scanning range changes if a memory address used in the scan range is changed.
- ◆ When the scanning range is beyond the band limits, the Band Setting function should be set "oF".
- ◆ This scan depend on the Band Setting. (P 22)
Example

The scanning range is programed from 145.20 to 435.10 MHz.

Band Setting is "oF".

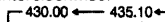


Band Setting is "on" and the Selector is turned clockwise.



(The scanning range is from the end frequency to the upper band limit.)

Band Setting is "on" and the Selector is turned counterclockwise.



(The scanning range is from the start frequency to the lower band limit.)

To erase the scan range



1 Press the **CALL** key to set CALL mode.



2 Press the **SC** key.



3 Turn the Selector to set the program number to be erased.

P1 03-04



4 Press the **SET** key to display "P1 CLr".

P1 CLr



5 Hold down the **F** key and turn the Selector.
(The scan range is erased and a high pitched beep is sounded.)

P1 of



◆ This range is erased when the memory that is used for scan range is erased.

Scan Frequencies in Memory (Memory Scan)

• To scan all frequencies in the memory.

1 Set to the VFO.



2 Press the **V/M** key to set the memory mode.



3 Press the **SC** key.

4 Confirm the scan has started.

M
01 43320

Scanning

Blinking



5 Press the **SC** to stop the scan.



6 Press the **V/M** key to return the original VFO frequency.



◆ In step 2, if no memory addresses are available, no memory mode can be set, a low pitched beep is sounded.

Scan Specific Memory Frequencies (Memory Scan Memory)




- To scan only the marked memory address.


Procedures:

The memory address to be scanned must be assigned to memory.



- 1 Set to the VFO.
- 2 Press the **[V/M]** key to set the memory mode.
- 3 Turn the Selector to select the a memory address.




M
01 433.44
- 4 Press the **[SET]** key.
- 5 Turn the Selector to change the Set menu display to "mm :oF".




mm :oF
- 6 Hold down the **[E]** key and turn the Selector to change the display from "oF" to "on".

 + 
- 7 Press the **[SET]** key.
- 8 Confirm (▼) is displayed on the "M".




M
01 433.44
- 9 When other memory address are to be selected, repeat step 3 to 5.
- 10 Press the **[V/M]** key to cancel this procedure.






To scan

- 1 Set to the VFO.
- 2 Press the **[SET]** key.
- 3 Turn the Selector to change the Set menu display to "mm :oF".




mm :oF
- 4 Hold down the **[E]** key and turn the Selector to change the display from "oF" to "on".

 + 
- 5 Press the **[SET]** key.
- 6 Confirm (▼) is displayed.
- 7 Press the **[V/M]** key to set the memory mode.
- 8 Press the **[SC]** key.
- 9 Confirm the scan has started.



433.20
- 10 Press the **[SC]** key to stop the scan.



M
01 433.44
- 11 Press the **[V/M]** key to return the original VFO frequency.

Scanning

Blinking



- In step 4, if no assigned memory addresses are available, this function can not be selected a low pitched beep is sounded.

Scan a Block (Block Memory Scan)

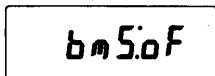


- The memory is scanned in blocks.
- 10 frequency channels in the memory is considered a block, during the Block Scan mode.
- The relation of block numbers and the memory addresses are shown in the table below.

Block number	Memory address
0	M00 - M09
1	M10 - M19
2	M20 - M29
3	M30 - M39
4	M40 - M49
5	M50 - M59

Preparation

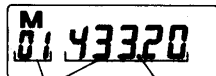
- 1 Press the **[SET]** key.
- 2 Turn the Selector to change the Set menu display to "brms :oF".



- 3 Hold down the **[E]** key and turn the Selector to change the display from "oF" to "on".
- 4 Press the **[SET]** key.

To start the scan

- 1 Press the **[VM]** key to set the memory mode.
- 2 Press the **[SC]** key.
- 3 Confirm the scan has started.



Scanning

Blinking

- 4 Press the **[SC]** key to stop the scan.
- 5 Press the **[VM]** key to return the original VFO frequency.



- ◆ The block can be changed by holding down the **[E]** key and turning the Selector.
- ◆ To change the Block Memory Scan to the Memory Scan refer to the Block Memory Scan preparation procedure.
- ◆ This can scan specially marked memory address. (P 37)



Scan the Tone Frequency (Tone Squelch Scan)

- The tone frequency is scanned on one set frequency.



- 1 Set the frequency to be scanned.
- 2 Press the **SET** key.
- 3 Turn the Selector to change the Set menu display to "tSq:oF".

t59.0F



- 4 Hold down the **F** key and turn the Selector to change the display from "tSq:oF" to "tso tSq:on".

tso
t59.0n



- 5 Turn the Selector to change the Set menu display to "CF 100.0".

CF 100.0



- 6 Press the **SC** key.
- 7 Confirm the scan has started.

CF 100.0

Scanning

Blinking



- 8 Press the **SC** key to stop the scan.



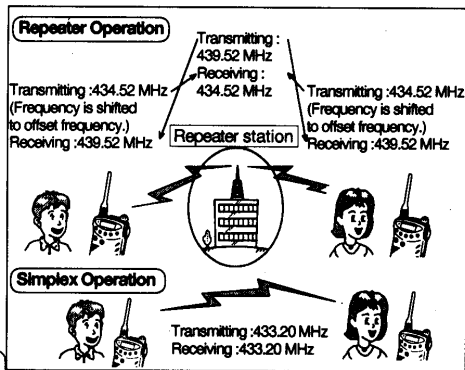
- ◆ Tone Squelch Scan is not available when "t sq:on" is set.
- ◆ In step 1, the frequency can be the VFO frequency, CALL frequency or the memorized frequency.

REPEATER OPERATIONS

Repeater Operation	42
Setting the Repeater Mode	42
Changing the Offset Frequency during Repeater Operation	43
Using a Repeater which Require a 1750 Hz Tone Burst	43
Reversing the Repeater Transmission/Reception Frequency (Reverse)	44

Repeater Operation

- Communicating through a repeater is known as repeater operation.
- Communication with a location where signals do not directly reach can be using a repeater station.
- In the Repeater Operation, the frequencies for transmission and reception are different. The difference is called the offset frequency. The offset frequency depends on the repeaters operation and band being used.
- Some repeaters require CTCSS sub-audible tone frequencies (D 50) or 1750 Hz tone burst.



Setting the Repeater Mode

- The Transceiver can be set to - offset, + offset or no offset (simplex). When the offset is + the transmission frequency is plus the offset and when the offset is - the transmission frequency is minus the offset. Set the receiving frequency the same as the out put frequency of the repeater station.



- 1 Press the **[SET]** key.
- 2 Turn the Selector to change the Set menu display to "rpt :oF".

rPt.oF



- 3 Hold down the **[+]** key and turn the Selector to select the direction of the offset.

rPt.oF No offset frequency.

↓
rPt.o- Sets the offset frequency lower.

↓
rPt.o+ Sets the offset frequency higher.



- 4 Press the **[SET]** key to end.



- When the transmission frequency is out of the limits, there is no transmission and "oFF" is displayed when the **[PTT]** is pressed.

Changing the Offset Frequency during Repeater Operation

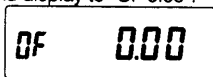
- This Transceiver has the capability of changing the offset frequency. The offset frequency can be set from 0 MHz to 99.995 MHz.



1 Press the **SET** key.



2 Turn the Selector to change the Set menu display to "OF 0.00".



3 Hold down the **F** key and turn the Selector to set the new offset frequency.



4 Press the **SET** key to end.



- This Transceiver has a Quick Encoder, when the Selector is turned fast, the frequency changes accordingly.

- ♦ The frequency step is same as the VFO frequency step.
- ♦ 1 MHz/100 kHz/ 10 MHz steps can not be used in this function.
- ♦ When shipped, the offset frequencies are as follows:

BAND	VHF	UHF
MODEL		
C508	0.00	0.00
C508A	0.60	5.00

Using a Repeater which Require a 1750 Hz Tone Burst

- This function transmits a tone burst signal to gain access to a repeater station.

- 1 Set frequency of the repeater station.
- 2 Set offset frequency.
- 3 Set repeater mode.



4 Hold down the **PTT** switch and press the **CALL** key. (While the **CALL** key is pressed, a 1750 Hz tone burst signal is transmitted.)

5 Release the **PTT** switch. (Switch to enter the receiving state.)

Reversing the Repeater Transmission/ Reception Frequency (Reverse)

- This function reverses the reception and transmission frequency. This allows you to listen on the input frequency of the repeater to determine if it is possible to change to simplex operation.



1 Set the frequency of the repeater station.

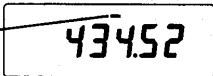
2 Set the repeater mode.



3 Hold down the **MONI** key. (While the **MONI** key is pressed, the frequencies are reversed.)

4 Confirm "-" or "+" is blinking.
(The repeater frequency input is displayed.)

Blinking



- ◆ When the reversed frequency is out of limits, "OFF" is displayed.
- ◆ Hold down the **[F]** key and press the **MONI** key, release the **MONI** key to monitor the reception frequency. To cancel, press the **MONI** key.

ADDITIONAL FUNCTIONS

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Using the Battery Save



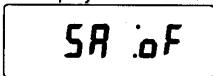
- This function is used to extend the life of the battery. The battery save function actually turns off the Transceiver for a set period of time and then turns on the Transceiver to check for a signal.



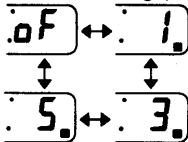
1 Press the **[SET]** key.



2 Turn the Selector to change the Set menu display to "SA: oF".



3 Hold down the **[E]** key and turn the Selector to change the display from "oF" to select the time setting. (Time in second.)



4 Press the **[SET]** to return.



- ◆ When this function is used, the beginning of a reception may be interrupted.
- ◆ "oF" is initially set.
- ◆ This function is not available when scanning.

Using the Auto Power Off

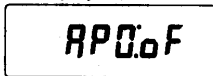


- The Transceiver can shut off automatically if the unit is not being used in the receive, transmit or keys entry mode for selected period. A warning beep is sounded 1 minute before the power is shut off.

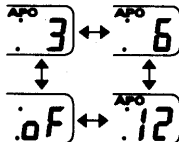


1 Press the **[SET]** key.

2 Turn the Selector to change the Set menu display to "APO: oF".



3 Hold down the **[E]** key and turn the Selector to change the display from "oF" to select the time setting. (This value is minutes until the transceiver is shut off. 3 is 30 minutes, 6 is 60 minutes, 12 is 120 minutes and oF is not activated.)



4 Press the **[SET]** to return.



- ◆ To prevent unwanted battery consumption, use this function.
- ◆ "oF" is initially set.
- ◆ This function is not available when scanning.

Preventing Unintentional Transmission (PTT Lock)

- To prevent unintentional transmission the **PTT** switch can be locked.



- 1 Press the **SET** key.



- 2 Turn the Selector to change the Set menu display to "PL: oF".

PL :oF



- 3 Hold down the **PTT** key and turn the Selector to change the display from "oF" to "on".

PL :on



- 4 Press the **SET** key to return.

- 5 Confirm that there is no transmission when the **PTT** switch is pressed.



- ◆ To cancel this setting, change the display from "on" to "oF" in step 3.
- ◆ "oF" is initially set.

Turning the Beep On or Off



- 1 Press the **SET** key.



- 2 Turn the Selector to change the Set menu display to "bEEP:on".

bE EP :on



- 3 Hold down the **PTT** key and turn the Selector to change the display from "on" to "oF".

bE EP :oF



- 4 Press the **SET** key to return.



- ◆ To cancel this setting, change the display from "oF" to "on" in step 3.
- ◆ "on" is initially set.

Controlling the Squelch with RF Level (RF-Squelch)

- The level that the squelch opens can be changed according to the strength of the input signal. The input signal strength is measured by the S-meter swing.



1 Press the **[SET]** key.



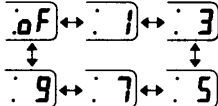
2 Turn the Selector to change the Set menu display to "rFSqL:oF".

rf 59L.oF



3

Hold down the **[F]** key and turn the Selector to change the display from "oF" select the setting value. (Each value indicates the level that the S-meter swings.)



4 Press the **[SET]** to return.



◆ The values relate S-meter swings are as follows:

oF	Not available	5	■■■■■■■
1	■■■	7	■■■■■■■■■
3	■■■■■	9	■■■■■■■■■■■

Setting the Auto AM Reception Mode

- When a frequency is set from 108.00 MHz to 141.995 MHz, the Transceiver is switched from FM to AM reception mode automatically. The frequency is automatically switched to the FM mode if the frequency is out side of the 108.00 MHz to 141.995 MHz limit. This function can be inhibited as following:



1 Press the **[SET]** key.



2 Turn the Selector to change the Set menu display to "AtAm:on".

At Am :on



3 Hold down the **[F]** key and turn the Selector to change the display from "on" to "oF".



4 Press the **[SET]** to return.



- ◆ To set the original, change the display from "oF" to "on" in step 3.
- ◆ This function cannot be used in the UHF band.



Setting the AM Reception Mode Manually

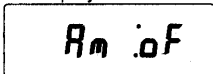
- The Transceiver can be switched from FM to AM reception mode manually in the VHF band.



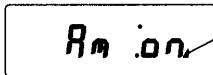
1 Press the **[SET]** key.



2 Turn the Selector to change the Set menu display to "Am:oF".



3 Hold down the **[E]** key and turn the Selector to change the display from "oF" to "on".



AM mode

4 Press the **[SET]** to return.

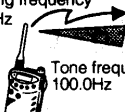


- To cancel this setting, change the display from "on" to "oF" in step 3.
- This function cannot be used in the UHF band.
- This function can be used when the Auto AM Reception mode is set "on". The frequency mode can be switched. The Auto AM Reception mode is activated when the frequency is changed.

Using the Tone Squelch Unit

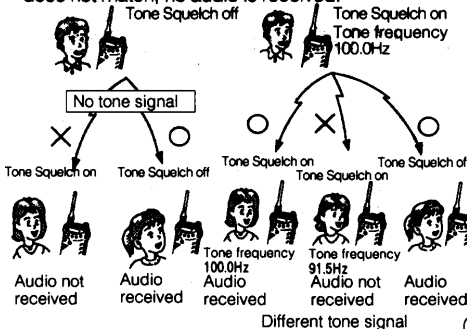
- The Transceiver has the tone squelch unit installed, (T)one, (SQ)uelch, the encode and decode functions can be used.

Transmitting frequency
433.20 MHz



- The tone encoder transmits with the sub-audible tone signal.

- When the selected sub-audible encode tone is transmitted with the carrier signal, the receiving station must have the same frequency and tone set in-order to receive the audio. If the tone frequency does not match, no audio is received.



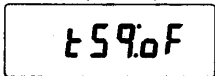
Using the Tone Encode/Tone Squelch



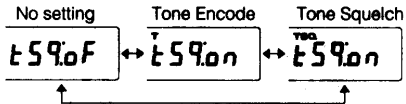
1 Press the **[SET]** key.



2 Turn the Selector to change the Set menu display to "tSq:oF".



3 Hold down the **[E]** key and turn the Selector to change the display from "tSq:oF" to "τ tSq:on" (For the Tone Encode) "τso tSq:on" (For the Tone Squelch).



4 Press the **[SET]** to return.



◆ The squelch is opened by pressing the **[MONI]** key when the Tone Squelch is set.

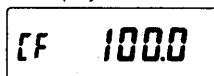
Changing the Frequency of the Tone Signal



1 Press the **[SET]** key.



2 Turn the Selector to change the Set menu display to "CF 100.0".



3 Hold down the **[E]** key and turn the Selector to set the new tone signal.



4 Press the **[SET]** to return.



◆ Chart of tone frequencies that can be selected (Hz)

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

Total: 39 signals

The factory setting is 100.0 Hz.

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Trouble Shooting

- Please check the following list of problems before consulting your dealer.

The power cannot be turned on.

- The battery is consumed.

The Transceiver is initialized every time the batteries are replaced.

- The internal lithium battery is consumed.

The frequency can not be changed.

- The "Frequency Lock" is set. (The  is displayed.)

Not receiving/Only Strong signals are received.

- The antenna is not properly connected.

The squelch is not closed. (Noise is sounded.)

- The Monitor is activated.

No received audio is sounded.

- The volume knob is turned fully counterclockwise.
- The Tone squelch is set.
- The RF-Squelch is set.

Not transmitting.

- The "PTT lock" is set. (The "PL" is displayed.)
- The battery is consumed.
- The transmitting frequency is not properly set in the repeater mode. (The "OFF" is displayed.)

The transmission power is low.

- The antenna is not properly connected.
- The battery is consumed.

The memory is not stored.

- The internal lithium battery is consumed.
- The battery is consumed.

Will not scan.

- The Monitor is activated.

Memory is not scanned.

- The frequency is not stored or one frequency is stored.
- The assigned memory is not set or only assigned memory is set in the memory scan memory.

The repeater station is not accessed.



- The repeater station is too far.
- The tone frequency is different.
- The offset frequency is different.
- The direction of shift is different.

The Tone squelch is not operational.

- Your partner is too far away.
- The tone frequency is different.

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List of the Set Mode Functions

C508 serie SET MODE		Recall / Set		PL .oF	★	Setting the PTT lock. (D47)
★:can be stored in MYkey.		Select		FL .oF	★	Setting the frequency lock.(D21)
Initial indication		Function		FL CH .oF	★	Setting the rotary for use in the frequency lock.(D21)
St 5	★	Changing the frequency step. (D18)		be EP .on	★	Setting the beep on/off.(D47)
F- St 10	★	Changing the frequency in 1 MHz/100 kHz/10MHz. (D18)		rf 59L.oF	★	Setting the RF-squelch. (D48)
rPt.oF	★	Setting the Repeater mode. (D42)		bnd.on	★	Setting the band on/off.(D22)
t59.oF	★	Setting the Tone Encode or Tone Squelch. (D50)		CLR		Erasing the memory. (D28)
CF 1000		Changing the tone frequency. (D50)		CH .oF	★	Displaying the memory address. (D30)
OF 000		Changing the offset frequency. (When dUP:oF) (D43)		.oF	★	Setting the memory scan memory. (D37)
SP 43300		Setting the split memory frequency (When dUP:on) (D29)		baS.oF	★	Setting the block memory scan.(D38)
dUP.oF	★	Setting the split memory (D29)		Scn. P	★	Changing the scan type (D33)
SA .oF	★	Changing the battery save time. (D46)		At RA .on	★	Setting the auto AM reception mode (D48)
APQ.oF	★	Changing the auto power off time.(D46)		RA .oF	★	Setting the AM reception mode (D49)

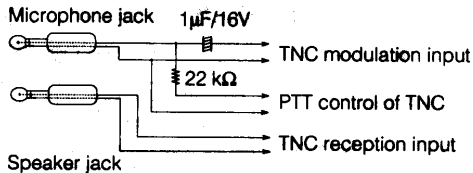
REFERENCES

Options

CHP111	Head Set with PTT
CHP150	Head Set with VOX
CMP111	Microphone & Speaker
CMP113	Tiepin-Type Microphone & Speaker
CMP115	Small-Sized Microphone & Speaker
CMP123	Ear Microphone
CNB401	Rechargeable Battery Pack
CSA401A	Desk Top Charger(120VAC type)
CSA401E	Desk Top Charger(230VAC type)
CTN115*	Tone Squelch Unit
CLC502	Soft Case
CMB112	Mobile Bracket
CMB600	Helmet Clip for CHP150

* Transceiver has the CTN115 installed.

Example of TNC (Packet Controller) Connection



Specifications

General

Frequency Range	144.000 - 147.995MHz
	430.000 - 439.995MHz(C508)
	438.000 - 449.995MHz(C508A)
Transmission Type	F3
Microphone Input Impedance	2k Ω
Speaker Impedance	8 Ω
Operating Voltage	DC2.2V - 3.5V
Rated Voltage	DC3.0V
Current Consumption (transmitted)	Approx. 280mA
Current Consumption (in waiting)	Approx. 34mA(VHF band)
	Approx. 38mA(UHF band)
Current Consumption (at SAVE 1 sec)	Approx. 11mA
Dimensions of Main Body (Not including projections)	
.....	58(W) x 85(H) x 25(D)mm
Dimensions of Main Body (Including projections)	
.....	64(W) x 95(H) x 29(D)mm
Weight (Including Battery and antenna)	Approx.160g

Reception

Reception System	Double super heterodyne system
Intermediate Frequency	1st IF 23.05MHz
	2nd IF 450kHz
Reception Sensitivity	144MHz band: less than 0.2 μ V
	430MHz band: less than 0.22 μ V
S/N Ration with Input of 0.5 μ V	30dB or more
Squelch Open Sensitivity	Less than 0.2 μ V
Audio Output	100mW(8 Ω , 10% distortion)

Transmission

Transmission Output	Approx.280mW
Modulation System	Reactance modulation
Max. Frequency Deviation	\pm 5kHz
Spurious Radiation	- 40dB or more
Built-in Microphone	Electret Condenser Microphone

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