ALAN CT-145

User's Manual

CONTENTS

This VHF Hand-Held Transceiver is engineered and manufactured with highest quality of microelectronics technology and workmanship. We are confident that you will be entirely satisfied with the superb performance and reliability of this Hand-Held (H/H) Transceiver.

Our very strict quality control and inspection ensure that each transceiver unit have left the factory-in perfect condition. However, if your transceiver does not operate properly or if you find any difficulty in its operation, contact your dealer immediately.
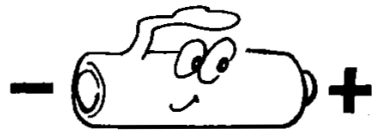
Read this instruction carefully before use to make the unit perform fully and last long.

PRIOR TO USAGE

1. Make sure that batteries are inserted with correct polarity.

2. Do not disassemble and tamper with cores and trimmers The Transceiver is produced under strict control and fully adjusted.
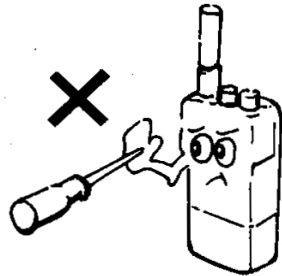
3. Keep out of high temperature, humidity and dust.
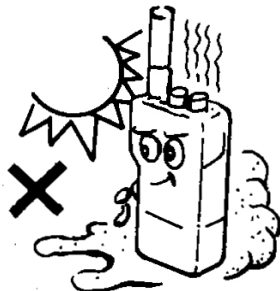
4. Apply 5.0 to 16.0V DC power supply only

5.0 – 16V
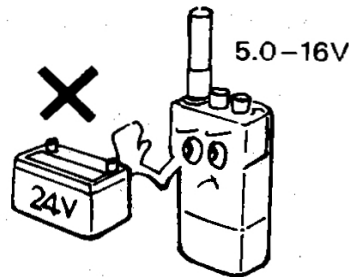
5. Do not use a new and used batteries together.
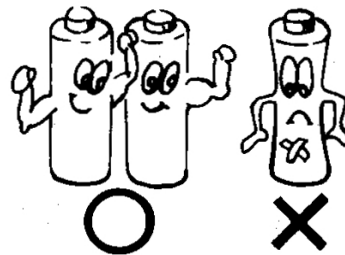
6. Do not dispose a battery in fire.

EQUIPMENT SUPPLIED
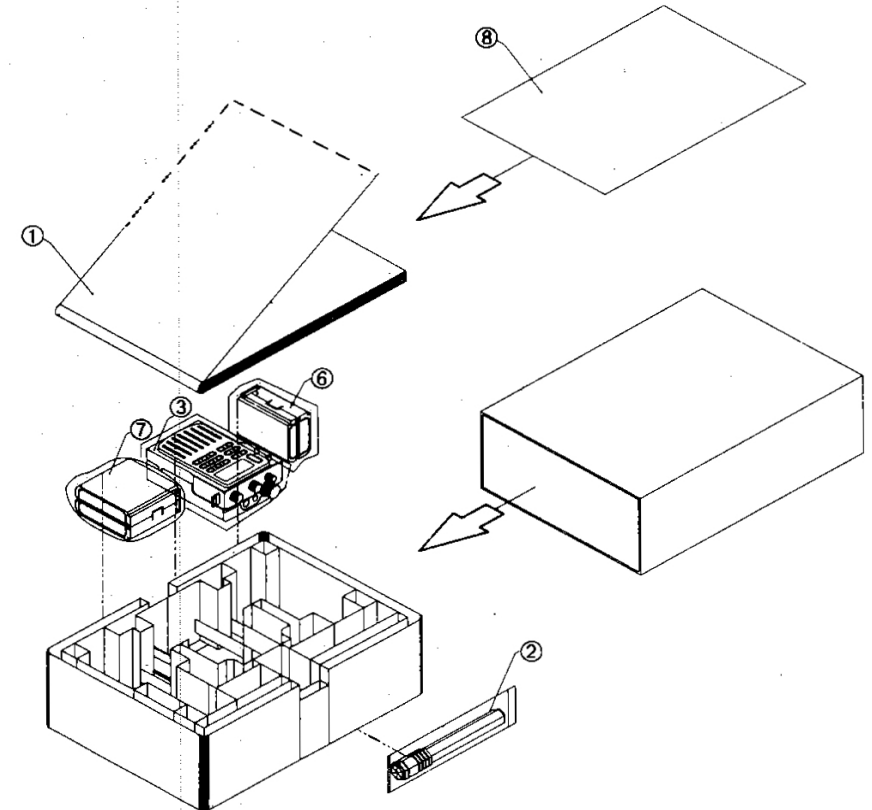
The Transceiver is normally supplied with the items listed below. When unpacking the unit carton check the all items are included. If items are missing, please notify your dealer immediately.

① User's Manual ⑤ Hand Strap (Installed)
② Antenna ⑥ Battery Case (for four size AA batteries)
③ Jack Cover ⑦ Battery Case (for six size AA batteries)
④ Belt Clip (Installed) ⑧ Warranty Card

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FEATURES

This is a highly versatile, yet compact VHF hand-held transceiver that is built and tested to stringent specifications. The following features are built into your Transceiver.

☆ Smallest and lightest transceiver in this class.
Dimensions: 83.5mm (height) × 55mm (width) × 31mm (depth) (excluding protrusions and battery case).
Weight: 185g (excluding battery case and antenna)

☆ Paging function is available when an optional DTMF unit DTF145 is installed. This features allows you to page one specific station or all group stations via 3-figured DTMF signals. When paging signal is received, a beep sound and the display will inform you that someone has you paged. The paging station can be identified by means of its individual code.

☆ Code Squelch operation is available when an optional DTMF unit DTF145 is installed. The Transceiver will hear certain stations using the identical code only.

☆ Tone Squelch operation is available when an optional tone squelch unit CTS145 is installed. The Transceiver will hear certain stations using the specific tone frequency only. Tone frequencies can be selected via the rotary channel selector.

☆ DTF145 and CTS145 can be used together allowing you the simultaneous operation of Code Squelch and Tone Squelch.

☆ An optional High Power Rechargeable Battery Pack or an external power supply of 13.8V enable powerful transmission (over 5W).

☆ A wide range of acceptable external power supply voltages (5 to 16V DC) allows you to power it from an automobile battery (specified for 12V only).

☆ High Sensitivity.

☆ Up to 20 memory channels are available, 10 in each M and $\bar{M}$ memory group.

☆ Two independent tone frequencies can be programmed in M1 (or $\bar{M}$1) and M2 (or $\bar{M}$2).

☆ Internal Dual-Watch allows the Transceiver to watch.
  • the selected dial-frequency and the stored frequency in memory address M1;
  • the selected dial-frequency and any other memory frequency
  • the selected dial-frequency and each memory frequency under scanning in sequence. (up to 20 channels)
  • the selected dial-frequency and call frequency

☆ Duplex feature permits a semi-duplex operation using two memory frequencies.

☆ Either Pause or Busy scan functions can be selected. Scanning of the dial-frequency provides a 1MHz scan, all band scan and programmed scan. Scanning of a memory frequency provides M memory group scan. $\bar{M}$ memory group scan, all memory scan and MS.M scan.

☆ A single pushbutton press opens the squelch so you can easily check the volume setting.

☆ A Battery-Save function allows you to reduce the current drain during receiver standby.

☆ An Auto-Power Off function reduces the current drain if you forget to turn the Transceiver off.

☆ Frequencies can be entered directly from the keyboard or via a rotary channel selector.

☆ Two battery cases, one for six size AA batteries and the other for four size AA batteries, are included.

☆ A Function button allows you to change the frequency with a 100kHz step when you turn the rotary channel selector.

☆ Selected frequencies and operating mode may be locked to prevent inadvertent key operation.

☆ PTT button may be locked to prevent inadvertent transmission.

☆ A full line-up of optional accessories.

OPTIONAL ACCESSORIES

We offer various accessories to increase your communication efficiency. Consult your dealer for further details.

DTF145   DTMF (Touch Tone) unit.

CTS145   CTCSS (Tone Squelch) unit.

RBP072   Standard Rechargeable Battery Pack (7.2V, 700mAh)

RBP120   High Power Rechargeable Battery Pack (12V, 600mAh)

CHA072   AC Charger (for RBP072)

CHA120   AC Charger (for RBP120)

DTC145   Desk Top Charger (Rapid Charger) (for RBP072, RBP120)

PCA145   Power Cable for an automobile

CBC145   Compact Battery Case (for 4 size AA batteries)

SBC145   Standard Battery Case (for 6 size AA batteries)

CMP145   Compact Microphone/Speaker with PTT

CONTROLS AND CONNECTIONS
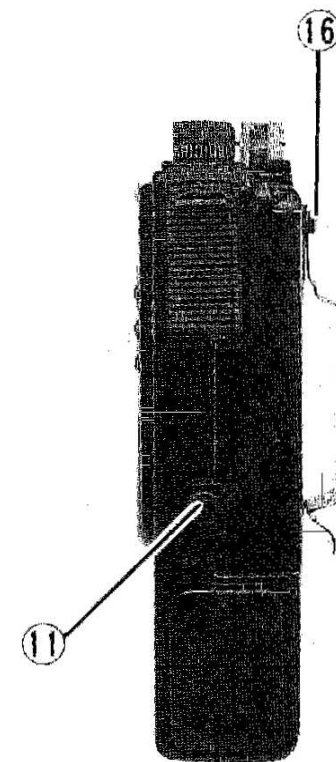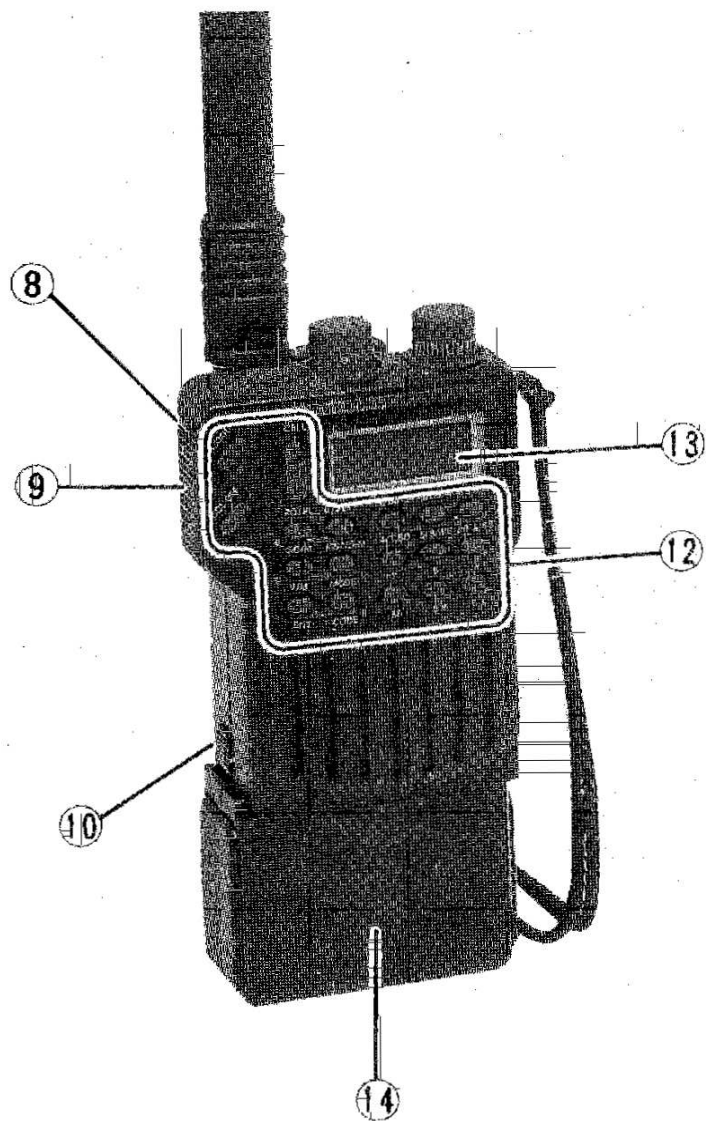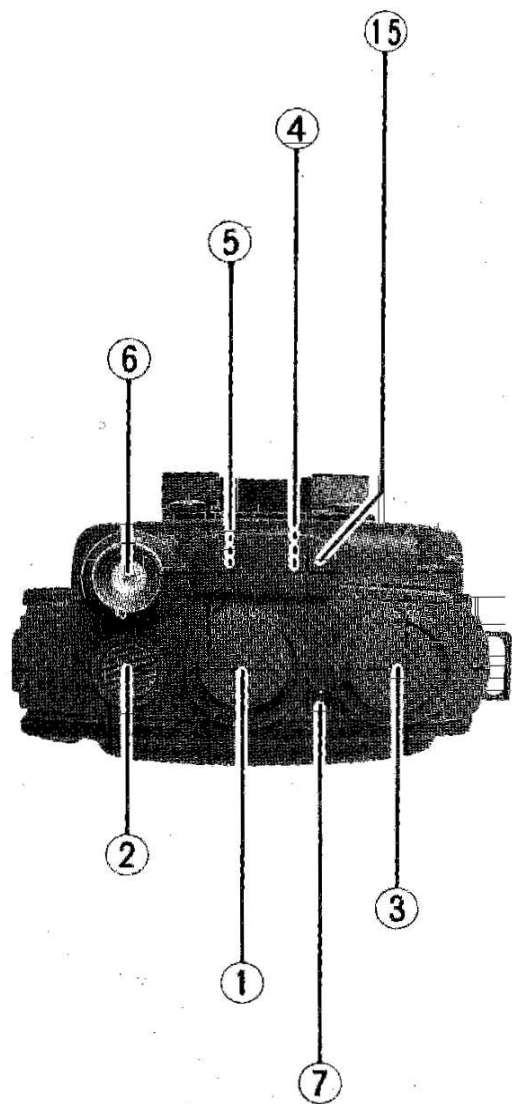
① Power On-OFF Switch/Volume Control

This is to turn the power on and off and to control the volume. Rotate the control clockwise to turn the power on, and rotate it clockwise further to increase the volume. The Squelch Off button should be held depressed or the Squelch Control rotated fully counterclockwise while controlling the volume. Turning the power on with the Function button held depressed initializes a microprocessor and deletes all data programmed in the memory.

② Squelch Control

This is to control the white noise. Rotate the control counter clockwise and the white noise will be turned up. Rotate it then clockwise slowly and set the control where the noise just stops.

NOTE:
(1) Do not rotate the control clockwise too far.
(2) the control should be placed where the white noise is not heard during following operations; Scanning, Dual-Watch, Battery-Save, Paging and Code Squelch.
(3) Adjust the control with the channel which is not receiving the signal.

③ Rotary Channel Selector

This is to select the transmit/receive frequency. It is also used to change the tone frequency, channel step and memory address number. Rotate the selector clockwise to increase the frequency and counterclockwise to lower it. The interval by which the frequency changes is referred to as "Channel Step". The Channel Step which is initially set to 10kHz can be changed to 5, 12.5, 20, 25 or 50kHz. (Refer to Changing the Channel Step, contents 12).

④ External Speaker Jack: S

This is to connect Microphone/Speaker or Head Set with PTT. Any other external speaker with 8Ω load or an earphone can be connected. A built-in speaker is disabled when an external speaker is connected to this jack.

⑤ External Microphone Jack: M

This is to connect Microphone Speaker Head Set with PTT.

⑥ Antenna Jack: ANT

This is a BNC connector to connect the attached helical antenna

⑦ Transmission/Battery Indicator

This red indicator lights up when the transmitter is keyed. With weakened batteries, it becomes darker recommending battery replacement.

⑧ Function Button

Special functions are available by pressing each button on the front panel with the function button held depressed.

⑨ PTT Button

For transmission, press this button and speak into the microphone. Release the PTT button to receive. When operated with Head Set with PTT, press the PTT button on HEAD SET to transmit.
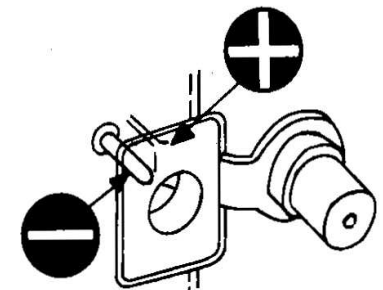
⑩ Lock Button

This is to lock the battery case. Push up this button to remove the battery case.

⑪ External Power Connector: DC IN

This is to connect Power Cable for an Automobile PCA145. When PCA145 is connected, power is not supplied from the battery.

NOTE:
Connect the PCA145 only to this connector, as its plug is the peculiar one.

A pin at the center is negative

CAUTION:

Turn the power switch off before connecting the cables. Nominal input voltage for this H/H Transceiver is from 5V to 16V DC. Do not apply voltage beyond the range.

⑫ Front Panel

Ⓐ Squelch Off Button: SQL OFF

This button functions as the squelch control rotated fully counterclockwise. While this button is held depressed, the squelch operation is turned off and the sound is heard from the speaker regardless of the position of the squelch control.

Ⓑ Lamp Button: LAMP

While this button is held depressed, the light at the display is turned on. Press this button with the Function button held depressed to leave the light on and press it again to turn it off.

Ⓒ Call Button: CALL

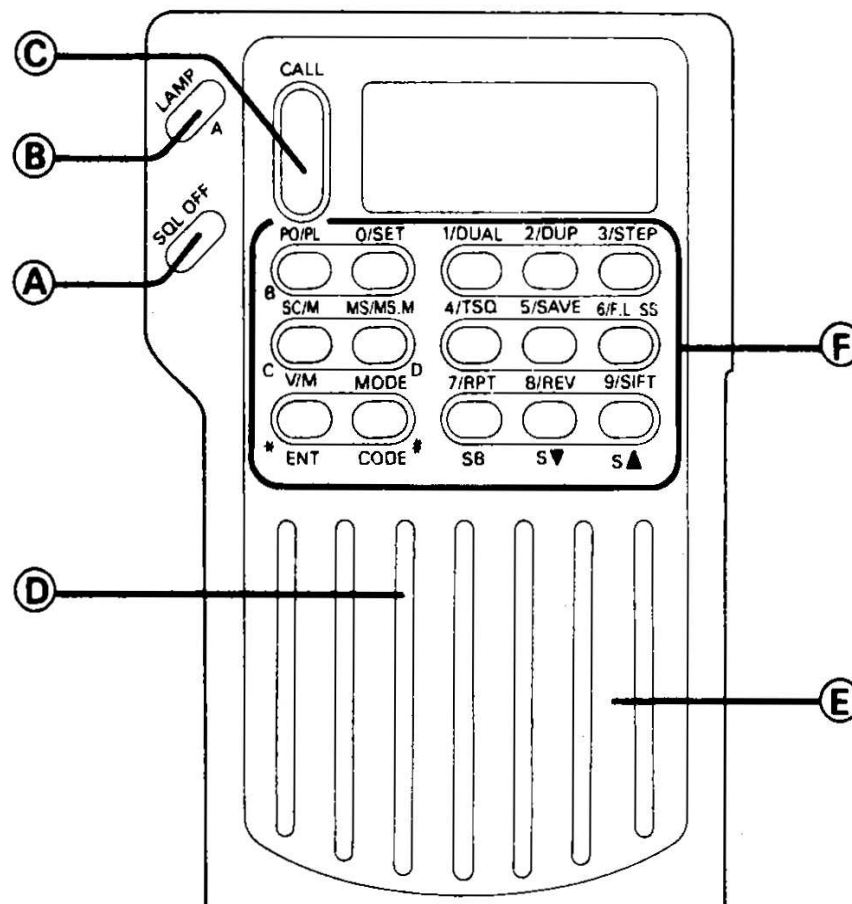Press this button to switch the operating frequency and call frequency.

Ⓓ Speaker

This is a built-in speaker, which is disabled when the external speaker is connected.

Ⓔ Microphone

This is a built-in condensor micrpohone

Ⓕ Key buttons for various operations

⑬ Display

The display indicates followings,

I. Frequency
II. Channel Step
III. Special Functions
PAG, DUAL, APO, DUP, F.L, T.SQ, P.L, C.SQ, S.B, +, −.
IV. Memory Address Number
V. Memory Mode.
VI. Scanning
VII. Shift Frequency
VIII. Busy Scanning
IX. S-meter and RF Output Indicator
It functions as a S-meter when receiving the signal and idicates the RF output power while transmitting. "1" is indicated regardless the input signal when the squelch control is rotated fully counterclockwise.
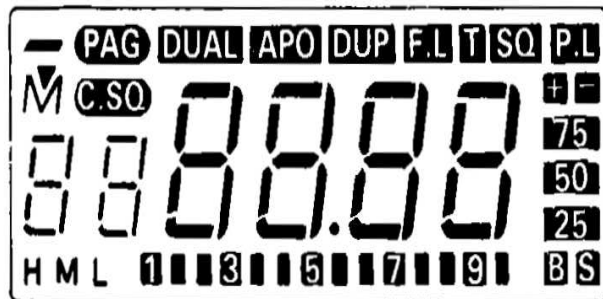
⑭ Battery Case

Two battery cases, one for six size AA batteries and the other for four size AA batteries, are included. The H/H Transceiver is available with SUM-3 manganese battery (1.5V), rechargeable nickel cadmium battery (1.2V) and alkaline battery.

NOTE:
Apply the new batteries only.

⑮ Jack Cap

Cover the jacks with this cap when the external microphone and external speaker are not in use.

⑯ Belt Clip Holder

The belt clip is fixed to the Transceiver at the factory. Remove the belt clip when unnecessary and fasten the screws solely.

GETTING READY

1. Install the included antenna.
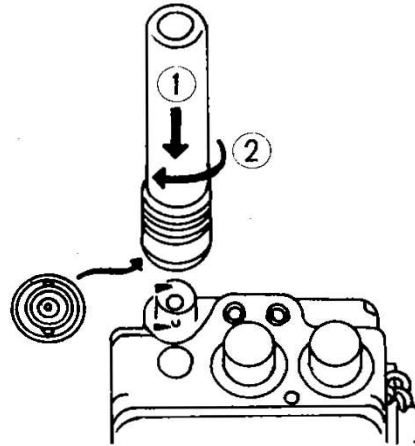
2. Detach the battery case.
a) Hold the Transceiver and place your thumb on the Lock button.
b) Push up the Lock Button and pull the battery case as illustrated to clear the lock.
c) Pull the battery case further and remove it from the Transceiver.
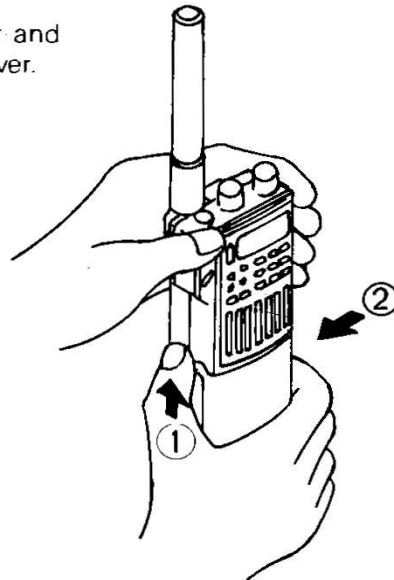
3. Insert size AA batteries into the battery case. Be sure that the batteries are inserted with correct polarity.
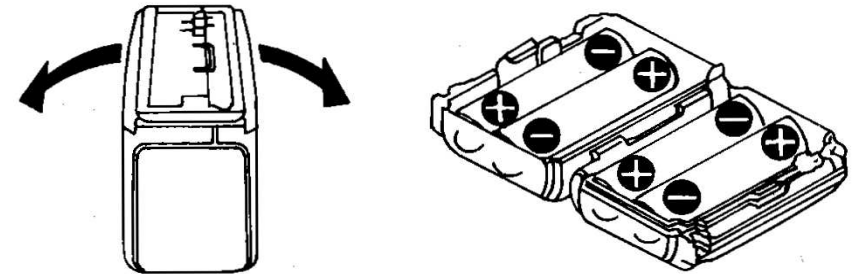
4. Replace the filled battery case to the Transceiver. Engage the battery case and the slot on the bottom of the Transceiver and push the battery case until it latches in the proper position.

9
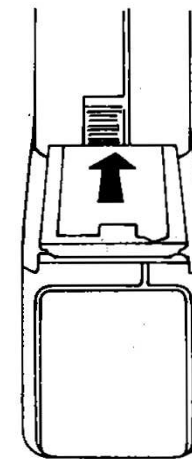
5. Turn the power switch on and set the volume control to a comfortable listening level.

on

off
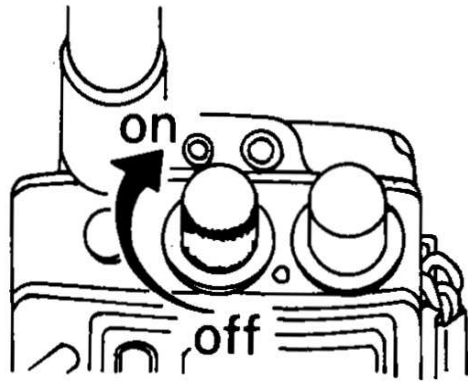
6. Rotate the squelch control clockwise slowly until the noise from the speaker just stops.

NOTE:
Do not rotate the control clockwise too far. Excessive squelch reduces the radio sensitivity and may prevent reception.
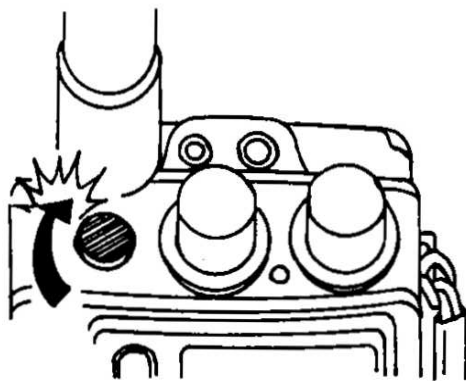
7. Press the PTT button to transmit and release it to receive

on

OPERATION

Operating Controls

Key buttons on the front panel function as described below. When operated correctly a high short beep tone will be generated. A low beep tone will warn you the wrong operation.

Button	Independent Function	Function with Function button
CALL	Switches the operating frequency and call frequency	
A/LAMP	Light at the display is turned on while held depressed	Turns on/off the light at the display
B/PO/PL	Switches the transmit power level	Disables the PTT button
C/SC/M	Scanning operation	Switches the memory channel group M and M̄
D/MS MS.M	Turns on/off the memory scan	Sets the MS.M scan frequency and turns on/off the MS.M scan
*/V/M/ENT	Switches the operating frequency and the memory frequency, and accesses the operating frequency	Stores and deletes the frequency in memory
#/MODE/ CODE	Turns on/off and switches the paging and code squelch operation	Recalls the stored code in memory for paging and code squelch operation

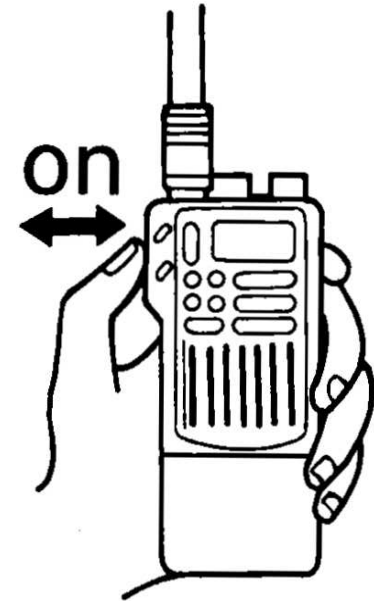| Button	Independent Function	Function with Function button
0/SET	Inputs "0"	Selects the set mode
1/DUAL	Inputs "1"	Turns on the dual watch
2/DUP	Inputs "2"	Turns on/off the duplex features
3/STEP	Inputs "3"	Recalls the channel step
4/T.SQ	Inputs "4"	Turns on/off the tone squelch operation
5/SAVE	Inputs "5"	Turns on/off the save function
6/F/L/SS	Inputs "6" • During dial-frequency scanning, switches 1 MHz scan, all band scan and programmed scan • During memory frequency scanning, switches M or M̄ memory group scan and all memory scan	Turns on/off the frequency lock function
7/RPT/SB	Inputs "7" • While scanning, switches the pause scan and busy scan	Turns on/off the repeater operation
8/REV/▼	Input "8" • Scans downwards	Exchanging the transmit and receive frequency during repeater operation
9/SIFT/▲	Inputs "9" • Scans upwards	Setting a shift frequency

1 Setting an Operating Frequency

① With a rotary channel selector

You can change the operating (transmit and/or receive) frequency by rotating the rotary channel selector. As the selector rotated, the displayed frequency changes in 10kHz steps. It changes in 100kHz steps when rotated with the function button held depressed.
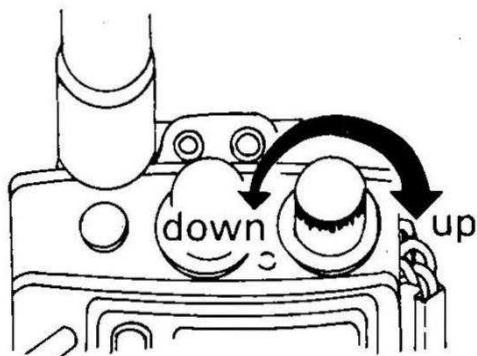
Rotate the rotary channel selector clockwise to increase the displayed frequency and counterclockwise to decrease it.

Information

- The frequency step rate as the selector rotated is referred to as a channel step.
- Although the channel step is initially set to 10kHz at the factory, you may use any one of six options, 5, 10, 12.5, 20, 25 and 50kHz. How to select the channel step is outlined under "Changing the Channel Step", contents.

② With buttons on the front panel

You can change the operating frequency with numeral buttons of "0" to "9".

Procedure

Example: To set 145.80 MHz
- a) a MHz figure .... press "5".
  [145.] will be displayed.
- b) a 100 kHz figure .... press "8".
  [145.8] will be displayed.
- c) a 10kHz figure........... press "0".
  [145.80] will be displayed.
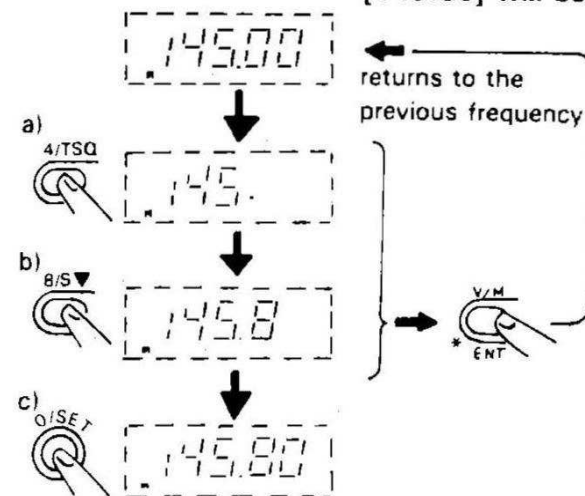
When three numeral buttons are pressed correctly, a long beep tone will be generated informing you that the frequency setting is complete.

Information

If you want to cancel the setting in the middle of the operation, press the * V/M/ENT button. The display will be returned to the previous frequency.

This is called the dial-frequency mode.

2 Programming Frequency in Memory [*/V/M/ENT Button]

Up to 20 frequencies can be stored in memory. They are memorized under the memory address number M0 through M9 and M̄0 through M̄9.

Procedure

(When the memory is vacant)

Example 1: To program 145.20MHz under M1.

a) Set the dial-frequency to 145.20MHz.

b) Press the */V/M/ENT button.

c) "0" will be indicated on the display with a flashing "M".

d) Set the memory address number to 1 by either pressing a "1" button or rotating the channel selector.

e) Press the */V/M/ENT button while pressing the Function button. The long beep tone will be generated to notify the operation is complete. "M" stops flashing and remain turned on. This is the memory mode and the stored frequency is **referred to as memory frequency.**

f) Press the */V/M/ENT button to return to the dial-frequency mode.

g) Memorize the followings,
145.22MHz for M2. 145.24MHz for M3
145.26MHz for M4. 145.28MHz for M5

Further description is made upon the assumption that the above frequencies are stored in the memory.

a)

b) c) flashing

d)

flashing

e)

remain turned on

memory mode

f)
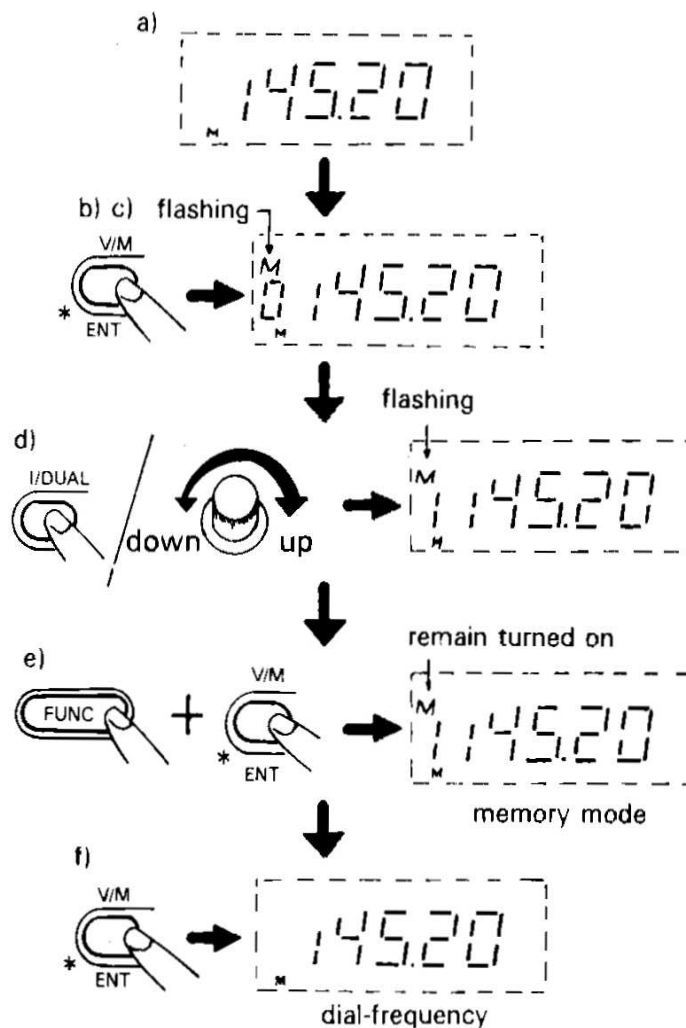
dial-frequency

Example 2: To program 145.60MHz under $\overline{M1}$.

Press the C/SC/M button first while pressing the Function button and select an address number to store the frequency under $\overline{M}$ address number group.

a) Set the dial-frequency to 145.60MHz.
b) Press the */V/M/ENT button
c) "M5" will be indicated on the display

NOTE:

The displayed address number when the Transceiver is set to the memory mode is the one used lastly. The initial setting at the factory is "M0".

d) Press the C/SC/M button while pressing the Function button and select the address number $\overline{M1}$ by either pressing the "1" button or rotating the channel selector.
e) Press the */V/M/ENT button while pressing the Function button. The long beep tone will be generated to notify the operation is complete "M" stops flashing and remain turned on.
f) Press the */V/M/ENT button to return to the dial-frequency mode.
g) Memorize the followings;
145.62MHz for $\overline{M2}$, 145.64MHz for $\overline{M3}$
145.66MHz for $\overline{M4}$, 145.68MHz for $\overline{M5}$

Further description is made upon the assumption that the above frequencies are stored in the memory.

a)

b) c)

d)

e)

f)

light flashing

flashing

light
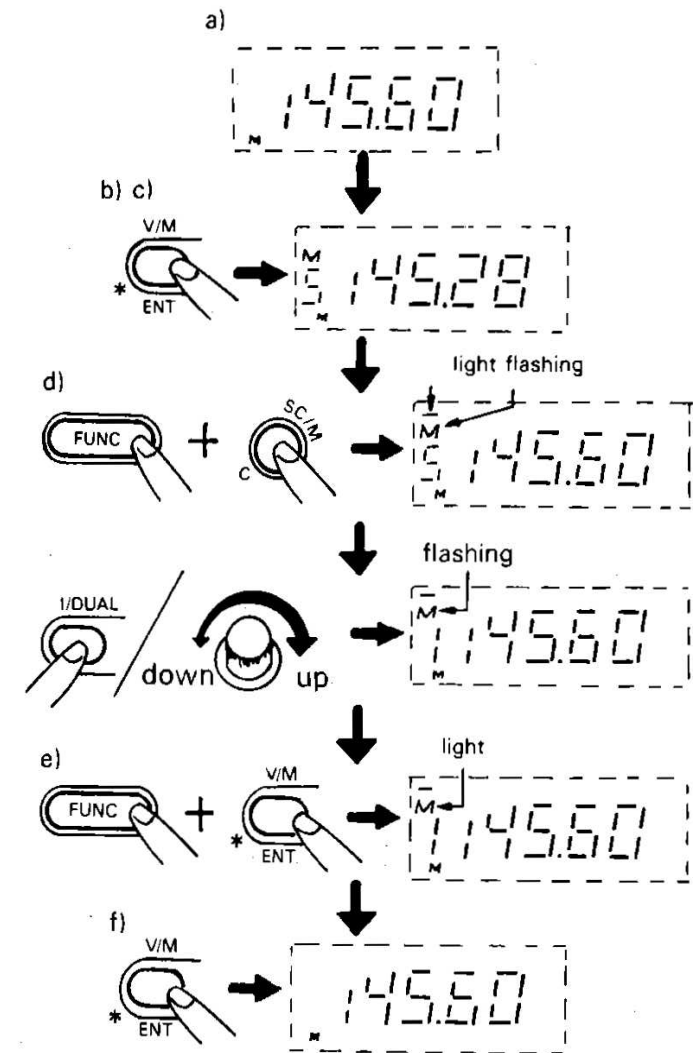
NOTE:
Programmed scan starts and ends at the frequencies stored under memory address $\overline{M8}$ and $\overline{M9}$.

3 Recalling a Memory Frequency [*/V/M/ENT Button]

Procedure

① Example: To recall "M1"

a) Press the */V/M/ENT button for the memory mode. The address number used lastly and the concerned frequency will be displayed. ("M" flashes when the indicated address number is vacant.)

b) Press the number 1 button or rotate the channel selector for the address number "M1" The stored frequency under "M1" will be displayed.
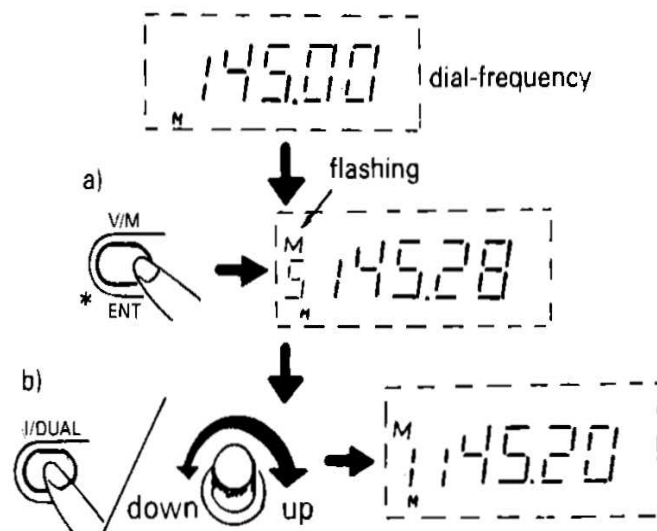
② Example: To recall the memory frequency successively

Keep the Transceiver in the memory mode. Press the numeral button or rotate the channel selector for the desired address number. The stored frequency under the address number will be displayed.

Information

- The numeral button can only recall the address number within either M or M̄ memory group currently selected, while the rotary channel selector can recall every address number in both M and M̄ memory groups. When the recalled address number is vacant (i.e. no frequency is stored), "M" on the display will flash and the dial-frequency will be indicated.
  The */V/M/ENT button switches the dial-frequency mode and memory mode.

4 Shifting a Memory Frequency [C/SC/M Button]

Press the C/SC/M button in the memory mode. The Transceiver will be set to the dial frequency mode with the displayed memory frequency remain unchanged. That is, the displayed memory frequency becomes the operating frequency. This is called the memory-shift operation.

Information

Press the */V/M/ENT button if you do not want memory-shift operation. The dial-frequency displayed before the Transceiver is set to the memory mode will be returned.

memory mode

dial-frequency mode   memory-shift operation
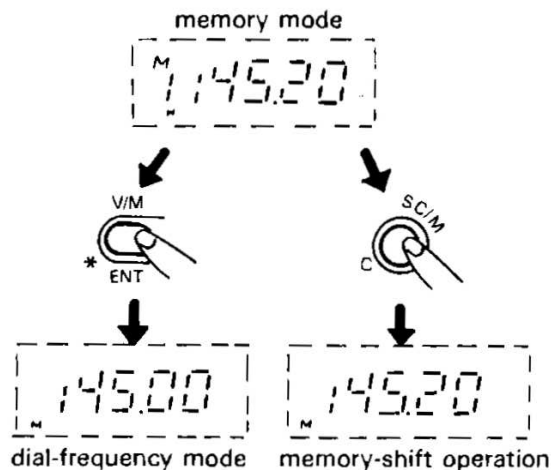
5 Changing a Memory Frequency

The stored frequency in memory can be changed by overwriting the new figure.

Example: To change the memory frequency of 145.20MHz under M1 to 145.16MHz.

Procedure

a) Set the displayed dial-frequency to 145.16 MHz with the numeral buttons or the rotary channel selector.

b) Press the */V/M/ENT button while pressing the Function button. "M" will appear on the display.

c) Press the "1" button for the address number "M1". The long beep tone will be generated informing you that the memory frequency is altered.

d) Press the */V/M/ENT button to return to the dial-frequency mode when the operation is complete.

e) Change the memory frequency of M1" again to 145.20MHz

16
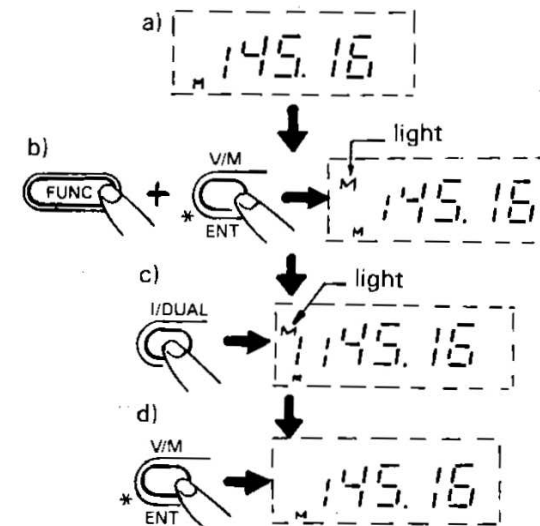
6 Deleting a Memory Frequency [*/V/M/ENT Button]

Follow the procedure below to delete the programmed frequency in memory.

Procedure

Example: To delete the frequency programmed under "M1".

a) Press the */V/M/ENT button. The memory address number used lastly and concerned frequency will be displayed.

b) Press the */V/M/ENT button while pressing the Function button. The long beep tone will be generated and "M" on the display will start flashing. The programmed frequency under "M1" is now deleted, (see 2 PROGRAMMING FREQUENCY IN MEMORY).

c) The dial-frequency will be displayed while the memory mode is sustained.

d) Press the */V/ENT button or C/SC/M button to release the memory mode.

e) The Transceiver should be set to the dial-frequency mode as the operation completed.
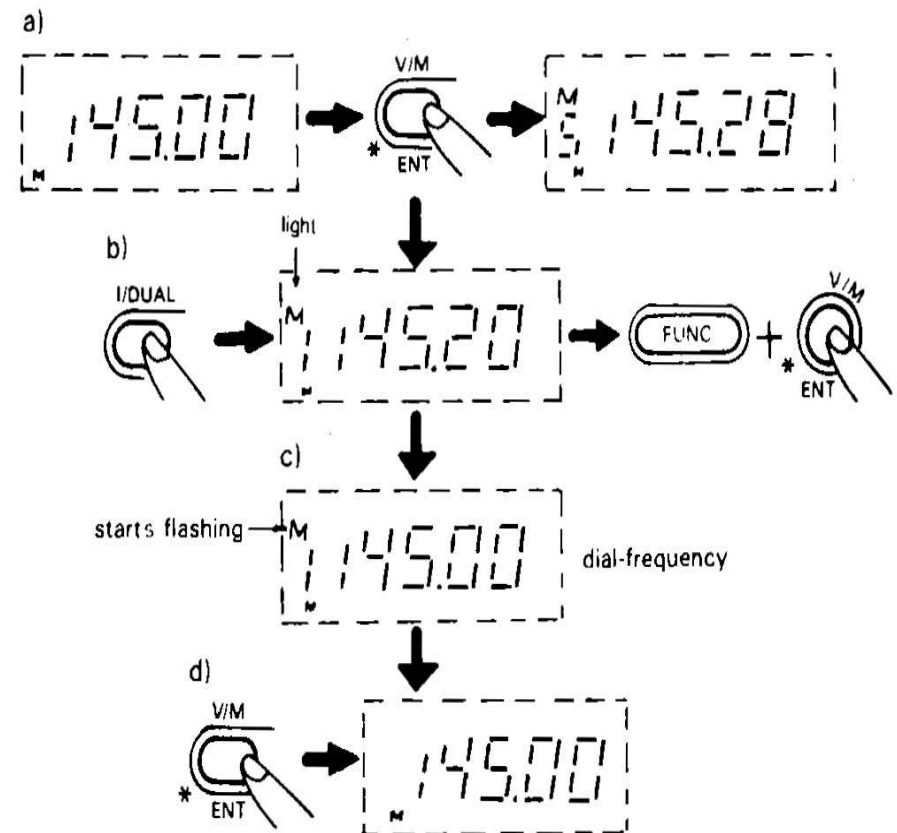
7 Recalling a Call Frequency [Call Button]

- In call frequency mode, the rotorary channel selector is disabled.
- Call frequency essentially is a special kind of memory frequency.

(Procedure)

a) Press the call button for the call frequency mode "C" and the call frequency will be displayed.

b) Press the call button in call frequency mode "C" and call frequency will disappear, and the dial-frequency will be displayed.

```
145.28   dial-frequency
```

a)

CALL → C 145.00   call frequency

b)

CALL → 145.28   dial-frequency

8 Shifting a Call Frequency [C/SC/M Button]

Press the C/SC/M button in the call frequency mode. The Transceiver will be set to the dial frequency mode with the displayed call frequency remain unchanged. That is, the displayed call frequency becomes the operating frequency. This is called the call-shift operation.

Information

Press the */V/M/ENT button if you do not want call-shift operation. The dial-frequency displayed before the Transceiver is set to the call frequency mode will be returned.

call frequency mode

dial-frequency mode   call shift operation
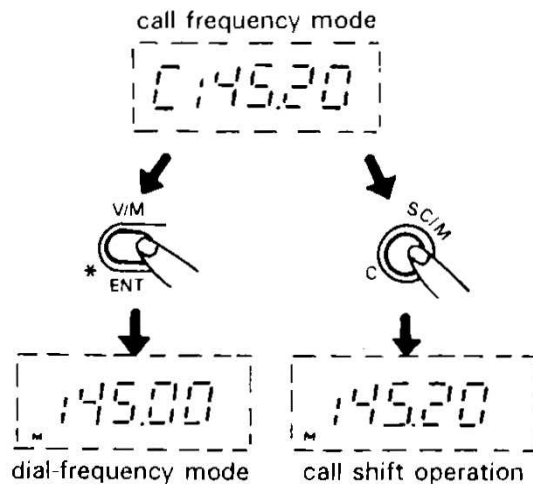
9 Changing a Call Frequency

The stored frequency in call memory can be changed by overwriting the new figure.

Example: To change the call frequency to 145.16MHz.

Procedure

a) Set the displayed dial-frequency to 145.16 MHz with the numeral buttons or the rotary channel selector.

b) Press the */V/M/ENT button while pressing the Function button. "M" will appear on the display.

c) Press the call button. The long beep tone will be generated informing you that the call frequency is altered.

d) Press the */V/M/ENT button to return to the dial-frequency mode when the operation is complete.
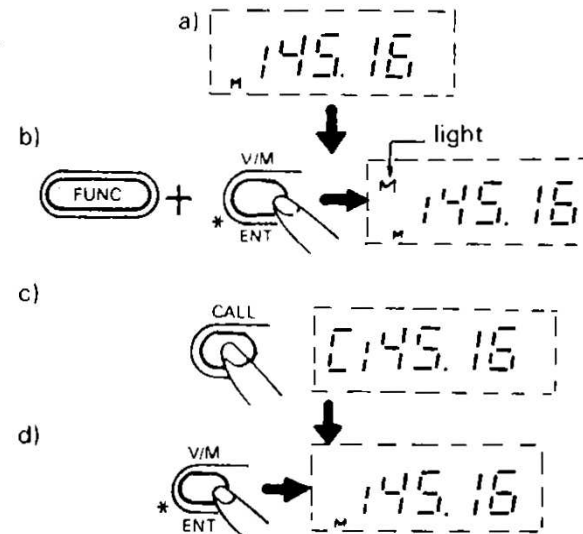
10 Scanning [C/SC/M Button and D/MS/MS.M Button]

The following buttons have special functions during scanning.

Buttons	During dial scanning	During memory scanning
6/F/L/SS	Switches 1MHz scan and all scan (switches 1 MHz scan and programmed scan when M̄8 and M̄9 are programmed)	Switches M memory scan (or M̄ memory scan) and all memory scan
7/RPT/SB	Switches pause scan and busy scan (B is indicated on the display during busy scan)	Switches pause scan and busy scan (B is indicated on the display during busy scan)
8/REV/▼	Lowers the frequency by one step and scans downwards.	Increase the memory address number by one step
9/SIFT/▲	Increase the frequency by one step and scans upwards.	Increase the memory address number by one step
5/SAVE	Turn on/off fast scanning	

(Information)

No indication is displayed for the above functions except the busy scan.

① Scanning Method

Either pause scan or busy scan can be selected.

- **Pause scan**

  Pause scan ceases scanning when a signal is received. Scanning will then resume five seconds later or when the signal disappears, whichever occurs first.

- **Busy scan**

  Busy scan stops scanning when a signal is received, but scanning resumes 4.5 seconds after the signal disappears.
  (The Transceiver is initially set to pause scan)

② Various Scanning

This Transceiver is capable of following scans.

- **Dial-frequency scan**

  (1) 1MHz scan
     To scan any 1 MHz segment.
  (2) All band scan
     To scan the band from one end to the other.
  (3) Programmed scan
     To scan within or outside the programmed limits (M̄8-M̄9).

- **Memory frequency scan**

  (1) M group memory scan
  (2) M̄ group memory scan
  (3) All memory scan
  (4) MS.M memory scan

NOTE:

Memory frequency scan can be operated with battery save function as save memory scan.

③ Operation

Dial-frequency scan

(1) 1MHz scan

a) Set the Transceiver to the dial-frequency mode.

b) Press the C/SC/M button. A short beep tone will be generated and the scanning will start at the displayed frequency for a 1 MHz segment. The decimal point keeps flashing during scanning operation.

c) Press the C/SC/M button again to cancel the scanning.

a)

144.80

b)

start flashing

144.02

144.80MHz
144.995MHz   1MHz scan
144.00MHz

c)

144.04

remain turned on and
scanning cancelled
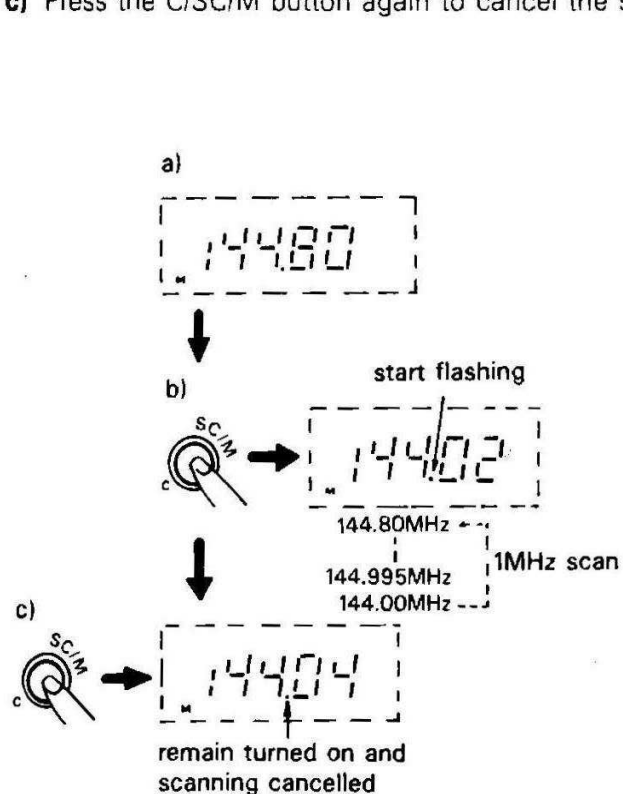
(2) All band scan

a) Press the C/SC/M button. 1 MHz scan will start.

b) Press the 6/F.L/SS button during 1 MHz scanning. A short beep tone will be generated and scanning of the entire band will start. The decimal point keeps flashing during scanning operation.

c) Press the 6/F.L/SS button again to cancel the all band scanning. 1MHz scan will return.

d) Press the C/SC/M button to cancel the scanning. The decimal point stops flashing.

during 1MHz scan

a)   145.20

flashing

b) 6/F.L SS   145.22

144.005MHz
145.995MHz   all scan
144.00MHz

flashing

c) 6/F.L SS   145.24   1MHz scan

flashing

d)   145.24

remain turned on and
scanning cancelled
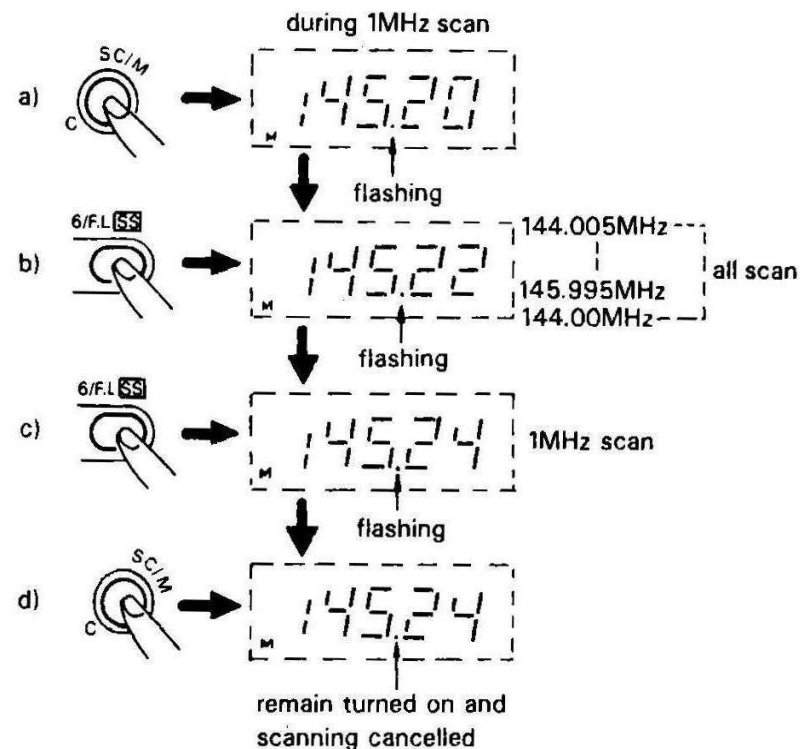
NOTE:
When frequencies are programmed for both $\overline{M8}$ and $\overline{M9}$, pressing the 6/F.L/SS button during 1MHz scanning will start programmed scan.

21

Information

- The display has no indicators for 1MHz scan and all band scan press the 5/SAVE button for rapid scanning and distinguish them if necessary.
- Once the scanning is cancelled, 1MHz scan always resumes as pressing to C/SC/M button for scanning operation. (Scanning is cancelled by turning the power switch off).
- Press either the 8/REV/▼ button or 9/SIFT/▲ button during scanning to change the scanning direction.
- Press the 5/SAVE button to turn on/off the fast scanning.
- Press either the */V/M/ENT button or C/SC/M button to cancel scanning. The frequency displayed as the button is depressed becomes the operating frequency.
- Be sure that the Transceiver is in the dial-frequency mode before starting the scan, especially right after the memory mode is used.
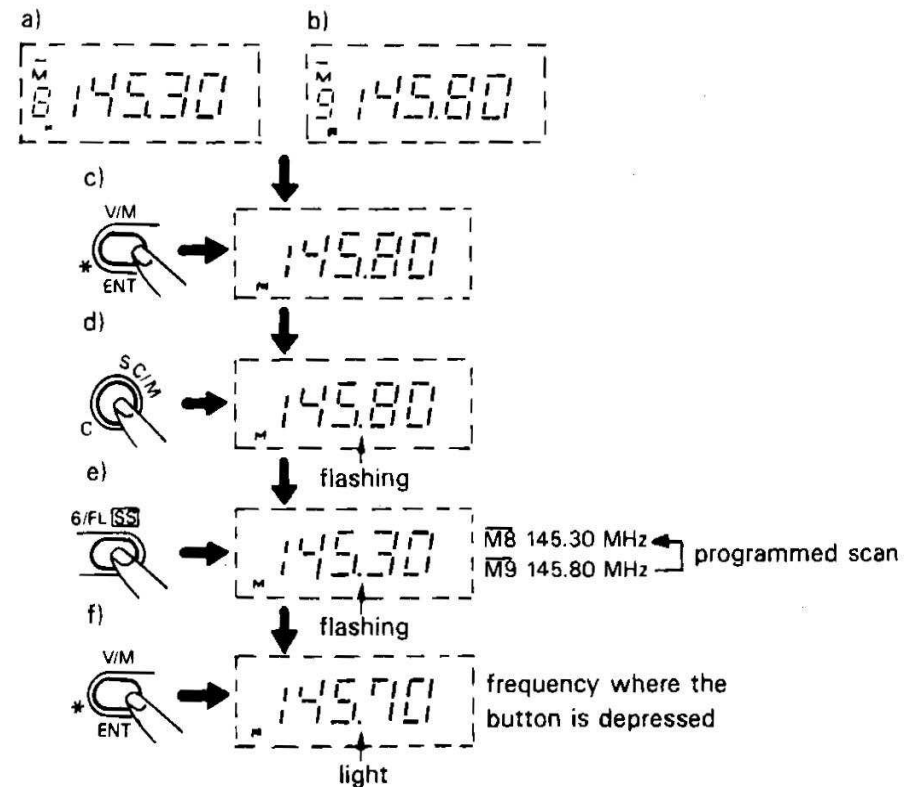
(3) Programmed scan

This function allows you to scan the programmed range of frequencies. The programmed scan starts at the frequency programmed under the memory address number $\overline{M8}$ and returns to that frequency and continue scanning when the scanning reaches the frequency programmed for $\overline{M9}$.

① To scan within the programmed limits
Example: To scan between 145.30 MHz and 145.80MHz

- a) Program 145.30MHz for the memory address number $\overline{M8}$ as a starting frequency.
- b) Program 145.80MHz for the memory address number $\overline{M9}$ as an ending frequency.
- c) Press the */V/M/ENT button for the dial frequency mode.
- d) Press the C/SC/M button for 1 MHz scan.
- e) Press the 6/F.L/SS button during 1 MHz scanning. A short beep tone will be generated and scanning of the range between 145.30MHz and 145.80MHz will start.
- f) Press either the */V/M/ENT button or CSC/M button to cancel the programmed scan.

a)   b)

c)

d)

e) $\overline{M8}$ 145.30 MHz — programmed scan
       $\overline{M9}$ 145.80 MHz —

f)

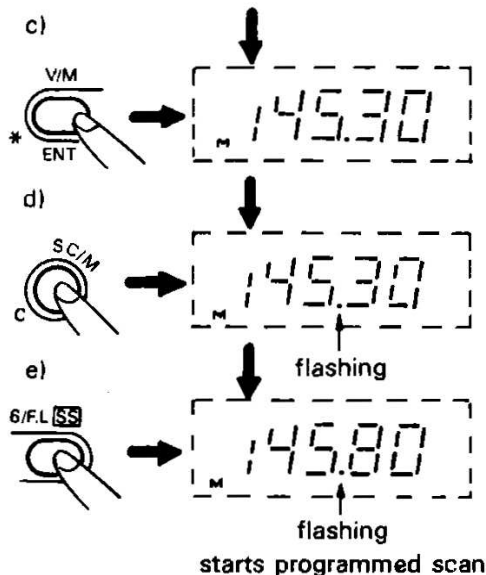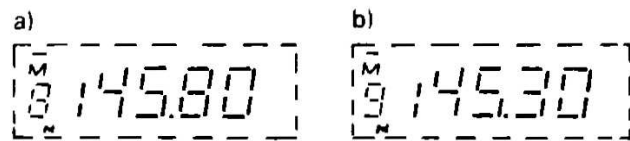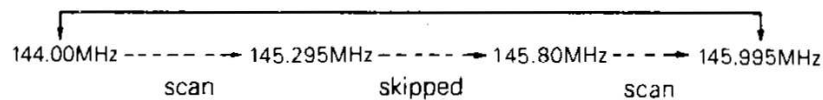frequency where the button is depressed

light

Information

- 1MHz scanning will return when the 6/F.L/SS button is pressed during programmed scanning.
- When frequencies are programmed for both $\overline{M8}$ and $\overline{M9}$, the 6/F.L/SS button switches the 1MHz scan and programmed scan. All band scan is only available when either or both of $\overline{M8}$ and $\overline{M9}$ are vacant.

② **To scan outside the programmed limits**
Example: to scan the entire band except the range between 145.30MHz and 145.80MHz
a) Program 145.80MHz for the memory address number $\overline{M8}$ as a starting frequency
b) Program 145.30MHz for the memory address number $\overline{M9}$ as an ending frequency.
c) Press the */V/M/ENT button for the dial-frequency mode.
d) Press the C/SC/M button for the 1 MHz scan.
e) Press the 6/F.L/SS button during 1MHz scanning. A short beep tone will be generated and scanning of the entire band except the range between 145.30MHz and 145.80MHz will start.

144.00MHz ----→ 145.295MHz ----→ 145.80MHz ---→ 145.995MHz
　　　　scan　　　　　skipped　　　　　scan

a)　　　　　　　　　　b)

c)
V/M
*　ENT

d)
SC/M
C

flashing

e)
6/F.L SS

flashing
starts programmed scan

• **Memory frequency scan**

This function allows you to scan frequencies programmed in the memory. Two types of memory scans are available;
I. Regular memory scan: to scan every memory frequency programmed in either or both of memory address group M and $\overline{M}$.
II. MS.M scan: To scan signified memory frequencies.

Information

Memory frequency scan can be operated with battery save function as save memory scan, scanning with intervals of 600ms.

(1) M group memory scan
This function allows you to scan the memory frequencies of M0 through M9. A vacant address number is automatically skipped.
a) Press the D/MS/MS.M button.
b) The memory scanning will start at the following memory address number used lastly. The decimal point starts flashing and keeps flashing during scanning operation.
c) Press the D/MS/MS.M button again to cancel the memory scan. The Transceiver will enter the memory mode.
d) The memory scan resumes by pressing the D/MS/MS.M button again.
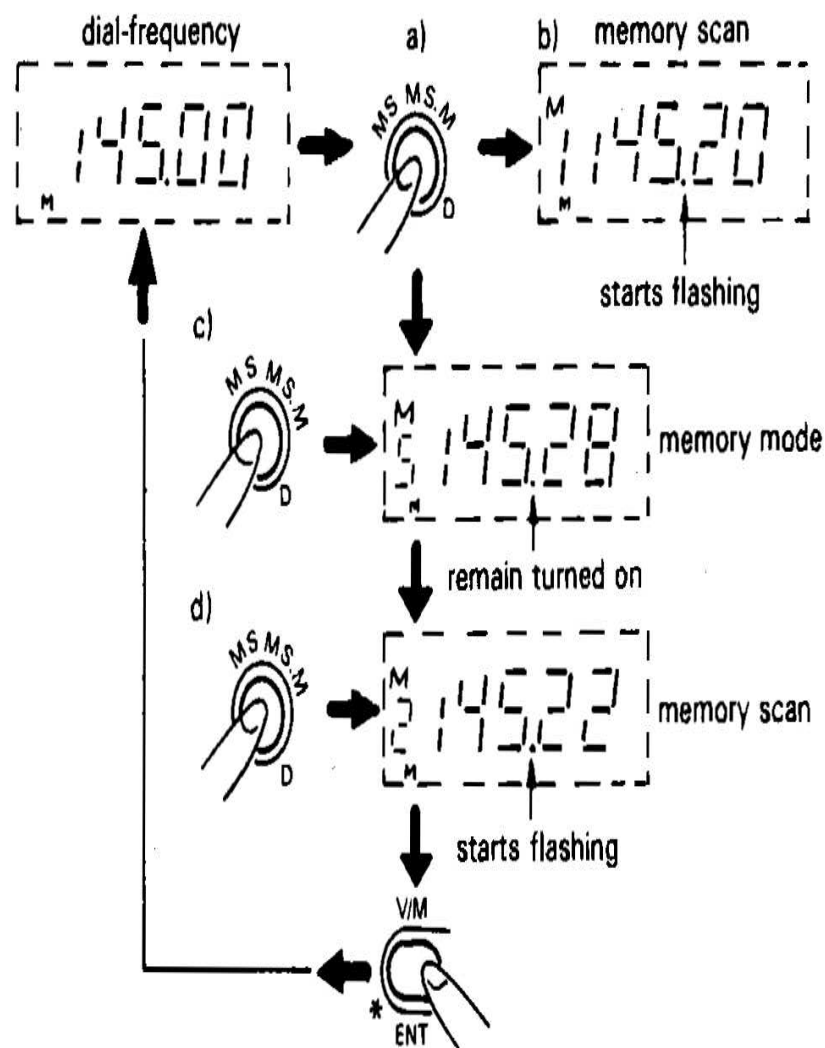
23

dial-frequency   a)   b)   memory scan

145.00 → 1 145.20

starts flashing

c)

→ 145.28   memory mode

remain turned on

d)

→ 2 145.22   memory scan

starts flashing

V/M
*
ENT

(2) $\overline{\text{M}}$ group memory scan

This function allows you to scan the memory frequencies of $\overline{\text{M0}}$ through $\overline{\text{M9}}$. A vacant address number is automatically skipped.

a) Press the */V/M/ENT button for memory mode.

b) Press the C/SC/M button while pressing the Function button to recall the $\overline{\text{M}}$ memory group.

c) Press the D/MS/MS.M button.
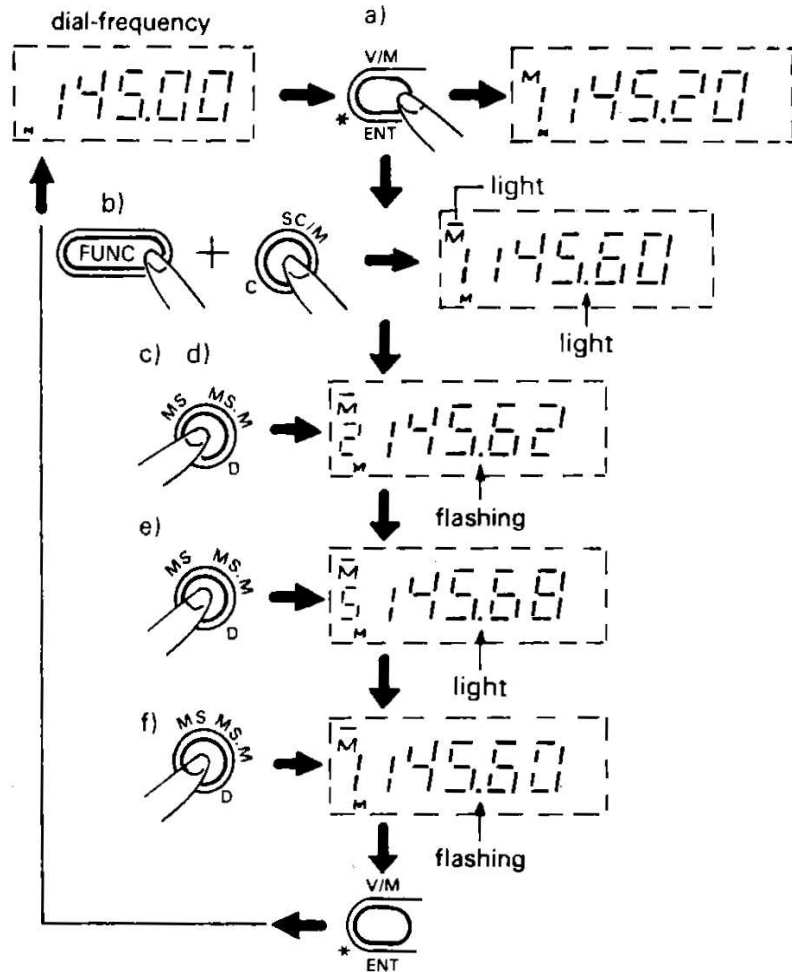
d) The memory scanning will start at the following memory address number used lastly. The decimal point starts flashing and keeps flashing during scanning operation.

e) Press the D/MS/MS.M button again to cancel the memory scan. The Transceiver will enter the memory mode.

f) The momory scan resumes by pressing the D/MS/MS.M button again.

g) Press the */V/M/ENT button to return to the dial-frequency mode.

dial-frequency

NOTE:
The procedure described above is made upon the assumption that the M group address number was used lastly. When an address number in M̄ group is used lastly, the procedure is identical to the one for M̄ group memory scan.

(3) All memory scan
this is to scan all memory frequencies, M0 to M9 and M̄0 to M̄9.
a) Press the 6/F.L/SS button during memory scanning.
b) The all memory scan will start. The decimal point starts flashing and keeps flashing during scanning operation.

scans memory frequencies
in sequence
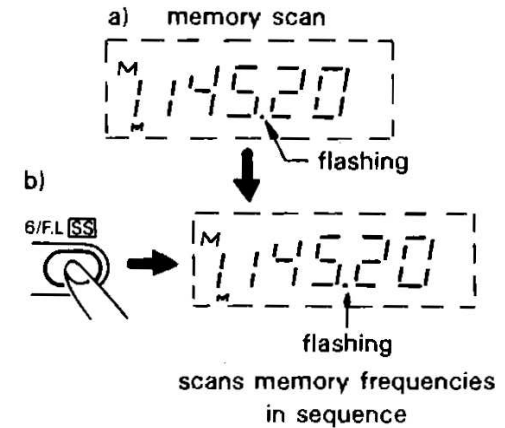
(Information)
Either the M group memory scan or the M̄ group memory scan resumes once the memory scan is cancelled and re-started. The memory scan will be cancelled by turning the power switch off.

(4) MS.M scan

This function allows you to scan the specified memory frequencies only.

① **Setting the memory address number for MS.M scan.**

  a) Press the */V/M/ENT button for the memory mode.

  b) Display the desired address number either with the numeral button or the rotary channel selector.

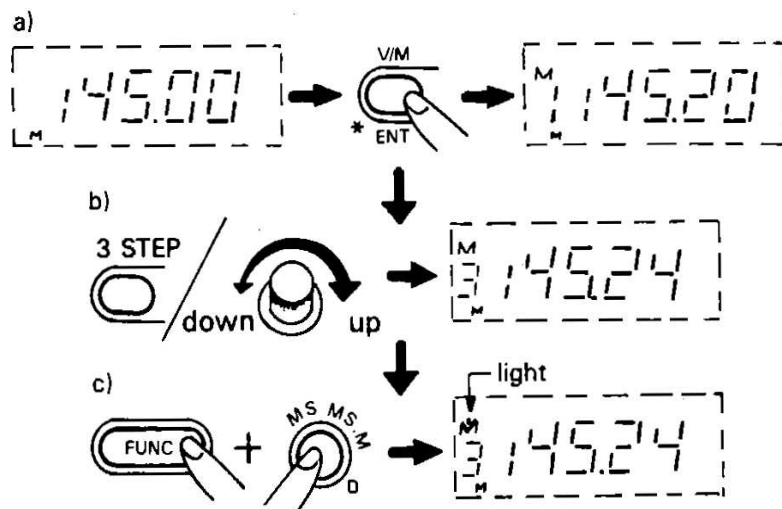 **c)** Press the D/MS/MS.M button while pressing the Function button "▼" will be indicated above "M" on the display and the displayed frequency is programmed for the MS.M scan.

  d) Repeat the above procedure and program the desired frequencies for the MS.M scan.

NOTE:
Repeat the above procedure to delete the programmed frequency for the MS.M scan. "▼" above "M" will disappear.

② **Operation I.**

  a) Set the Transceiver to the dial-frequency mode. Press the D/MS/MS.M button while pressing the Function button "▼" will be indicated above "M" on the display and the Transceiver is now ready for MS.M scan.

  b) Press the D/MS/MS.M button. The MS.M scan will start.

NOTE:
The MS.M scan in only available when the MS.M scan frequencies have been programmed.

③ **Operation II.**
  a) Press the D/MS/MS.M button for memory scan.
  b) Press the D/MS/MS.M button while pressing the Function button during memory scanning. The MS.M scan will start.

④ **Operation III.**
  a) Start the MS.M scan either by operation I or II aforementioned. Press the 6/F.L/SS button during MS.M scanning. The all MS.M scan, scans all MS.M frequencies in both M and M̄ memory group, will start. Press the 6/F.L/SS button again. The MS.M scan of either memory group, the one where the button is depressed, will start.

during memory scan

flashing

MS.M scan

flashing

all MS.M scan

flashing

flashing
MS.M scan

flashing

NOTE:
The MS.M scan in only available when the MS.M scan frequencies have been programmed.

(Information)
The MS.M scan and all MS.M scan can be cancelled by depressing the D/MS/MS.M button while pressing the Function button. The memory scan will start.

NOTE:
(1) "▼" above "M" on the display is an indicator for MS.M scan.
(2) The MS.M scan is only available when the MS.M scan frequencies have been programmed.

11 Switching the Transmit Power [B/PO/PL Button]

This is to switch the transmit power. Three power levels are available for the H/H Transceiver. Select high, middle or low power depending on your purpose.

High power (H is displayed) 5.0W
Middle power (M is displayed) 2.5W
Low power (L is displayed) 0.35W

Procedure

a) Press the B/PO/PL button to switch the transmit power. The "M" on the display will be replaced by "L" indicating that the transmit power is switched to low.

b) Press the B/PO/PL button again for high power. "H" will be displayed.

c) Press the B/PO/PL button again. The middle power will be returned.
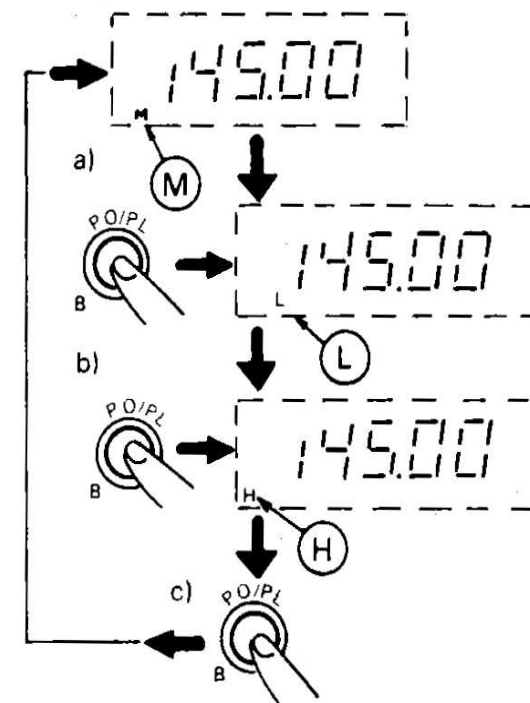
Information

The Transceiver is initially set to the middle at the factory.

12 Dual-Watch Operation [1/DUAL Button]

This function allows you to watch two different frequencies. The Transceiver is capable of following types of dual-watch operation.
(1) Listen on the dial-frequency and the memory frequency under M1.
(2) Listen on the dial-frequency and one of the memory frequencies.
(3) Listen on the dial-frequency and a memory frequency under scanning.

Information
- The world "DUAL" is indicated on the display during dual-watch operation.
- the dial-frequency can be changed during dual-watch operation.
- During dual-watch operation, the Transceiver listens on a memory frequency once every three seconds and instantaneously displays its frequency.
- Dual-watch operation pauses while the memory frequency is being received.
- When a signal is received on the dial-frequency during dual-watch operation, the signal will be heard interruptedly as the. Transceiver leaves the dial-frequency once every three seconds.
- Rotate the squelch control fully counterclockwise to pause the dual-watch operation with the memory frequency to listen.

NOTE:
(1) During dual-watch operation, transmission is only available at the dial-frequency.
(2) Press the PTT button to transmit. The dial-frequency is displayed and you can transmit at the dial-frequency. Release the PTT button to return to dual-watch.
(3) When a signal is received at the memory frequency, release the dual-watch operation and recall the memory frequency for communication.

① Dual-watch on the dial-frequency and the memory frequency under M1.

Procedure
a) Set the Transceiver to the dial-frequency mode.
b) Press the 1/DUAL button while pressing the Function button. A word "DUAL" will appear on the display to indicate the dual-watch operation.
c) Press the */V/M button "DUAL" will disappear and the dual-watch will be cancelled.

a)

light

b)   FUNC + 1/DUAL

c)
displayed for app. 3 second   displayed for app. 0.5 second
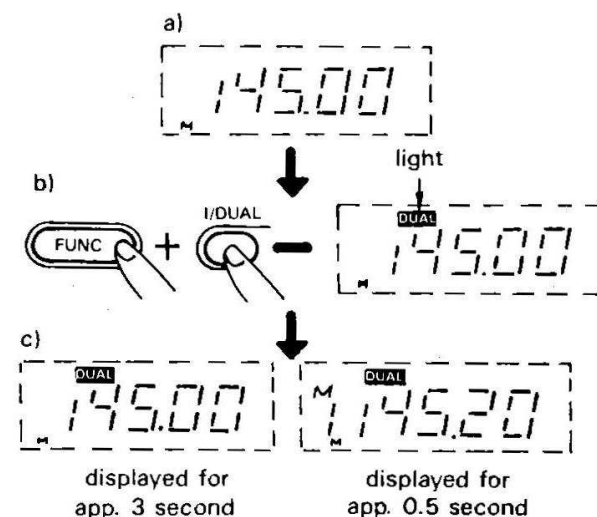
NOTE:
If no frequency has been stored in memory address number M1, the dual-watch operation is unavailable. You will hear a low-toned short beep when you press the 1/DUAL button informing you an incorrect entry.

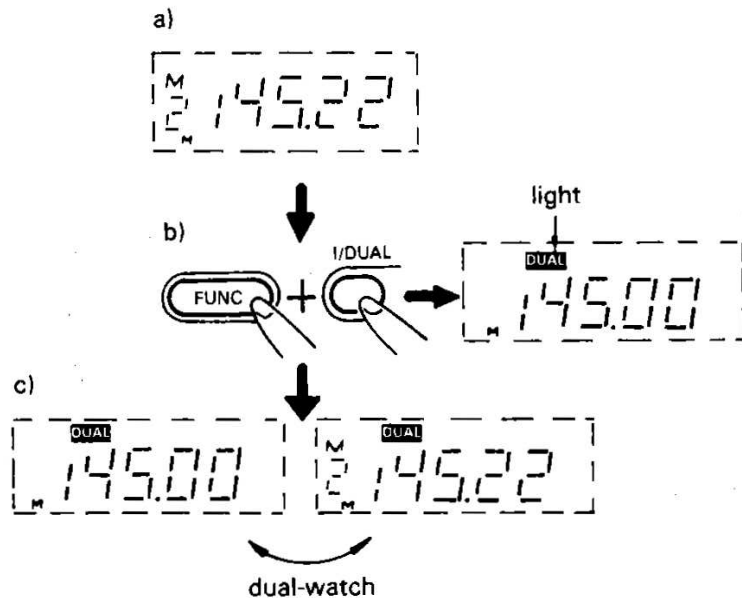## ② Dual-watch on the dial-frequency and a memory frequency. (or call frequency)

(Procedure)

a) Recall a memory frequency you wish to use in the dual-watch.
b) Press the 1/DUAL button while pressing the function button. A word "DUAL" will appear on the display to indicate the dual-watch opertion.
c) The display will alternately indicate the dial frequency and a select momory frequency.

a)

b)

light

c)

dual-watch

NOTE:

(1) **If no frequency has been stored in memory, the dual-watch operation is unavailable. You will hear a low-toned short beep when you press the 1/DUAL button informing you an incorrect entry.**

(2) **In dual-watch operation call frequency is coneidered as one of memory frequencies. That is, you can have dual-watch operation to listen on dial frequency and call frequency.**

③ Dual-watch on the dial-frequency and a memory frequency under scanning in sequence.

(Procedure)

a) Set the Transceiver to the memory scan mode
b) Press the 1/DUAL button while pressing the Function button. A word "DUAL" will appear on the display to indicate the dual-watch operation. The display will sequentially indicate the dial-frequency and the memory frequencies under scanning one by one.
c) Press either the C/SC/M button or */V/M/ENT button to cancel the dual-watch operation and to set the dial-frequency mode. The Transceiver will be set to either the dial-frequency mode or the memory mode depending on the condition at which the button is depressed.

a)

memory scan

light   flashing

b)

c)

disappears

30
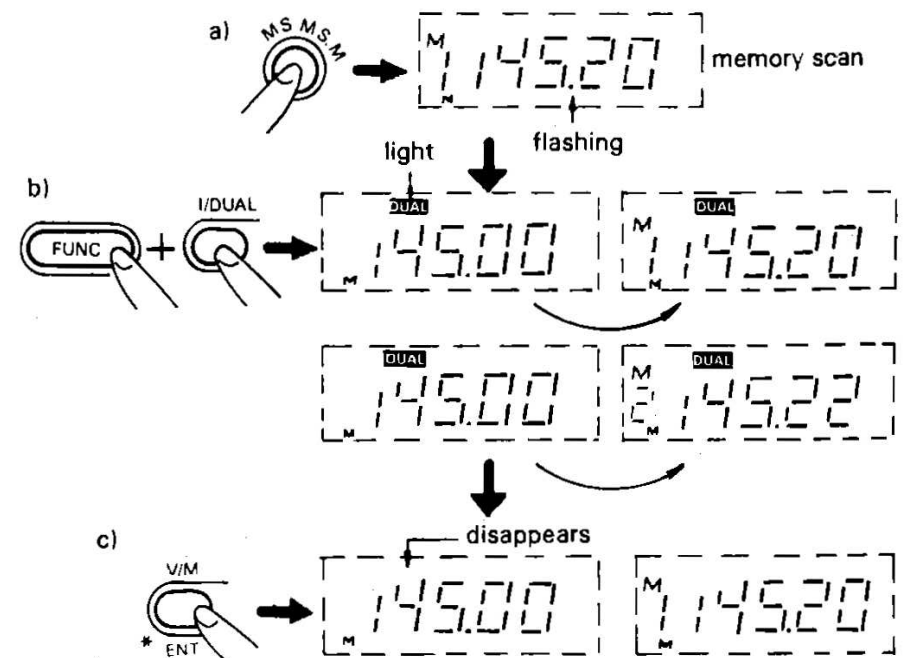
13 Duplex Operation [2/DUP Button]

Semi-duplex operation is available by using two different frequencies.

Procedure

a) Program two frequencies you wish to use for duplex operation in M1 and $\overline{M1}$.

Example: Program a receive frequency under memory address M1 and a transmit frequency for $\overline{M1}$. (or vice versa)

b) Set the Transceiver to the memory mode.

c) Press the 2/DUP button while pressing the Function button. A word "DUP" will appear on the display to indicate duplex operation.

d) Depress the PTT button to transmit. The display will indicate the transmit frequency. The Transceiver will receive at the frequency displayed when the PTT button is not pressed.

Information

Press the C/SC/M button while pressing the Function button to exchange the transmit and receive frequencies.

Example

	receive	transmit	receive	transmit
Station A	145.20MHz (M1)	145.60MHz ($\overline{M1}$)	145.60MHz ($\overline{M1}$)	145.20MHz (M1)
Station B	145.60MHz (M2)	145.20MHz ($\overline{M2}$)	145.20MHz ($\overline{M2}$)	145.60MHz (M2)

NOTE:

Duplex operation is not available in the dial-frequency mode.

145.20 M1
145.60 $\overline{M1}$

145.60 M2
145.20 $\overline{M2}$

a) b)

c)

2/DUP

FUNC

light

d)

on

off

meter appears

SC/M

FUNC

on
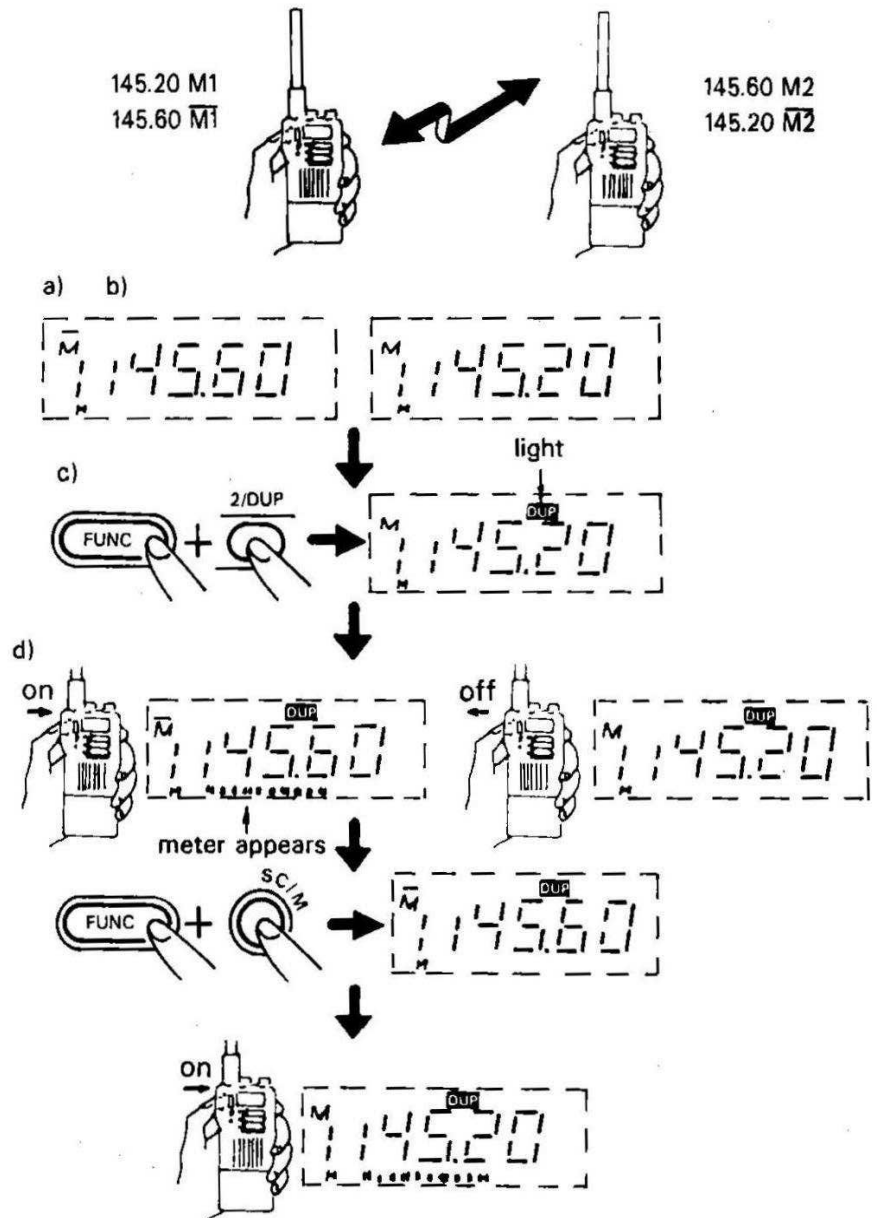
14 Changing the Channel Step [3/STEP Button]

You can set the Transceiver's step rate to 5kHz, 10kHz, 12.5kHz, 20kHz, 25kHz or 50kHz.

Procedure

a) Press the 3/STEP button while pressing the Function button. The frequency display will disappear and replaced by the current step rate.

b) Rotate the rotary channel selector. The six step rates will be sequentially indicated.

c) Select the desired step rate. Then press the */V/M/ENT button to return to the previous dial-frequency.

Information

- When the step rate is set to 25kHz, 12.5kHz and 5kHz, the kHz digit of the dial-frequency will be shown in a small black box on the right side of the display.
- The step rate is initially set to 10kHz at the factory.

a)

b)

c)

frequency changes with selected channel step
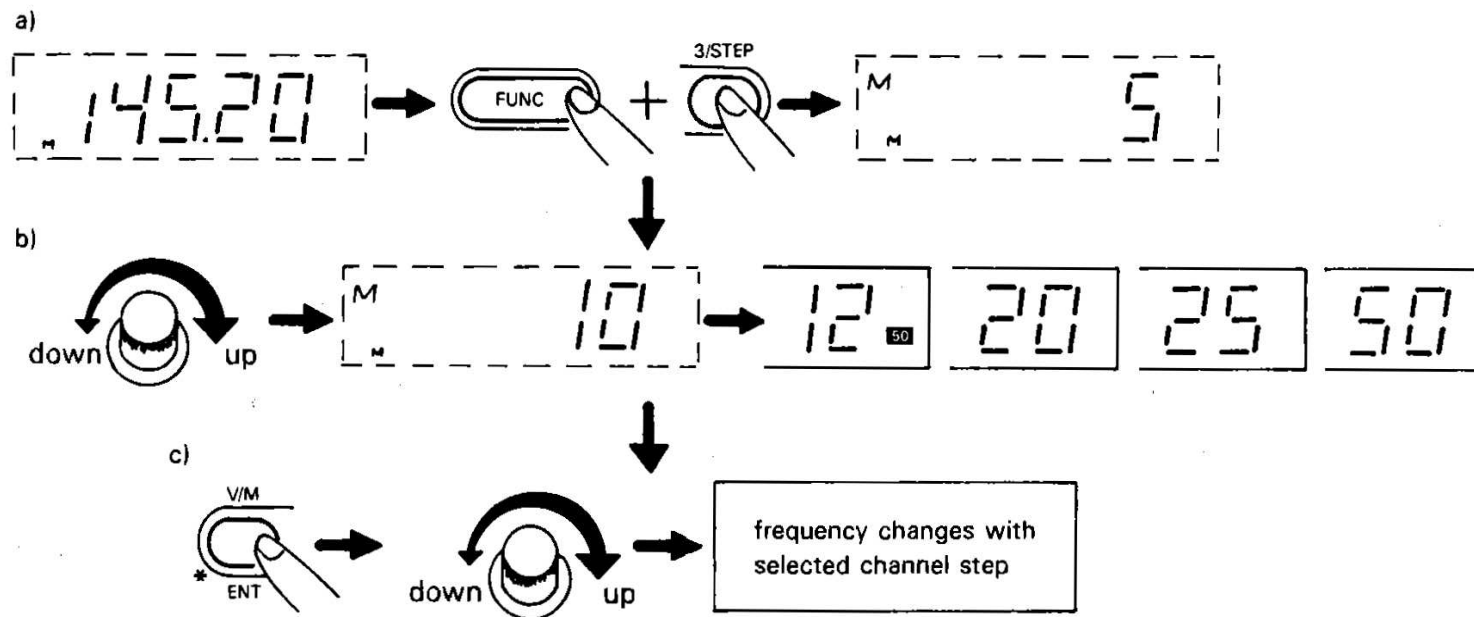
15 Battery-Save Function [5/SAVE Button]

This function allows you to reduce the current drain to 1/3 during receiver standby. The receiver will be activated once every single second.

Procedure

a) Press the 5/SAVE button while pressing the Function button. A "S" will appear on the display to indicate that the battery-save function is enabled.

b) Press the 5/SAVE button again while pressing the Function button to release the battery saver.
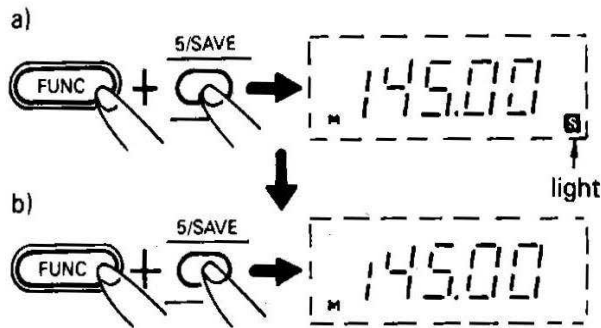
NOTE:
The battery saver is disabled during dual-watch operation and scanning.

16 Frequency Lock [6/F.L./SS Button]

This feature allows you to lock the frequency and operating mode to prevent improper operation. You can also use this feature during scanning and dual-watch operation.

Procedure

a) Press the 6/F.L./SS button while pressing the Function button. A "F.L" will appear on the display to indicate that the frequency and operating mode is locked.

b) Press the 6/F.L./SS button again while pressing the Function button to unlock them.
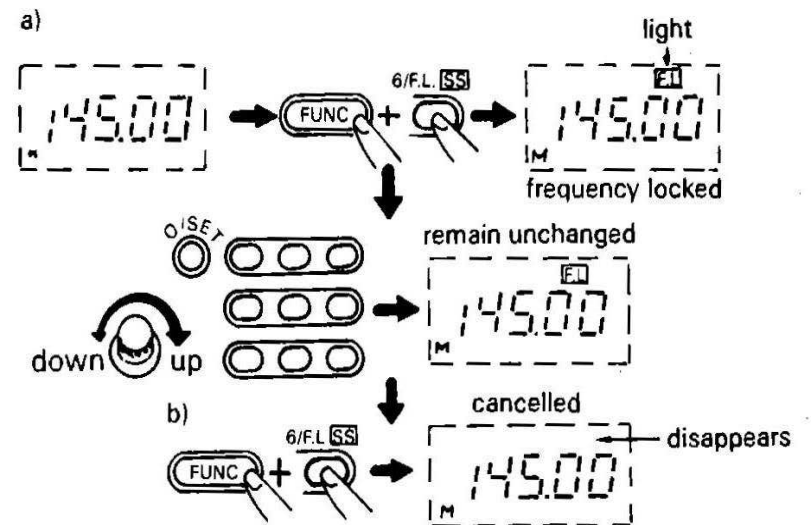
17 PTT Lock [B/PO/PL Button]

This function allows you to disable the PTT button to reduce the chance of accidental transmission.

Procedure

a) Press the B/PO/PL button while pressing the Function button. A "P.L" will appear on the display and the PT.T button is disabled.
b) Press the B/PO/PL button again while pressing the Function button to enable the PTT button.

a)

no transmission

on

cancelled   disappears

b)
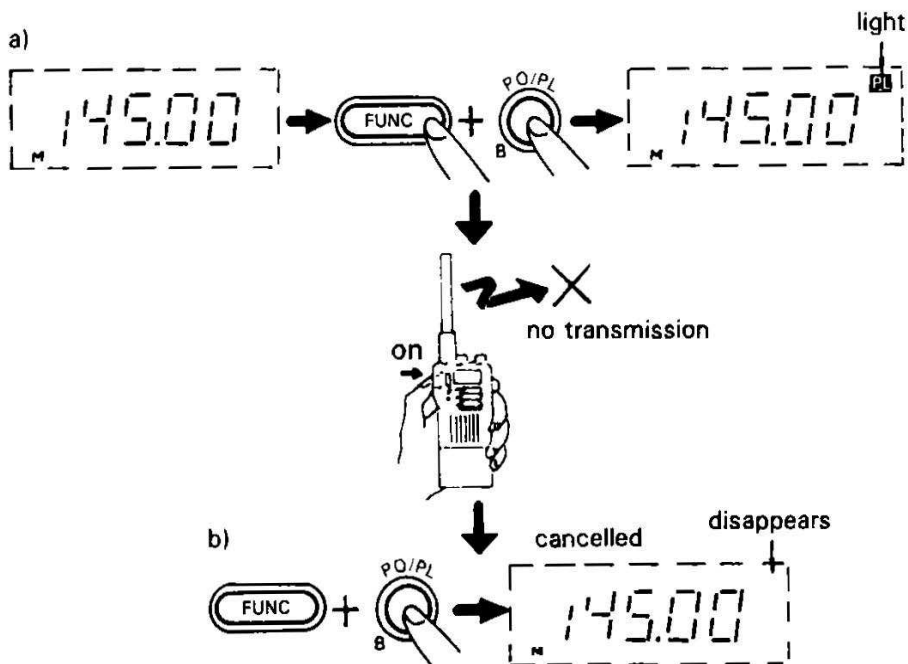
18 Switching Pause Scan and Busy Scan [7/RPT/SB Button]

This function allows you to select either pause scan or busy scan. The Transceiver is initially set to pause scan at the factory.
(see 10 Scanning in page 20)

Procedure

a) Set the Transceiver to the scanning mode.
b) Press the 7/SB button during scanning, a "B" will appear on the display to indicate the busy scan
c) Press the 7/SB button again to return to the pause scan, the "B" will disappear

a)

busy scan   flashing

b)

light

pause scan

c)

disappears
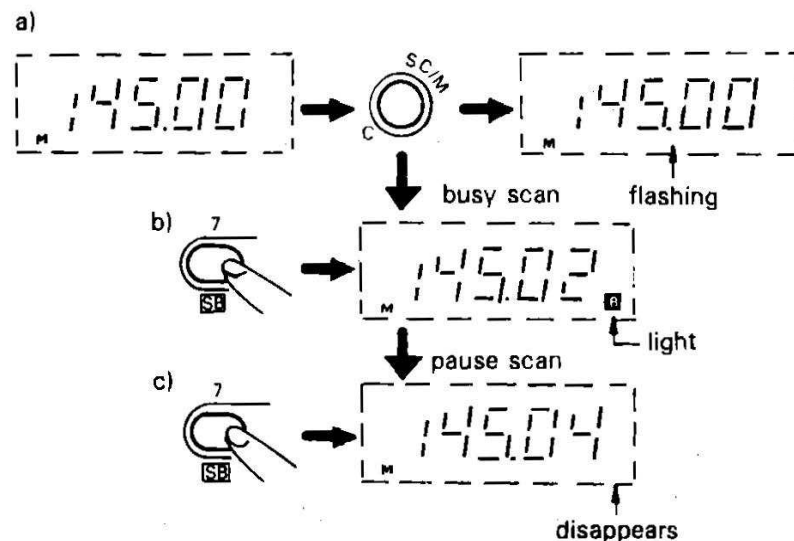
19 Tone Squelch Control [4/T.SQ Button]

Tone squelch operation is available when an optional tone squelch unit CTS145 is installed.

NOTE:
(1) Communication between stations incapable of tone squelch operation or having different tone frequencies is unavailable.
(2) Select and program the required tone frequency before attempting tone squelch operation.

Procedure

a) Press the 4/T.SQ button while pressing the Function button. "T" and "SQ" will appear on the display to indicate that the tone squelch is turned on.

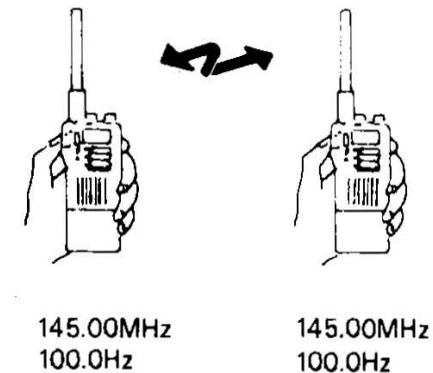**b)** Press the 4/T.SQ button again while pressing the Function button to disable the tone squelch. "T" and "SQ" will disappear.

145.00MHz
100.0Hz

145.00MHz
100.0Hz
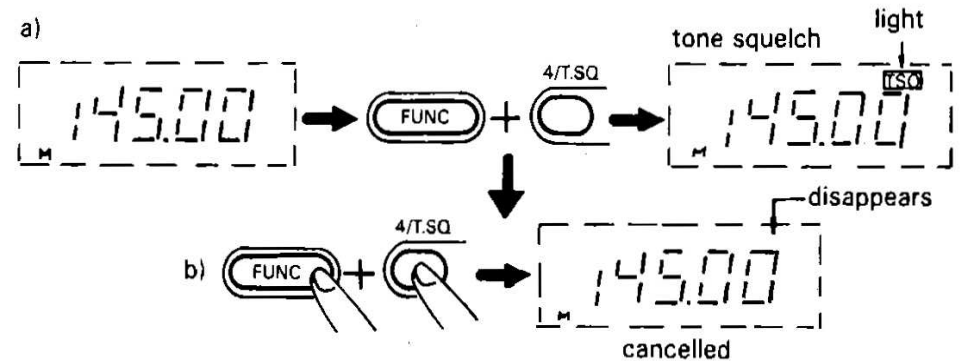
Advice

To store the tone squelch ON/OFF condition in M1, $\overline{M1}$ and M2, or in $\overline{M2}$, first recall the memory address No. to store the tone squelch ON/OFF condition, then set the condition according to the procedure describe above.

This allows the tone squelch operation condition to be written directly in M1, $\overline{M1}$ and M2, or in $\overline{M2}$.

NOTE:

(1) "T" and "SQ" will be displayed even though the tone squelch unit CTS145 is not installed.

(2) The tone frequency is initially set to 88.5Hz for this H/H Transceiver at the factory. However, you can select any frequency indicated in the table "Recalling the tone frequency" page 40 to change the tone frequency.

20 Special Functions with SET Button [O/SET Button]

Press the O/SET button while pressing the Function button to enter the set mode. In the set mode, special functions listed in the table below are available.

NOTE:
(1) A "M" will be indicated on the display when the Transceiver is in the set mode. However, there are no indicators on the display for special functions.
(2) Press the */V/M/ENT button to return to the dial-frequency mode. Repeat the each procedure to release special functions.

Button	Special functions in set mode
O/SET	Muting the buzzer
1/DUAL	Setting for the KHz digits (with numeral buttons)
2/DUP	
3/STEP	Switching the 100 KHz and 1 MHz channel step (when the channel selector rotated while pressing the function button)
4/T.SQ	Recalling the tone frequency
5/SAVE	Turning on/off the Auto-Power OFF (APO)
6/F.L/SS	Enabling and disabling the rotary channel selector when frequency lock is turned on
7/RPT/SB	Disabled (low beep tone)
8/REV/▼	Disabled (low beep tone)
9/SIFT/▲	Disabled (low beep tone)

Muting the buzzer

The H/H Transceiver produces the following sounds.
(2) Beeping alarm .... generated during Auto-Power Off operation and when receiving signals during pager operation
(3) Low-toned beep .... indicates improper key entry
(4) High-toned short beep .. indicates proper key entry.

(Procedure)

a) Press the O/SET button while pressing the Function button A "M" will appear on the display to indicate the set mode.
b) Press the O/SET button.
c) The buzzer is muted and pressing a button will not generate any sounds.
d) Press the O/SET button while pressing the Function button and then press the O/SET button again by itself to enable the buzzer.

NOTE:
(1) The display does not indicate whether the buzzer is muted or not.
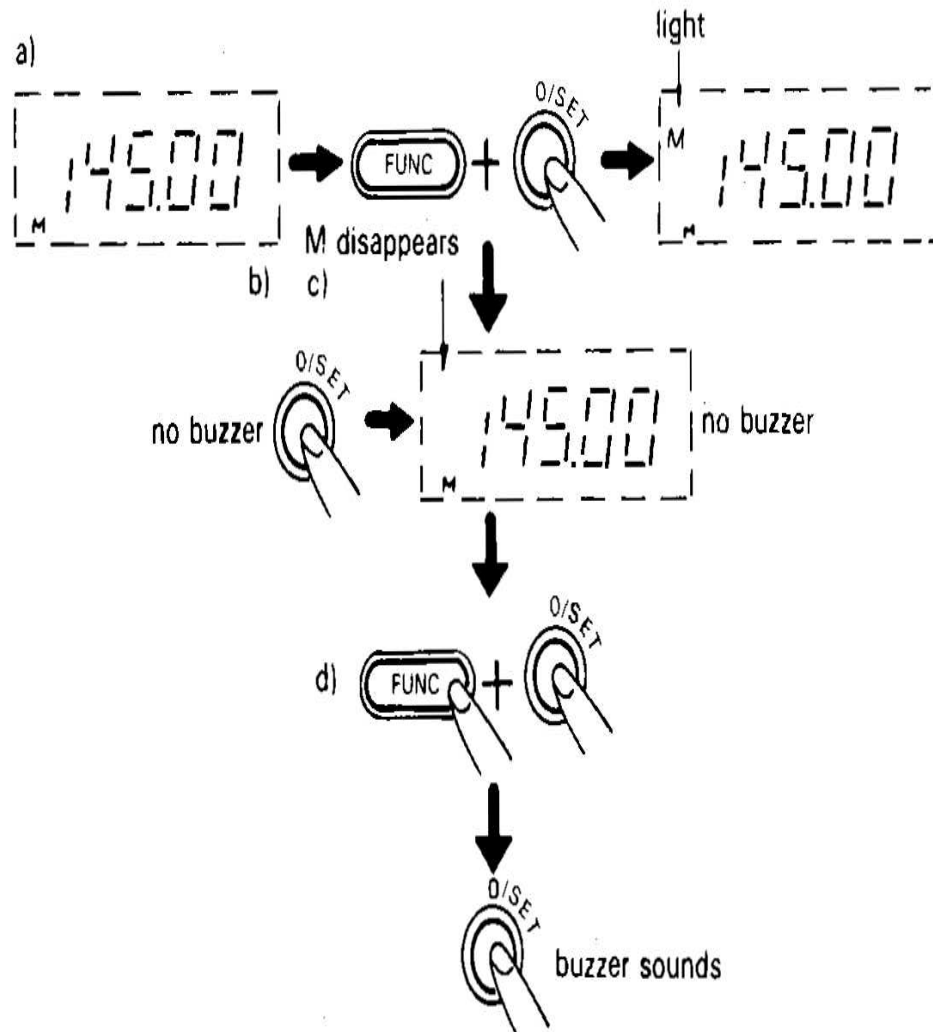
2. Setting for the kHz digits

This feature allows you to enter the kHz digits, either 0 or 5.

Example: Normal entry	145.45MHz
With this special function	145.455MHz

Procedure

a) Press the 0/SET button while pressing the function button. A "M" will appear on the display to indicate the set mode.

b) Press the 1/DUAL button.

c) Set the desired frequency with a kHz digit by the numeral buttons. (i.e. enter four digits)

d) Press the 0/SET button while pressing the Function button and then press the 1/DUAL button to return to the normal entry.

NOTE:

The display does not indicate whether the kHz digit can be entered or not. Simply press numeral buttons and enter the frequency to check it.

a)

145.00 → FUNC + O/SET → 145.00 (light)

b) 1/DUAL → c) 5/SAVE → 145.

5/SAVE → 145.5

5/SAVE → 145.55

5/SAVE → 145.55 50

d) FUNC + O/SET

1/DUAL → 3-digit entry

③ Recalling the tone frequency

You can select any one of thirty-eight tones which have been programmed in the microprocessor. The selected tone frequency can be stored in memory.

Available Tone Frequencies (in Hz)

67.0	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		

NOTE:

(1) This feature is only available when an optional tone squelch unit CTS145 is installed.

(2) Memory address M1 ($\overline{M1}$) and M2 ($\overline{M2}$) are capable of storing two independent tone frequencies.
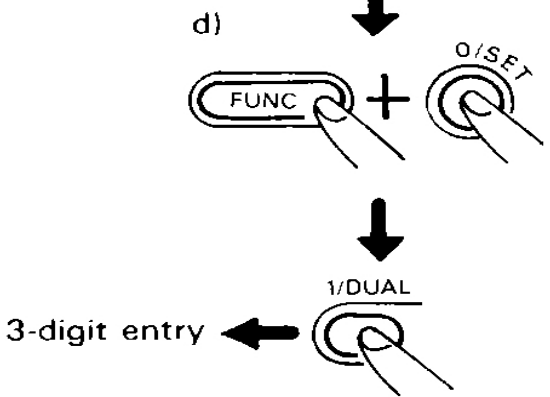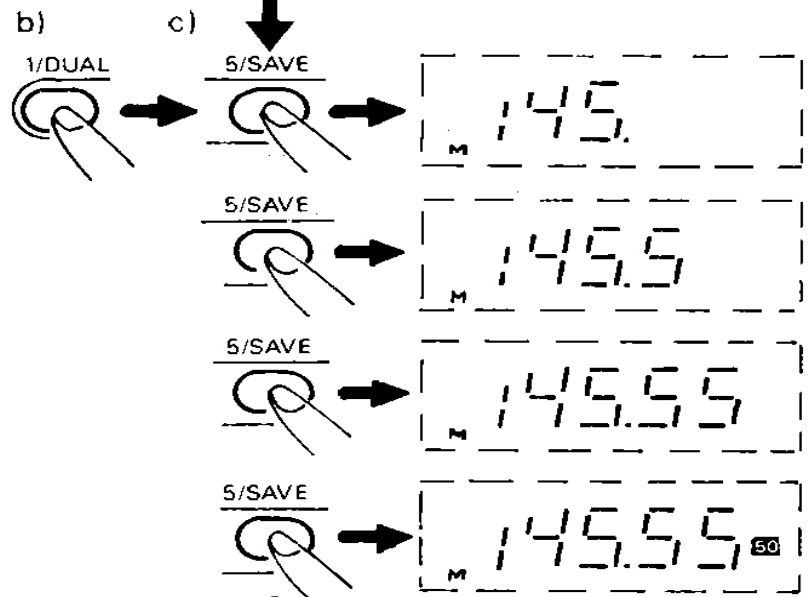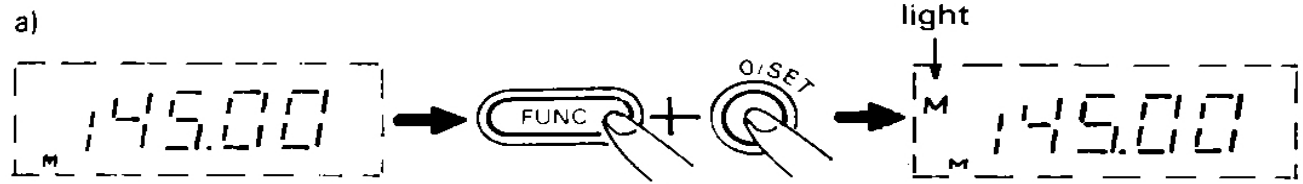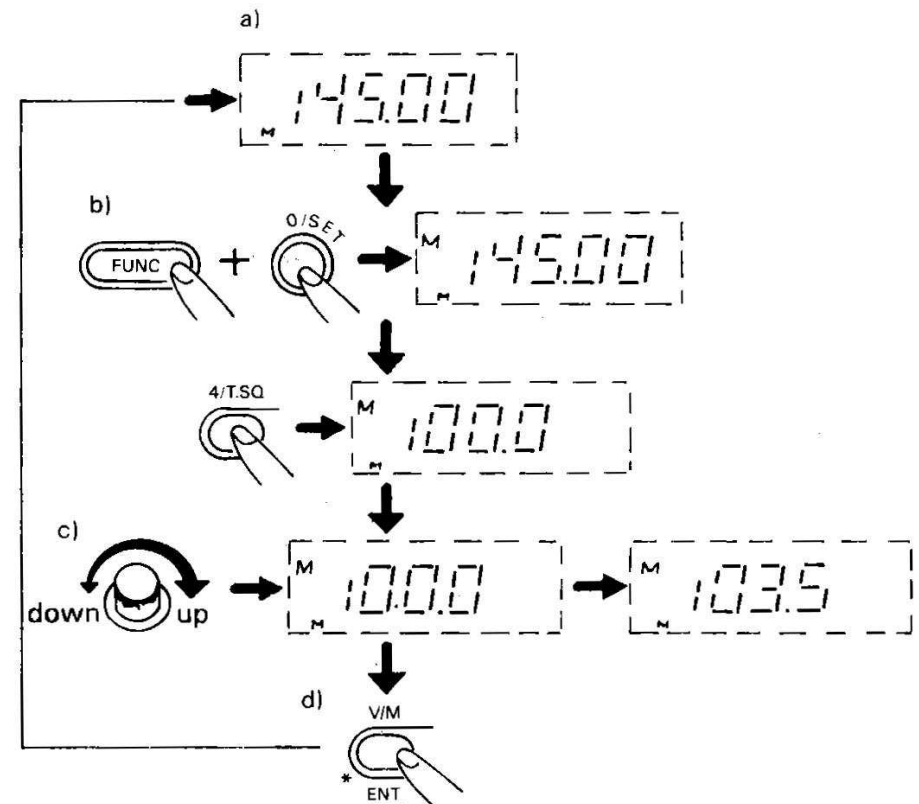
(Procedure)

a) Press the O/SET button while pressing the Function button. A "M" will appear on the display to indicate the set mode.

b) Press the 4/T.SQ button. The dial-frequency on the display will disappear and be replaced by a tone frequency. (88.5Hz) is initially set at the factory)

c) rotate the channel selector for a desired tone frequency.

d) Press the */V/M/ENT button to complete the setting. The previous mode will be returned.

(Information)

To program an independent tone frequency for M1 ($\overline{M1}$) or M2 ($\overline{M2}$), recall the desired memory address number first and then follow the above procedure.

④ Auto-Power Off

An Auto-Power Off feature is built in to conserve power. When the Transceiver is left unused with the power switch turned on for 30 minutes, the Transceiver will generate beeping alarm. After the alarm, the Transceiver will automatically extinguish the most of the display and reduce the power consumption to approximately 5mA.

Procedure

a) Press the O/SET button while pressing the Function button. A "M" will appear on the display to indicate the set mode.

b) Press the 5/SAVE button and the word "OFF" will appear on the display to indicate Auto-Power Off.

c) When the operating buttons have not been operated or a signal has not been received for 30 minutes, the beeping alarm is generated.

d) The H/H Transceiver will extinguish the most of the display to reduce the power consumption. The frequency will disappear and be replaced by a word "OFF" (i.e. the Transceiver is in the sleep standby mode.)

e) Press the C/SC/M button to release sleep standby. The power will be turned on and the Auto-Power Off timer will be extended for another 30 minutes. i.e. the Transceiver returns to the condition of (b).

NOTE:

(1) When the "OFF" replaces the frequency on the display, both the receiver and transmitter are disabled.

(2) Although the Auto-Power Off function enables to reduce the power consumption to a minimum, make sure that the power switch is turned off when you finish operation.

(3) Every operating button is disabled in the sleep standby mode except the C/SC/M button.
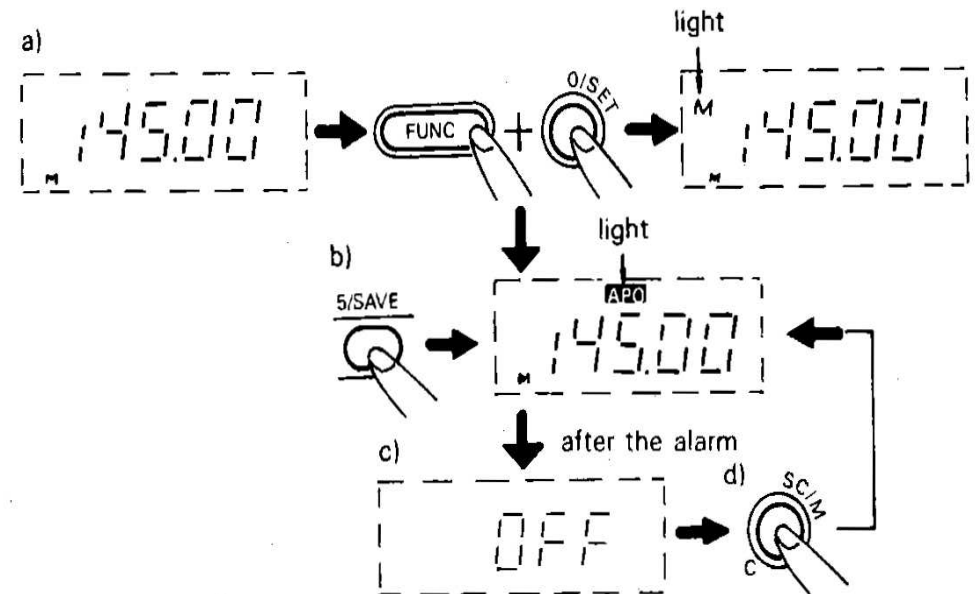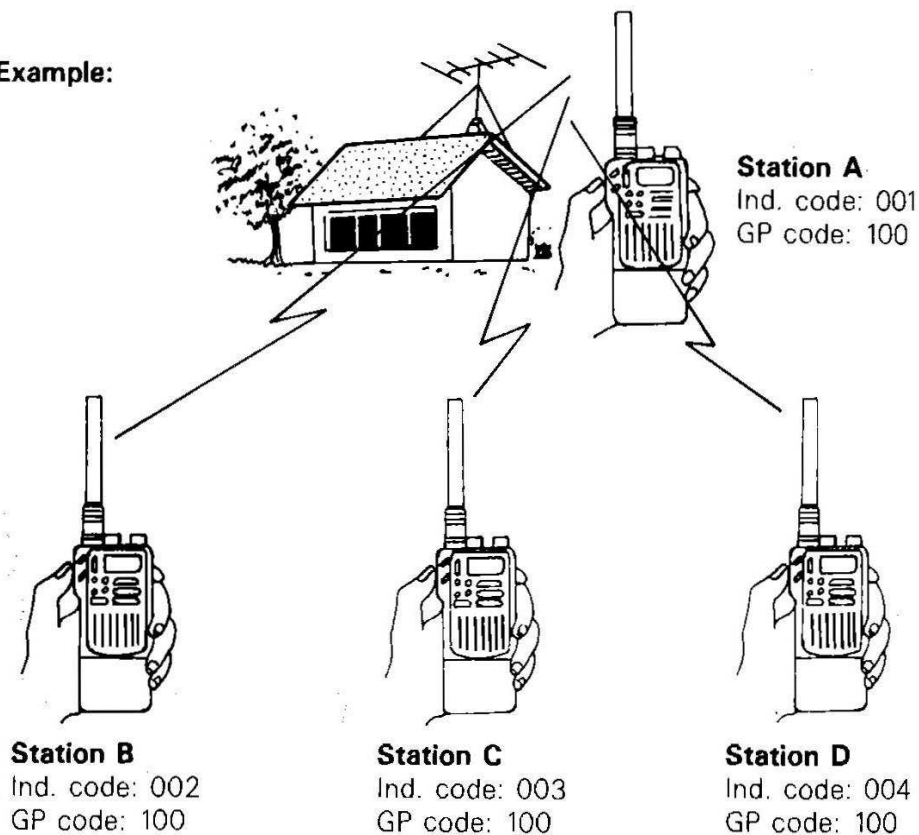
21 Pager and Code Squelch [#/MODE/CODE Button]

This feature enables you to page one specified station (individual paging) or all group stations (group paging) over the Transceiver.

NOTE:

Install an optional Touch Tone unit DTF145 for pager and code squelch operation.

Individual code and group code, each with 3 figures, must be programmed before the operation. Pager and code squelch operation is only available when they are programmed.

Example:

Station A
Ind. code: 001
GP code: 100

Station B
Ind. code: 002
GP code: 100

Station C
Ind. code: 003
GP code: 100

Station D
Ind. code: 004
GP code: 100

An individual code and group code have been respectively programmed for Station A through D.

- **To call stations from Station A.**
  Recall a group code and press the PTT button. At the Station B through D, a beep sound will be generated and "M2 C100" will appear on the display to indicate that they have been paged.

- **To call Station B from Station A**
  Program an individual code of Station B for address number M1 and press the PTT button. At Station B, a beep sound will be generated and "M0 C001" will appear on the display to indicate that Station A is paging Station B.

42

Preparation for paging

1) Install an optional Touch Tone Unit DTF145 to the Transceiver
2) Program an individual code
3) Program a group code.

NOTE:
A group code must be common for all members of the group. Both individual and group codes must be a number of 3 figures.

(Procedure)

Example: To program an individual code 001 for the code memory address M3 and a group code 100 for M2.

a) Press the #/MODE/CODE button while pressing the Function button.
b) The frequency on the display will disappear and be replaced by "M0 C000".
c) Code memory address M0 through M3 are used for paging operation. They are indicated on the display successively by rotating the channel selector. (the initial display is M0 C000).
d) Rotate the channel selector for M3 and press numeral buttons 0, 0 and 1. A long beep tone will be generated to inform you that programming of the individual code is complete.
e) Rotate the channel selector for M2 and press numeral buttons 1, 0 and 0. A long beep tone will be generated to inform you that programming of the group code is complete.
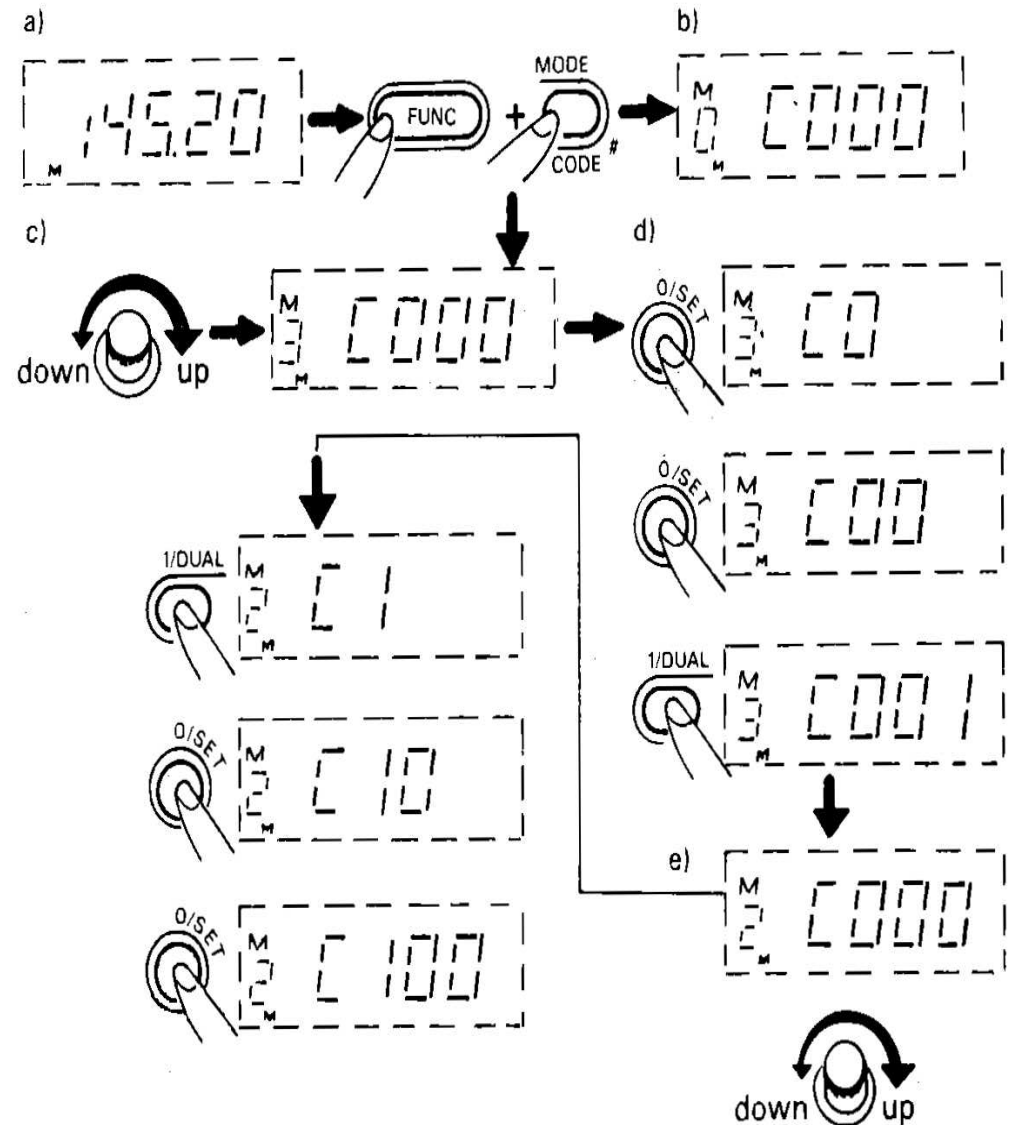
(Information)

A 3-figured individual and group code are composed of three DTMF signals.

Code Memory Address Number	USE
M0	Memory for individual code of the paging station. The paging station can be called back in return with the stored code in this memory. (paging operation)
M1	Memory for individual code of the station to be paged. This memory is for transmission only. (paging operation)
M2	Memory for group code. This memory is for both transmission and reception. (paging and code squelch operation)
M3	Memory for individual code of its own. This memory is for reception only. (paging operation)

② Operating

[Paging Station]

• Individual paging

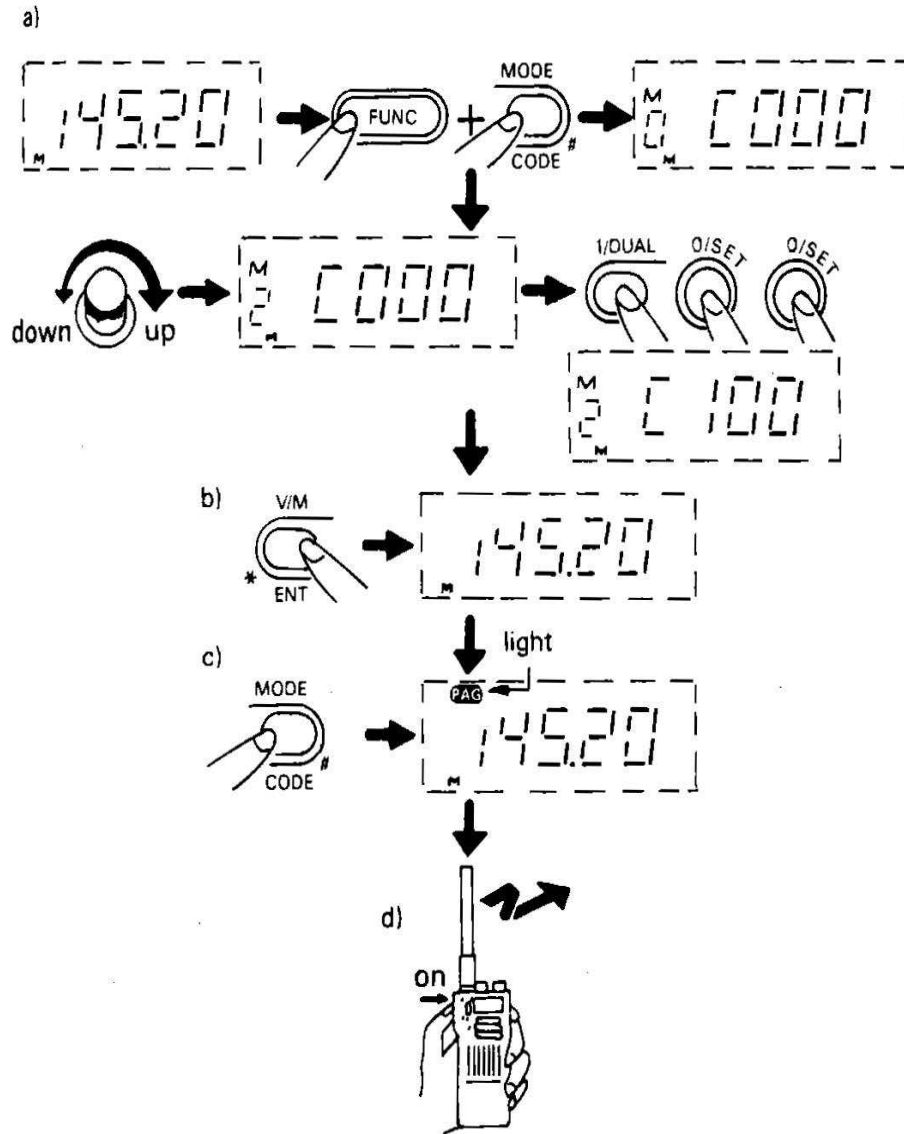The operating frequency should have been selected prior to usage.
a) Program your individual code and a group code.
b) Program an individual code of the station to be paged. Press the #/MODE/CODE button while pressing the Function button. Rotate the channel selector for the code memory address M1 and set the desired individual code with numeral buttons.
c) Press the */V/M/ENT button for the dial-frequency mode. A word "PAG" will appear on the display.
d) Press the PTT button. DTMF signals, the destination code followed by your own code, will be automatically transmitted. (DTMF signal tone can be heard.)
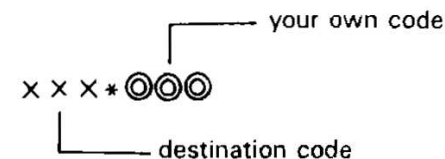
* Group paging

The operating frequency should have been selected prior to usage.
Program a group code to call member stations. Press the #/MODE/CODE button while pressing the Function button. Rotate the channel selector for the code memory address M2 and set the group code with numeral buttons.
b) Press the */V/M/ENT button for the dial-frequency mode.
c) Press the #/MODE/CODE button for the paging mode. A word "PAG" will appear on the display.
d) Press the PTT button. DTMF signals, the group code followed by your own code, will be automatically transmitted. (DTMF signal tone can be heard.)
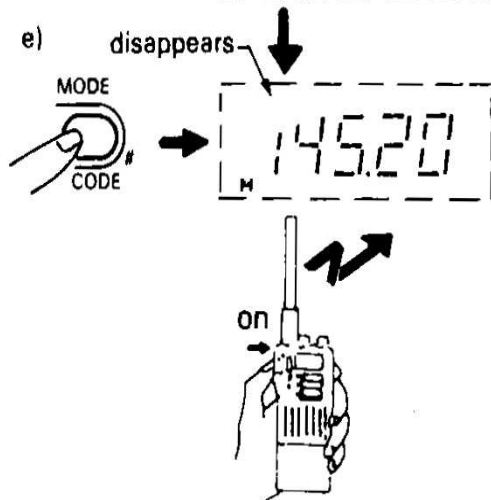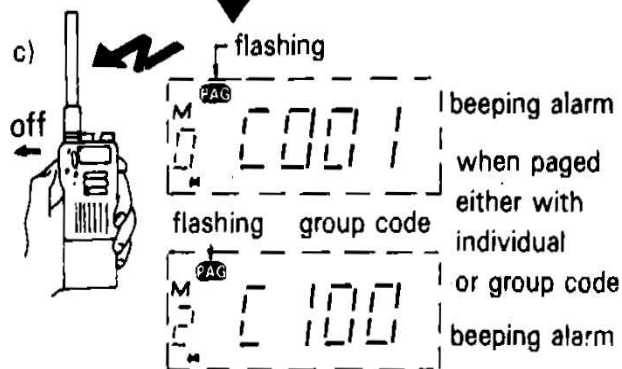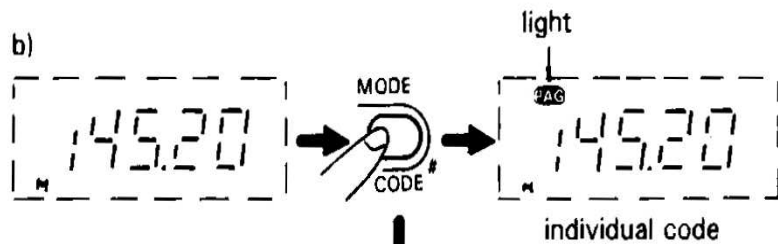
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[Receiving Station]

• Individual paging

The operating frequency should have been selected prior to usage.

a) Program your own individual code and a group code.
b) Press the #/MODE/CODE button for the paging mode. A word "PAG" will appear on the display.
c) When the received individual code is identical to the stored your own code, beep sounds will be generated and a "PAG" will start flashing to indicate that you have been paged. A frequency on the display will disappear and be replaced by an individual code of the paging station, M0 CXXX.
d) Press the PTT button to respond. DTMF signals will be transmitted in turn.
e) Press the #/MODE/CODE button and release the paging mode to communicate.

• Group paging

The operating frequency should have been selected prior to usage.

a) Program a group code.
b) Press the #/MODE/CODE button for the paging mode. A word "PAG" will appear on the display.
c) When the received group code is identical to the stored group code, beep sounds will be generated and a "PAG" will start flashing to indicate that you have been paged. A frequency on the display will disappear and be replaced by the group code. M2 CXXX.
d) Press the PTT button to respond. DTMF signals will be transmitted in turn.
e) Press the #/MODE/CODE button and release the paging mode to communicate.

b)

145.20 → MODE/CODE → 145.20

light

individual code

c)

off

PAG flashing

C001

beeping alarm when paged either with individual

flashing   group code

C100

or group code beeping alarm

e)

MODE/CODE → 145.20

disappears

on

Information

- A "PAG" on the display stops flashing and remains turned on when any operating button is pressed.
- Press the Function button to stop the beep sound halfway.
- A group code will be transmitted when the PTT button is pressed with M3 (your own individual code) selected. (This is an improper operation.)
- An unidentified code received will appear on the display when the reception is incomplete and the individual code of the paging station is not clear. Therefore, the paging station cannot be identified.

Examples of paging operation

• Individual paging

Station A	Station B
Individual Code M3 001	Individual Code M3 002
Group Code M2 100	Group Code M2 100

a) Press the #/MODE/CODE button for the paging mode.

a) Press the #/MODE/CODE button for the paging mode.

b) Press the #/MODE/CODE button while pressing the Function button. Program the individual code of Station B 002 for memory address M1.

c) Press the PTT button. Individual code of Station B and of its own will be transmitted. ➡️

b) A pager beep sound will be generated and a "PAG" will start flashing. "M0 C001" will appear on the display to indicate that Station A is paging.

d) A pager beep sound will be generated and a "PAG" will start flashing "M0 C002" will appear on the display to indicate that Station B is calling back. ⬅️

c) Press the PTT button to call back Station A in return. Individual codes of Station A and of its own will be transmitted.

e) Press the #/MODE/CODE button to release the paging mode and start communication as usual.

d) Press the #/MODE/CODE button to release the paging mode and start communication as usual.

• Group paging

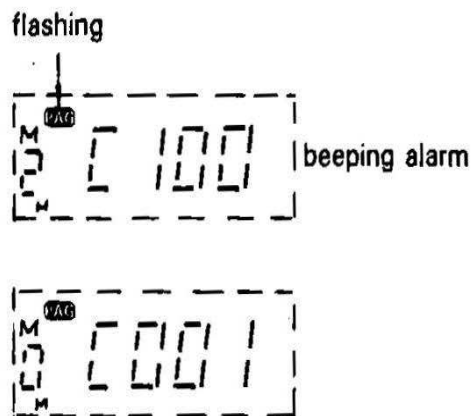| Station A	Station B	Station C

Station A

Individual Code M3 001
Group Code M2 100

Recall the stored group code in code memory address M2 and press the PTT button. Stations having the identical group code will be paged.

Station B

Individual Code M3 002
Group Code M2 100

M2 C100'' will appear on the display to indicate that the Station is paged with the group code.

flashing

| beeping alarm
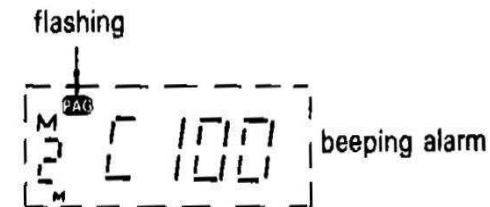

Rotate the channel selector for memory address M0 to display the individual code of paging station.

Station C

Individual Code M3 003
Group Code M2 100

M2C100'' will appear on the display to indicate that the Station is paged with the group code if the individual code of the paging station cannot be identified.

flashing

| beeping alarm

The unidentified code will be stored in M0.

2 Paging Operation

For the PAG or C.SQ operation by using the repeater, use the procedure described below.
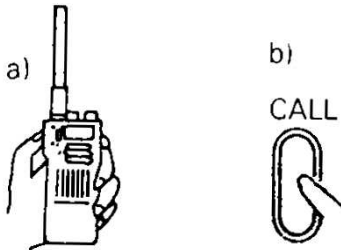
1) Set your Transceiver ready for the repeater operation by using the procedure described with "1 Repeater Operation" above.
2) Press the CALL button while pressing the PTT button to start the repeater operation.
3) Set the PAG or C.SQ mode and press the PTT button.

3. How to call the Repeater (Call Button)

You can generate 1750Hz tone by pressing the CALL button while the PTT button is held depressed. A tone will be generated as long as the CALL button is held.

Procedure

a) Press the PTT button to transmit.
b) Press the CALL button while the PTT button is held depressed.

• **Paging operation through a repeater**

When making the PAG C.SQ operation by way of the repeater, perform the following procedure.

a) Perform the operation of item [22] (1) to enter the state that the repeater operation feasible.
b) While pressing the PTT button, press the CALL button to operate the repeater.

c) Set the PAG or C.SQ mode and press the PTT button.

NOTE:
• **The transceiver is capable to page other stations through a repeater. During simplex operation, DTMF signals for paging operation will be transmitted approximately 0.25 second after the PTT button is pressed. However, during repeater operation, the time lag is extended to approximately 0.45 second.**
Some repeaater stations may not respond quick enough for pager operation. In such a case, turn on the Auto-Power Off function to extend the time lag to approximately 0.75 second.

50

2 Paging Operation

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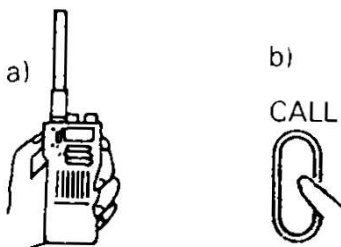
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50

23 Exchange the Transmit and Receive Frequency during Repeater Operation [8/REV/S▼ Button]

This feature allows you to exchange the transmit and receive frequencies during repeater operation. You can check if the other station is accessible.

Procedure

a) Set the Transceiver to the repeater mode.
b) Press the 8/REV/S▼ button while pressing the Function button. "−" or "+" on the display will start flashing and the transmit and receive frequencies will be reversed.
c) Press the 8/REV/S▼ button again while pressing the Function button. "−" or "+" on the display will stop flashing and remain turned on. The transmit and receive frequencies will be reversed again and the regular repeater-mode will be returned.

NOTE:
This feature is only available during repeater operation and when the transmit frequency is within the operating frequency range.

24 Setting a Shift Frequency [9/SIFT/S▲ Button]

A shift frequency for repeater operation can be changed within the limits of 0.00MHz to 39.995MHz. An independent shift frequency can be programmed for each three groups.
Group 1: dial-frequency, M0, M3 through M9, $\overline{M0}$, $\overline{M3}$ through $\overline{M9}$, call frequency
Group 2: M1 and $\overline{M1}$
Group 3: M2 and $\overline{M2}$

Procedure

a) Select a group you wish to program a shift frequency
b) Press the 9/SIFT/S▲ button while pressing the Function button. The current shift frequency in memory will be displayed. (The shift frequency is initially set to 0.60MHz)
c) Select the desired shift frequency with the rotary channel selector or numeral buttons.
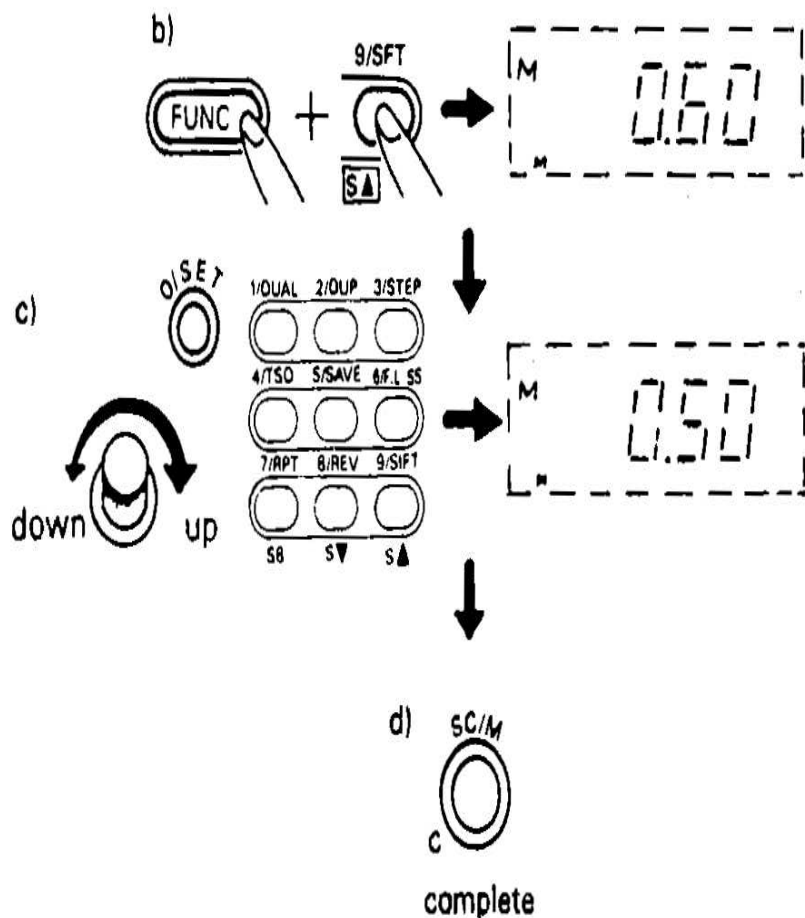d) Press the C/SC/M button to return to the previous mode.

Information

When setting the shift frequency with numeral buttons three digits starting the MHz figure can only be entered.

NOTE:
When memory address M1, $\overline{M1}$, M2 and $\overline{M2}$ are vacant, a shift frequency cannot be programmed for group 2 and 3. Moreover, attempting to program it will change the one of group 1.

b)

FUNC + 9/SFT / S▲

M 0.60

c)

0/SET   1/DUAL 2/DUP 3/STEP
        4/TSO   5/SAVE 6/F.L SS
        7/RPT   8/REV 9/SIFT
        S8   S▼   S▲

down ↺ up

M 0.50

d) SC/M

complete

25 Lithium Battery

The information stored in your Transceiver's memory is retained even after you turn its power off. A lithium type battery is used to provide back-up power for its microprocessor. Under normal use, this battery should last for approximately 5 years.

Information

- When the battery voltage drops below a certain level the displayed frequency may no longer be correct. At that time, replace the lithium battery promptly.
- When the lithium battery is replaced, turn the power switch on while pressing the Function button.

NOTE:
Use a special lithium battery for the transceiver only. Do not attempt to replace this battery yourself. Consult your dealer or our authorized agency when replacement and checking are required. Do not dispose a battery in fire.

TROUBLESHOOTING

Q: **The frequency display is weak.**
A: The battery voltages are low. Replace the batteries.

Q: **The Transceiver returns to the initial condition every time the power switch is turned on and off.**
A: Memory addresses are no longer able to retain their information due to a weakened lithium battery. Replace the lithium battery.

Q: **The unit does not receive.**
A: Press the squelch button and see if any sound comes out of the speaker.
A: Isn't the squelch control rotated fully clockwise?
Rotate back the squelch control counterclockwise for the threshold setting.
A: Isn't your Transceiver set for tone squelch operation? (when CTS145 is installed.)
Release the tone squelch operation.
A: Isn't the volume control rotated fully counterclockwise?
Rotate back the volume control for comfortable listening level.
A: Isn't your Transceiver set for paging or code squelch operation? (when DTF145 is installed.)
Release the paging or code squelch operation.

Q: **The Transceiver appears to receive only the strong signals.**
A: Is your antenna installed properly?
Check it and install it properly
A: Isn't the squelch control rotated fully clockwise?
Rotate back the squelch control for the threshold setting.

Q: **The Transceiver does not transmit.**
A: Doesn't the RF output indicator light dark when pressing the PTT button?
Replace batteries.
A: Isn't "P.L" indicated on the display?
Press the B/PO/PL button while pressing the function button to release the PTT Lock function.

**Q:** **The Transceiver does not transmit at the displayed frequency.**
A: Isn't "DUP" indicated on the display?
Press the 2/DUP button while pressing the Function button in the memory mode to release duplex function.

Q: **The displayed frequency cannot be changed.**
A: Isn't "F.L" indicated on the display?
Press the 6/F.L/SS button while pressing the Function button to release the Frequency Lock function.

Q: **No beep sound is generated.**
A: Isn't the buzzer disabled?
Press the O/SET button while pressing the Function button and then press the O/SET button to enable the buzzer.
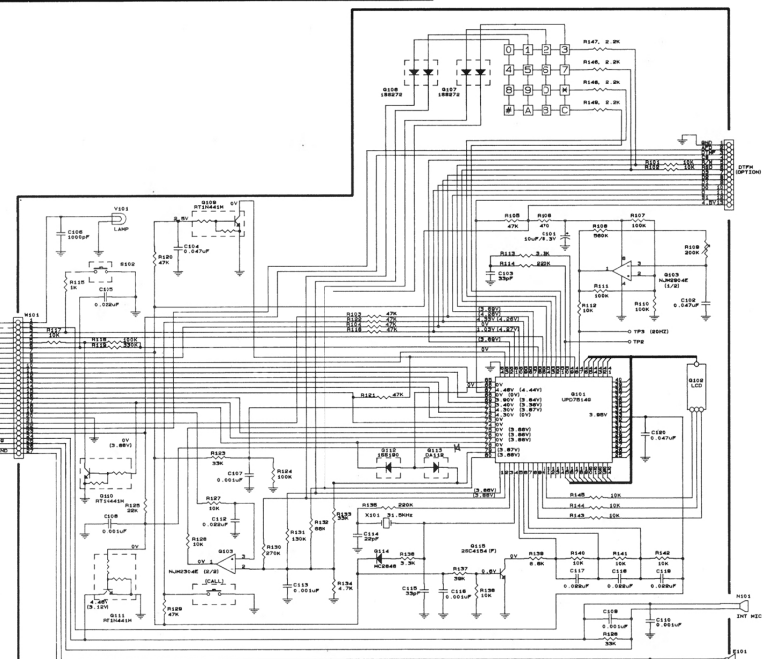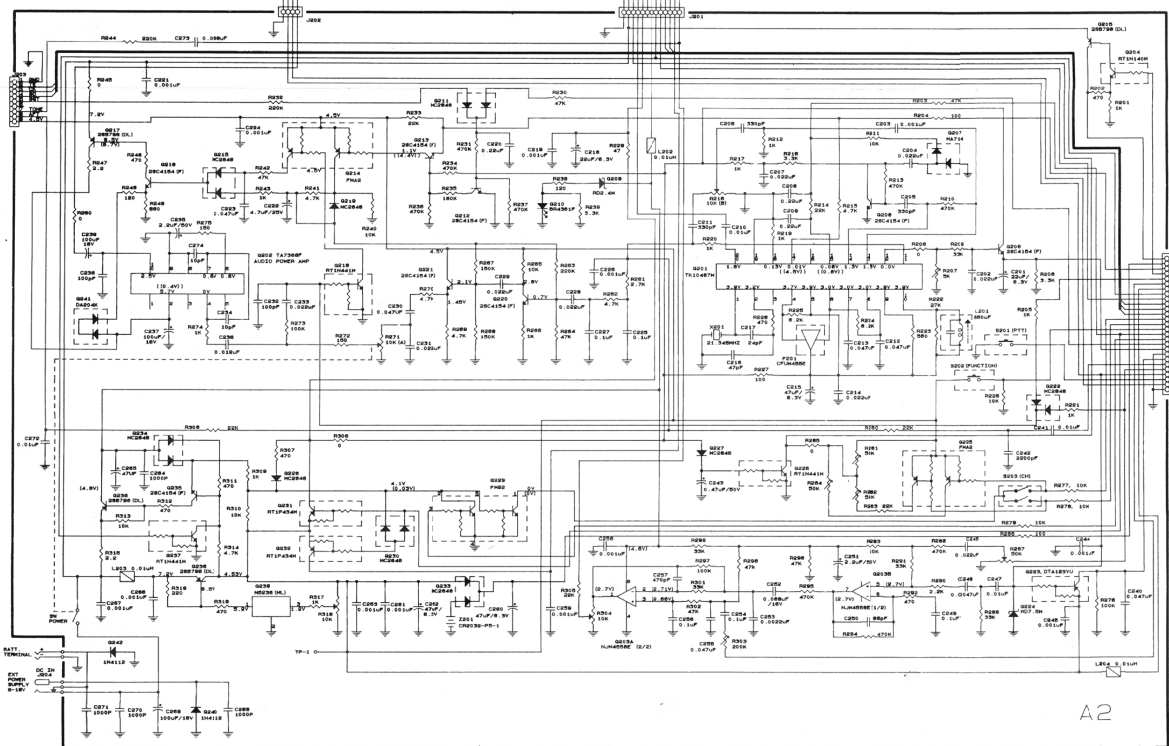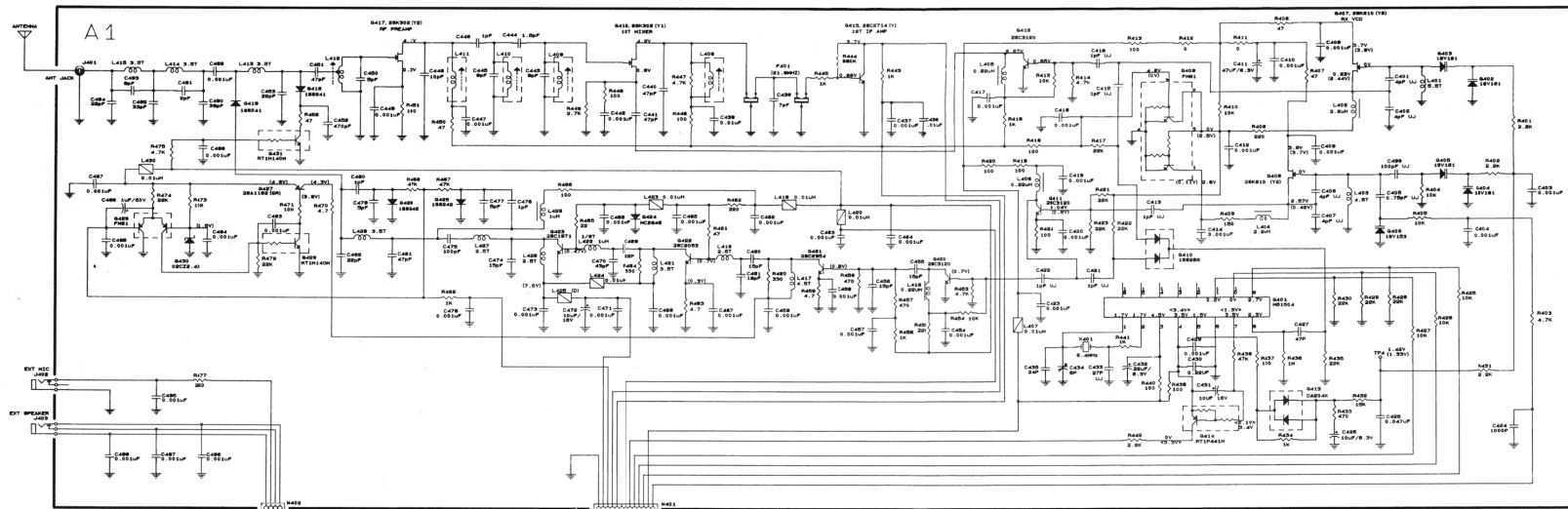
NOTES:

1. UNLESS OTHERWISE NOTED, RESISTORS ARE IN OHM, CAPACITORS ARE
   IN FARAD AND INDUCTORS ARE IN HENRY.
2. VOLTAGE NOTATIONS ARE AS FOLLOWS, IN THE PARENTHESES ARE APPROXIMATED
   VALUES.
   a. NO MARKING----RX.
   b. <   >----UNLOCK.
   c. (( ))----SQL ON.
   d. ( )----TX HI POWER.
3. TR145S00 CIRCUIT DIAGRAM. JAN/20/1995.
4. DRAFT/ (X, Y) = (-16, -12) /S.7

A1

A2

A3

NX155A002

Mods and Expansion RX-TX

CT - 145

KEY-PAD COMMAND FOR SETTING RX/TX FREQUENCY

0) F + POWER ON   (SYSTEM RESET)
1) 3+POWER ON   (RX RANGE 130.0 - 169.995)
                           (TX RANGE 144.0 - 146.000)

2A) SET CH STEP = 5 KHz   F + 3/STEP   (DISPLAY = "5")
2B) SET OFF-SET FREQ = 30.63 50 MHz   F + 9   (DISPLAY = "30.6350")
2C) SET CH STEP =10 KHz F + 3   (DISPLAY = "30.6350")
2D) F + 0 --> 7 (DISPLAY = ";")   (DISPLAY = "10")
2E) PRESS BUTTON "3" --> "0" --> "6" --> "3"
2F) PRESS "*/ENT "
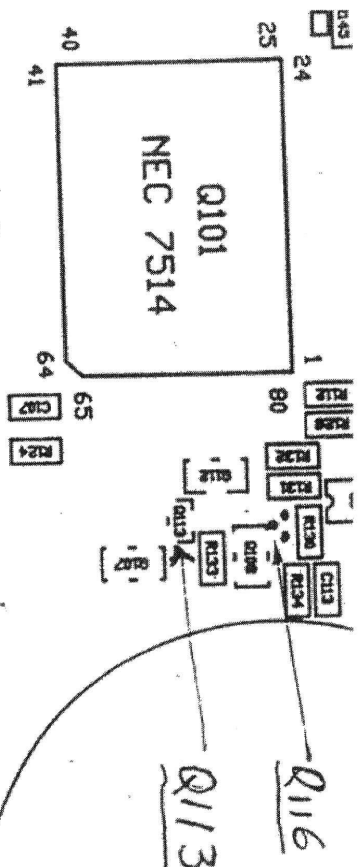RESULTS: RX RANGE 130.00 - 163.995 MHz

TX RANGE 130.00 - 163.995 MHz
STEP 3. AFTER STEPS 1 & 2, THE TRANSECIVER RX/TX B.W.
CAN BE SET TO ANY B.W. ACCORDING TO FOLLOWING STEPS.
EXAMPLE 1, SET THE RX/TX B.W. TO 140.0 - 167.995MHz;
(3-a) " F " + "0 " --> " 7 "
(3-b) " 4 " + "0 " --> " 6 " --> " 7 "
(3-c) PRESS " */ENT "

EXAMPLE 2. SET THE RX/TX B.W. TO 144.0 - 147.995MHz;
(3-a) " F " + " 0 " --> " 7 "
(3-b) " 4 " + "4 " --> " 4 " --> " 7 "
(3-c) PRESS " */ENT "

CT - 145

HARDWARE SETTING RX/TX FREQ. BANDWITH

FREQ. RANGE AS FOLLOWING :

RANGE (MHz)	PORT4	Q116	Q113	
0. 150-170		----	----	/no EXPANDING
1. 145-146	S.W.EXPANSION NOT ALLOWED	DA112		/ DA112

Q101 NEC 7514

Q43
40
41
25
24
64
65
80
1

Q116
Q113

DATA6 BIT0=1

2. 144-146 ---> DA113 -------- /DA112
3 + POWER ON

3. 144-148 MC2846 -------- /DA112

4. 138-174 ------ DA113 /MC2846

5. 130-170 DA112 DA113 /MC2846

6. 142-155 DA113 DA113 /MC2846

7. 100-180 MC2846 DA113 /MC2846

NOTE :

INSTALL > DA112> > ONLY 1750 Hz (EUROPE)
Q112 =>
WITHOUT > 1750 HZ + "CALL" FUNC. (ASIA)

Игорь UN7GM