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## INSTRUCTION MANUAL

DUAL BAND FM TRANSCEIVER

**IC-W32A**

**IC-W32E**

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This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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**Icom Inc.**

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## IMPORTANT

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**READ ALL INSTRUCTIONS** carefully and completely before using the transceiver.

**SAVE THIS INSTRUCTION MANUAL** — This instruction manual contains important operating instructions for the IC-W32A and IC-W32E.

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## EXPLICIT DEFINITIONS

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The explicit definitions below apply to this instruction manual.

WORD	DEFINITION
<b>⚠ WARNING</b>	Personal injury, fire hazard or electric shock may occur.
<b>CAUTION</b>	Equipment damage may occur.
<b>NOTE</b>	If disregarded, inconvenience only. No risk of personal injury, fire or electric shock.



The IC-W32E complies with the essential requirements of the 89/336/EEC directive for Electromagnetic Compatibility. This compliance is based on conformity with the ETSI specification prETS300 684 (EMC product standard for Commercially Available Amateur Radio Equipment).

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## CAUTIONS

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**⚠ WARNING! NEVER** hold the transceiver so that the antenna is very close to, or touching exposed parts of the body, especially the face or eyes, while transmitting. The transceiver will perform best if the microphone is 5 to 10 cm (2 to 4 in) away from the lips and the transceiver is vertical.

**⚠ WARNING! NEVER** operate the transceiver with a headset or other audio accessories at high volume levels. Hearing experts advise against continuous high volume operation. If you experience a ringing in your ears, reduce the volume level or discontinue use.

**NEVER** connect the transceiver to an AC outlet or to a power source of more than 16 V DC. Such a connection will damage the transceiver.

**NEVER** connect the transceiver to a power source that is DC fused at more than 5 A. Accidental reverse connection will be protected by this fuse, higher fuse values will not give any protection against such accidents and the transceiver will be ruined.

**NEVER** attempt to charge alkaline or dry cell batteries. Beware that external DC power connections will charge batteries inside the battery case. This will damage not only the battery case but also the transceiver.

# UNPACKING

**DO NOT** push the PTT when not actually desiring to transmit.

**DO NOT** allow children to play with any radio equipment containing a transmitter.

**DO NOT** operate the transceiver near unshielded electrical blasting caps or in an explosive atmosphere.

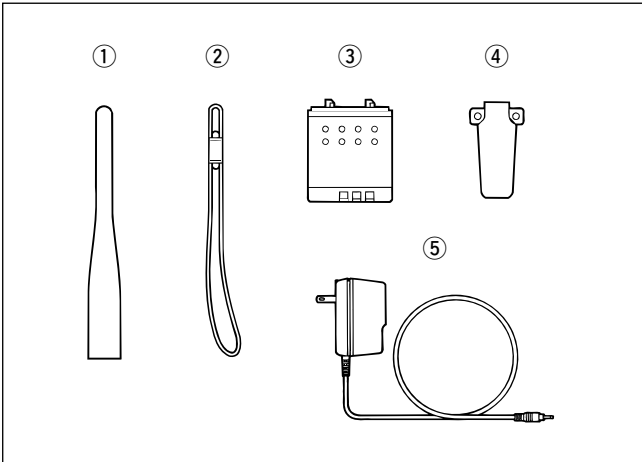
**AVOID** using or placing the transceiver in direct sunlight or in areas with temperatures below  $-10^{\circ}\text{C}$  ( $+14^{\circ}\text{F}$ ) or above  $+60^{\circ}\text{C}$  ( $+140^{\circ}\text{F}$ ).

The use of non-Icom battery packs/chargers may impair transceiver performance and invalidate the warranty.

Even when the transceiver power is OFF, a slight current still flows in the circuits. Remove the battery pack or case from the transceiver when not using it for a long time. Otherwise, the battery pack or installed dry cell batteries will become exhausted.

Accessories included with the transceiver:	Qty.
① Antenna .....	1
② Handstrap .....	1
③ Battery pack (BP-173 or BP-180) or battery case (BP-170) attached to the transceiver .....	1
④ Belt clip .....	1
⑤ Wall charger* .....	1

\*Not supplied for some versions.



Antenna for U.S.A. version differs from that shown above.

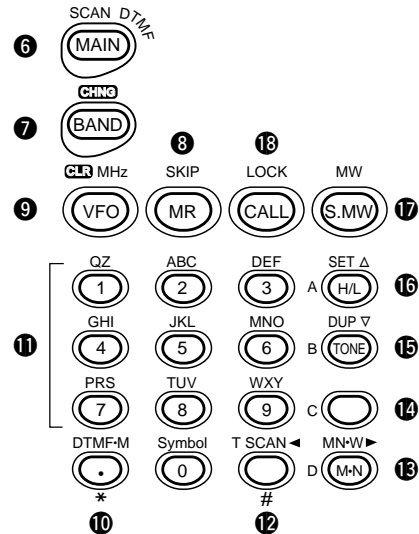
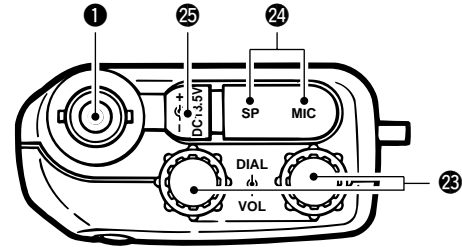
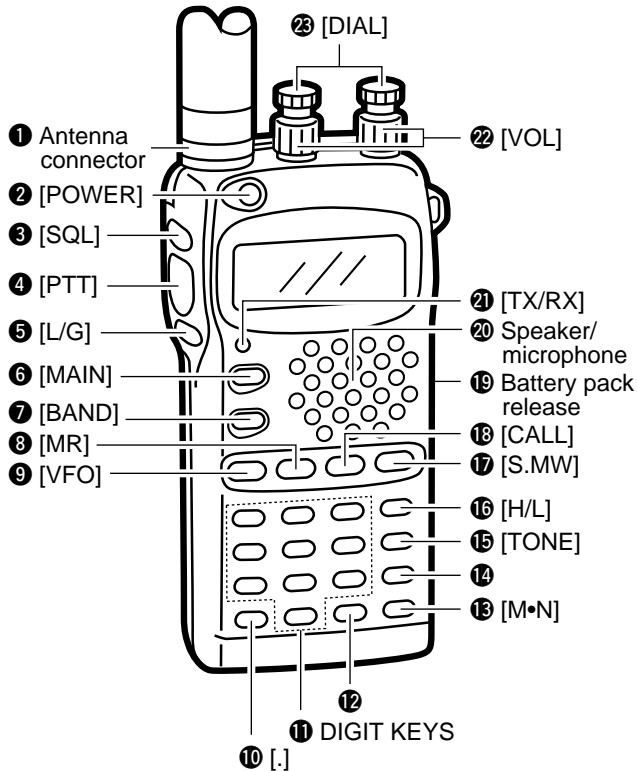
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## Switches, controls, keys and connectors



# 1 PANEL DESCRIPTION

## ❶ ANTENNA CONNECTOR (p. 11)

Connects the supplied antenna.

## ❷ POWER SWITCH [POWER] (p. 12)

Push and hold for 2 sec. to toggle the transceiver power ON and OFF.

## ❸ SQUELCH SWITCH [SQL] (p. 17)

➔ Push to open the main band's squelch and monitors the operating frequency.

➔ Set the squelch level while pushing this key and rotating the tuning dial.

## ❹ PTT SWITCH [PTT] (p. 17)

Push and hold to transmit; release to receive.

## ❺ LIGHT/GUIDE SWITCH [L/G]

➔ Activates the display and keypad backlighting for 5 sec.  
• The backlighting can be set as manual ON/OFF, automatic ON/OFF and automatic OFF with 5 sec. timer (default) using initial set mode. (p. 35)

➔ Shows a quick description of a key's function when pushing this key and the desired key. (p. 34)  
• In set mode, the quick description automatically appears when pausing an operation for 5 sec.

## ❻ MAIN KEY [MAIN (SCAN) (DTMF)]



➔ Push to toggle the main band assignment. (p. 13)

➔ Starts and stops a scan when pushed for 2 sec. (p. 29)

➔ While pushing [PTT], this key transmits the selected DTMF memory contents. (p. 26)

## ❼ BAND KEY [BAND (CHNG)]



➔ Push to select the operating band (VHF, UHF, etc.) or deactivation. (p. 13)

• For VHF display, 144 MHz band, 430(440) MHz band, avionics band\*<sup>1</sup> and weather channels\*<sup>2</sup> can be selected.

\*<sup>1</sup>U.S.A. and Asia versions only

\*<sup>2</sup>U.S.A. version only

• For UHF display, 144 and 430(440) MHz bands can be selected.

➔ Enters the band arrangement condition to exchange the VHF and UHF displays when pushed at turning power ON. (p. 13)

## ❽ MEMORY MODE KEY [MR (SKIP)]



➔ Push to select memory mode. (p. 22)

➔ While in memory mode, push this key for 2 sec. to toggle the selected memory channel between a skip and non-skip channel. (p. 30)

**9 VFO MODE KEY [VFO (CLR) (MHz)]**



- ➔ Push this key to cancel most functions, then push again to select VFO mode. (p. 12)
  - When making a mistake during digit input, push this key to cancel and start from the beginning.
- ➔ Selects 1 MHz tuning step when pushed for 2 sec. in VFO mode. (p. 16)
- ➔ Partially resets the VFO frequencies, VFO settings and set mode settings when pushed at turning power ON. (p. 38)

**10 DECIMAL POINT KEY [•(DTMF•M) (\* )]**



- ➔ In VFO mode, push to enter the operating frequency from the 100 kHz digit. (p. 14)
- ➔ Push this key for 2 sec. to enter DTMF memory mode, then push again for 2 sec. to program the DTMF memory. (p. 26)
- ➔ While pushing [PTT], this key sends a DTMF “E” (\*).

**11 DIGIT KEYS**

- ➔ Input the specified digit during frequency input, memory channel selection, etc.
- ➔ Transmit the DTMF code of the specified digit while pushing [PTT].

- ➔ For the [1]–[5] and [0] keys, select scan edges during full/programmed scan.
  - Push [1]–[5] to select scan edges “1A/1B”–“5A/5B,” respectively.
  - Push [0] to select full scan.
- ➔ In addition, each key has character input for memory or DTMF memory names (characters are assigned to keys using the same convention as for telephones). (pgs. 24, 26)

**12 TONE SCAN KEY [T SCAN (◀) (#)]**



- ➔ Push this key for 2 sec. to start the tone scan. (p. 33)
- ➔ While programming memory channels or DTMF memory names, this key moves the cursor backward.
- ➔ While pushing [PTT], this key sends a DTMF “#”.


**13 MEMORY NAME KEY [M•N (MN•W) (▶)]**




- ➔ Push to toggle between frequency and name indications. (p. 24)
- ➔ While programming memory channels or DTMF memory names, this key moves the cursor forward.
- ➔ While pushing [PTT], this key sends a DTMF “D.”

# 1 PANEL DESCRIPTION

## 14 C KEY [C]

 While pushing [PTT], this key sends a DTMF “C.”

## 15 TONE/DUPLEX KEY [TONE (DUP) (▽)]

 Push this switch to activate the following functions in order (pgs. 19, 32).


- Subaudible tone encoder—“T” appears.
- Pocket beep—“T SQL (·)” appears.
- Tone squelch—“T SQL” appears.
- No tone operation—no indicator appears.

➔ Push this key for 2 sec. to select semi-duplex or simplex operation. (p. 19)

- “-DUP” appears during minus duplex operation, “DUP” appears during plus duplex operation and no indicator appears during simplex operation.

➔ While pushing [PTT], this key sends a DTMF “B.”

## 16 OUTPUT POWER/SET MODE KEY [H/L (SET) (Δ)]


 Push this key to toggle between high and low output power. (p. 17)

➔ Push this key for 2 sec. to enter set mode. (p. 41)

➔ Enters initial set mode when pushed at power ON. (p. 41)

➔ While pushing [PTT], this key sends a DTMF “A.”

## 17 SELECT MEMORY WRITE KEY [S.MW (MW)]


 Push this key to select the desired memory channel number to be programmed. (p. 22)

- “M” and memory channel number flash and the [DIAL] can be used for channel selection.


➔ Push this key for 2 sec. to write the displayed frequency and information into the selected memory channel (or VFO, call channel). (p. 22)

➔ Push then push and hold this key while in memory select mode to erase the contents of the selected memory channel. (p. 25)

## 18 CALL MODE KEY [CALL (LOCK)]

 Push this key to select the call channel. (p. 12)

➔ Push this key for 2 sec. to toggle the lock function ON and OFF. (p. 15)

- “

➔ While pushing [PTT], push this key for 1 to 2 sec. to transmit a 1750 Hz tone burst for repeater access. (Eur., U.K. and Italy versions only; p. 19)

## 19 BATTERY PACK RELEASE (p. 10)

Push to open the latch for battery pack removal.

## 20 SPEAKER/MICROPHONE



## 21 TX/RX INDICATOR [TX/RX] (p. 17)

Lights green while receiving a signal or when the squelch is open; lights red while transmitting; lights orange during crossband full duplex operation.

## 22 VOLUME CONTROLS [VOL] (p. 17)

Rotate [VOL] to adjust the audio level.

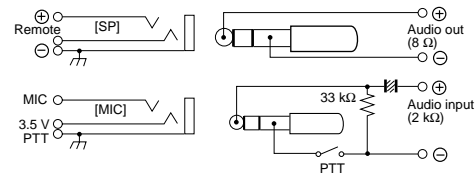
## 23 TUNING DIALS [DIAL]

- ➔ Rotate [DIAL] to set operating frequencies, memory channels, set mode contents, etc. (p. 15)
- ➔ While pushing [SQL], this dial sets the squelch level. (p. 17)
- ➔ While pushing [BAND], this dial sets the operating band. (p. 13)

## 24 EXTERNAL SPEAKER AND MICROPHONE JACKS [SP/MIC]

Connect an optional speaker-microphone or headset, if desired. The internal microphone and speaker will not function when either is connected. (See p. 43 for a list of available options.)

## ◇ External connection



The above connection does not apply when a condenser microphone is connected.

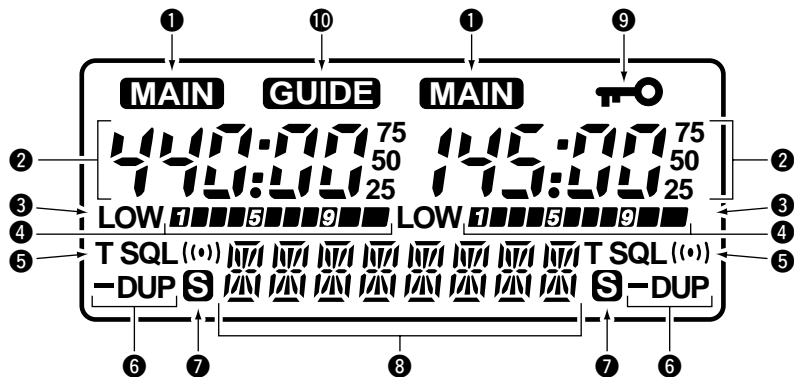
## 25 EXTERNAL DC POWER JACK [DC13.5V]

Allows operation with a 13.5 V DC power source using the optional cables, CP-12/L or OPC-254/L.

**CAUTION:** Operation with an external DC power source simultaneously charges batteries inside the battery case or the battery pack. When using dry cell batteries this may cause battery leakage and damage the transceiver; when using a Ni-Cd battery pack this may cause battery overcharging and shorten the life of the battery pack.

# 1 PANEL DESCRIPTION

## ■ Function display



### 1 MAIN BAND INDICATORS (p. 13)

Appear above the frequency which is selected as the main band.

- Only one of these indicators appears at a time.

### 2 FREQUENCY READOUTS

Show the operating frequency, set mode contents, etc.

- The frequency on the left and right can be exchanged. (p. 13)
- The smaller “75,” “50” and “25” to the right of each readout indicate 7.5, 5.0 and 2.5 kHz, respectively.
- The decimal point of the frequency flashes during scan. (p. 29)
- While operating in the avionics band, a colon appears to indicate AM mode. (U.S.A. and Asia versions only)

**3 LOW POWER INDICATORS** (p. 17)

Appear when low output power is selected.

**4 S/R F INDICATORS** (p. 17)

- ➔ Show the relative signal strength while receiving.
- ➔ Show the output power selection while transmitting.

**5 TONE INDICATORS** (pgs. 19, 32)

“T” appears when the subaudible tone encoder is in use; “T SQL (••)” appears during pocket beep operation and “T SQL” appears when the tone squelch function is activated.

**6 DUPLEX INDICATORS** (p. 19)

Appear when semi-duplex operation (repeater operation) is in use.

- “-DUP” appears when minus duplex is selected; “DUP” only, appears when plus duplex is selected.

**7 SKIP INDICATORS**

- ➔ Appear when a selected memory channel is set as a skip channel. (p. 30)
  - Skip channels are not detected (ignored) during memory scan.
- ➔ Flash during full/programmed scan when the frequency skip function is activated. (p. 31)

**8 ALPHANUMERIC READOUT**

- ➔ Shows the selected memory channel number in memory mode.
  - Memory name can be selected instead of channel numbers. (p. 24)
- ➔ Shows guide (or description) when the [L/G] and desired keys are pushed, or no key operation is performed for 5 sec. in set mode, during name programming, etc. (p. 34)

**9 LOCK INDICATOR** (p. 15)

Indicates that the lock function is in use.

**10 QUICK GUIDE INDICATOR** (p. 34)

Appears when the quick guide function is activated.

## ■ Battery pack charging

The supplied\* BP-173 or BP-180 BATTERY PACK includes rechargeable Ni-Cd batteries and can be charged approx. 300 times. Charge the battery pack before first operating the transceiver or when the battery pack becomes exhausted.

\*Optional for versions which come with the BP-170 BATTERY CASE.

If you want to be able to charge the battery pack more than 300 times, the following points should be observed:

1. Avoid overcharging. The charging period should be less than 48 hours.
2. Use the battery until it becomes almost completely exhausted under normal conditions. We recommend battery charging just after transmitting becomes impossible.

## ■ Charging precautions

**NEVER** attempt to charge dry cell batteries. This will cause internal liquid leakage and damage the battery case and transceiver.

**NEVER** connect two or more chargers at the same time.

Charging may not occur under temperatures of 10°C (50°F) or over temperatures of 40°C (104°F).

## ■ About the battery pack

### ◇ Operating period

Depending on the attached battery pack, the operating period of the transceiver varies. Refer to p. 43 for battery pack specifications.

### ◇ Battery pack life

If your battery pack seems to have no capacity even after being fully charged, completely discharge it by leaving the power ON overnight. Then, fully charge the battery pack again.

If the battery pack still does not retain a charge (or very little), a new battery pack must be purchased.

### ◇ Recycling information (U.S.A. only)



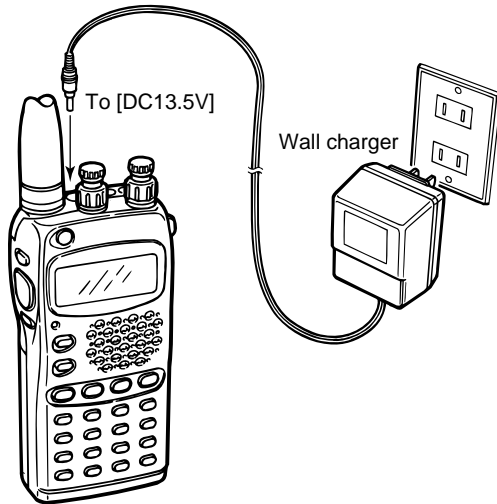
The product that you have purchased contains a rechargeable battery. The battery is recyclable. At the end of its life, under various state and local laws, it may be illegal to dispose of this battery into the municipal waste stream. Call 1-800-8-BATTERY for battery recycling options in your area or contact your dealer.

## ■ Charging connections

### ◇ Regular charging

Attach the supplied\* or optional battery pack; then, connect the supplied\* wall charger via an AC outlet as shown below.

\*Optional for versions which include a battery case.



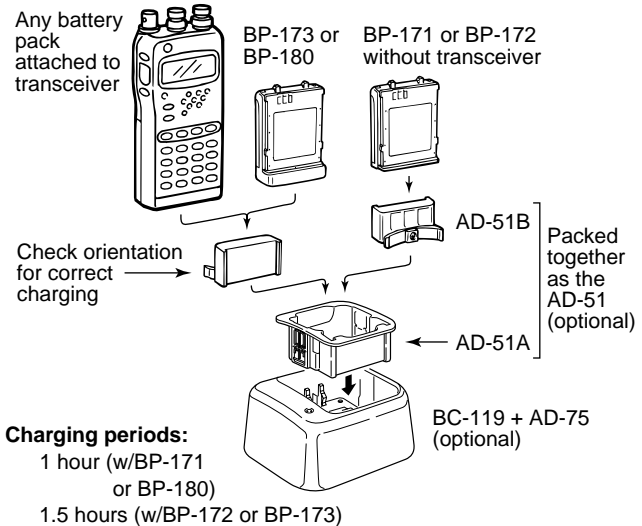
### Charging periods:

15 hours (w/BP-171, BP-173 or BP-180)

20 hours (w/BP-172)

### ◇ Rapid charging with the BC-119

- ① Insert the AD-51A into the charging slot of the BC-119.
  - The AD-75 may be additionally necessary if the BC-119 contains no connection terminals.
- ② Insert the AD-51B into the groove in the AD-51A (front-facing side of the AD-51A) observing the proper orientation.
- ③ Insert the battery pack, either by itself or attached to the transceiver, into the AD-51A.

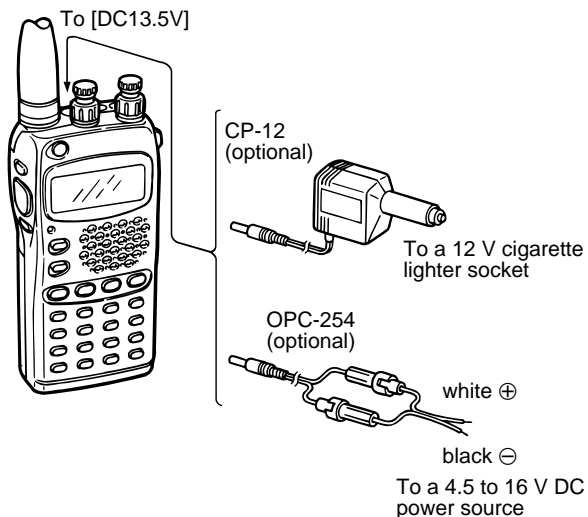


## 2 BATTERY PACKS AND ACCESSORIES

### ◇ Operation with an optional cable

Connect an optional charger or cable to the transceiver as illustrated below. Be careful of battery overcharging as the connected battery is charged simultaneously.

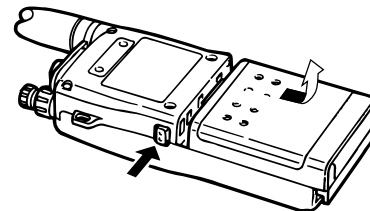
**CAUTION:** Remove dry cell batteries from the BP-170 BATTERY CASE when using the [DC13.5V] jack.



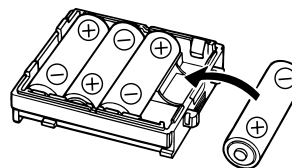
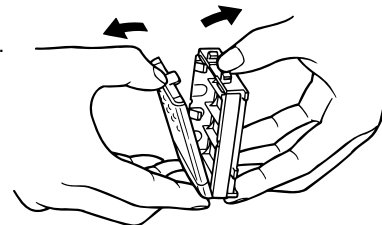
### ■ Battery case

When using a battery case attached to the transceiver, install 4 AA(R6) size alkaline batteries as illustrated below.

Remove the case from the transceiver.



Open the case.



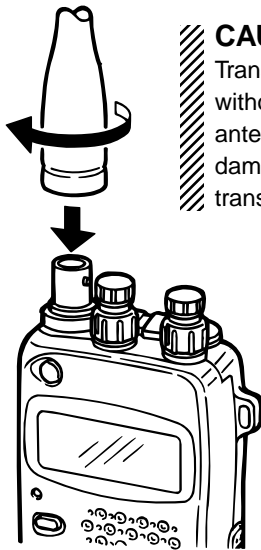
Install 4 AA(R6) size dry cell batteries into the battery case.

## ■ Accessory attachment

### ◇ Antenna

Insert the supplied antenna into the antenna connector and rotate the antenna as shown in the diagram below.

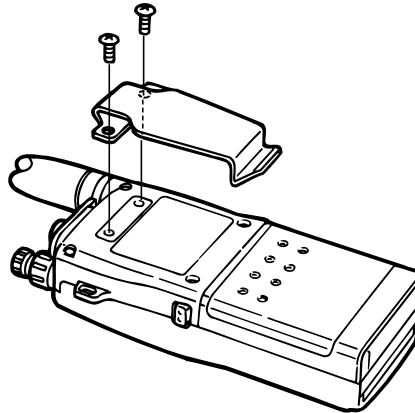
**Keep** the jack cover attached when jacks are not in use to avoid bad contacts.



**CAUTION:**  
 Transmitting without the antenna may damage the transceiver.

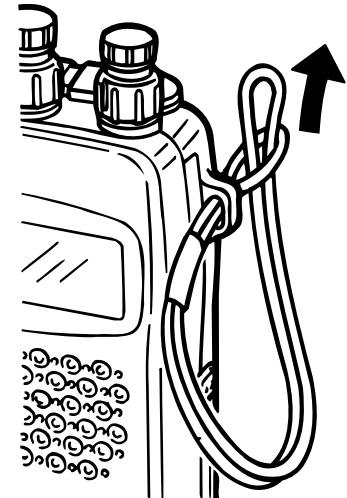
### ◇ Belt clip

Remove screws, then attach the belt clip using the same screws. Conveniently attaches to your belt.



### ◇ Handstrap

Attach the handstrap as shown in the diagram below. Facilitates carrying.



# 3

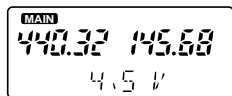
## FREQUENCY AND CHANNEL SETTING

### ■ Power ON

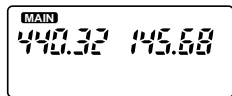
- ① Charge the battery pack or install alkaline batteries into the battery case. (pgs. 9, 10)
- ② Push and hold [POWER] for 2 sec. to turn power ON.
  - Remaining battery voltage is displayed for 2 sec. (p. 34)



POWER ↓ for 2 sec.



↓ after 2 sec.



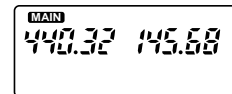
- The display shows the approx. voltage in 0.5 V steps.
- When the battery voltage is lower than 4.5 V, "LOW V" appears. Charge the battery pack or place new dry cells in the battery case in this case.
- If "OVER V" appears, **UNPLUG** the external DC plug immediately. Connected voltage is over 16 V and could damage the transceiver.

### ■ VFO and memory/call channels

This transceiver has 2 normal operating modes: VFO mode and memory mode.

**VFO mode** is used for setting a desired frequency within the band range.

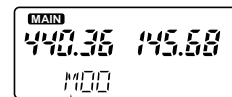
➔ Push [VFO] to select VFO mode.



**Memory (call) mode** is used for operation of memory (call) channels which have programmed frequencies.

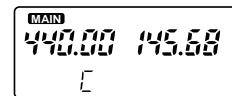
➔ Push [MR] to select memory mode.

- To program a memory, refer to p. 22.



↑  
"M" (or a memory name) appears.

➔ Push [CALL] to select a call channel.



↑  
"C," "VHF CALL" or "UHF CALL" appears.

#### What is VFO?

VFO is an abbreviation of Variable Frequency Oscillator. Frequencies for transmitting and receiving are generated and controlled by the VFO.



## ■ Main band selection

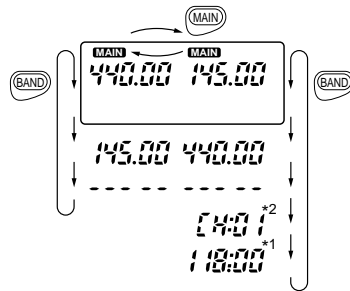
This transceiver can receive 2 band signals simultaneously. To change frequency or to activate a function, you must designate a band, VHF or UHF, as the main band. All switches affect the designated main band only.

•“**MAIN**” appears above the main band.

## ■ Operating band selection

The VHF display can also receive UHF, avionics band\*1 and VHF weather channels.\*2 The UHF display can also receive VHF band signals. Using this capability, the transceiver can receive 2 frequencies simultaneously on either the VHF or UHF band. In addition, a display can be turned OFF to use the transceiver as a mono band transceiver.

- ① Select the desired band with [MAIN].
- ② Push [BAND] several times to select the desired band.
  - “- - - -” appears when the display is OFF.
  - Rotating [DIAL] while pushing [BAND] also selects the display.



\*1 U.S.A. and Asia versions only \*2 U.S.A. version only

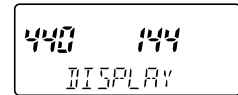
### NOTE:

- VHF and UHF memory channels are called up from the respective operating band, regardless of left/right displays.
- 5 kHz tuning steps cannot be selected in the VHF display when both displays are set for the UHF band.
- The sub band is muted when crossband full duplex is deactivated and the main band is transmitting.
- The sub band is muted under the following conditions even when crossband full duplex is activated:
  - Both displays show the same band.
  - Sub band is the avionics band and main band is VHF transmission.
  - Sub band is a weather channel and main band is UHF transmission.

### ◇ Exchanging the displays

AT POWER ON

VHF and UHF displays can be exchanged at power ON if desired. The right and left displays are used for VHF and UHF, respectively, by default.



- ① Turn power ON while pushing [(BAND)CHNG] to enter band arrangement condition.
- ② Rotate [DIAL] to select the displays.
- ③ Push [VFO] to program the display selection.
- ④ Turn power OFF to exit band arrangement condition.

## 3 FREQUENCY AND CHANNEL SETTING

### ■ Frequency or channel selection via the keypad

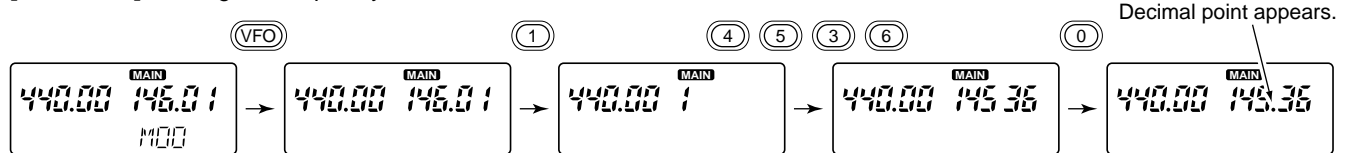
#### ◇ Frequency

- ① Assign the main band to the desired display with [MAIN].
- ② Select VFO mode with [VFO].
- ③ Push 6 digit keys to input a frequency.
  - Push [•] to input the frequency starting from the 100 kHz digit.
  - When a digit is mistakenly input, push [(VFO)CLR] and input from the beginning.
  - “0,” “2,” “5” and “7” are acceptable for the 1 kHz digits (depending on the 10 kHz digit).
  - Any frequency in the receive frequency range can be selected, regardless of the operating band.

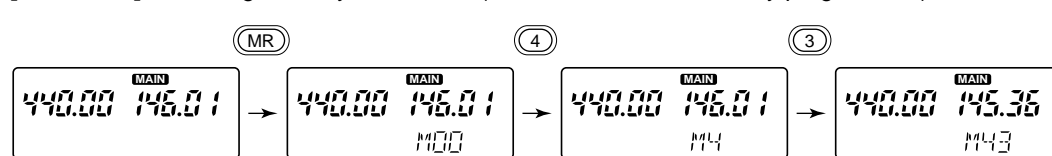
#### ◇ Memory channels

- ① Assign the main band to the desired display with [MAIN].
- ② Select memory mode with [MR].
- ③ Push 2 digit keys to select the desired memory channel.
  - The first ten memory channels (00–09) are preceded by a “0.”
  - To select scan edge channels, 1A to 5B, use [(\*)(DTMF•M)] for “A” and [(#(T SCAN))] for “B.”
  - Only programmed memory channels can be selected.

[EXAMPLE]: Setting the frequency to 145.360 MHz.



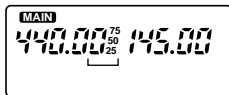
[EXAMPLE]: Selecting memory channel 43 (when channel 43 is already programmed).



## ■ Using the tuning dial

### ◇ Frequency

- ① Assign the main band to the desired display with [MAIN].
- ② Select VFO mode with [VFO].
- ③ Rotate the main band's [DIAL] to change the frequency.
  - The frequency changes according to the preset tuning steps. See the next page for setting tuning steps.
  - Push [(VFO)MHz] for 2 sec. then rotate [DIAL] to change the frequency in 1 MHz steps. Push [VFO] again to return to regular tuning steps.



[DIAL] changes the frequency according to the selected tuning step.




After pushing [(VFO)MHz] for 2 sec., [DIAL] changes the frequency in 1 MHz steps.

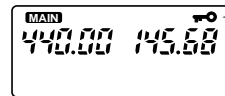
### ◇ Memory channels

- ① Assign the main band to the desired display with [MAIN].
- ② Select memory mode with [MR].
- ③ Rotate the main band's [DIAL] to change the indicated memory channel.
  - Only programmed memory channels can be selected.

## ■ Lock function

The lock function prevents accidental frequency changes and accidental function access.

- ➔ Push [(CALL)LOCK] for 2 sec. to toggle the lock function ON and OFF.
  - “” appears while the lock function is activated.
  - [POWER], [VOL], [SQL], [PTT], [L/G] and [H/L] can still be accessed while the lock function is ON.



Appears when the lock function is in use.

## 3 FREQUENCY AND CHANNEL SETTING

### ■ Setting tuning dial increments

#### ◇ Tuning step selection

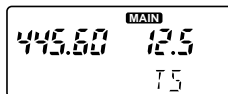
USING SET MODE

Tuning steps can be selected for each band. This transceiver has 8 tuning steps as follows:

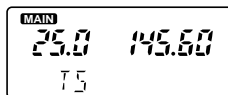
- 5 kHz\*    •10 kHz    •12.5 kHz    •15 kHz
- 20 kHz    •25 kHz    •30 kHz    •50 kHz

\*5 kHz cannot be selected in the VHF display when both displays are set for the UHF band.

- ① Assign the main band to the desired display with [MAIN].
- ② Select VFO mode with [VFO].
- ③ Push [(H/L)SET] for 2 sec. to enter set mode.
- ④ Push [(H/L)(SET)Δ] or [(TONE)∇] several times until "TS" appears.
  - Previously selected tuning step appears.
- ⑤ Rotate the main band's [DIAL] to select the desired tuning step.
- ⑥ Push [(VFO)CLR] to set the selected tuning step.



12.5 kHz tuning step (VHF)



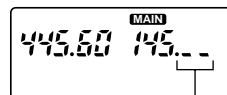
25 kHz tuning step (UHF)

**NOTE:** Both displays have independent tuning steps according to the operating band. (e.g. VHF band in left display: 5 kHz step; VHF band in right display: 12.5 kHz step)

#### ◇ Using 1 MHz tuning step

This transceiver has a 1 MHz tuning step for quick frequency setting.

- ① Assign the main band to the desired display with [MAIN].
- ② Select VFO mode with [VFO].
- ③ Push [(VFO)MHz] for 2 sec. to select the 1 MHz tuning step.
  - The digits below 100 kHz disappear.
- ④ Rotate the main band's [DIAL] to change the frequency in 1 MHz steps.
- ⑤ Push [(VFO)CLR] to cancel the 1 MHz tuning step and to return to the previous tuning step.



100 kHz digit and below disappear.

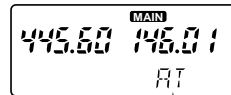
## Receive and transmit

**CAUTION:** Transmitting without an antenna may damage the transceiver.

- ① Push [POWER] for 2 sec. to turn power ON.
- ② Adjust the [VOL] control to the desired level.
  - While pushing [SQL], rotate the main band's [VOL].
- ③ Set the squelch level.
  - While pushing [SQL], rotate the main band's [DIAL].
  - The first click of [DIAL] indicates the current squelch level.
  - "SQ1" is loose squelch and "SQ8" is tight squelch.
  - "AT" is automatic level adjustment with a noise pulse count system.
- ④ Set an operating frequency.
 

When a signal is received:

  - ➔ The TX/RX indicator lights green.
  - ➔ Squelch opens and audio is emitted from the speaker.
  - ➔ The receiving band's S/R/F indicator shows the relative signal strength.
- ⑤ Push [H/L] to toggle output power between high and low.
  - "LOW" appears when low output power is selected.



Automatic squelch is selected.

- ⑥ Push and hold [PTT] to transmit; then speak into the mic.
  - **Do not** hold the microphone too close to your mouth or speak too loudly. This may distort the signal.
  - The TX/RX indicator lights red.
  - The S/R/F indicator shows the output power selection.
  - The sub band can receive while transmitting on the main band, depending on the set mode setting. (See the next page.)
- ⑦ Release [PTT] to return to receive.

### CONVENIENT

**Monitor function:** Push and hold [SQL] to listen to weak signals without disturbing the squelch settings.

**Quick guide function:** Push the desired key while pushing [L/G] for a quick description of the key's function. (p. 34)

- Push any key to cancel the quick guide.


## 4 BASIC OPERATION

### ◇ Beep tones on/off


The confirmation beep tones, which sound each time a switch is pushed, can be turned ON or OFF, as desired.

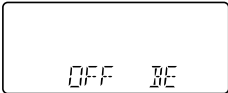
*USING Initial set mode*

#### SETTING THE CONFIRMATION BEEP ON/OFF



Confirmation beep is ON.





Confirmation beep is OFF.


- ① Turn power ON while pushing [(H/L)SET] to enter initial set mode.
- ② Push [(H/L)(SET)Δ] or [(TONE)∇] several times until “BE” appears as shown above.
- ③ Rotate [DIAL] to turn the confirmation beep ON or OFF.
- ④ Turn power OFF to exit initial set mode.

### ◇ Crossband full duplex operation


The crossband full duplex function can be turned ON or OFF in initial set mode. When the function is OFF, the sub band audio is muted during transmission.


*USING Initial set mode*

#### SELECTING CROSSBAND FULL DUPLEX OR SEMI-DUPLEX



Crossband full duplex is ON.





Crossband full duplex is OFF. (semi duplex)

- ① Turn power ON while pushing [(H/L)SET] to enter initial set mode.
- ② Push [(H/L)(SET)Δ] or [(TONE)∇] several times until “CB” appears as shown above.
- ③ Rotate [DIAL] to select semi-duplex or full duplex.
- ④ Turn power OFF to exit initial set mode.

## ■ General

When using a repeater, the transmit frequency is shifted from the receive frequency by the offset frequency. (p. 20) It is convenient to program repeater information into memory channels. (p. 22)

- ① Assign the main band to the desired display with [MAIN].
- ② Set the receive frequency (repeater output frequency).
- ③ Push [(TONE)DUP] for 2 sec. once to select –DUP or twice to select DUP.
  - “–DUP” or “DUP” appears to indicate the transmit frequency for minus shift or plus shift, respectively.
  - When the auto repeater function is in use (U.S.A. version only), this selection and step ④ are not necessary. (p. 21)
- ④ Push [TONE] to activate the subaudible tone encoder, according to repeater requirements.
  - Refer to the next page for tone frequency settings.
- ⑤ Push and hold [PTT] to transmit.
  - The displayed frequency automatically changes to the transmit frequency (repeater input frequency).
  - If “oFF” appears, check the offset frequency. (p. 20)
- ⑥ Release [PTT] to receive.
- ⑦ Push and hold [SQL] to check whether the other station’s transmit signal can be directly received or not.

Some repeaters require DTMF tones or a 1750 Hz tone to be accessed. In this case, perform the following instead of step ④ at left with the required tone.

### DTMF TONES (IC-W32A only)

While pushing [PTT], push the desired digit key(s) to transmit DTMF tones.

- The transceiver has 4 DTMF memory channels. See p. 26 for details.

### 1750 Hz TONE (Europe, Italy and U.K. versions only)

While pushing [PTT], push and hold [CALL] for 1 to 2 sec. to transmit a 1750 Hz tone burst signal.

- Pushing [PTT] 2 times quickly also transmits a 1750 Hz tone. Release [PTT] briefly, then push [PTT] again to talk in this case.

### ○ CONVENIENT

**Tone scan function:** When you don’t know the subaudible tone used for a repeater, the tone scan is convenient for detecting the tone frequency.

Push [(#)T SCAN] for 2 sec. to activate. See p. 33 for more information.

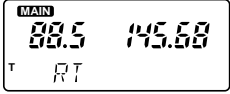
## 5 REPEATER OPERATION

### ■ Subaudible tones


Some repeaters require subaudible tones to be accessed. Subaudible tones are superimposed over your normal signal and must be set in advance.

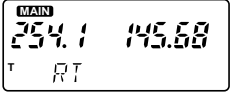
USING **SET MODE**

#### SETTING SUBAUDIBLE TONES



88.5 Hz tone





254.1 Hz tone

- ① Push [(H/L)SET] for 2 sec. to enter set mode.
- ② Push [(H/L)(SET)Δ] or [(TONE)∇] several times until “RT” appears as shown above.
- ③ Rotate [DIAL] to select the desired subaudible tone.
  - Each operating band for each display and each memory channel have independent settings.
- ④ Push [(VFO)CLR] to set the condition and to exit set mode.

#### • Subaudible tone frequency list

(Unit: Hz)

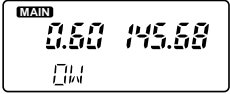
67.0	79.7	94.8	110.9	131.8	156.7	171.3	186.2	203.5	229.1
69.3	82.5	97.4	114.8	136.5	159.8	173.8	189.9	206.5	233.6
71.9	85.4	100.0	118.8	141.3	162.2	177.3	192.8	210.7	241.8
74.4	88.5	103.5	123.0	146.2	165.5	179.9	196.6	218.1	250.3
77.0	91.5	107.2	127.3	151.4	167.9	183.5	199.5	225.7	254.1

### ■ Offset frequency

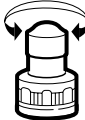
When communicating through a repeater, the transmit frequency is shifted from the receive frequency by an amount determined by the offset frequency.

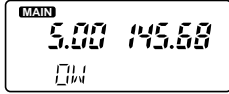
USING **SET MODE**

#### SETTING AN OFFSET FREQUENCY



0.6 MHz (600 kHz) offset





5.0 MHz offset

- ① Push [VFO] to select VFO mode.
- ② Push [(H/L)SET] for 2 sec. to enter set mode.
- ③ Push [(H/L)(SET)Δ] or [(TONE)∇] several times until “OW” appears as shown above.
- ④ Rotate [DIAL] to select the desired offset (separately selectable for each band).
  - Pushing [(VFO)MHz] for 2 sec. selects MHz steps.
- ⑤ Push [(VFO)CLR] to set the condition and to exit set mode.



## ■ Auto repeater function

(U.S.A. version only)

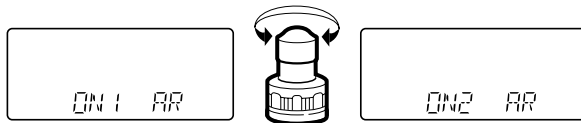
The U.S.A. version automatically activates the repeater settings (duplex ON/OFF, duplex direction, tone encoder ON/OFF) when the operating frequency falls within or outside of the general repeater output frequency range. The offset and repeater tone frequencies are not changed by the auto repeater function, reset these frequencies, if necessary.

### •Frequency range and offset direction

FREQUENCY RANGE	DUPLEX DIRECTION
145.200–145.495 MHz 146.610–146.995 MHz	“-DUP” appears
147.000–147.395 MHz	“DUP” appears
442.000–444.995 MHz	“DUP” appears
447.000–449.995 MHz	“-DUP” appears

USING *Initial set mode*

### SETTING THE AUTO REPEATER FUNCTION



Activates for duplex only.

Activates for duplex and tone.

- ① Turn power ON while pushing [(H/L)SET] to enter initial set mode.
- ② Push [(H/L)(SET)Δ] or [(TONE)∇] several times until “AR” appears as shown above.
- ③ Rotate [DIAL] to turn the auto repeater function ON (“ON1” and “ON2”) or OFF.
- ④ Turn power OFF to exit initial set mode.

## ■ General

The transceiver has 100 memory channels (plus 5 pairs of scan edge channels) and 1 call channel on each band for storage of often-used frequencies.

Avionics band frequencies are stored in the VHF memory channels (U.S.A. and Asia versions only).

### ◇ Memory/call channel contents

The following information can be programmed into memory/call channels:

- Operating frequency
- 8-digit memory name\*1
- Duplex direction (DUP or –DUP) with an offset frequency (pgs. 19, 20)
- Subaudible tone encoder or tone squelch ON/OFF (pgs. 19, 32)
- Subaudible tone and tone squelch frequencies (pgs. 20, 32)
- Skip information\*2 (p. 30)

\*1 Except for call channels.

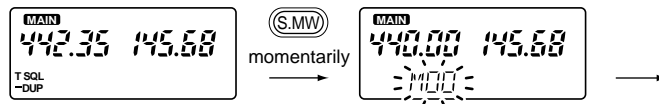
\*2 Except for the scan edge memory channels.

## ■ Programming during selection

- ① Assign the main band to the desired display with [MAIN].
- ② Select VFO mode with [VFO].
- ③ Set the desired frequency:
  - ➔ Set the frequency using the keypad or [DIAL].
  - ➔ Set other data (e.g. offset frequency, duplex direction, subaudible tone frequency, etc.), if required.
- ④ Push [S.MW] momentarily to indicate memory channels.
  - Do not hold [S.MW] for more than 0.5 sec., otherwise the memory channel will overwrite the displayed number.
- ⑤ Rotate [DIAL] to select the desired channel.
  - Call channel (CAL) and scan edge channels (1A–5B), as well as regular memory channels, can be programmed in this way.
- ⑥ Push [(s.MW)MW] for 2 sec. to program.

**[EXAMPLE]:** Memory programming of ch 40 during selection.

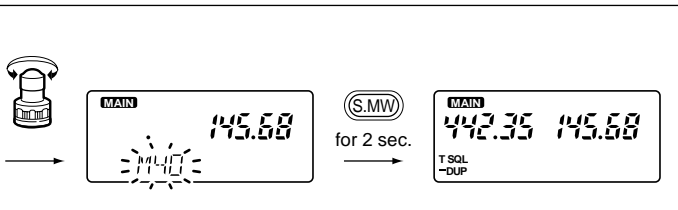
Set frequency and other data.



## ■ Programming after selection

- ① Assign the main band to the desired display with [MAIN].
- ② Select the memory channel to be programmed.
  - ➔ Push [MR] to select memory mode.
  - ➔ Rotate [DIAL] or push 2 digit keys to select the memory channel (only programmed memories can be selected).
- ③ Set the desired frequency in VFO mode:
  - ➔ Push [VFO] to select VFO mode.
  - ➔ Set the desired frequency using the keypad or [DIAL].
  - ➔ Set other data (e.g. offset frequency, duplex direction, subaudible tone frequency, etc.), if required.
- ④ Push [(S.MW)MW] for 2 sec. to program.
  - If beep tones are turned ON, 3 beeps alert you that the VFO contents, including duplex information, subaudible tone frequency, etc., are programmed.

/// **NOTE:** Call channels cannot be programmed in this way.



## ■ Memory edit (transferring)

Memory (call) channel contents can be moved to VFO or to another memory.

### ◇ Memory/call>VFO

- ① Assign the main band to the desired display with [MAIN].
- ② Select the memory (call) channel to be transferred:
  - ➔ Push [MR] (or [CALL]) to select memory (call) mode.
  - ➔ Rotate [DIAL] or push 2 digit keys to select the memory channel (only programmed memories can be selected).
- ③ Push [(S.MW)MW] for 2 sec. to transfer.
  - The contents are transferred and VFO mode is selected.

### ◇ Memory/call>memory/call

- ① Assign the main band to the desired display with [MAIN].
- ② Select the memory (call) channel to be transferred:
  - ➔ Push [MR] (or [CALL]) to select memory (call) mode.
  - ➔ Rotate [DIAL] or push 2 digit keys to select the memory channel (only programmed memories can be selected).
- ③ Push [(S.MW)MW] momentarily.
  - "VFO" appears in the display.
- ④ Rotate [DIAL] to select a memory or call channel to transfer the data.
- ⑤ Push [(S.MW)MW] for 2 sec. to transfer.
  - The contents are transferred and the original channel is selected.

## 6 MEMORY/CALL PROGRAMMING

### Memory names

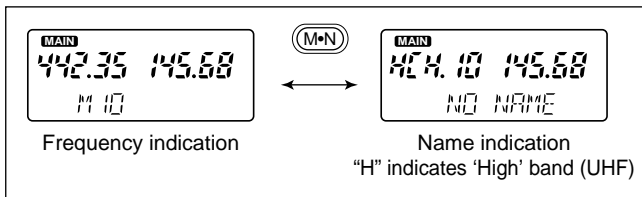
Memory channels can be programmed with names of up to 8 characters in length.

Names cannot be programmed into the call channel.

#### Frequency ↔ name

To toggle between frequency indication and memory name indication:

- Push [M•N] to toggle between frequency and name indications.
  - “NO NAME” appears when a memory channel has not been programmed with a name.



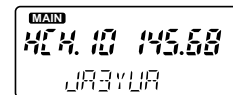
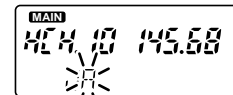
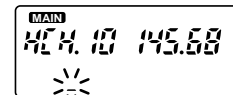
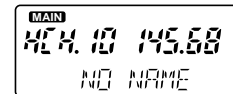
The following characters can be used in names:

- 0 to 9, A to Z (capitals), (space), ( , ), \* , + , - , “ \ ” / , “ ! ” and =.

**NOTE:** While using the monitor function, the frequency readout shows the transmit frequency even when memory name indication is selected.

#### Programming memory names

- Assign the main band to the desired display with [MAIN].
- Select the memory channel to be programmed:
  - Push [MR] to select memory mode.
  - Rotate [DIAL] or push 2 digit keys to select the memory channel (only programmed memories can be selected).
- Push [M•N] to select memory name indication.
- Push [(M•N)MN•W] for 2 sec. to enter memory name writing mode.
  - The first character of the name flashes.
- Enter the desired name via the keypad or [DIAL].
  - Push the appropriate keys to input the desired characters using the same convention as for telephones.
  - To erase a character, overwrite with a “space” using the [(0)Symbol] key.
  - To move the cursor forwards or backwards, use the [(M•N)▶] or [(#)◀] key.
- Push [(VFO)CLR] to input the set name.
  - Flashing stops.
  - Eight characters is the maximum for a name.



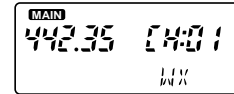
## Memory clear

Unwanted memory channels can be cleared (erased). Before clearing a memory channel make sure it is no longer needed as cleared memories cannot be recalled.

- ① Assign the main band to the desired display with [MAIN].
- ② Push [S.MW] momentarily.
  - “VFO” or memory channel number flashes.
- ③ Select the memory channel to be cleared.
  - Scan edges 1A and 1B and call channel cannot be cleared.
- ④ Push [S.MW] briefly, then a second time for 2 sec.
  - 3 beeps sound, then the frequency is cleared.
  - Memory channel number flashes continuously.
- ⑤ Push [(VFO)CLR] to stop the flashing.

### WEATHER CHANNELS (U.S.A. version only)

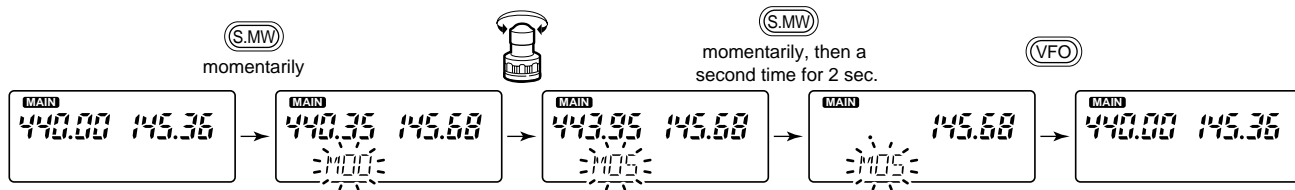
There are 10 weather channels for monitoring weather channels from the NOAA (National Oceanographic and Atmospheric Administration) broadcasts.



Weather channels cannot be programmed into a memory channel.

- ① Push [MAIN] to select VHF display as the main band.
- ② Push [BAND] several times to select a weather channel.
- ③ Rotate [DIAL] to select the desired channel.

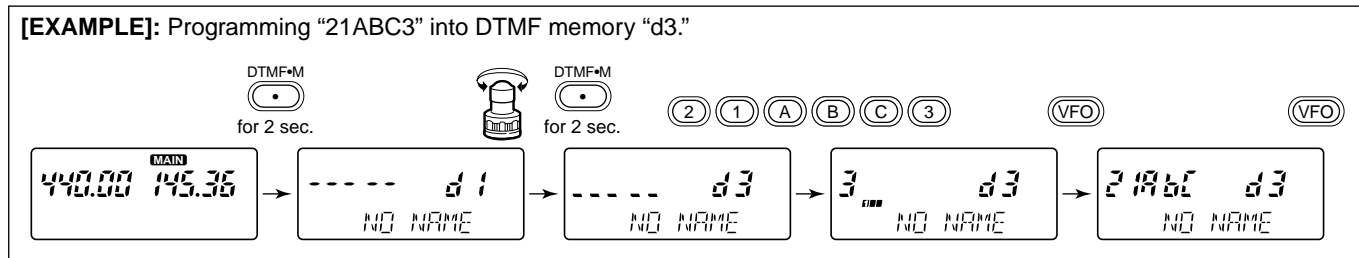
**[EXAMPLE]:** Clearing memory channel 5.



## ■ Programming a DTMF code

The transceiver has 4 DTMF memory channels (d1 to d4) for storage of often-used DTMF codes of up to 16 digits. The memory channels are for common use on both bands.

- ① Push [(◂)DTMF•M] for 2 sec. to enter DTMF memory mode.
  - ② Rotate either band's [DIAL] to select the desired channel.
    - ③ Push [(◂)DTMF•M] for 2 sec. to enter DTMF programming mode.
      - "-----" appears.
      - Programmed DTMF code is cleared in this way.
    - ④ Push digit keys to enter the desired DTMF code.
      - The S/R/F indicator shows the digit group. The indication increases from no indication, 3 digits and 7 digits.
      - If a pause time (2 sec.) is required in the DTMF code, push [CALL] to input a pause code.
    - ⑤ Push [(VFO)CLR] to store them.
- ⑥ Program DTMF memory name in a similar manner to memory channel names, if desired.
  - ➔ Push [(M•N)MN•W] for 2 sec. to enter name writing mode.
  - ➔ Enter the desired name via the keypad or [DIAL].
    - To erase a character, overwrite with a "space" using the [(0)Symbol] key.
    - To move the cursor forwards or backwards, use the [(M•N)▶] or [(#)◀] key.
  - ➔ Push [(VFO)CLR] to input the set name.
- ⑦ Push [(VFO)CLR] to exit DTMF memory mode.



## ■ Transmitting a DTMF code

### ◇ Using a DTMF memory channel

- ① Push [(\*)DTMF•M] for 2 sec. to enter DTMF memory mode.
- ② Rotate either band's [DIAL] to select the desired channel.
- ③ Push [(VFO)CLR] again to exit DTMF memory mode.
- ④ While pushing [PTT], push [(MAIN)(SCAN)DTMF] to transmit the selected DTMF code.

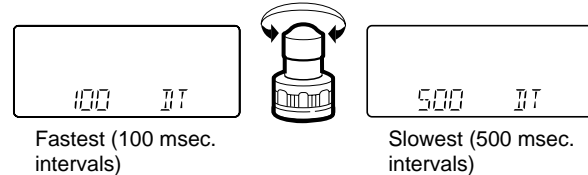
**NOTE:** Push [(MAIN)(SCAN)DTMF] while in DTMF memory mode to monitor a DTMF channel without transmitting it.

## ■ DTMF transmission speed

When slow DTMF transmission speeds are required (as for some repeaters), the transceiver's rate of DTMF transmission can be adjusted.

USING *Initial set mode*

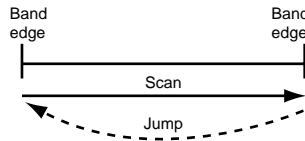
### SETTING THE DTMF TRANSMISSION SPEED



- ① Turn power ON while pushing [(H/L)SET] to enter initial set mode.
- ② Push [(H/L)(SET)Δ] or [(TONE)∇] several times until “DT” appears as shown above.
- ③ Rotate [DIAL] to select the DTMF transmission speed.
- ④ Turn power OFF to exit initial set mode.

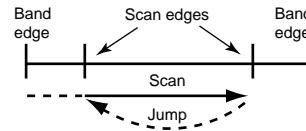
## Scan types

### FULL SCAN (p. 29)



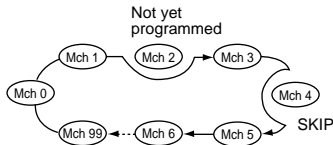
Repeatedly scans all frequencies over the entire band.

### PROGRAMMED SCAN (p. 29)



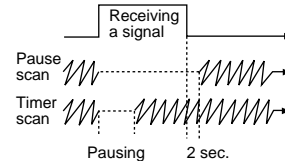
Repeatedly scans between two user-programmed frequencies. Used for checking for frequencies within a specified range such as repeater output frequencies, etc.

### MEMORY SKIP SCAN (p. 29)



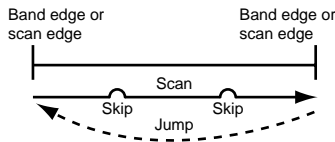
Repeatedly scans memory channels except skip channels.

### SCAN RESUME CONDITION (p. 30)



4 resume conditions are available: pause scan and 3 timer scans. When receiving a signal, pause scan pauses until the signal disappears; timer scans pause for 5, 10 or 15 sec.

### FREQUENCY SKIP FUNCTION (p. 31)




Skips unwanted frequencies that inconveniently stop scanning. This function can be turned ON and OFF in scan set mode.


Each band has 3 scan types with skip functions and 4 resume conditions providing scanning versatility. Scans on both bands can be operated separately or simultaneously.



## ■ Full/programmed scan

- ① Assign the main band to the desired display with [MAIN].
- ② Select VFO mode with [VFO].
- ③ Make sure the squelch is set to the threshold point.
  - Select automatic squelch (AT) or a level (SQ1–SQ8) where the noise is muted. (p. 17)
- ④ Push [(MAIN)SCAN] for 2 sec. to start the programmed scan.
  - Decimal point flashes while scanning.
  - “P1” – “P5” flash to indicate which pair of scan edges is being scanned.
  - To change the scanning direction, rotate [DIAL].
  - If the pocket beep function is activated, the transceiver automatically selects the tone squelch function when a scan starts.
- ⑤ Push [1] – [5] to select the desired scan range or push [0] to select full scan.
- ⑥ To stop the scan, push [(VFO)CLR].

 For programmed scan, scan edges must be programmed in advance. Program scan edges in the same manner as regular memory channels. (p. 22)

 If the same frequencies are programmed into a pair of scan edges, a programmed scan edge appears, such as “P1,” but programmed scan does not proceed.

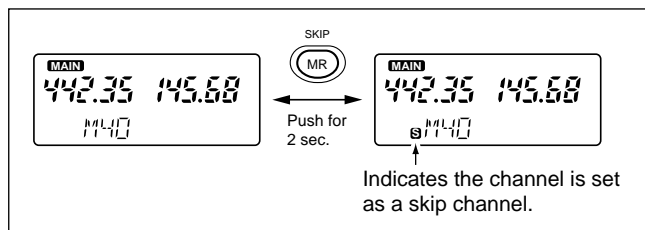
## ■ Memory scan

- ① Assign the main band to the desired display with [MAIN].
- ② Select memory mode with [MR].
- ③ Make sure the squelch is set to the threshold point.
  - Select automatic squelch (AT) or a level (SQ1–SQ8) where the noise is muted. (p. 17)
- ④ Push [(MAIN)SCAN] for 2 sec. to start the memory scan.
  - To change the scanning direction, rotate [DIAL].
  - If the pocket beep function is activated, the transceiver automatically selects the tone squelch function when a scan starts.
- ⑤ To stop the scan, push [(VFO)CLR].

## 8 SCAN OPERATION

### ■ Skip channel setting

Memory channels can be set to be skipped for memory skip scan. This is useful to speedup the memory skip scan interval.



- ① Select the memory channel to be programmed as a skip channel:
  - ➔ Push [MAIN] to select the desired band.
  - ➔ Push [MR] to select memory mode.
  - ➔ Rotate [DIAL] or push 2 digit keys to select the memory channel.
- ② Push [(MR)SKIP] for 2 sec. to set the memory channel as a skip channel.
  - “S” appears.
- ③ Repeat step ② to cancel a skip channel.
  - “S” disappears.

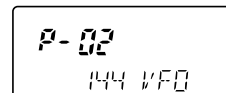
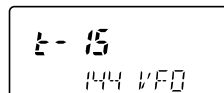
### ■ Scan resume condition

The resume condition can be selected as a pause or timer scan for each band (VHF VFO and memory channels, UHF VFO and memory channels, avionics\* band).

USING *Scan set mode*

#### SETTING THE SCAN RESUME CONDITION

(Following displays show the 144 MHz band full/programmed scan)



- ① Turn power ON while pushing [(MAIN)SCAN] to enter scan set mode.
- ② Push [(H/L)Δ] or [(TONE)∇] several times to select the desired band to be set.
  - Avionics\*/144/430(440) VFO, VHF/UHF memories are available.
- ③ Rotate [DIAL] to select the desired resume condition.
  - “t-15”: scan pauses for 15 sec. on a received signal.
  - “t-10”: scan pauses for 10 sec. on a received signal.
  - “t-05”: scan pauses for 5 sec. on a received signal.
  - “P-02”: scan pauses on a received signal until it disappears.
- ④ Turn power OFF to exit scan set mode.

\* U.S.A. and Asia versions only.

## Frequency skip function

### ◇ Programming a skip frequency

Unwanted frequencies can be skipped and programmed as skip channels when full or programmed scan is pausing.

- ① Turn ON the frequency skip function as described at right.
- ② Start full scan or programmed scan. (p. 29)
- ③ While receiving an unwanted signal and scan pauses, push [(S.MW)MW] for 2 sec. to program the received frequency as a skip frequency.
  - Do not release [(S.MW)MW] before 2 sec., otherwise, scan stops and select memory mode is selected.
  - The transceiver emits 3 beeps and the scan resumes.
  - Non-programmed memory channels are used for skip frequency programming from channel 99 to 10 in reverse sequence.
  - To scan the skip frequency after programming, cancel the skip information or clear the memory channel. (pgs. 25, 30)

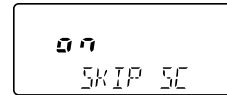
**NOTE:** When the frequency skip function is turned OFF, the paused frequency is overwritten on the preselected memory channel.

### ◇ Frequency skip function ON/OFF

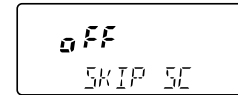
The frequency skip function can be turned OFF in set mode. In this case, the frequencies will not be skipped even if skip information is programmed and “S” will not blink during full scan or programmed scan.

USING *Scan set mode*

#### SETTING THE FREQUENCY SKIP FUNCTION ON/OFF



The frequency skip function is ON.



The frequency skip function is OFF.

- ① Turn power ON while pushing [(MAIN)SCAN] to enter scan set mode.
- ② Push [(H/L)Δ] or [(TONE)∇] several times until “SKIP SC” appears as shown above.
- ③ Rotate [DIAL] to turn the frequency skip function ON or OFF.
- ④ Turn power OFF to exit scan set mode.

## ■ Tone squelch operation

### ◇ Operation

The tone squelch opens only when receiving a signal containing a matching subaudible tone. You can silently wait for calls from group members using the same tone.

- ① Assign the main band to the desired display with [MAIN].
- ② Set the operating frequency.
- ③ Set the desired CTCSS tone in set mode.
  - See right for programming.
- ④ Push [TONE] several times until “T SQL” appears.
- ⑤ When the received signal includes a matching tone, squelch opens and the signal can be heard.
  - When the received signal’s tone does not match, tone squelch does not open, however, the S-indicator shows signal strength.
  - To open the squelch manually, push and hold [SQL].
- ⑥ Operate the transceiver in the normal way.
- ⑦ To cancel the tone squelch, push [TONE].

**NOTE:** The transceiver has 50 tone frequencies and consequently their spacing is narrow compared with units having 38 tones. Therefore, some tone frequencies may receive interference from adjacent tone frequencies.

### ○ CONVENIENT

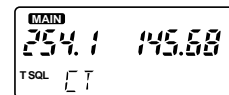
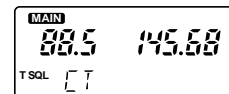
Store subaudible tone frequencies and tone squelch ON/OFF settings in memories (call) for easy recall.

### ◇ Setting subaudible tones for tone squelch operation (CTCSS tones)

USING SET MODE

Separate tone frequencies can be set for tone squelch operation than for repeater operation (the same range of tones is available—see below). Like repeater tones, these are set in set mode.

- ① Select VFO or a memory channel.
- ② Push [(H/L)SET] for 2 sec. to enter set mode.
- ③ Push [(H/L)(SET)Δ] or [(TONE)∇] several times until “CT” appears as shown at right.
- ④ Rotate [DIAL] to select the desired subaudible tone.
- ⑤ Push [(VFO)CLR] to exit set mode.



### • Subaudible tone frequency list

(Unit: Hz)

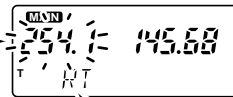
67.0	79.7	94.8	110.9	131.8	156.7	171.3	186.2	203.5	229.1
69.3	82.5	97.4	114.8	136.5	159.8	173.8	189.9	206.5	233.6
71.9	85.4	100.0	118.8	141.3	162.2	177.3	192.8	210.7	241.8
74.4	88.5	103.5	123.0	146.2	165.5	179.9	196.6	218.1	250.3
77.0	91.5	107.2	127.3	151.4	167.9	183.5	199.5	225.7	254.1

## ■ Tone scan

The transceiver can detect the subaudible tone frequency in a received signal. By monitoring a signal that is being transmitted on a repeater input frequency, you can determine the tone frequency required to access the repeater.

- ① Assign the main band to the desired display with [MAIN].
- ② Set the desired frequency or memory channel to be checked for a tone frequency.
- ③ Push [(#)T SCAN] for 2 sec. to start the tone scan.
  - To change the scanning direction, rotate [DIAL].
- ④ When the tone frequency is decoded, the set mode contents are programmed with the tone frequency.
  - The tone scan pauses when a tone frequency is detected.
  - The decoded tone frequency is used for the tone encoder or tone decoder/decoder, depending on the the tone squelch ON/OFF setting.
  - “CT” or “RT” appears during tone scan when the tone squelch is in use or not.
- ⑤ Push [VFO] to stop the scan.

Subaudible tone frequencies flash as they are scanned.



“RT” or “CT” appears during tone scan

## ■ Pocket beep operation

This function uses subaudible tones for calling and can be used as a “common pager” to inform you that someone has called while you were away from the transceiver.

### ◇ Waiting for a call from a specific station

- ① Assign the main band to the desired display with [MAIN].
- ② Set the operating frequency.
- ③ Set the desired CTCSS tone in set mode.
  - See the opposite page for a list of available tone frequencies and programming information.
- ④ Push [TONE] several times until “TSQL (·)” appears in the function display.
- ⑤ When a signal with the correct tone is received, the transceiver emits beep tones for 30 sec. and flashes “TSQL (·).”
- ⑥ Push [PTT] to answer or push [(VFO)CLR] to stop the beeps and flashing.
  - Tone squelch is automatically selected.

### ◇ Calling a waiting station using pocket beep

A subaudible tone matched with the station’s tone frequency is necessary. Use the tone squelch on the opposite page or a subaudible tone encoder.

# 10 OTHER FUNCTIONS

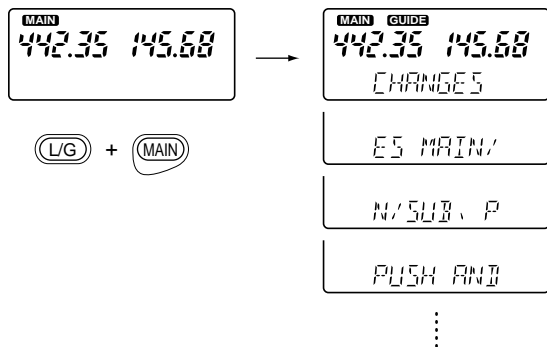
## ■ Guide function

The transceiver has a guide function that enables quick descriptions of key functions without the need to search a menu list.

### ◇ Calling up a description

- ➔ Push the desired key while pushing the [L/G] key.
  - “**GUIDE**” and a quick description of the key’s function appear.

#### [EXAMPLE]



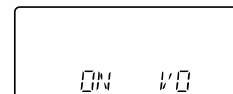
While in set mode, memory name programming, etc., the quick description automatically appears 5 sec. after operation. Push any key to clear the description.

## ■ Battery voltage indication USING Initial set mode

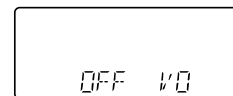
The transceiver has a battery voltage indicator to check dry cell battery consumption in the BP-170 BATTERY CASE. When the indication is set to ON, the battery voltage is indicated for 2 sec. at power ON (LOW V, 4.5–16 V in 0.5 V steps).

If the battery voltage is lower than 4.5 V, “LOW V” appears. Place new dry cells in the battery case. If the voltage surpasses 16 V, “OVER V” appears and flashes regardless of this setting.

- ① Turn power ON while pushing [(H/L)SET] to enter initial set mode.
- ② Push [(H/L)(SET)Δ] or [(TONE)∇] several times until “VO” appears as shown at right.
- ③ Rotate [DIAL] to turn the voltage indication ON or OFF.
- ④ Turn power OFF to exit initial set mode.

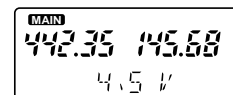


Battery indication ON



Battery indication OFF

After turning the voltage indication ON, the battery voltage is displayed for 2 sec. at power ON.



## ■ Auto power-off function USING Initial set mode

The transceiver can be set to automatically turn OFF after a specified period in which no switch is pushed.

60 min., 40 min., 20 min. and OFF can be specified. The specified period is retained even when the transceiver is turned OFF by the auto power-off function. To cancel the function, select "OFF" in step ③ below.

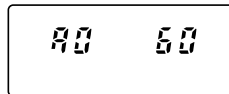
- ① Turn power ON while pushing [(H/L)SET] to enter initial set mode.
- ② Push [(H/L)(SET)Δ] or [(TONE)∇] several times until "AO" appears as shown at right.
- ③ Rotate [DIAL] to select the desired time or to turn the function OFF.
- ④ Turn power OFF to exit initial set mode.



Auto power-off is OFF.



After setting the auto power-off time, the specified period is displayed for 2 sec. at power ON.

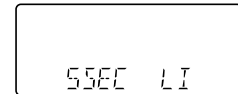


## ■ Function display backlighting USING Initial set mode

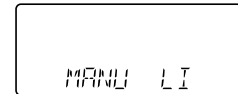
For easy operation at nighttime, the transceiver has an LCD (Liquid Crystal Display) and keypad lighting function.

5 sec. timer, manual and automatic can be specified. When set to 5 sec., display backlighting can be turned ON with 5 sec. timer; when set to MANU (manual), the [L/G] key toggles display backlighting ON and OFF; when set to AUTO, display backlighting automatically turns ON with 5 sec. timer when any operation is performed except [PTT].

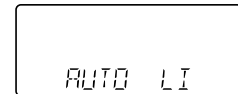
- ① Turn power ON while pushing [(H/L)SET] to enter initial set mode.
- ② Push [(H/L)(SET)Δ] or [(TONE)∇] several times until "LI" appears as shown at right.
- ③ Rotate [DIAL] to select the desired backlighting function.
- ④ Turn power OFF to exit initial set mode.



5 sec. timer



Manual ON/OFF



Automatic ON with timer

## 10 OTHER FUNCTIONS

### ■ Power saver

USING *Initial set mode*

The power saver function reduces the current drain to conserve battery power. The power saver duty cycle can be set to automatic, 1:4, 1:16 or OFF. Setting it to 1:16 conserves the most power. For packet operation, the power saver should be turned OFF to receive reliable packet data. The power saver is deactivated when more than 12 V DC is connected to the [DC13.5V] jack.

- ① Turn power ON while pushing [(H/L)SET] to enter initial set mode.
- ② Push [(H/L)(SET)Δ] or [(TONE)∇] several times until “PS” appears as shown at right.
- ③ Rotate [DIAL] to select the desired duty cycle or to turn the function OFF.
  - “AUTO” selects “1:4” duty ratio when receiving no signal for 5 sec., then “1:8” 60 sec. after that.
- ④ Turn power OFF to exit initial set mode.

**NOTE:** When the duty cycle is set to 1:16, signals may be clipped up to a 2 sec. maximum.

A rectangular LCD display showing the text "AUTO PS" in a simple, segmented font.

Automatic duty cycle

A rectangular LCD display showing the text "1:4 PS" in a simple, segmented font.

Standby: 125 msec.  
Circuit off: 500 msec.

A rectangular LCD display showing the text "1:16 PS" in a simple, segmented font.

Standby: 125 msec.  
Circuit off: 2 sec.

A rectangular LCD display showing the text "OFF PS" in a simple, segmented font.

Power saver is OFF.

### ■ LCD contrast

USING *Initial set mode*

The LCD (Liquid Crystal Display) contrast can be selected from 1 of 3 levels. Select a contrast which gives the best readability for the ambient light conditions. “1” is the lowest contrast available and “3” is the highest contrast available.

- ① Turn power ON while pushing [(H/L)SET] to enter initial set mode.
- ② Push [(H/L)(SET)Δ] or [(TONE)∇] several times until “LC” appears as shown at right.
- ③ Rotate [DIAL] to select the desired contrast.
- ④ Turn power OFF to exit initial set mode.

A rectangular LCD display showing the text "1 LC" in a simple, segmented font. The display also shows "MAIN GUIDE MAIN" at the top and "T SQL (H) -DUP S" at the bottom.

Low contrast

A rectangular LCD display showing the text "2 LC" in a simple, segmented font. The display also shows "MAIN GUIDE MAIN" at the top and "T SQL (H) -DUP S" at the bottom.

A rectangular LCD display showing the text "3 LC" in a simple, segmented font. The display also shows "MAIN GUIDE MAIN" at the top and "T SQL (H) -DUP S" at the bottom.

High contrast



## ■ Optional HM-75A functions

The optional HM-75A allows you to remotely select memory channels, operating frequency, etc. The switches on the HM-75A function depends on the initial set mode setting.

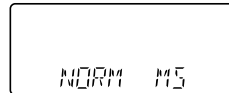
**CAUTION:** When connecting the HM-75A to the transceiver, make sure that power to the transceiver is turned OFF, otherwise the CPU may malfunction.

### ◇ Setting the HM-75A functions

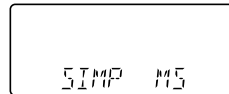
USING *Initial set mode*

This item turns the microphone simple mode ON or OFF.

- ① Turn power ON while pushing [(H/L)SET] to enter initial set mode.
- ② Push [(H/L)(SET)Δ] or [(TONE)▽] several times until "MS" appears as shown at right.
- ③ Rotate [DIAL] to select the desired HM-75A function.
- ④ Turn power OFF to exit initial set mode.







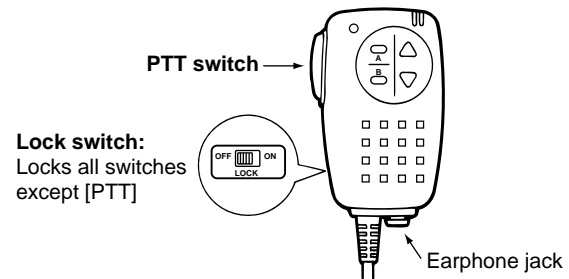
Normal mode



Simple mode

**NOTE:** VFO mode cannot be selected via the microphone when SIMPLE mode is selected.

SWITCH	NORMAL		SIMPLE
 A	MAIN (BAND) Push to toggle the main band assignment.  Push and hold to select the operating band.		MONITOR Push and hold to open the squelch.
 B	VFO/MEMORY Toggles VFO and memory mode.		CALL Selects the call channel.
	UP	Change the frequency or memory channel when pushed.	M1 Selects memory channel 1.
	DOWN	Starts previously selected scan when pushed for 2 sec.	M2 Selects memory channel 2.



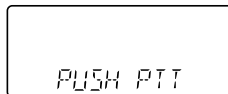
## 10 OTHER FUNCTIONS

### ■ Handheld-to-handheld cloning

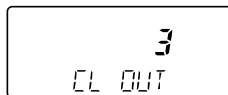
The information in the transceiver, such as memory channels, memory names, etc. can be transferred from one IC-W32A/E to another. An optional OPC-474 CLONING CABLE is required.

In addition, optional CS-W32 CLONING SOFTWARE is available to clone and edit contents using a PC.

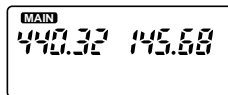
- ① Connect the OPC-474 between both transceiver's [SP] jacks.
- ② Turn the 'slave' transceiver power ON.
- ③ Turn the 'master' transceiver power ON while pushing [MR] and [M•N].
  - "PUSH PTT" appears.
- ④ Push [PTT] on the 'master' transceiver to transfer the data.
  - "CL OUT" appears and digits (0–9, A–F) indicate the data flow.



Cloning standby



While cloning



Previous operating condition appears.

### ■ Partial reset

AT POWER ON

If you want to initialize the operating conditions (VFO frequency, VFO settings, set mode contents) without clearing the memory contents, a partial resetting function is available for the transceiver.

- ➔ While pushing [(VFO)CLR], turn power ON to partially reset the transceiver.

### ■ All reset

AT POWER ON

Reset the CPU before operating the transceiver for the first time, or when the internal CPU malfunctions.

- ➔ While pushing [SQL], [VFO] and [MR], turn power ON to reset the CPU.

**CAUTION:** Resetting the CPU returns all programmed contents to their default settings.

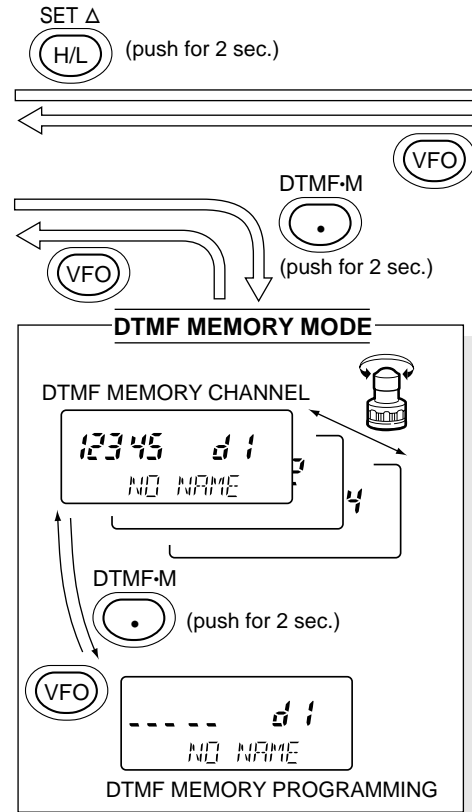
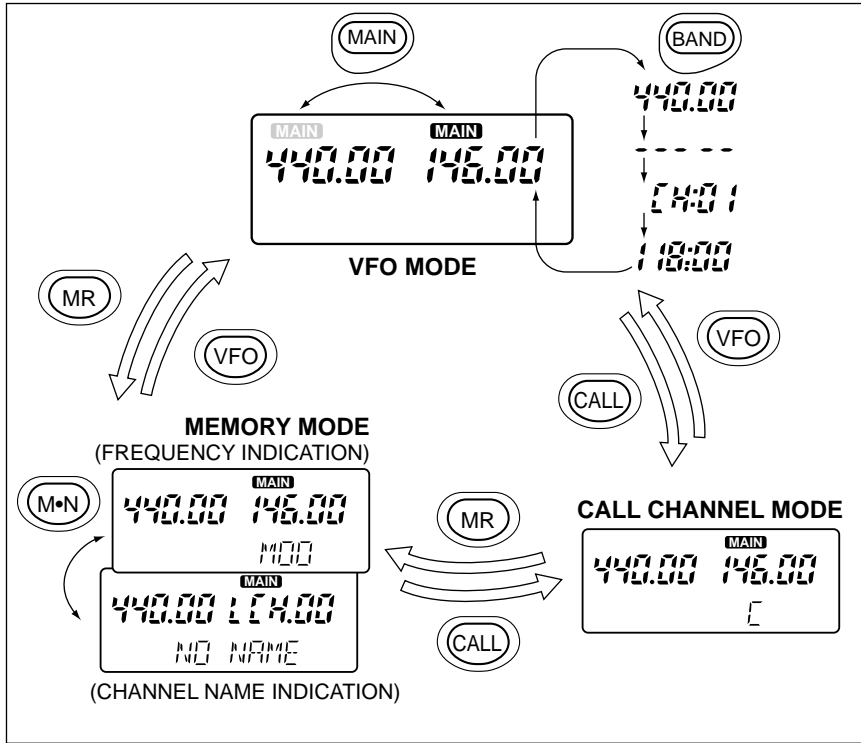
# TROUBLESHOOTING 11

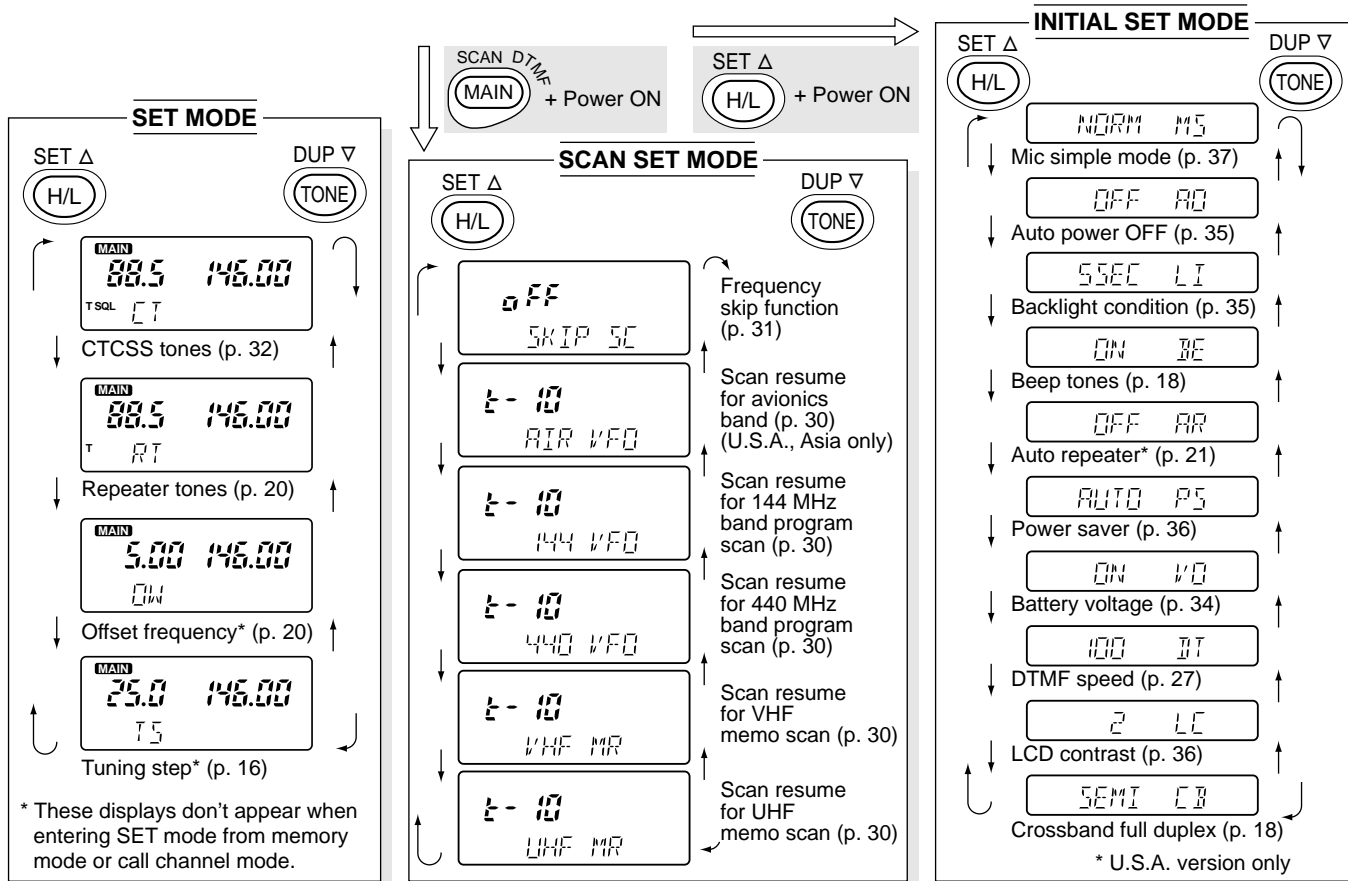
If your transceiver seems to be malfunctioning, please check the following points before sending it to a service center.

PROBLEM	POSSIBLE CAUSE	SOLUTION	REF.
<ul style="list-style-type: none"> <li>• No power comes on.</li> </ul>	<ul style="list-style-type: none"> <li>• The battery is exhausted. (A slight current flows in the circuits even when the power is OFF).</li> <li>• Poor plug connection to the external DC power cable.</li> </ul>	<ul style="list-style-type: none"> <li>• Charge the battery pack or place new dry cell batteries in the battery case. (Remove the battery pack if you will not be using the transceiver for a long time.)</li> <li>• Check the connector or remove and replace the cable.</li> </ul>	<p>pgs. 9, 10</p> <p>—</p>
<ul style="list-style-type: none"> <li>• No sound comes from the speaker.</li> </ul>	<ul style="list-style-type: none"> <li>• Squelch level is too deep. (e.g. SQ8)</li> <li>• Volume level is too low.</li> </ul>	<ul style="list-style-type: none"> <li>• Set squelch to automatic (AT).</li> <li>• Set the desired band's [VOL] to a suitable level.</li> </ul>	<p>p. 17</p> <p>p. 17</p>
<ul style="list-style-type: none"> <li>• Transmitting is impossible.</li> </ul>	<ul style="list-style-type: none"> <li>• The battery is exhausted.</li> <li>• Avionics band frequency (U.S.A./Asia only) or weather channel (U.S.A. only) is selected.</li> </ul>	<ul style="list-style-type: none"> <li>• Charge the battery pack or place new dry cell batteries in the battery case.</li> <li>• Set an amateur frequency.</li> </ul>	<p>pgs. 9, 10</p> <p>p. 13</p>
<ul style="list-style-type: none"> <li>• No contact possible with another station.</li> </ul>	<ul style="list-style-type: none"> <li>• The transceiver is set to semi-duplex.</li> <li>• The output power is set to low.</li> </ul>	<ul style="list-style-type: none"> <li>• Set to simplex.</li> <li>• Push [H/L] to select high power.</li> </ul>	<p>p. 19</p> <p>p. 17</p>
<ul style="list-style-type: none"> <li>• Frequency cannot be set.</li> </ul>	<ul style="list-style-type: none"> <li>• Memory mode or call channel is selected.</li> <li>• Weather channel (U.S.A. only) is selected.</li> <li>• Lock function is activated.</li> </ul>	<ul style="list-style-type: none"> <li>• Push [VFO] to select VFO mode.</li> <li>• Push [BAND] to select an amateur band or avionics band.</li> <li>• Push [(CALL)LOCK] for 2 sec. to cancel the function.</li> </ul>	<p>p. 12</p> <p>p. 13</p> <p>p. 15</p>
<ul style="list-style-type: none"> <li>• Scan does not start.</li> </ul>	<ul style="list-style-type: none"> <li>• The squelch is open.</li> <li>• Call or weather channel (U.S.A. only) is selected.</li> </ul>	<ul style="list-style-type: none"> <li>• Set squelch to automatic (AT) or the squelch closed point (SQ1 or more).</li> <li>• Push [BAND] to select an amateur band, memory channel or avionics band.</li> </ul>	<p>p. 17</p> <p>p. 13</p>

# 12 MODE ARRANGEMENT

Although the following chart refers mainly to the VHF (right) band, the same arrangement applies to the UHF (left) band (except commonly used mode, DTMF memory, SCAN SET and INITIAL SET).





Turn power OFF, then ON to return to normal operation.

# 13 SPECIFICATIONS

			VHF	UHF
			Frequency coverage (MHz)	U.S.A.
Europe	144–146	430–440		
Asia	Tx: 144–148 Rx: 118–174* <sup>1</sup>	430–440		
Italy	Tx: 144–148 Rx: 136–174* <sup>1</sup>	Tx: 430–440 Rx: 400–470* <sup>3</sup>		
Guaranteed ranges are: * <sup>1</sup> 144–148 * <sup>2</sup> 440–450 * <sup>3</sup> 430–440				
Mode		FM (U.S.A./Asia versions: AM Rx 118–136 MHz)		
Frequency stability		±5 ppm (0°C to +50°C; +32°F to +122°F)		
Tuning steps (kHz)		5, 10, 12.5, 15, 20, 25, 30 or 50		
Antenna connector		BNC (50 Ω)		
Usable battery pack/case		See options on page at right.		
External DC power		4.5 to 16 V DC (negative ground)		
Current drain (at 13.5 V, typical)	Tx	High	1.6 A	1.5 A
		Low	500 mA	600 mA
	Rx	Rated audio	210 mA	
		Power saved	40 mA (average)	
Usable temperature range		–10°C to +60°C; +14°F to +140°F		
Dimensions (with BP-173 or BP-180; projections not included)		57(W) × 137(H) × 33(D) mm; 2¼(W) × 5½(H) × 1⅝(D) in		
Weight (with BP-173 and antenna)		450 g; 1 lb		

		VHF	UHF	
		TRANSMITTER	Output power* (at 13.5 V)	5 W, 0.5 W (selectable)
Modulation system	Variable reactance frequency modulation			
Max. frequency deviation*	±5.0 kHz			
External microphone jack	2.5 mm (1/10 in) 3-conductor/2 kΩ			
RECEIVER	Receive system	Double conversion superheterodyne		
	Intermediate frequencies	1st	30.85 MHz	46.05 MHz
		2nd	450 kHz	
	Sensitivity* (12 dB SINAD)	Original band	Less than 0.16 μV	
		Opposite band	Less than 0.32 μV	
	Squelch sensitivity	Less than 0.16 μV		
	Selectivity	More than 15 kHz/–6 dB Less than 30 kHz/–60 dB		
	Spurious and image rejection ratio*	More than 60 dB	More than 50 dB	
		Except for ½ of IF and 2nd image freq.		
Audio output power* (at 13.5 V)	More than 180 mW (at 10% distortion with an 8 Ω load)			
External speaker jack	3.5 mm (1/8 in) 3-conductor/8 Ω			

\* Specifications guaranteed at a transceiver temperature of +25°C (+77°F).

**All stated specifications are subject to change without notice or obligation.**

## ◇ Battery packs

BATTERY PACK	HEIGHT (mm/in)	VOLTAGE	CAPACITY	OUTPUT POWER	OPER. PERIOD*
BP-170	63.5/2.5	Battery case for R6(AA) X 4 alkaline cells		1.5 (1.3) W	Depends on battery
BP-171	63.5/2.5	4.8 V	700 mAh	1.5 (1.3) W	5.5 (4.5) h
BP-172	63.5/2.5	4.8 V	950 mAh	1.5 (1.3) W	7.5 (6.0) h
BP-173	75.5/3.0	9.6 V	650 mAh	5.0 (4.5) W	3.5 (3.0) h
BP-180	75.5/3.0	7.2 V	600 mAh	3.5 (3.5) W	3.5 (3.0) h

Bracketed values in the output power column refer to the UHF band. Operating periods are calibrated for the following conditions:

at 25°C (77°F), Tx (high power) : Rx : standby = 1 : 1 : 8

## ◇ Chargers and cables

### BC-110A/D/V WALL CHARGERS

Regularly charge battery packs.

### BC-119 DESKTOP CHARGER + AD-51 DESKTOP CHARGER ADAPTER

Rapidly charge battery packs in 1 to 1.5 hrs. depending on the battery pack. The AD-51 must be used with the BC-119 for charging a battery pack. Some BC-119 versions require the AD-75 additionally. The CP-17L or OPC-515L can be used instead of the supplied AC adapter.

### CP-12/L CIGARETTE LIGHTER CABLE WITH NOISE FILTER

For operation and charging via a 12 V cigarette lighter socket.

### OPC-254/L DC POWER CABLE

For operation and charging via an external power supply.

## ◇ Carrying case

### LC-128 CARRYING CASE

## ◇ Speaker-microphones

### HM-46



### HM-54



### HM-75A



### HS-85 HEADSET



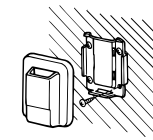
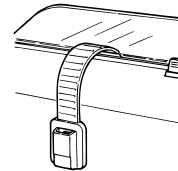
- PTT switch
- VOX
- One-touch PTT for hands-free operation

## ◇ Others

### MB-30 MOUNTING BRACKET

When using the bracket hanger

When using no bracket hanger



### SP-13 EARPHONE

Provides clear receive audio in noisy environments.

### CS-W32 CLONING SOFTWARE + OPC-478 CLONING CABLE

Provide quick and easy programming of memory channels, memory names and set mode contents, etc.

### OPC-474 CLONING CABLE

Used for handheld-to-handheld data cloning.

**Count on us!**

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