

# ICOM

## INSTRUCTION MANUAL

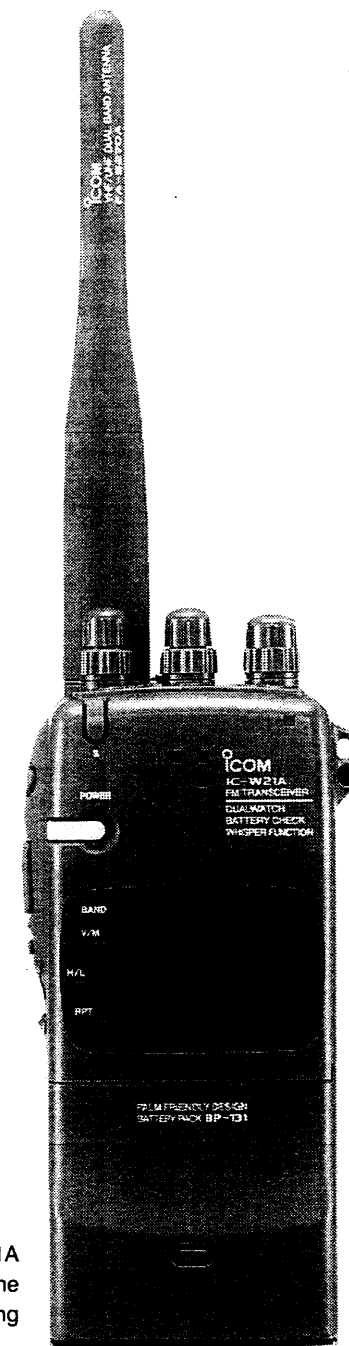
DUAL BAND FM TRANSCEIVER

# IC-W21A

# IC-W21E

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.

**Icom Inc.**



The photo shows IC-W21A with optional BP-131. The battery pack differs according to versions.

## IMPORTANT

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

### SAVE THIS INSTRUCTION MANUAL

— This instruction manual contains important safety and operating instructions for the IC-W21A and IC-W21E.

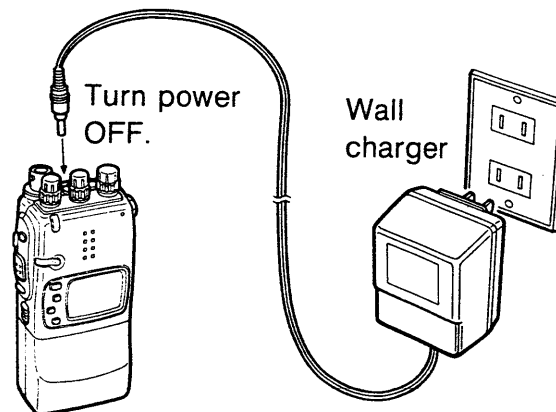
Note that this instruction manual applies only to those functions accessible in its factory-shipped state. For operating more advanced functions, a booklet titled "Tech Talk" is available from your Icom Dealer.

## WHEN FIRST APPLYING POWER

### ◆ Battery pack charging

- ① Attach the battery pack to the transceiver.
- ② Connect the wall charger to the [DC12.5V] jack to charge the battery pack.
  - Charging period of the BP-157 and BP-131 is approx. 15 hrs.

To  
[DC12.5V]

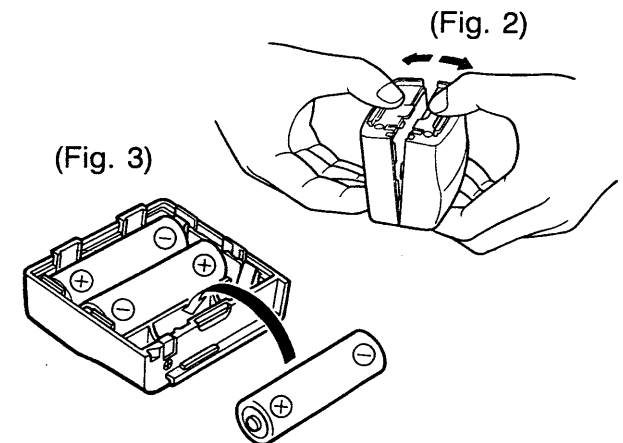
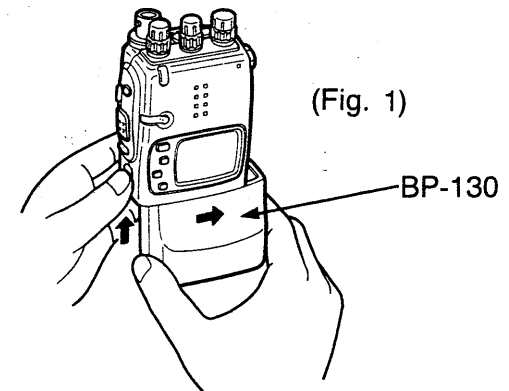


BP-157 or  
BP-131

### ◆ Installing batteries into the battery case

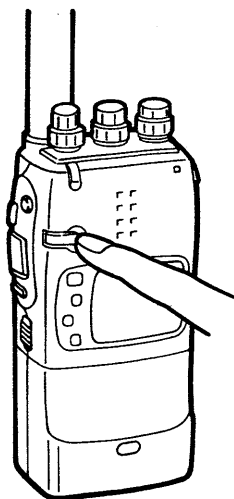
Install six dry cell batteries as shown in the figures below.

- Pay attention to the polarities.



◆ **Power ON**

Push and hold [POWER] for 1 sec. to turn power ON.



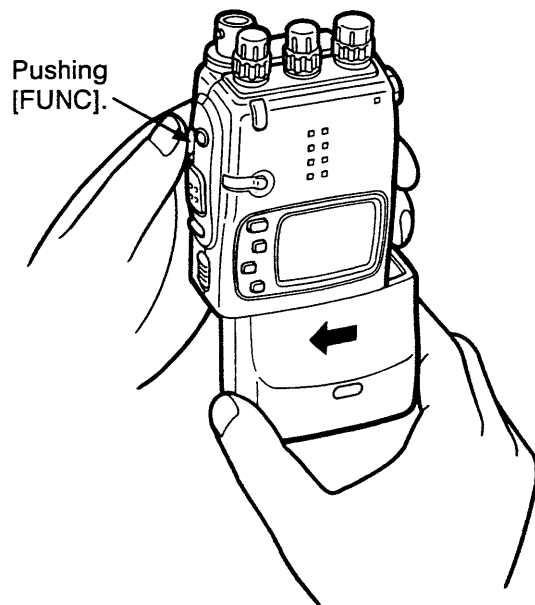
Push and hold [POWER] for 1 sec. again to turn power OFF.

The power key may not function when the transceiver has not been operated for 2 months or more as the internal rechargeable backup battery may have become empty. In this case, activate the CPU as described in the box at right.

◆ **Activating the CPU**

(when the power does not come on)

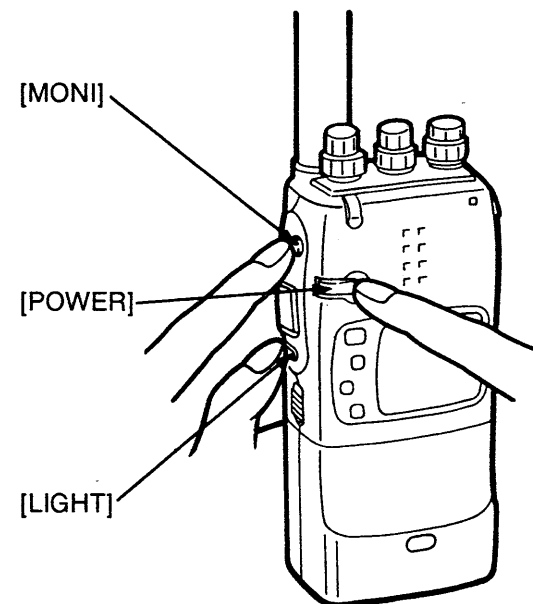
While pushing the [FUNC] key, attach the charged battery pack. Then, turn power ON.



◆ **Resetting the transceiver**

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

- ① Turn power OFF.
- ② While pushing [MONI] and [LIGHT], push and hold [POWER] for 1 sec. to reset the CPU.



## CAUTIONS

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

**NEVER** connect the transceiver to a power source using reverse polarity. This connection will ruin the transceiver.

**NEVER** allow children to touch the transceiver.

**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  $+60^{\circ}\text{C}$  ( $+140^{\circ}\text{F}$ ).

**BE CAREFUL!** When transmitting for a long time with high output power, the rear panel may become hot.

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

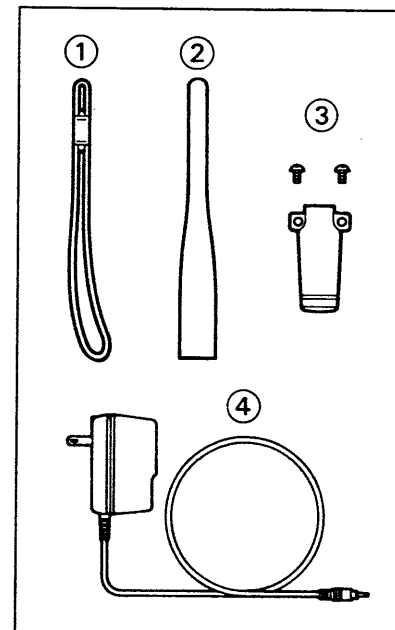
Even when the transceiver power is OFF, a slight current still flows in the circuits. Remove the battery pack or case from the transceiver when not using the transceiver for a long time. Otherwise, the battery pack or installed dry cell batteries in the battery case will become exhausted.

## EXPLICIT DEFINITIONS

The following explicit definitions apply to this manual.

WORD	DEFINITION
CAUTION	Equipment damage may occur.
NOTE	If disregarded, inconvenience only. No risk of personal injury, fire or electric shock.

## UNPACKING



Included accessories:	Qty.
① Handstrap .....	1
② Antenna (FA-B270A) .....	1
③ Belt clip and screws .....	1 set
④ Wall charger* .....	1
Battery pack (BP-157) or battery case (BP-130) (attached with the transceiver) .....	1

\* Not included with versions which include a battery case.

---

# TABLE OF CONTENTS

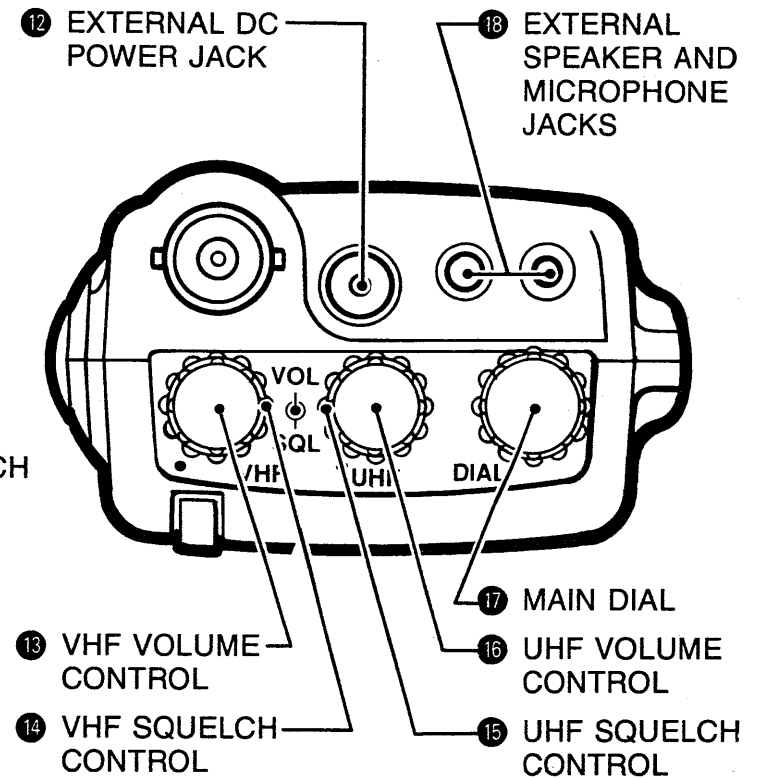
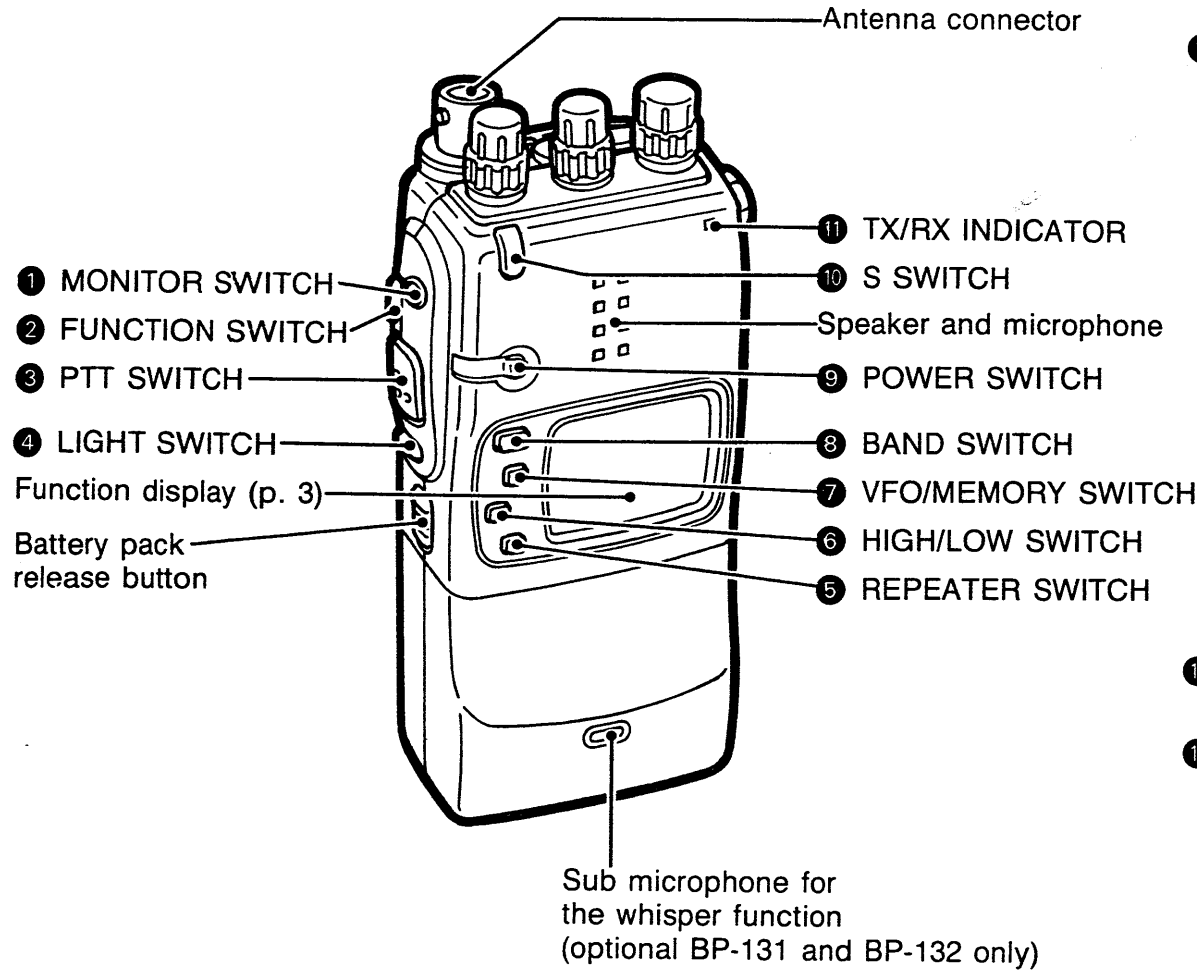
---

<b>IMPORTANT</b> .....	i		
<b>WHEN FIRST APPLYING POWER</b> .....	i ~ ii		
<b>CAUTIONS</b> .....	iii		
<b>EXPLICIT DEFINITIONS</b> .....	iii		
<b>UNPACKING</b> .....	iii		
<b>TABLE OF CONTENTS</b> .....	iv		
<b>1 PANEL DESCRIPTION</b> .....	1 ~ 3		
■ Panel description .....	1		
■ Function display .....	3		
<b>2 BATTERY PACK CHARGING</b> .....	4 ~ 6		
■ Battery pack charging .....	4		
■ Charging precautions .....	4		
■ About the battery pack .....	4		
■ Charging examples .....	5		
<b>3 OPERATION</b> .....	7 ~ 12		
■ Accessory attachment .....	7		
■ Main band .....	8		
■ Setting a frequency .....	9		
■ Receiving .....	11		
■ Transmitting .....	12		
<b>4 MEMORY CHANNEL</b> .....	13 ~ 14		
■ Selecting a memory channel .....	13		
■ Programming a frequency into a memory channel .....	13		
■ Transferring a programmed frequency to VFO ....	14		
<b>5 CALL CHANNEL</b> .....	15		
■ Calling up a call channel .....	15		
■ Programming a call channel .....	15		
<b>6 SCAN</b> .....	16 ~ 17		
■ Scan types .....	16		
■ Programmed scan .....	16		
■ Memory scan .....	17		
<b>7 OTHER FUNCTIONS</b> .....	18 ~ 20		
■ Clock indication .....	18		
■ Battery voltage indication .....	19		
■ Optional whisper function .....	20		
■ Optional HM-75 operation .....	20		
<b>8 REPEATER OPERATION</b> .....	21 ~ 24		
■ EASY mode and MULTI-FUNCTION mode .....	21		
■ Basic repeater use .....	21		
■ Repeater memory .....	22		
■ Entering the MULTI-FUNCTION mode .....	23		
■ Setting an offset frequency .....	24		
■ Setting a subaudible tone frequency .....	24		
<b>9 TROUBLESHOOTING</b> .....	25		
<b>10 SPECIFICATIONS</b> .....	26		
<b>SCHEMATIC AND BLOCK DIAGRAMS</b> .....	SEPARATE		

# PANEL DESCRIPTION

## ■ Panel description

**CAUTION** when using dry cell batteries!  
 Operation with an external DC power source simultaneously charges batteries inside the battery case. This may cause battery leakage and damage the transceiver.



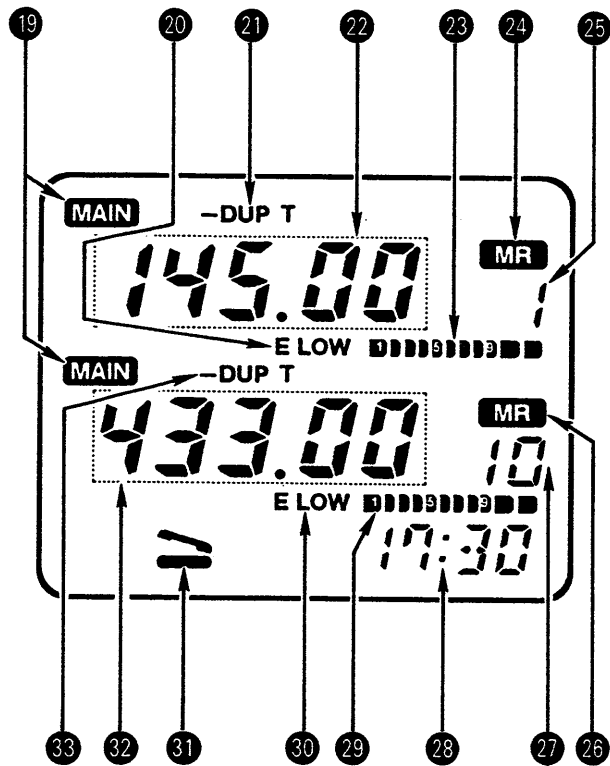
- ① **MONITOR SWITCH [MONI]** (p. 11)
  - Manually opens the main band's squelch and monitors the transmit frequency.
  - Alters the dial select step while pushing [FUNC].
- ② **FUNCTION SWITCH [FUNC]**  
 While pushing this switch, other switches and the main dial perform secondary functions.
  - "Push [FUNC] + [LIGHT]" means "while pushing the [FUNC] switch, push the [LIGHT] switch."
- ③ **PTT SWITCH [PTT]** (p. 12)  
 Push and hold to transmit; release to receive.
- ④ **LIGHT SWITCH [LIGHT]**
  - Turns the LCD lighting ON and OFF. (p. 10)
  - Turns the lock function ON and OFF while pushing [FUNC]. (p. 10)
- ⑤ **REPEATER SWITCH [RPT/WSPR]**
  - Turns the duplex or tone encoder ON and OFF. (p. 21)
  - Calls the repeater memory up when pushed for 1 sec. (p. 22)
  - Turns the optional whisper function ON and OFF while pushing [FUNC]. (p. 20)
  - Generates a 1750 Hz tone while pushing [PTT]. (IC-W21E only)

- ⑥ **HIGH/LOW SWITCH [H/L/TS]**
  - Selects high or low output powers.
  - The main dial selects a low output power level while pushing this switch. (p. 12)
  - Enters the tuning step setting condition while pushing [FUNC]. (p. 10)
- ⑦ **VFO/MEMORY SWITCH [V/M MW]**
  - Changes the mode between VFO and MEMORY. (p. 8)
  - Programs the displayed frequency into a memory channel while pushing [FUNC]. (p. 13)
- ⑧ **BAND SWITCH [BAND]**
  - Changes the main band between VHF and UHF. (p. 8)
  - Turns the sub band OFF for single band operation while pushing [FUNC]. (p. 11)
- ⑨ **POWER SWITCH [POWER]** (p. ii)  
 Turns power ON and OFF when pushed for 1 sec.
- ⑩ **S SWITCH [S]**
  - Selects a call channel. (p. 15)
  - Starts scan when pushed for 1 sec. (pgs. 16~17)
  - Selects clock or battery voltage indication while pushing [FUNC]. (pgs. 18~19)

- ⑪ **TX/RX INDICATOR**  
 Lights up in green while the squelch is open. Lights up in red while transmitting.
- ⑫ **EXTERNAL DC POWER JACK [DC12.5V]**  
 Allows operation with a 12.5 V DC power source using the optional cables, CP-13 or OPC-288.
- ⑬ **VHF VOLUME CONTROL [VOL]**  
 Adjusts the VHF audio output level.
- ⑭ **VHF SQUELCH CONTROL [SQL]**  
 Varies the VHF squelch threshold point for noise mute.
- ⑮ **UHF SQUELCH CONTROL [SQL]**  
 Varies the UHF squelch threshold point for noise mute.
- ⑯ **UHF VOLUME CONTROL [VOL]**  
 Adjusts the UHF audio output level.
- ⑰ **MAIN DIAL [DIAL]** (pgs. 8, 9)  
 Selects an operating frequency, memory channel, etc.
- ⑱ **EXTERNAL SPEAKER AND MICROPHONE JACKS [MIC]/[SP]**  
 Connects an optional speaker-microphone or headset, if desired.

# 1 PANEL DESCRIPTION

## Function display



### 19 MAIN BAND INDICATOR

Appears in one of two positions to show the main band for transmitting and function control.

### 20 VHF LOW POWER INDICATOR

(p. 12)

- "LOW" appears while one of the low output powers (LOW 1 ~ LOW 3) is selected in VHF.
- "E LOW" appears while economical low output power is selected in VHF.

### 21 VHF DUPLEX/TONE INDICATOR

(p. 21)

- "- DUP" or "DUP" appears when duplex is ON.
- "T" appears when the subaudible tone encoder is ON.

### 22 VHF FREQUENCY READOUT

Shows the VHF operating frequency.

### 23 VHF S/RF INDICATOR

(p. 12)

- Shows the relative signal strength while receiving in VHF.
- Shows the selected output power while transmitting in VHF.

### 24 VHF MEMORY MODE INDICATOR

(p. 8)

Appears while MEMORY mode is selected in VHF.

### 25 VHF MEMORY CHANNEL READ-OUT

(p. 13)

Indicates a VHF memory channel number, etc.

### 26 UHF MEMORY MODE INDICATOR

Refer to 24.

### 27 UHF MEMORY CHANNEL READ-OUT

Refer to 25.

### 28 CLOCK/BATTERY VOLTAGE INDICATOR

(pgs. 18, 19)

Shows the time or shows the connected battery voltage as a %.

### 29 UHF S/RF INDICATOR

Refer to 23.

### 30 UHF LOW POWER INDICATOR

Refer to 20.

### 31 WHISPER FUNCTION INDICATOR

(p. 20)

Appears while the optional whisper function is activated.

### 32 UHF FREQUENCY READOUT

Refer to 22.

### 33 UHF DUPLEX/TONE INDICATOR

Refer to 21.



## ■ Battery pack charging

The supplied\* BP-157 BATTERY PACK includes rechargeable NiCd batteries and can be charged approx. 300 times. Charge the battery pack before first operating the transceiver or when the battery pack becomes exhausted (p. 6).

A charging circuit is included in this transceiver, therefore the connected battery pack (BP-131, BP-157) can be charged when external DC power (12~16 V DC) is connected.

## ■ Charging precautions

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

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

Charging may not occur in extreme cold (under 0°C; +32°F) or extreme heat (over +40°C; +104°F).

**DO NOT** charge a fully charged battery pack.

Full charge capacity may become lower when repeatedly recharging after only partial discharging. If this happens, discharge almost completely through normal use before recharging.

## ■ About the battery pack

### ◇ Using your battery pack wisely

Although battery packs may not be damaged by charging periods of one week or more, overcharging and complete discharging shorten the life of a battery pack. Recharging can usually be performed 300 times, but battery life can be lengthened to about 500 recharges as follows:

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 as soon as transmitting becomes impossible.

### ◇ Operating period

Depending on the attached battery pack, the operating period of the transceiver varies. Refer to the table below.

BATTERY PACK	OUTPUT VOLTAGE	BATTERY CAPACITY	OPERATING PERIOD (Approx.)	
			VHF	UHF
BP-131, BP-157	7.2 V	900 mA	6 h 40 m	6 h 10 m
BP-132	12.0 V	600 mA	4 h 30 m	4 h 10 m

**Operating condition:** Transmitting at high power for 1 min., receiving for 1 min. and standby (power saved) for 8 min. with the sub band OFF. Operating periods are estimated values and vary depending on output power, temperature, etc.

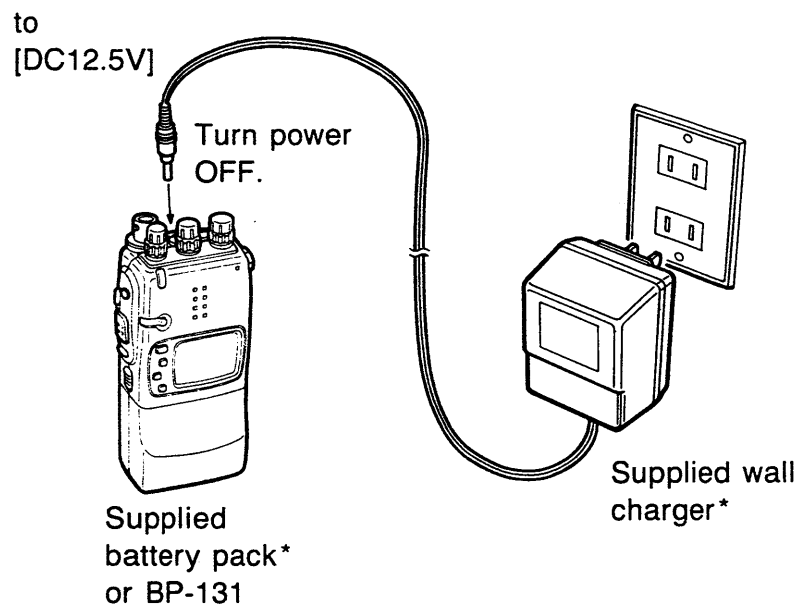
## 2 BATTERY PACK CHARGING

### ■ Charging examples

#### ◇ Regular charging

Attach the supplied\* battery pack or optional BP-131; then, connect the supplied\* wall charger to the transceiver as shown below.

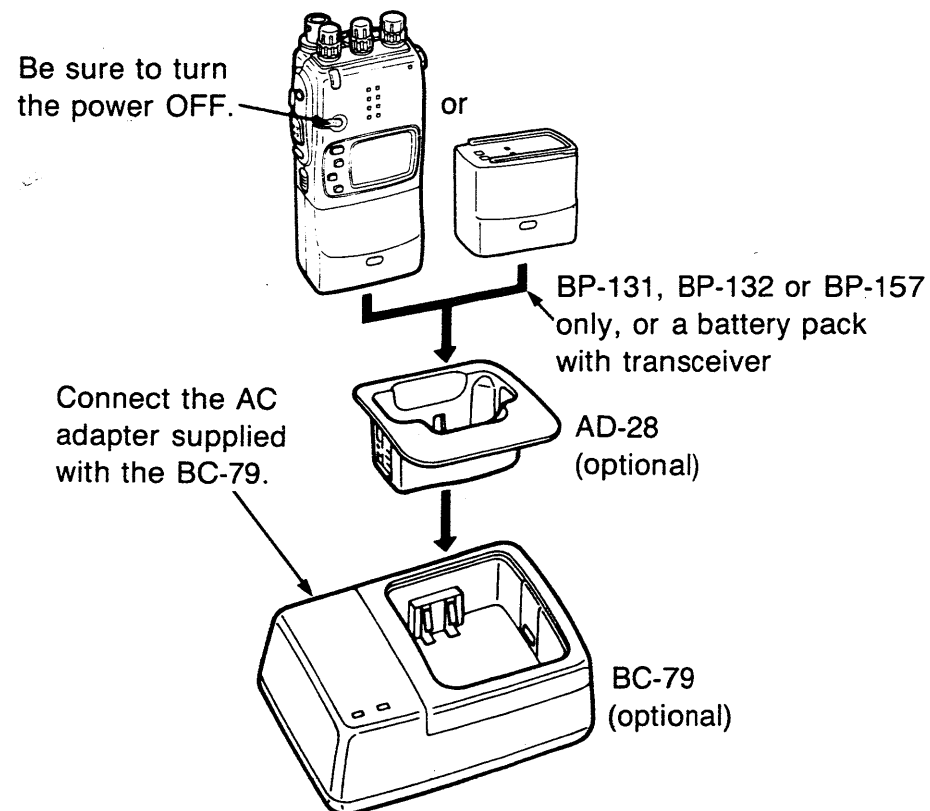
\* Optional for versions which include a battery case.



- The optional BP-132 cannot be charged via the transceiver.
- The optional CP-13/L or OPC-288/L with a 12 ~ 16 V DC can be used for the charging power source.
- **Charging period: 15 hrs. (approx.)**

#### ◇ Rapid charging with the optional BC-79

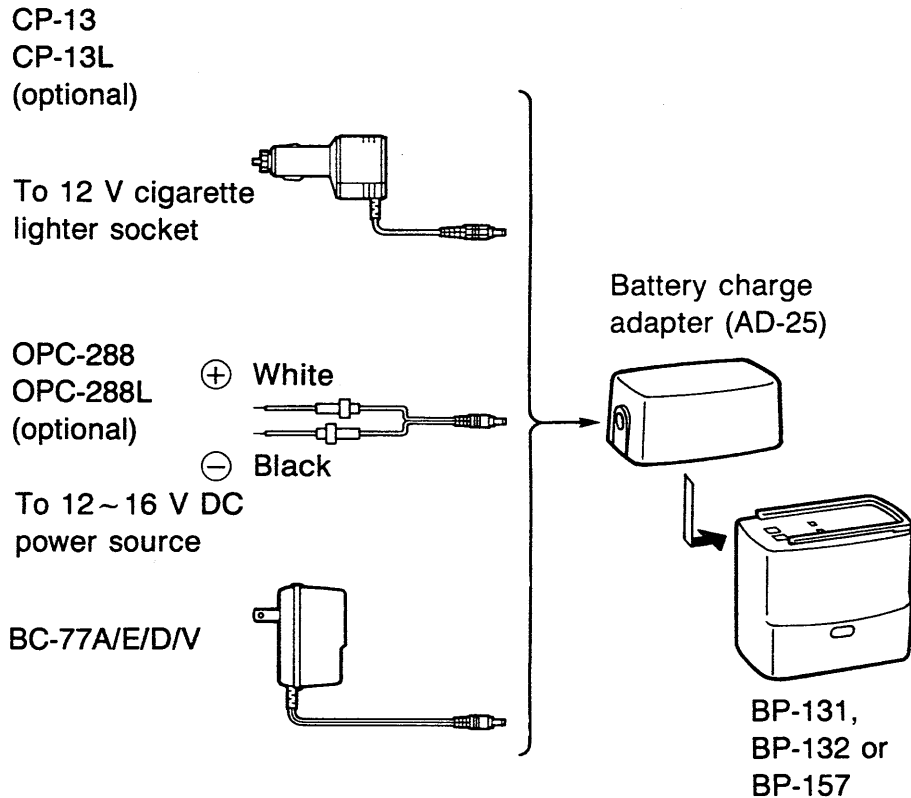
- ① Insert the optional AD-28 BATTERY PACK ADAPTER into the charging slot of the BC-79.
- ② Firmly insert a battery pack into the AD-28.



<b>BATTERY PACK</b>	BP-131, BP-157	BP-132
<b>APPROX. CHARGING PERIOD</b>	1 hr.	1.5 hrs.

## ◇ Charging without transceiver

Attach the optional battery charge adapter (AD-25) to the battery pack; then, connect the CP-13/L or OPC-288/L to the battery charge adapter as shown in the figure below.



## ◇ When the battery pack becomes exhausted:

- Transmitting is interrupted even when the [PTT] switch is continuously pushed.
- The economical low output power is automatically selected by the automatic power down function (p. 12).
- The function display dims.
- The transceiver emits a battery alarm sound.
- The [POWER] switch does not function to turn power OFF.

As you cannot turn the transceiver power OFF when the battery pack becomes exhausted, connect the charger to the [DC12.5V] jack on the transceiver and turn power OFF; then, disconnect the charger.

Finally, remove the battery pack from the transceiver and charge the battery pack.

## ◇ Battery pack life

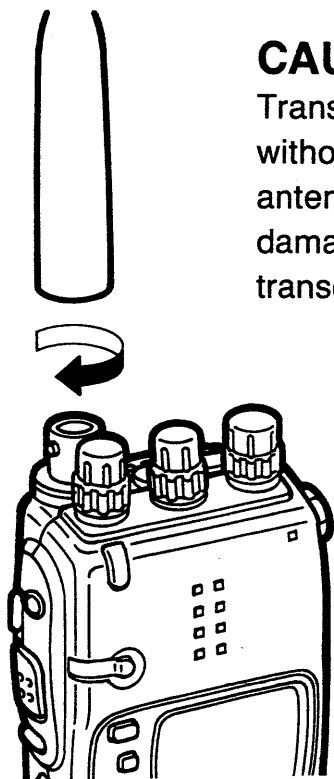
When the operating period becomes extremely short even after charging the battery pack fully, a new battery pack is needed.

BATTERY PACK	BP-131, BP-157	BP-132
APPROX. CHARGING PERIOD	15 hrs.	20 hrs.

## ■ Accessory attachment

### ◇ Antenna

Attach the supplied antenna to the antenna connector.

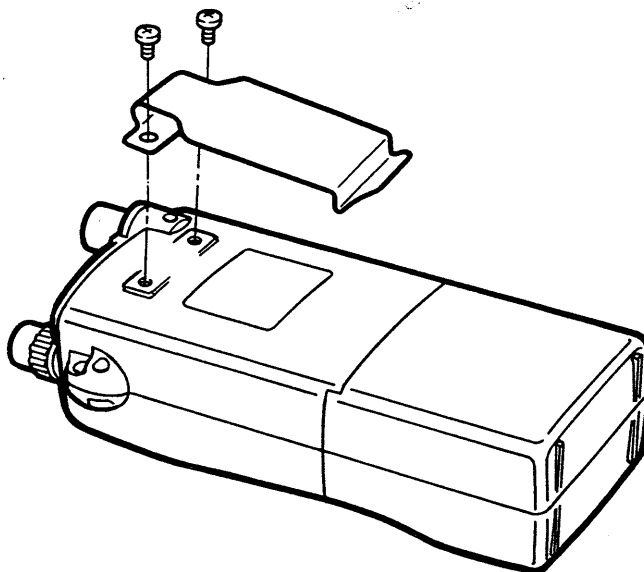


### CAUTION:

Transmitting without the antenna may damage the transceiver.

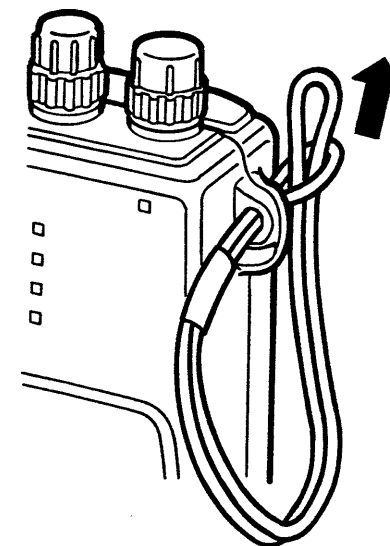
### ◇ Belt clip

Remove the plastic screws, then attach the belt clip with the supplied metal screws. Conveniently attaches to your belt.



### ◇ Handstrap

Install the handstrap as shown in the figure below. Facilitates carrying.



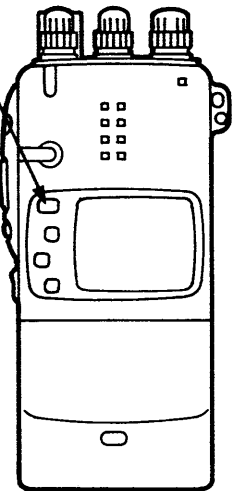
## ■ Main band

The IC-W21A/E is a dual band transceiver and receives VHF and UHF simultaneously. To change frequency or to activate a function, you must designate the band, VHF or UHF, as a main band. All switches and the main dial control only the main band.

The [BAND] switch changes the main band between VHF and UHF.

- “**MAIN**” indicator shows the selected band as the main band.

Band switch



Main band indicator

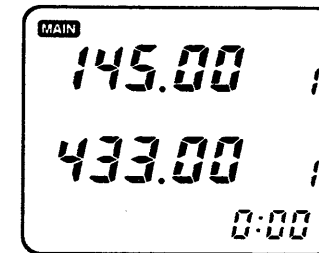


## ◇ VFO and MEMORY mode

This transceiver has 2 normal operating modes: VFO mode and MEMORY mode. You can select VFO mode or MEMORY mode independently on each band.

### VFO mode (for setting a frequency):

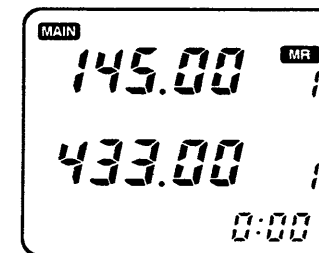
This mode is used for setting a desired frequency within the band range.



“**MR**” is not indicated.

### MEMORY mode:

This mode is used for operation of memory channels which have programmed frequencies. 32 memory channels are available on each band to store 32 different frequencies.



“**MR**” is indicated.

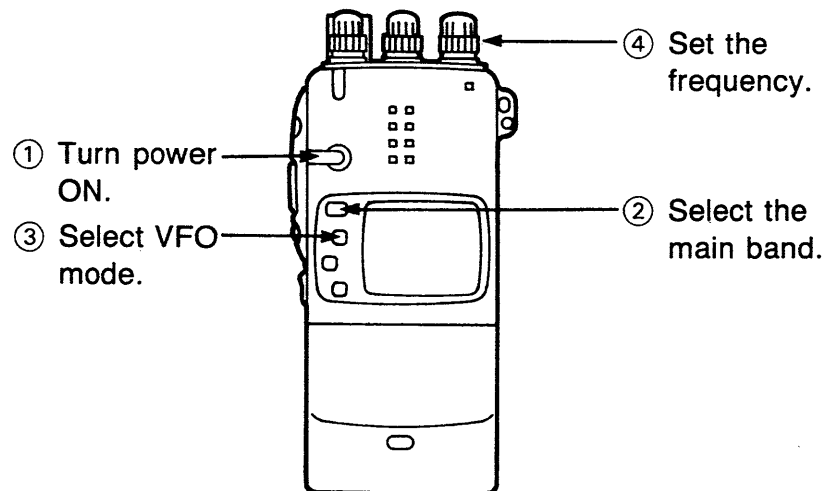
### What is VFO?

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

## 3 OPERATION

### ■ Setting a frequency

- ① Turn power ON.
- ② Select VHF or UHF with the [BAND] switch.
  - “**MAIN**” is indicated above the selected band.
- ③ Select VFO mode if MEMORY mode has been selected.
  - Push [V/M MW] to select VFO mode.
  - See p. 8 for more about VFO mode.
- ④ Rotate the main dial to set the frequency.
  - For quick tuning, rotate the main dial while pushing [FUNC] (“Dial select tuning” described at right).
  - Tuning step can be changed. See p. 10.
  - When “**L**” is indicated instead of the memory channel number, the lock function has been activated and a frequency cannot be set. To cancel the lock function, push [FUNC] + [LIGHT]. (While pushing [FUNC], push [LIGHT].) (p. 10)



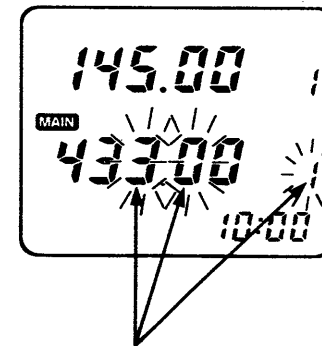
### ◇ Dial select tuning

In VFO mode, [FUNC] + [DIAL] changes the frequency in 100 kHz steps or 1 MHz steps, or the memory channel number.

- 10 MHz step may be available depending on the version.

This function is useful for quick tuning or memory channel selection in VFO mode such as when programming 2 or more memory channels. A dial select tuning step can be set in each band.

- ① Select VHF or UHF with [BAND].
- ② Select VFO mode if MEMORY mode has been selected.
- ③ While pushing [FUNC], push [MONI] one or more times.
  - The selected digit (100 kHz or 1 MHz) or memory channel number blinks.
- ④ While pushing [FUNC], rotate [DIAL] to change the frequency or memory channel using the dial select tuning.



Selected digit (1 MHz or 100 kHz) or memory channel number blinks.

◇ **Tuning step selection**

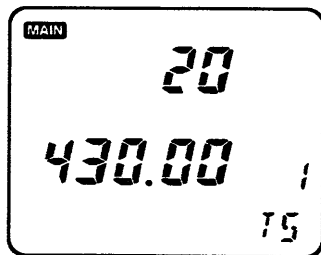
A desired tuning step can be selected for each band. This transceiver has 8 tuning steps as follows:

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

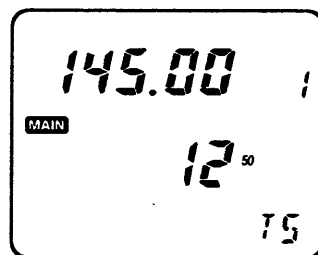
- ① Select VHF or UHF with [BAND].
- ② Select VFO mode if MEMORY mode has been selected.
- ③ Push [FUNC] + [H/L/TS] to enter the tuning step setting condition.
  - Previously selected tuning step appears.
- ④ Rotate the main dial to select the desired tuning step.
- ⑤ Push [H/L/TS] to set the selected tuning step.

**NOTE:** For convenience, select a tuning step that matches the frequency intervals of repeaters in your area.

[DISPLAY EXAMPLE]



20 kHz tuning step in VHF

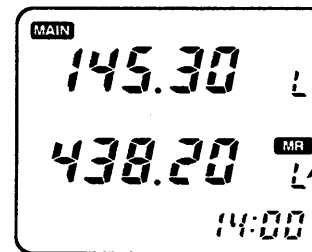


12.5 kHz tuning step in UHF

◇ **Lock function**

The lock function prevents accidental frequency changes, and accidental function activation.

- ① Push [FUNC] + [LIGHT] to turn the function ON.
  - Two “L”’s appear instead of the memory channel number.
- ② To turn the function OFF, repeat step ① above.
  - Two “L”’s disappear.



Two “L”’s appear to show the lock function is activated.

**NOTE:** Output power can be selected between high and one of low powers even if the lock function is in use.

◇ **LCD lighting**

For easy viewing at nighttime, the transceiver has an LCD lighting function with a 5 sec. timer.

- ① Push [LIGHT] to turn the lighting ON.
- ② The lighting will automatically turn OFF when no switches or dial have been operated for 5 sec.
- ③ To turn OFF the lighting manually, push [LIGHT] again.

## 3 OPERATION

### ■ Receiving

- ① Turn power ON.
- ② Set the VHF audio level.
  - Rotate VHF [SQL] maximum counterclockwise.
  - Rotate VHF [VOL] to adjust the desired audio output level.
  - Rotate VHF [SQL] clockwise until noise is muted.
- ③ Set the UHF audio level.
  - Rotate UHF [SQL] maximum counterclockwise.
  - Rotate UHF [VOL] to adjust the desired audio output level.
  - Rotate UHF [SQL] clockwise until noise is muted.
- ④ Set the VHF and UHF frequencies with [BAND] and [DIAL].  
(p. 9)

#### When a signal is received:

- The TX/RX indicator lights up in green.
- Squelch opens and audio is emitted from the speaker.
- The receiving band's S/R/F indicator shows the relative signal strength.

**NOTE 1:** When a [SQL] control is set too "tight" (extremely clockwise), squelch may not open for weak signals. To receive weak signals, set the squelch to a "loose" (less clockwise) position or use the monitor function.

**NOTE 2:** The IC-W21A/E receives in the sub band even when transmitting in the main band. However, the receiver's sensitivity becomes lower during transmission.

### ◇ Monitor function

This function is used to listen to weak signals without disturbing the squelch setting.

When receiving a signal that is too weak to open the squelch completely, push and hold [MONI].

- This function is available only to the main band.
- While duplex is ON for repeater operation, the transmitting frequency can be monitored with [MONI].

### ◇ Single band function

This function turns the sub band circuit OFF and allows the transceiver to be used as a mono band transceiver. This function is useful to conserve battery power.

- ① Push [FUNC] + [BAND] to turn the sub band OFF.
  - The sub band frequency, etc. disappears.
  - The operating band can be changed with [BAND].
- ② To turn the sub band ON again, repeat step ① above.
  - The sub band frequency, etc. appears.

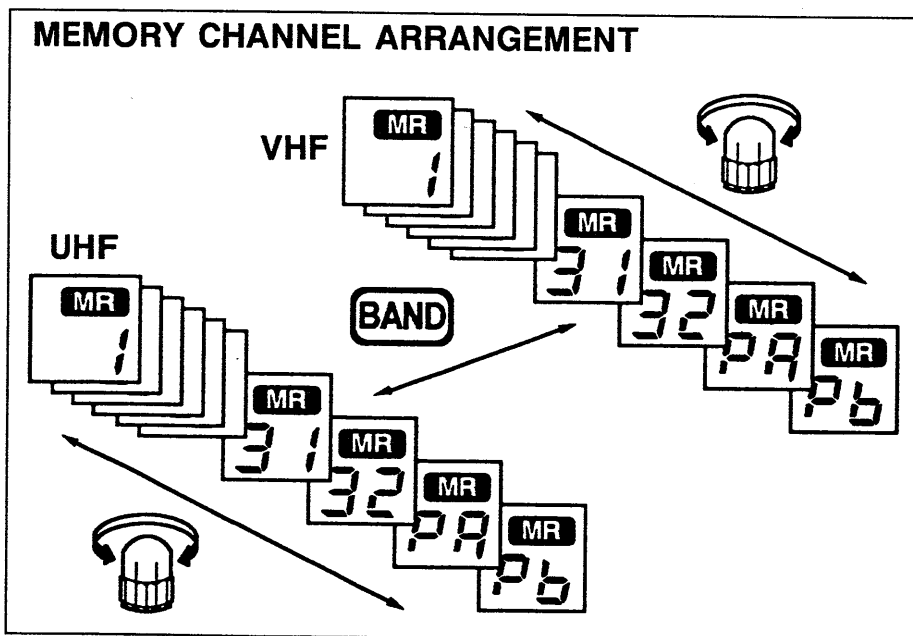




## ■ Selecting a memory channel

In each band, 32 memory channels are available to store your desired frequencies. In addition, the transceiver has 2 scan edge channels, "PA" and "PB," for storing scan edge frequencies in each band.

- ① Select VHF or UHF with [BAND].
- ② Push [V/M MW] to select MEMORY mode.
  - "MR" appears.
- ③ Rotate [DIAL] to select the desired memory channel.
- ④ Push [V/M MW] to return to VFO mode.
  - "MR" disappears.



## ■ Programming a frequency into a memory channel

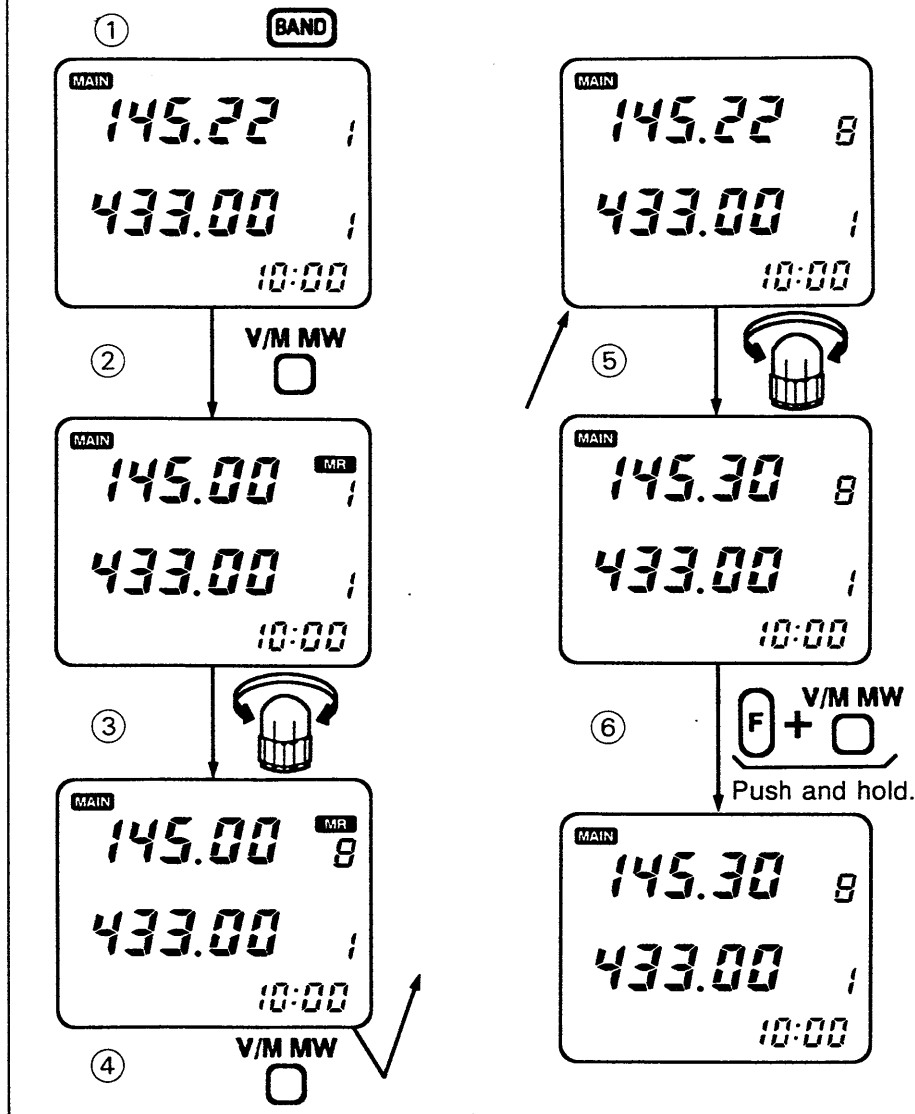
- ① Select VHF or UHF with [BAND].
- ② Push [V/M MW] to select MEMORY mode.
  - "MR" appears.
- ③ Rotate [DIAL] to select the memory channel to be programmed.
  - To select a memory channel which has not been programmed, rotate the main dial while pushing [FUNC].
- ④ Push [V/M MW] to return to VFO mode.
- ⑤ Set the desired frequency to be programmed with [DIAL].
- ⑥ Push and hold [FUNC] + [V/M MW] for 1 sec.
  - 3 beeps may sound to indicate programming completion.
- ⑦ Push [V/M MW] to select MEMORY mode and confirm the programmed frequency.

### MEMORY CHANNEL CONTENTS

- Operating frequency.
- Simplex, -duplex ON or +duplex ON, and offset frequency.
- Subaudible tone encoder ON/OFF or tone squelch ON/OFF, and tone frequency.
  - See p. 23 for setting the offset and tone frequencies.

**NOTE:** Scan edge frequencies can be programmed into the scan edge channels PA and PB in the same way as for memory channel programming.

[EXAMPLE]: Programming 145.30 MHz into the VHF memory channel 8.

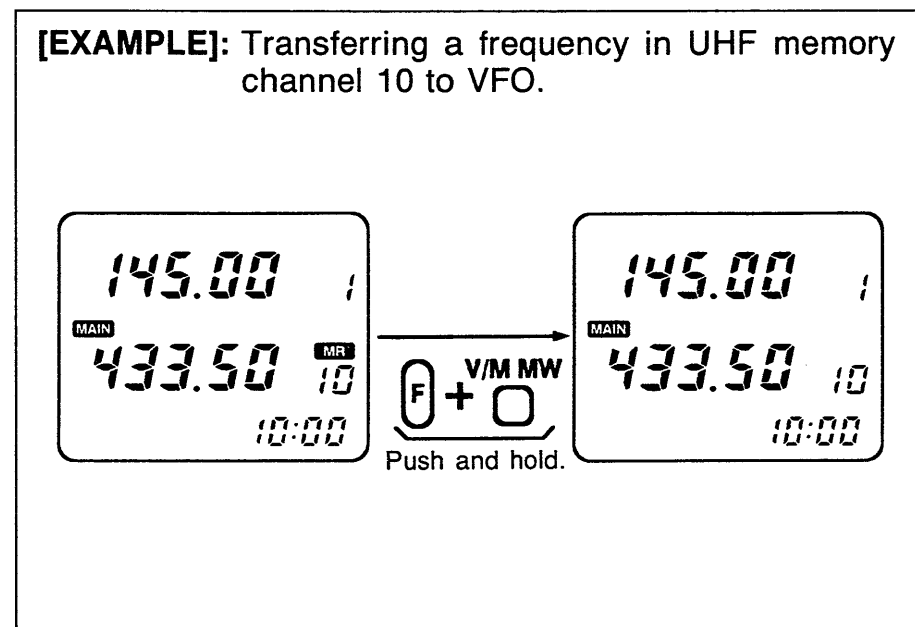


## Transferring a programmed frequency to VFO

A programmed frequency can be transferred to VFO.

- ① Select VHF or UHF with [BAND].
- ② Push [V/M MW] to select MEMORY mode.
  - “MR” appears.
- ③ Rotate [DIAL] to select the memory channel to be transferred.
- ④ Push and hold [FUNC] + [V/M MW] for 1 sec.
  - 3 beeps may sound to indicate transfer completion.
  - VFO mode is automatically selected.

[EXAMPLE]: Transferring a frequency in UHF memory channel 10 to VFO.



## ■ Calling up a call channel

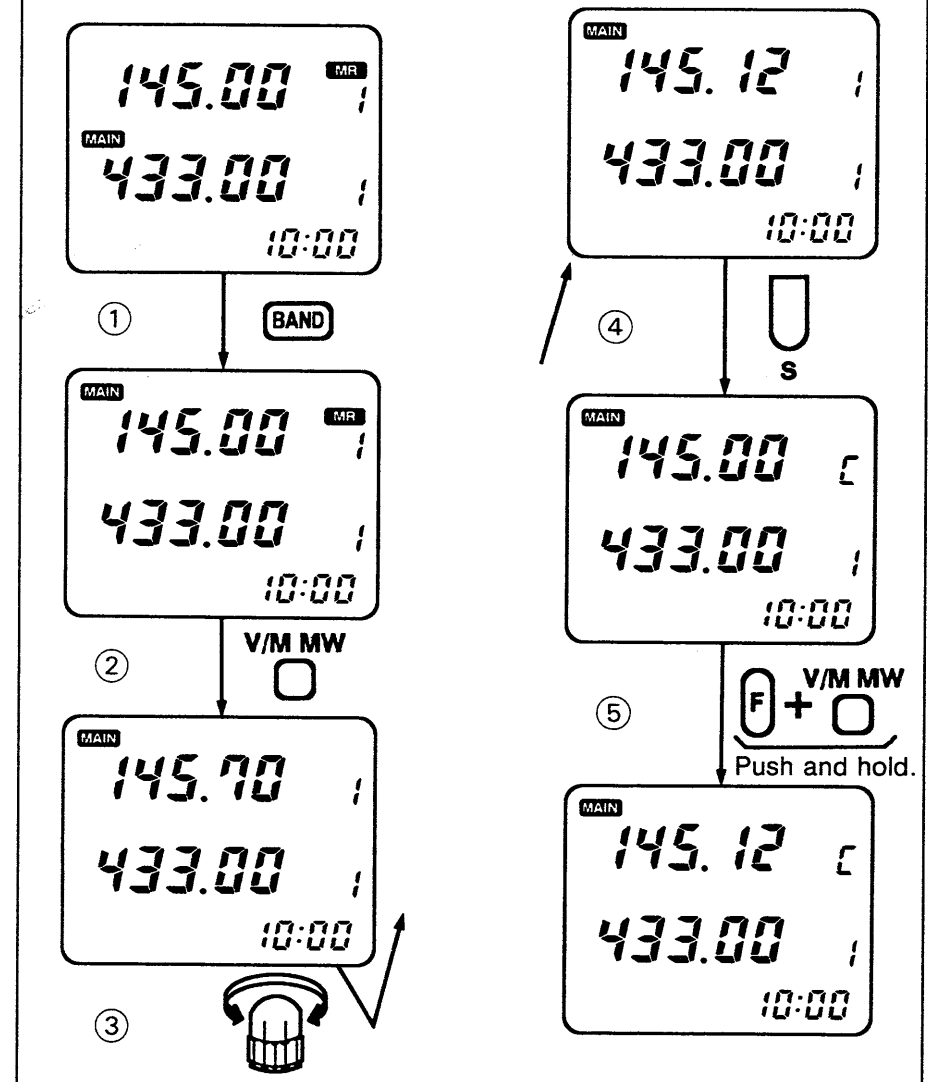
Each band has an independent call channel to store a most-often-used frequency for quick recall.

- ① Select VHF or UHF with [BAND].
- ② Push [S] momentarily to call up the call channel.
  - “ [ ” appears instead of the memory channel number.
- ③ To return to the normal operating mode (VFO or MEMORY), push [S] again momentarily.

## ■ Programming a call channel

- ① Select VHF or UHF with [BAND].
- ② Select VFO mode if MEMORY mode has been selected.
- ③ Set the frequency to be programmed into the call channel.
- ④ Push [S] momentarily to call up the call channel.
  - “ [ ” appears instead of the memory channel number.
- ⑤ Push and hold [FUNC] + [V/M MW] for 1 sec.
  - 3 beeps may sound to indicate programming completion.
- ⑥ To return to the normal operating mode (VFO or MEMORY), push [S] momentarily.

[EXAMPLE]: Programming 145.12 MHz into the VHF call channel.

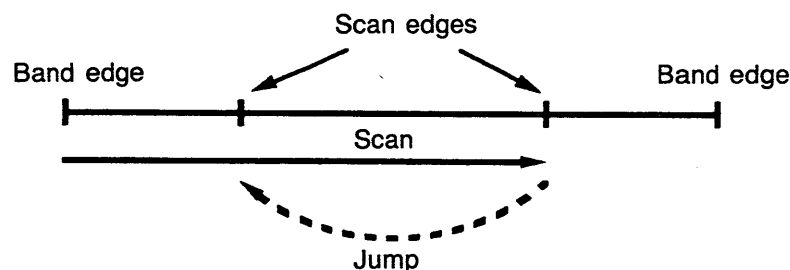


## ■ Scan types

Scan is convenient for searching used frequencies and for finding new signals. 2 scan types are available for your convenience and scans on both bands can be operated separately or simultaneously.

### ◇ Programmed scan

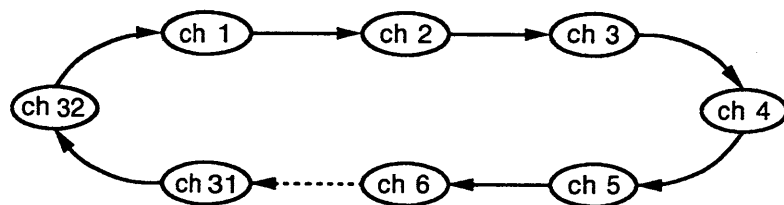
Repeatedly scans all frequencies between 2 specified frequencies. This scan is convenient to search signals in a specific range such as the repeater band.



### ◇ Memory scan

Repeatedly scans memory channels 1~32 sequentially. This scan searches desired frequencies only.

- The scan receives only programmed memory channels.

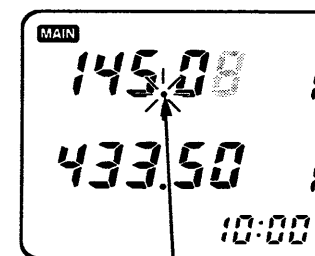


## ■ Programmed scan

Scan edge frequencies should be programmed into the scan edge channels "PA" and "PB" in advance. (p. 13)

- ① Select VHF or UHF with [BAND].
- ② Select VFO mode with [V/M MW] if MEMORY mode has been selected on the selected band.
- ③ Set the selected band's [SQL] to the point where noise is muted.
- ④ Push and hold [S] for 1 sec. to start the scan.
  - To change the scanning direction, rotate [DIAL].
- ⑤ To stop the scan, push [S] momentarily.

### [DISPLAY EXAMPLE DURING PROGRAMMED SCAN]



The decimal point blinks.

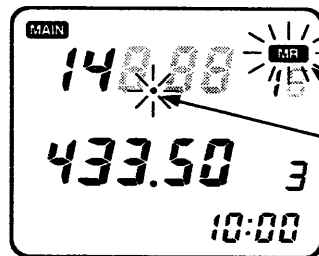
### ■ Memory scan

Scanning frequencies should be programmed into memory channels in advance. (p. 13)

- ① Select VHF or UHF with [BAND].
- ② Select MEMORY mode with [V/M MW] if VFO mode has been selected on the selected band.
- ③ Set the selected band's [SQL] to the point where noise is muted.
- ④ Push and hold [S] for 1 sec. to start the scan.
  - To change the scanning direction, rotate [DIAL].
- ⑤ To stop the scan, push [S] momentarily.

**NOTE:** Memory channels which have not been programmed are skipped during memory scan.

#### [DISPLAY EXAMPLE DURING MEMORY SCAN]



The decimal point and "MR" blink.

#### ◇ When the scan detects a signal:

- Scan pauses on the frequency for 10 sec. and then resumes.
- If the signal disappears while pausing, scan resumes 2 sec. after the signal disappears.
- To resume the scan manually, rotate [DIAL].
- During programmed scan, the detected frequency can be programmed into the displayed memory channel by [FUNC] + [V/M MW].

#### ◇ If the scan does not start:

To start a scan, pushing the [S] switch for 1 sec. is necessary. If you only push the [S] switch momentarily, the call channel is selected and the scan cannot be started. In this case, push [S] momentarily again to return to VFO or MEMORY mode and then, push and hold [S] to start the scan. (Refer to p. 15 for the call channel details.)

## ■ Clock indication

The transceiver has an internal 24-hour system clock which is indicated in the function display.

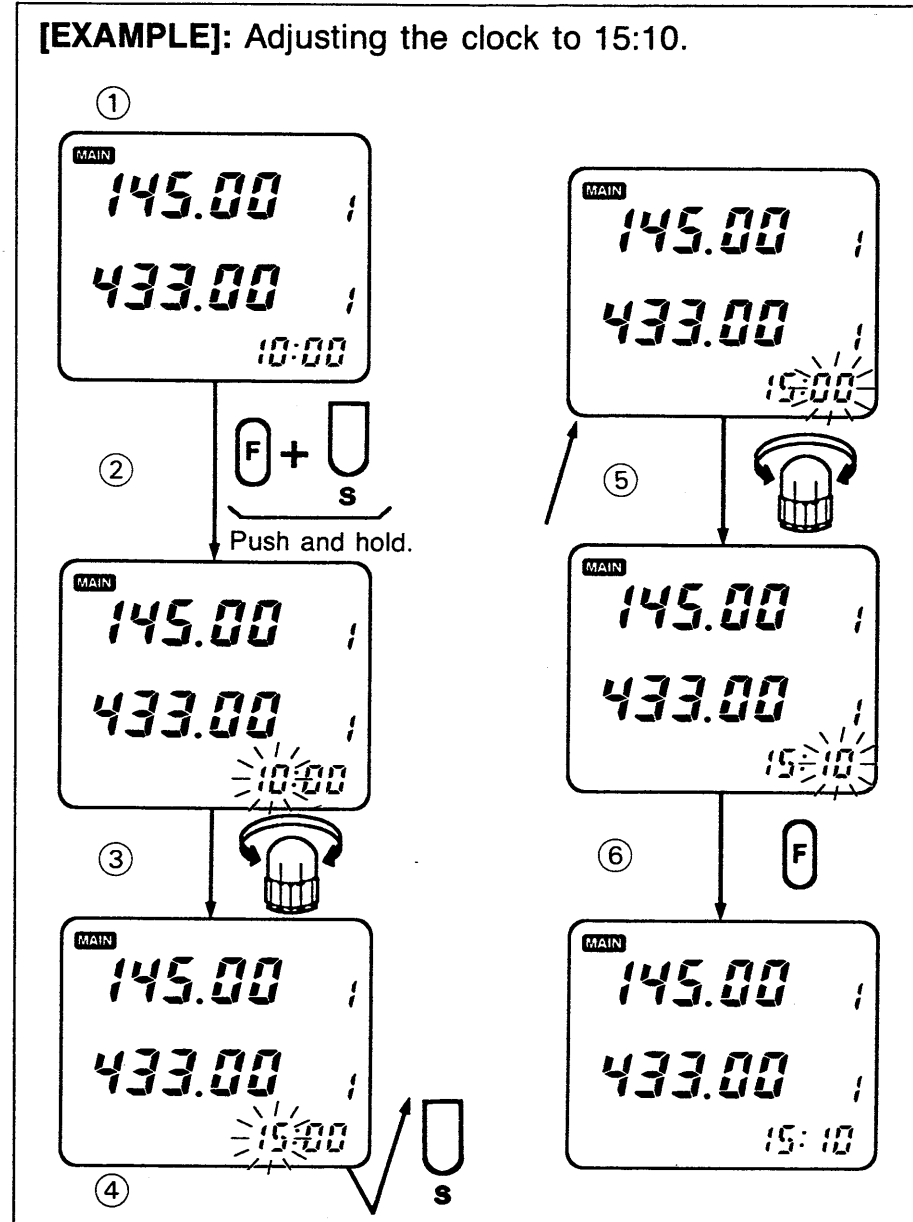
If the battery voltage indicator is indicated on the function display, push [FUNC] + [S] momentarily to indicate the clock.

To return to the battery capacity indication, push [FUNC] + [S] again momentarily.

### ◇ Adjusting the clock

When the clock loses or gains time, clock adjustment should be performed.

- ① Indicate the clock as described above.
- ② While pushing [FUNC], push and hold [S] for 1 sec.
  - 3 beeps may sound to indicate that the clock setting condition has been entered.
  - The hour digits blink.
- ③ Rotate [DIAL] to set the hour.
- ④ Push [S].
  - The minute digits blink.
- ⑤ Rotate [DIAL] to set the minutes.
- ⑥ Push [FUNC] to set the clock.
  - The time is now programmed and starts from 0 sec.



## 7 OTHER FUNCTIONS

### ■ Battery voltage indication

The transceiver has a battery capacity indicator that indicates the connected battery voltage as a %.

**NOTE:** This indicator is designed to show dry cell battery consumption in the BP-130\* BATTERY CASE. When using the BP-131, BP-132 or BP-157, voltage is indicated; however, it is not useful. This is because once the voltage goes down, it will decrease rapidly as a result of the NiCd battery characteristics.

\*Optional for versions which include the BP-157.

### ◇ Display the battery voltage indicator

Push [FUNC] + [S] momentarily if the clock is indicated in the function display.

The indicator shows the current voltage.

- "B 100" means the same voltage as the starting voltage.
- "B 80" means the voltage is at 80% of the starting voltage.

To return to the clock indication, push [FUNC] + [S] again momentarily.

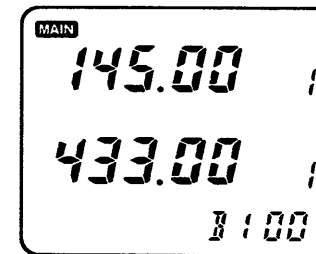
**NOTE:** This indicator shows the battery voltage and therefore never shows "B 0" (0%). When the indicator shows "B 60" ~ "B 50," the dry cell batteries in the BP-130 cannot activate the transmitter circuitry.

### ◇ Resetting the indicator

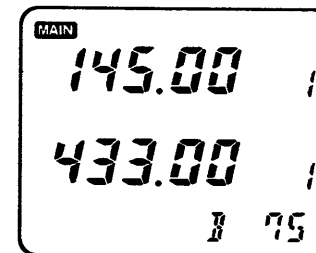
When placing new dry cell batteries in the battery case, the indicator should be reset.

- ① Display the battery capacity indicator as described at left.
- ② Push and hold [FUNC] + [S] for 1 sec.
  - 3 beeps may sound to indicate resetting completion.
  - The indicator shows "B 100" (100% voltage).

### [BATTERY VOLTAGE INDICATION EXAMPLE]



Shows the voltage is at 100%.




Shows the voltage is at 75%.



## ■ Optional whisper function

The whisper function provides crossband full duplex communication, like a telephone, using a sub microphone on the battery pack, BP-131 or BP-132.

**NOTE:** The whisper function can be activated, but your voice is not transmitted when the BP-130 or BP-157 is attached.

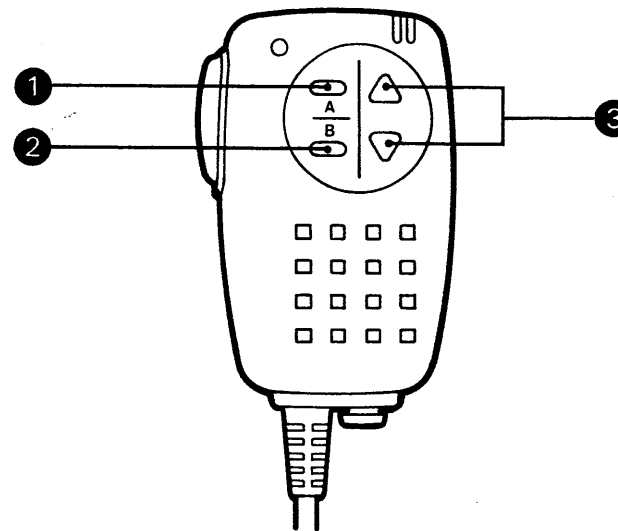
- ① Set the main band frequency as a transmit frequency.
- ② Set the sub band frequency as a receive frequency.
- ③ Push [FUNC] + [RPT/WSPR] to activate the function.
  - “” appears.
  - The transceiver automatically starts transmitting without pushing [PTT] and the TX indicator lights up in red.
- ④ Hold the transceiver as you would a telephone handset, then, speak into the microphone on the battery pack.
  - Received signals are emitted from the speaker.
  - 5 min. after the whisper function starts, the transceiver automatically returns to the normal operating mode (VFO or MEMORY) by the time-out timer.
  - The main dial and switches cannot be used.
- ⑤ To cancel the function manually, push [RPT/WSPR].

### THE TIME-OUT TIMER

To prevent continuous transmission with the whisper function, the transceiver has a time-out timer. The timer turns the whisper function OFF 5 min. after the function starts.

## ■ Optional HM-75 operation

When using an optional HM-75 SPEAKER-MICROPHONE WITH REMOTE CONTROL FUNCTION with the IC-W21A/E, the switches on the HM-75 function as follows:



- ① **A SWITCH**  
Changes the main band between VHF and UHF.
- ② **B SWITCH**  
Changes mode between VFO and MEMORY.
- ③ **Δ/▽ SWITCHES**
  - Changes the frequency in the selected tuning steps in VFO mode.
  - Changes memory channel in MEMORY mode.
  - Starts scan when pushed for 1 sec.

## ■ EASY mode and MULTI-FUNCTION mode

This transceiver has an EASY mode and a MULTI-FUNCTION mode. To use a repeater, you may have to enter the MULTI-FUNCTION mode.

This instruction manual only covers EASY mode operations plus the offset frequency and subaudible tone frequency settings of MULTI-FUNCTION mode. For MULTI-FUNCTION mode details, see the separate "Tech Talk."

MODE	ACCESSIBLE FUNCTIONS FOR REPEATERS
EASY	<ul style="list-style-type: none"> <li>- Duplex ON/OFF.</li> <li>- Subaudible tone ON/OFF.*</li> <li>- 1750 Hz tone call. (IC-W21E only)</li> <li>- Repeater memory.</li> </ul>
MULTI-FUNCTION	<ul style="list-style-type: none"> <li>- All accessible functions in the EASY mode.</li> <li>- Offset frequency setting.</li> <li>- Subaudible tone frequency setting.*</li> <li>- DTMF memories.</li> </ul>

\*An optional UT-63 TONE SQUELCH UNIT is necessary except for the U.S.A. version.

## ■ Basic repeater use

In the EASY mode, you can turn duplex and subaudible tone encoder ON. If the following default values match the repeater condition, you can access the repeater in the EASY mode without entering the MULTI-FUNCTION mode.

- Offset frequency : 0.6 MHz (for VHF)  
5 MHz (for IC-W21A UHF)  
7.6 MHz (for IC-W21E UHF)  
(Depending on the version, offset frequency may vary.)
- Subaudible tone frequency : 88.5 Hz  
(U.S.A. version only. The UT-63 is necessary for other versions.)

- ① Select VHF or UHF to be used for the repeater.
- ② Set the repeater output frequency with [DIAL] in VFO mode.
  - MEMORY mode can also be used.
- ③ Push [RPT/WSPR] several times to turn duplex ON and set the duplex direction.
  - "– DUP" or "DUP" appears to indicate the transmit frequency for minus shift or plus shift, respectively.
  - When the UT-63 TONE SQUELCH UNIT is installed, "T" appears along with "DUP" or "– DUP." "T" indicates the subaudible tone encoder is ON.

- ④ Push and hold [PTT] to access the repeater; then, speak into the microphone.
  - The frequency readout shows the transmit frequency (repeater input frequency).
  - When a 1750 Hz tone is necessary to access a European repeater, push and hold [PTT], then push [RPT/WSPR] for one second before speaking to generate the 1750 Hz tone. The IC-W21E has 1750 Hz tone capability.
  - When a DTMF tone is necessary to access a repeater, use the DTMF keypad on the optional HM-55/A DTMF SPEAKER-MICROPHONE.  
This transceiver includes a DTMF encoder/decoder and 4 DTMF memory channels in each band for storing DTMF codes. See "Tech Talk" to use the DTMF memory.
- ⑤ Release [PTT] to return to receive.
- ⑥ To turn OFF duplex (and the subaudible tone encoder), push [RPT/WSPR] several times until "DUP" disappears.

Push and hold [MONI] to check whether the other station's signal on the repeater input frequency can be directly received or not.

**NOTE:** To install an optional UT-63 TONE SQUELCH UNIT, see the separate "Tech Talk."

## ■ Repeater memory

This transceiver has a repeater memory in each band to store repeater information separately from regular memory channels and the call channel.

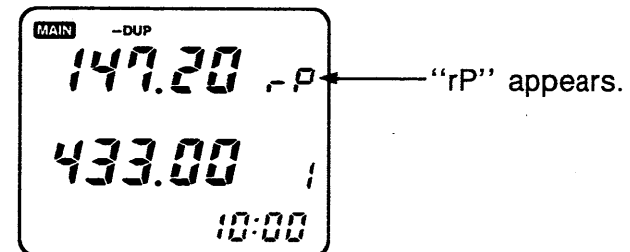
When transmitting with duplex ON, the following information is automatically programmed into the repeater memory.

- Repeater output frequency (your receiving frequency).
- "- DUP" or "DUP" setting and offset frequency.
- "T" setting and subaudible tone frequency (when used).

After you operate the transceiver in simplex, you can easily call up the repeater memory.

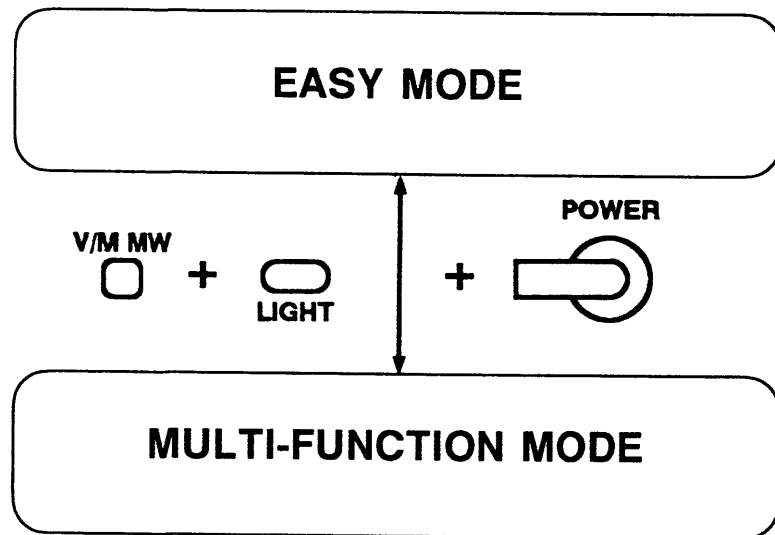
- ① Push and hold [RPT/WSPR] for 1 sec. to call up the repeater memory.
  - Programmed repeater information and "rP" appear.
- ② To return to the normal operating mode (VFO or MEMORY), push [RPT/WSPR] momentarily.

### [REPEATER MEMORY]



### ■ Entering the MULTI-FUNCTION mode

The offset frequency or subaudible tone frequency can be set only in the MULTI-FUNCTION mode. Only the offset frequency and subaudible tone frequency settings of MULTI-FUNCTION mode are covered in this manual.

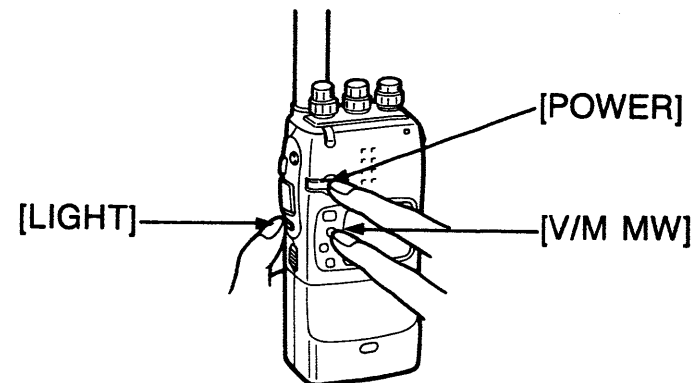


If you program repeater information, including offset frequencies and subaudible tone frequencies, into memory channels in the MULTI-FUNCTION mode, this information can also be used in the EASY mode.

### ◇ Entering the MULTI-FUNCTION mode

To enter the MULTI-FUNCTION mode, a special operation is required at power ON.

- ① Push and hold [POWER] to turn power OFF.
- ② While pushing [V/M MW] and [LIGHT], push and hold [POWER] to turn power ON.
  - The MULTI-FUNCTION mode is now selected.



- ③ To confirm that the MULTI-FUNCTION mode is selected, push and hold [S].
  - When the MULTI-FUNCTION mode has been selected, the displayed time or "BATT" blinks.
  - If the MULTI-FUNCTION mode has not been selected, scan starts. In this case, push [S] momentarily to stop the scan; then, repeat from step ① above.

To return to the EASY mode, repeat steps ① and ②.

## ■ Setting an offset frequency

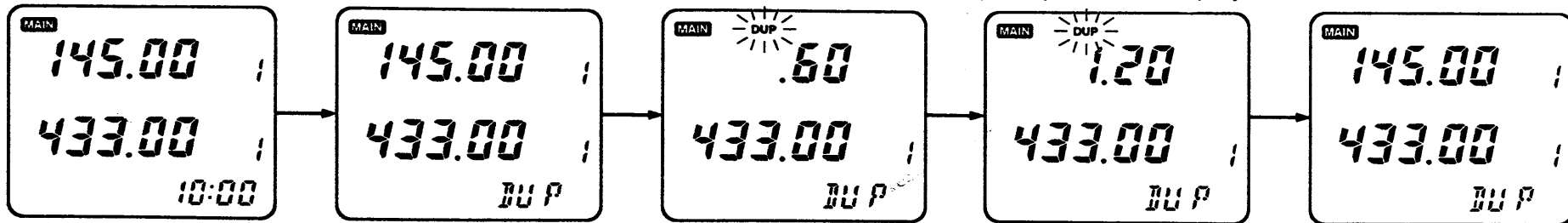
- ① Select the desired band with [BAND].
- ② Select VFO mode.

③ While pushing [S], rotate [DIAL] to select "DUP."

④ Push [FUNC] + [S].

⑤ Rotate the dial to select the desired offset frequency.

⑥ Push [S] to return to the frequency display.



"DUP" appears.

Previously selected offset frequency appears.

Use [FUNC] + [DIAL] for quick freq. changing.

## ■ Setting a subaudible tone frequency

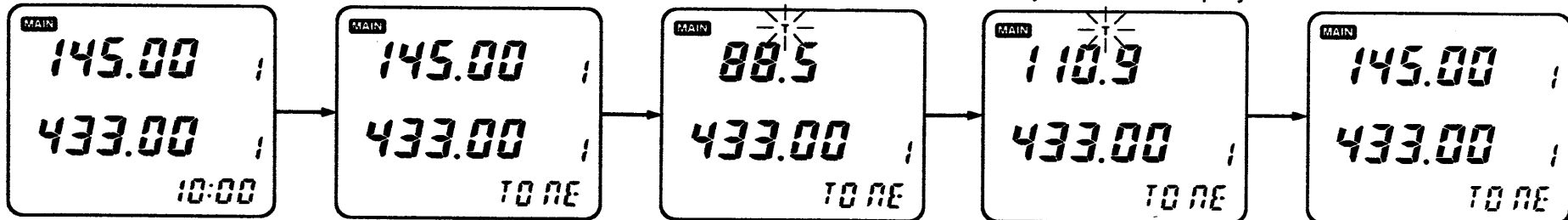
- ① Select the desired band with [BAND].
- ② Select VFO mode.

③ While pushing [S], rotate [DIAL] to select "TONE."

④ Push [FUNC] + [S].

⑤ Rotate the dial to select the desired tone frequency.

⑥ Push [S] to return to the frequency display.



"TONE" appears.

Previously selected tone frequency appears.

The example above shows the 110.9 Hz tone.

# 9

# TROUBLESHOOTING

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. 5, 6</p> <p>—</p>
<ul style="list-style-type: none"> <li>Power cannot be turned OFF.</li> </ul>	<ul style="list-style-type: none"> <li>The battery became exhausted during operation.</li> </ul>	<ul style="list-style-type: none"> <li>Charge the battery pack or place new dry cell batteries in the battery case, then, turn the power OFF.</li> </ul>	<p>pgs. 5, 6</p>
<ul style="list-style-type: none"> <li>No sound comes from the speaker.</li> </ul>	<ul style="list-style-type: none"> <li>[SQL] is turned too far clockwise.</li> <li>An external speaker or earphone is connected.</li> </ul>	<ul style="list-style-type: none"> <li>Rotate [SQL] counterclockwise.</li> <li>Unplug the speaker or earphone.</li> </ul>	<p>p. 11</p> <p>—</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> </ul>	<ul style="list-style-type: none"> <li>Charge the battery pack or place new dry cell batteries in the battery case.</li> </ul>	<p>pgs. 5, 6</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>The lock function is activated.</li> </ul>	<ul style="list-style-type: none"> <li>Push [V/M MW] to select VFO mode.</li> <li>Push [FUNC] + [LIGHT] to deactivate the lock function.</li> </ul>	<p>p. 9</p> <p>p. 10</p>
<ul style="list-style-type: none"> <li>Scan cannot be activated.</li> </ul>	<ul style="list-style-type: none"> <li>The squelch is open.</li> </ul>	<ul style="list-style-type: none"> <li>Rotate the [SQL] control clockwise until noise disappears.</li> </ul>	<p>p. 13</p>
<ul style="list-style-type: none"> <li>The contents of the memories are erased.</li> </ul>	<ul style="list-style-type: none"> <li>The internal memory backup battery is exhausted because no charging has been performed for a long time.</li> </ul>	<ul style="list-style-type: none"> <li>Charge the battery pack or place new dry cell batteries in the battery case. The memory backup battery is simultaneously charged.</li> </ul>	<p>pgs. 5, 6</p>

# SPECIFICATIONS 10

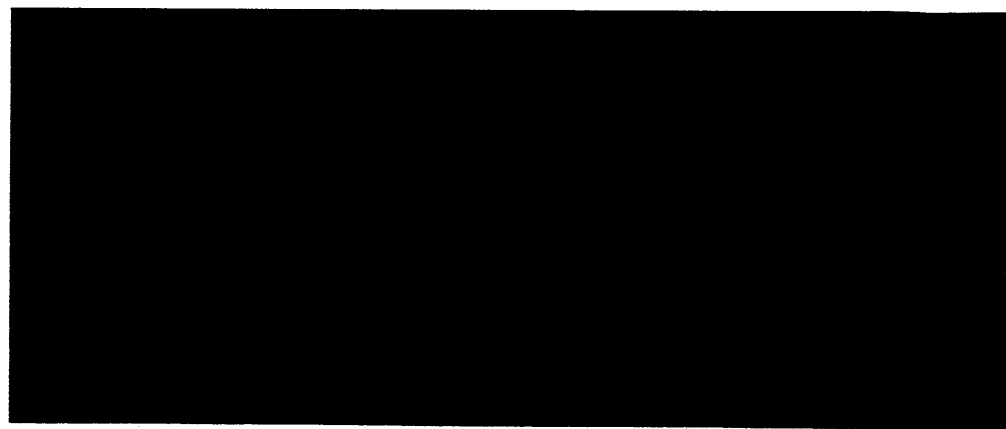
			VHF	UHF
Frequency coverage (Guaranteed range of VHF is 144 ~ 148 MHz)	U.S.A.		Tx: 144 ~ 148 MHz Rx: 138 ~ 174 MHz	440 ~ 450 MHz
	Asia		Tx: 144 ~ 148 MHz Rx: 138 ~ 174 MHz	430 ~ 440 MHz
	Australia		144 ~ 148 MHz	430 ~ 440 MHz
	Europe, U.K.		144 ~ 146 MHz	430 ~ 440 MHz
	Italy		Tx: 144 ~ 148 MHz Rx: 138 ~ 174 MHz	430 ~ 440 MHz
Mode			FM (F3E)	
Frequency stability			± 5 ppm (0°C ~ +50°C; +32°F ~ +122°F)	
Tuning steps			5, 10, 12.5, 15, 20, 25, 30 or 50 kHz	
Antenna impedance			50 Ω (nominal)	
Usable battery pack/case			BP-130 ~ BP-132	
External DC power			6 ~ 16 V DC (negative ground)	
Current drain (typical)	Tx (at 13.5 V)	High	1.4 A	1.5 A
		Low 1	500 mA	600 mA
	Rx (at 12.5 V)	Rated audio	150 mA	150 mA
		Power saved	15 mA (average)	15 mA (average)
	2 bands Rx (at 12.5 V)	Rated audio	200 mA	
Power saved		30 mA (average)		
Usable temperature range			-10°C ~ +60°C; +14°F ~ +140°F	
Dimensions (with BP-157) (projections not included)			57(W) × 125(H) × 35(D) mm; 2.2(W) × 4.9(H) × 1.4(D) in	
Weight (with BP-157)			390 g; 13.8 oz	

		VHF	UHF	
TRANSMITTER	Output power* (at 13.5 V)	5 W, 3.5 W, 1.5 W, 500 mW, 15 mW (selectable)		
	Modulation system	Variable reactance frequency modulation		
	Max. freq. deviation*	± 5 kHz		
	Spurious emissions*	Less than -60 dB		
	Microphone impedance	2 kΩ		
RECEIVER	Receive system	Double-conversion superheterodyne		
	Intermediate frequencies	1st	43.1 MHz	35.8 MHz
		2nd	455 kHz	
	Sensitivity* (for 12 dB SINAD)	Less than 0.16 μV		
	Squelch sensitivity	Less than 0.13 μV (at threshold)		
	Selectivity	More than 15 kHz/-6 dB Less than 30 kHz/-60 dB		
	Spurious and image rejection ratio*	More than 60 dB (More than 45 dB at IF/2)		
	Audio output power* (at 12.5 V)	More than 200 mW (at 10% distortion with an 8 Ω load)		
	Audio output impedance	8 Ω		

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

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

**Count on us!**



A-5221S-1EX-①  
Printed in Japan  
Copyright © 1992 by Icom Inc.

**Icom Inc.**  
6-9-16, Kamihigashi, Hirano-ku, Osaka 547, Japan

---