

ICOM

TECH TALK

Upgraded functions

IC-4SA/SE
IC-2SA/SE

Radio mods manuals
KB2LJJ

MULTI-FUNCTIONS

Welcome to MULTI-FUNCTION mode! Icom's revolutionary ultra-small IC-2SA/SE and IC-4SA/SE handhelds are small, light, and easy to operate, yet contain sophisticated high-tech features normally only found in bigger transceivers. MULTI-FUNCTION mode allows you those "big-sized" features in incredibly small transceivers. Use special initialized settings available with MULTI-FUNCTION mode to fit your specific operating requirements.

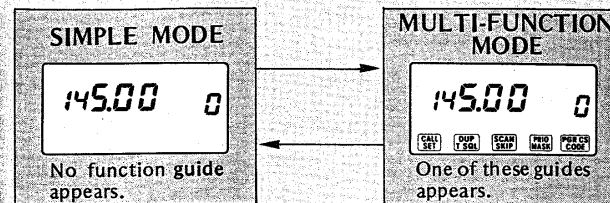
Three kinds of operation can be used with the handheld:

- (1) SIMPLE mode operation.
- (2) MULTI-FUNCTION mode operation.
- (3) Setting MULTI-FUNCTION mode and operating with SIMPLE mode. In this way you can use a specially set handheld with simple operation.

"Tech Talk" will give you information about the IC-2SA/SE or IC-4SA/SE in MULTI-FUNCTION mode. When the transceiver is set in SIMPLE mode, the transceiver does not function as described in this sheet.

SIMPLE & MULTI

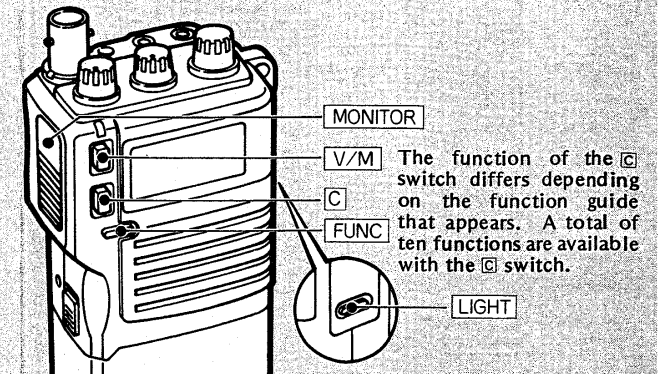
While pushing [LIGHT] and [C], turn power ON to enter MULTI-FUNCTION mode.



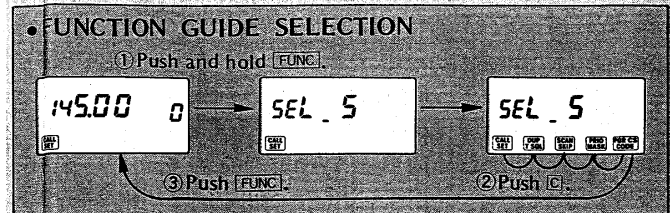
While pushing [LIGHT] and [V/M], turn power ON to return to SIMPLE mode.

When the handheld is used by another person, it should be set in SIMPLE mode as above. Once the handheld is set in MULTI-FUNCTION mode, it remains in the mode even if you reset it ([LIGHT] + [MONITOR] + Power ON).

SO MANY FUNCTIONS



The function of the [C] switch differs depending on the function guide that appears. A total of ten functions are available with the [C] switch.



[C] SWITCH FUNCTION

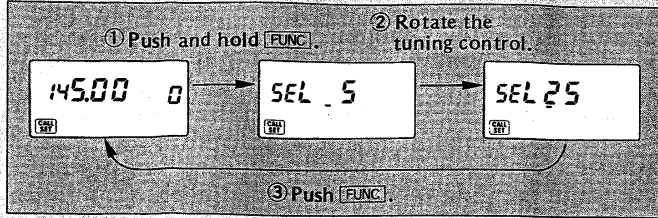
FUNCTION GUIDE	FUNCTION
CALL SET	Calling up the call channel. Access SET mode.
DUP T SQL	Operates with duplex (with repeater). Turns on in sequence an optional subaudible tone encoder or tone squelch.
SCAN SKIP	Starts scan. Programs the memory skip channel.
PRIO MASK	Starts priority watch. Masks the memory channel.
PGR CS CODE	Turns on in sequence an optional pager function or code squelch. Programs ID and Tx/Rx codes for pager function or code squelch.

To operate function guides in sequence: Push [C] to operate the functions above in the function guide. Push [FUNC] then push [C] to operate the functions below in the function guide.

SET YOUR DESIRED STEP

TUNING STEP

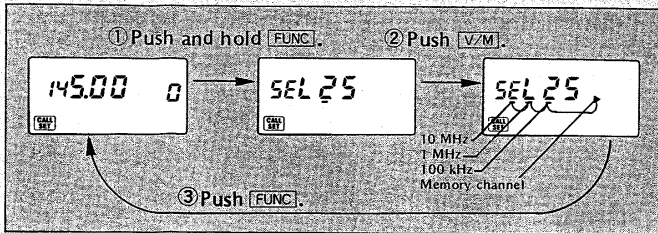
The handheld has seven tuning steps to fit your needs. Steps can be selected using SELECT mode as shown at right.



DIAL SELECT STEP

The tuning control changes the frequency in 100 kHz, 1 MHz or 10 MHz* steps using the dial select step for setting a frequency quickly. In addition, the memory channel number can also be changed in VFO mode for writing memories quickly.

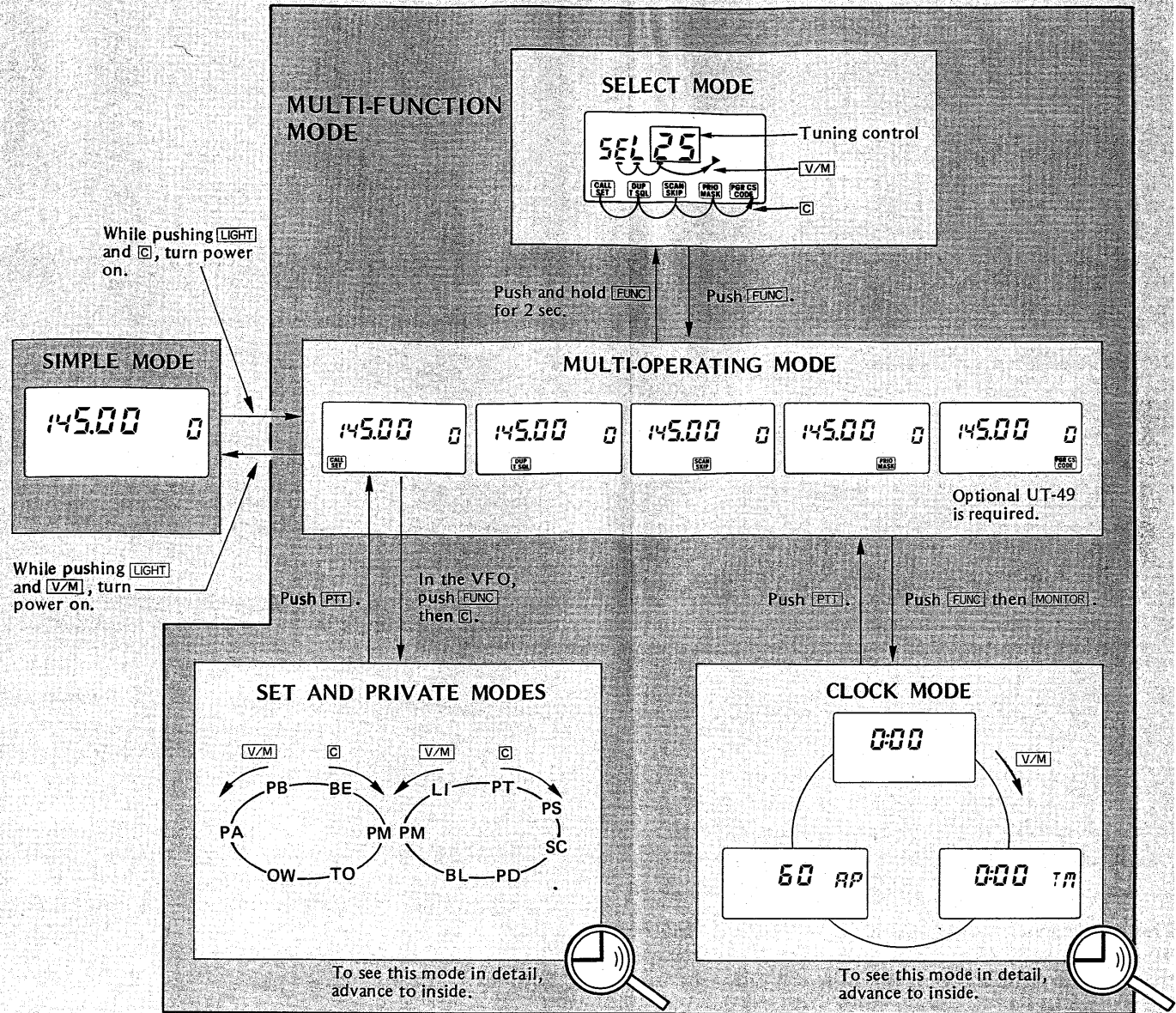
*10 MHz steps can be selected only in the IC-2SA U.S.A., Asia and IC-2SE Italy versions.



The dial select function can operate after pushing [FUNC].

The selected step cannot be used in SIMPLE mode which has a default value of 100 kHz.

CHECK THE CHART IF YOU LOSE YOUR WAY



COMPLETE SELECTIVE CALL—PAGER & CODE SQUELCH

WHAT IS SELECTIVE CALL

An optional UT-49 DTMF DECODER UNIT is necessary for pager and code squelch functions.

These functions can be operated only in MULTI-FUNCTION mode.

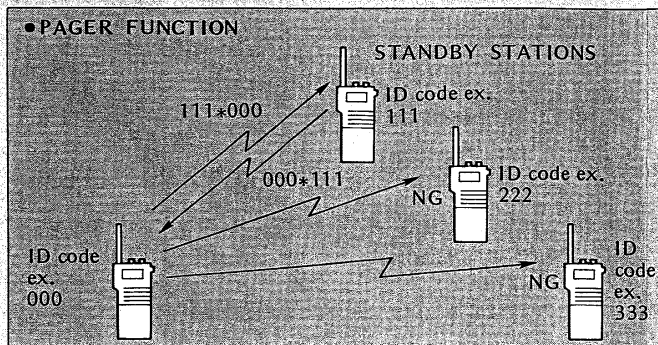
PAGER FUNCTION:

The pager function informs your ID code, decided in your group, to the contacting station's display with beep tones. This function is very convenient when you are away from the transceiver. Use the pager function for calling and the code squelch for communication.

CODE SQUELCH:

The code squelch function allows you silent standby since you will receive only a call from the station that knows your ID code.

Both pager and code squelch use DTMF codes for acknowledging the specified station.



SETTING IN ADVANCE

- 1) Install UT-49 into each transceiver in your group.
- 2) Decide the ID code of each transceiver and the group code in your group.
- 3) Decide whether to return to normal operation or code squelch operation after contact.

CHANNEL ASSIGNMENT

PAGER CODE	PROGRAMMING CHANNEL	RECEIVE INHIBIT/ACCEPT
Your ID code	C0	"Accept" only.
Another station's ID codes	C1 ~ C5	"Inhibit" should be programmed in each channel.
Group code	One of C1 ~ C5	"Accept" must be programmed.

- Channels C1 ~ C5 can be programmed with another station's ID code or group code. Decide in your group which channel is used for the group code.
- Channel CP is used for the memorizing space that automatically memorizes an ID code when receiving a call.

CODE PROGRAMMING

- 1) Select **[PGR CS CODE]**: - Push and hold **[FUNC]** for 2 sec.
- Push **[C]** until **[PGR CS CODE]** appears.
- Push **[FUNC]**.
- 2) Push **[FUNC]** then push **[C]**.
- 3) Rotate the tuning control to select the code channel to be programmed.
 - Code channel CP cannot be programmed.
- 4) While pushing **[FUNC]**, push **[C]**.
 - 1st digit blinks.
- 5) Rotate the tuning control to set the blinking digit.
- 6) Push **[C]** then repeat steps 5 and 6 to set other digits.
- 7) Push **[FUNC]** to store the selected digits.
- 8) Push **[V/M]** to set the channel "receive inhibit" or "receive accept."
- 9) Repeat steps 3 ~ 8 for another channel programming.
- 10) Push **[PTT]** to return to the previous mode.

000 C0

000 C1

000 C1

100 C1

111 C1

Appears when selecting "receive accept."

OPERATION

• MAKING A SELECTIVE CALL

- 1) Select **[PGR CS CODE]**: - Push and hold **[FUNC]** for 2 sec.
- Push **[C]** until **[PGR CS CODE]** appears.
- Push **[FUNC]**.
- 2) Push **[C]** until "PGR" or "C SQL" appears on the display to activate the function.
 - "PGR" : Pager function
 - "C SQL" : Code squelch
- 3) Select the code channel:
 - Push **[FUNC]** then push **[C]**.
 - Rotate the tuning control to select the channel.
 - Push **[PTT]**.

Code squelch
Pager

145.68 0

111 C1

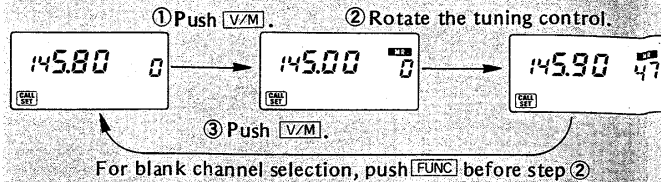
- Select the specified station's ID code for personalized communication or the group code for group communication.
- 4) Push **[PTT]** to transmit the selected DTMF code.
 - 5) **Pager function only:** Wait for an answer back from the standby station, then proceed to STANDBY steps 3 ~ 5.
 - 6) **Code squelch only:** Operate the transceiver the same as in the normal way (push **[PTT]** for transmit and release to receive). However, only the signal including the correct code can be received.
 - 7) Push **[C]** once or twice to turn off the function.

• WAITING FOR A SELECTIVE CALL

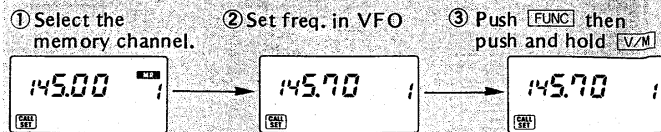
- 1) Select **[PGR CS CODE]**.
- 2) Push **[C]** to turn on the pager function.
- 3) When receiving a call from the calling station, the display shows as follows:
 - When receiving the ID code, channel CP appears.
 - When receiving the group code, group code channel appears.
- 4) Push **[PTT]** to transmit the answer back and to return the display to the previous one.
- 5) Push **[C]** as soon as transmit is finished to turn off the pager function and select the code squelch.
 - If receiving the next call before pushing **[C]**, proceed again from step 3.

48 MEMORIES

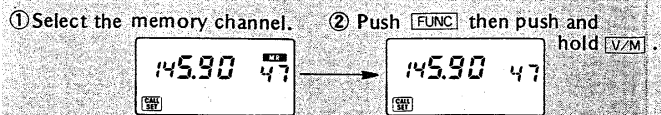
● SELECTING A MEMORY CHANNEL



● WRITING A MEMORY CHANNEL



● TRANSFERRING MEMORY CONTENTS



IT'S SO CONVENIENT

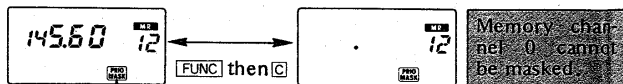
● DIAL SELECT FUNCTION

A memory channel number can be selected in VFO mode using the dial select function. This function performs quick memory writings.

● MEMORY TRANSFER

Memory channels 0 ~ 9 can independently program offset frequencies and optional subaudible tone frequencies. This means you can easily select these frequencies in the VFO using the memory transfer function, even when the transceiver is returned to SIMPLE mode.

● MEMORY CHANNEL MASKING



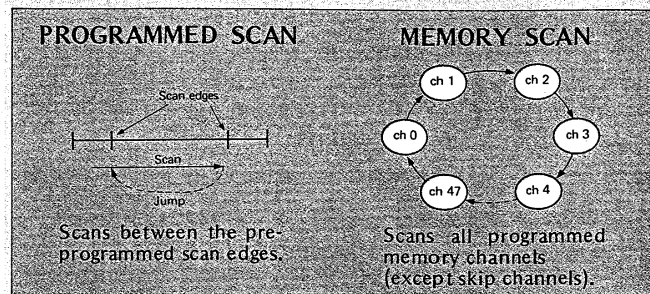
Unwanted memory channels can be masked (hidden). A masked memory channel cannot be selected for normal use. However, the contents can be revived. The masked memory can be revived only in MULTI-FUNCTION mode.

SCANNING YOUR FAVORITE FREQUENCIES

The handheld includes both programmed scan and memory scan. The following initialized setting can be performed when in MULTI-FUNCTION mode:

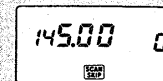
- Programmed scan edges (using SET mode)
- Frequency skip function on/off (using PRIVATE mode)
- Memory skip function (when **SCAN SKIP** appears.)
- Scan resume condition, pause/timer (using PRIVATE mode)

■ SCAN TYPES

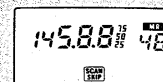
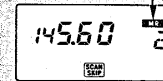


■ SCAN OPERATION

- 1) Select **SCAN SKIP**:
 - Push and hold [FUNC] for 2 sec.
 - Push [C] until **SCAN SKIP** appears.
 - Push [FUNC].
- 2) Push [V/M] to select the operating mode, VFO or MEMORY.
 - Programmed scan : VFO mode.
 - Memory scan : MEMORY mode.
- 3) Set [SQL] to the threshold point.
- 4) Push [C] to start scan.
- 5) Push [C] again to stop scan.



Appears when in MEMORY mode.



TRY TO OPERATE

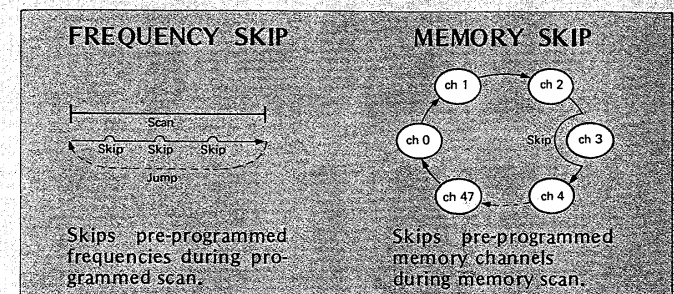
● MANUAL SCAN RESUME AND SCAN DIRECTION

While scan pauses, the tuning control resumes the scan regardless of the scan resume condition, resume/timer. While the scan is operating, the tuning control changes the scan direction.

■ FREQUENCY SKIP & MEMORY SKIP

The frequency skip function can be activated during programmed scan. The function skips unwanted signals that inconveniently stop scanning such as no modulation signals.

The memory skip function skips unnecessary memory channels during memory scan, making shorter intervals for memory scanning.



■ SKIP CHANNEL PROGRAMMING

● FREQUENCY SKIP

While scan pauses, push [FUNC] then push and hold [V/M] to program the frequency as the skip channel.

To cancel the program, see the memory skip function below since the skip frequencies has been automatically programmed into memory channels 47 ~ 10 the same as the memory skip channel.

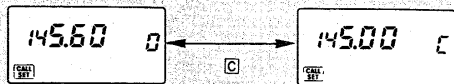
● MEMORY SKIP

- 1) Select the memory channel to be programmed.
- 2) Select **SCAN SKIP**:
 - Push and hold [FUNC] for 2 sec.
 - Push [C] until **SCAN SKIP** appears.
 - Push [FUNC].
- 3) Push [FUNC] then push [C] to write "SKIP" into the memory channel.
- 4) To erase "SKIP," repeat step 3 again.

CALL CHANNEL

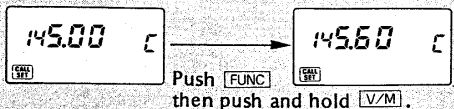
When the **CALL SET** guide appears on the function display, the one-touch-access call channel can be used as your most-often-used frequency.

ACCESSING A CALL CHANNEL



- 1) Select **CALL SET**: - Push and hold **FUNC** for 2 sec.
- Push **C** until **CALL SET** appears.
- Push **FUNC**.
- 2) Push **C** to call up the call channel.
- 3) Push **C** again to return to the previous mode.

PROGRAMMING A CALL CHANNEL



- 1) Set the frequency in VFO mode.
- 2) Select **CALL SET** then push **C** to call up the call channel.
- 3) Push **FUNC** then push and hold **V/M**.
• The VFO frequency is programmed into the call channel.

IT'S SO CONVENIENT

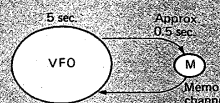
The call channel is less convenient in MULTI-FUNCTION mode. When you often use the call channel, we recommend that you use SIMPLE mode since its call channel is really "one-touch-access."

WAITING FOR CALLS DURING OPERATION—PRIORITY WATCH

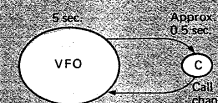
While using a VFO frequency, priority watch checks a memory channel, a call channel or some memory channels with 5 sec. intervals.

Priority watch can be operated in only MULTI-FUNCTION mode.

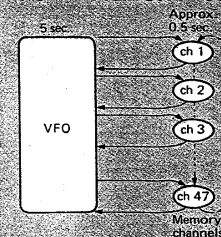
• VFO ↔ CALL CHANNEL



• VFO ↔ MEMORY SCAN

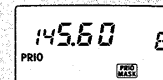
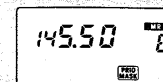
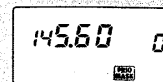


• VFO ↔ MEMORY CHANNEL



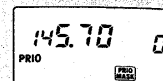
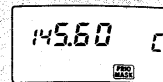
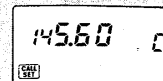
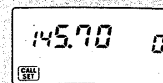
WATCHING A MEMORY CHANNEL

- 1) Select **PRIO MASK**:
- Push and hold **FUNC** for 2 sec.
- Push **C** until **PRIO MASK** appears.
- Push **FUNC**.
- 2) Select the memory channel to be watched.
- 3) Push **C** to start the priority watch.
- 4) Push **C** again to stop the watch.



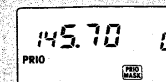
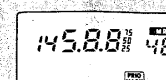
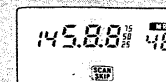
WATCHING A CALL CHANNEL

- 1) Select **CALL SET**:
- Push and hold **FUNC** for 2 sec.
- Push **C** until **CALL SET** appears.
- Push **FUNC**.
- 2) Push **C** to call up the call channel.
- 3) Select **PRIO MASK**:
- Push and hold **FUNC** for 2 sec.
- Push **C** until **PRIO MASK** appears.
- Push **FUNC**.
- 4) Push **C** to start the priority watch.
- 5) Push **C** again to stop the watch.



WATCHING MEMORY CHANNELS

- 1) Select **SCAN SKIP**:
- Push and hold **FUNC** for 2 sec.
- Push **C** until **SCAN SKIP** appears.
- Push **FUNC**.
- 2) Push **V/M** to select MEMORY mode.
- 3) Push **C** to start memory scan.
- 4) Select **PRIO MASK**:
- Push and hold **FUNC** for 2 sec.
- Push **C** until **PRIO MASK** appears.
- Push **FUNC**.
- 5) Push **C** to start the priority watch during memory scan.
- 6) Push **C** again to stop the watch.



TRY TO OPERATE

• RESUME THE PAUSE

To resume the watch operation while pausing the watching frequency:

- Push **C** while receiving the watching frequency.
- Wait 15 sec. or until the signal disappears. The watch automatically resumes 15 sec. after the signal is received, or 2 sec. after the signal disappears.

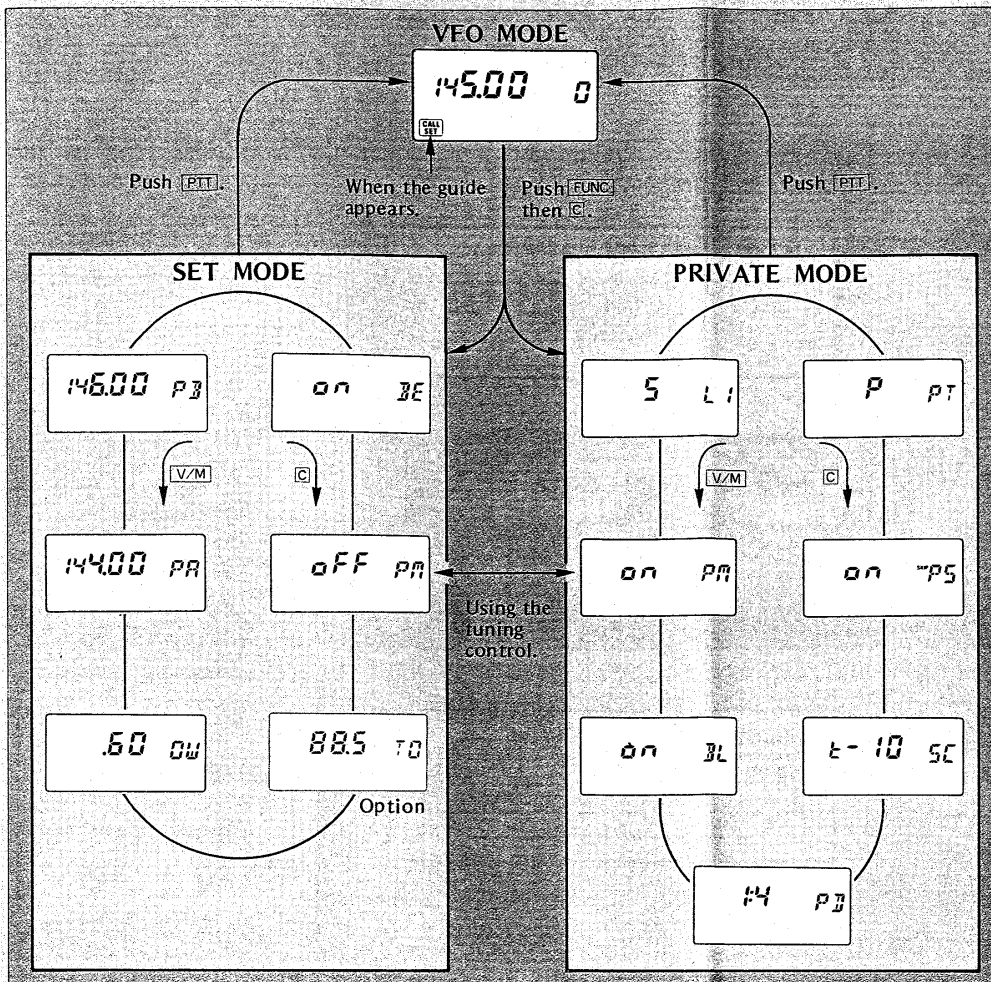
FOR SPECIAL SETTINGS YOU DESIRE — SET & PRIVATE MODES

SET & PRIVATE MODE GUIDANCE

SET mode and PRIVATE mode change the initial settings of your handheld to fit your desired operation.

SET or PRIVATE mode can be accessed by pushing [FUNC] then [C] when:
 - [CALL SET] is displayed.
 - VFO mode is selected.

- Once SET or PRIVATE mode is accessed, [V/M] and [C] change the display.
- The tuning control selects contents in the display.



SET MODE CONTENTS

OFFSET FREQUENCY

.60 0W

Set the transmit/receive shift frequency (offset frequency) for repeater operation with the tuning control. Offset frequency can be changed in 100 kHz steps for quick changes:

- ① Push [FUNC], ② Rotate the tuning control.

PROGRAMMED SCAN EDGES

144.00 PR 146.00 P3

Programmed scan operates between the programmed frequency range. The dial select function, [FUNC] then the tuning control, can be used for setting.

BEEP TONE ON/OFF

on 3E OFF 3E

The beep tone emits each time a switch is pushed. For silent operation, beep tones can be turned off.

SUBAUDIBLE TONE FREQUENCY

88.5 T0

This display appears only when an optional UT-50 or UT-51 unit is installed.

When the subaudible tone frequency is required for repeater or tone squelch operation, set a tone on this display with the tuning control.

PRIVATE MODE CONTENTS

LIGHT SWITCH FUNCTION

5 L1 on L1

The display backlight is selectable, automatically turning off with the 5 sec. timer, or continuously lighting up with manual off.

- 5 : 5 sec. timer
- on : Continuously lights up

PTT LOCK

P PT PL PT

Transmit inhibiting can be used to prevent accidental transmissions.

- P : Transmit is accepted.
- PL : Transmit is inhibited.

FREQUENCY SKIP FUNCTION ON/OFF

on -PS OFF -PS

The frequency skip function can be turned off during programmed scan even when you program the skip frequencies.

- on : Frequency skip activates.
- OFF : Frequency skip deactivates.

SCAN RESUME CONDITION

t-10 5C P-02 5C

Two pause conditions are available for scanning to fit your requirements. While receiving a signal, scan pauses for approx. 10 sec. or until the signal disappears.

- t-10 : 10 sec. timer.
- P-02 : Pause until signal disappears.

POWER SAVER DUTY CYCLE

1:4 1:16 OFF P3

The power saver function alternately switches "circuit off" and "standby" to conserve the battery power. The ratio of the duty cycle can be selected in 1:4, 1:16 and off ("off" only functions in the standby condition, not in the circuit off condition).

SET MODE AND PRIVATE MODE SELECTION

To change SET mode and PRIVATE mode:

- 1) Access SET or PRIVATE mode.
- 2) Push **[V/M]** or **[C]** until "PM" appears on the right of the display.
- 3) Rotate the tuning control to select "on" or "oFF."

oFF PM

SET mode is selected.

on PM

PRIVATE mode is selected.

RECEIVE INDICATOR (BUSY LIGHT)

on BL

oFF BL

The receive indicator can be turned off to conserve battery power.

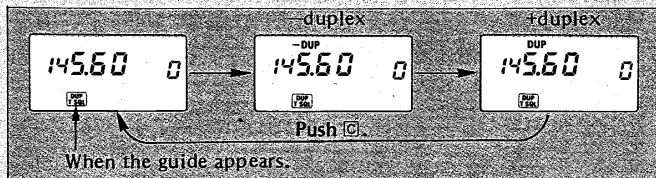
- on : Indicator lights up.
- oFF : Indicator does not light up.

OPERATING THRU A REPEATER

SETTING IN ADVANCE

- 1) Set the offset frequency. (See SET mode)
- 2) Set the subaudible tone frequency if the repeater requires it. (An optional UT-50 or UT-51 unit is necessary. See SET mode.)

OPERATION



- 1) Select **[DUP TSQL]**: - Push **[FUNC]** for 2 sec.
- Push **[C]** until **[DUP TSQL]** appears.
- Push **[FUNC]**.
- 2) Push **[C]** to select duplex.
- 3) Set the receive frequency (repeater output frequency).
- 4) Turn on the subaudible tone encoder or transmit a 1750 Hz tone call, when the repeater requires it. See right for details.
- 5) Push and hold **[PTT]** to transmit and speak into the microphone.
- 6) Release **[PTT]** to return to receive.
- 7) When the contacting station is located close to you, the repeater should not be used. Push **[MONITOR]** to check the direct signal from the contacting station.

SUBAUDIBLE TONE ENCODER

An optional UT-50 or UT-51 is necessary.

- 1) Select **[DUP TSQL]**: - Push **[FUNC]** for 2 sec.
- Push **[C]** until **[DUP TSQL]** appears.
- Push **[FUNC]**.
- 2) Push **[FUNC]** then push **[C]** to turn on tone.

1750 Hz TONE CALL (IC-2SE only)

Quickly push **[PTT]** twice and briefly hold **[PTT]** down (for second push).

IT'S SO CONVENIENT

PROGRAM INTO A MEMORY CHANNEL

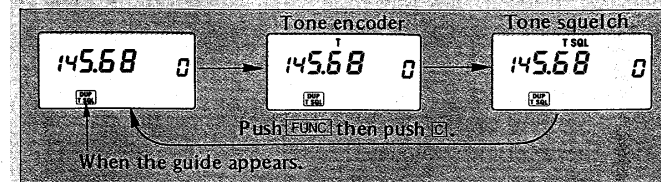
Each memory channel programs the duplex condition — Once you program the repeater frequency and duplex into a memory channel, the **[DUP TSQL]** guide is not necessary to select a repeater operation.

Memory channels 0 ~ 9 can independently program an offset frequency and an optional subaudible tone frequency. And these frequencies of memory channels 10 ~ 47 are the same as the VFO contents. We therefore, recommend programming the special repeater into memory channels 0 ~ 9, and standard repeater (offset and tone frequencies are the same as others) into 10 ~ 47.

TONE SQUELCH

An optional UT-50 TONE SQUELCH UNIT is necessary for operation.

The tone squelch function allows you to receive only signals with the same subaudible tone as programmed in your transceiver.



- 1) Set the tone frequency to use. See SET MODE above for details.
- 2) Select **[DUP TSQL]**: - Push and hold **[FUNC]** for 2 sec.
- Push **[C]** until **[DUP TSQL]** appears.
- Push **[FUNC]**.
- 3) Push **[FUNC]** then push **[C]** until "T SQL" appears as above.

IT'S SO CONVENIENT

PROGRAM INTO MEMORY CHANNELS

Each memory channel programs "tone squelch on/off" — Once you program the "tone squelch on," the **[DUP TSQL]** guide is not necessary to select a tone squelch operation.

Memory channels 0 ~ 9 can independently program a tone frequency. We therefore recommend programming the "tone squelch on" into memory channels 0 ~ 9. Use memory channels 10 ~ 47 for duplex operation.