

■ General

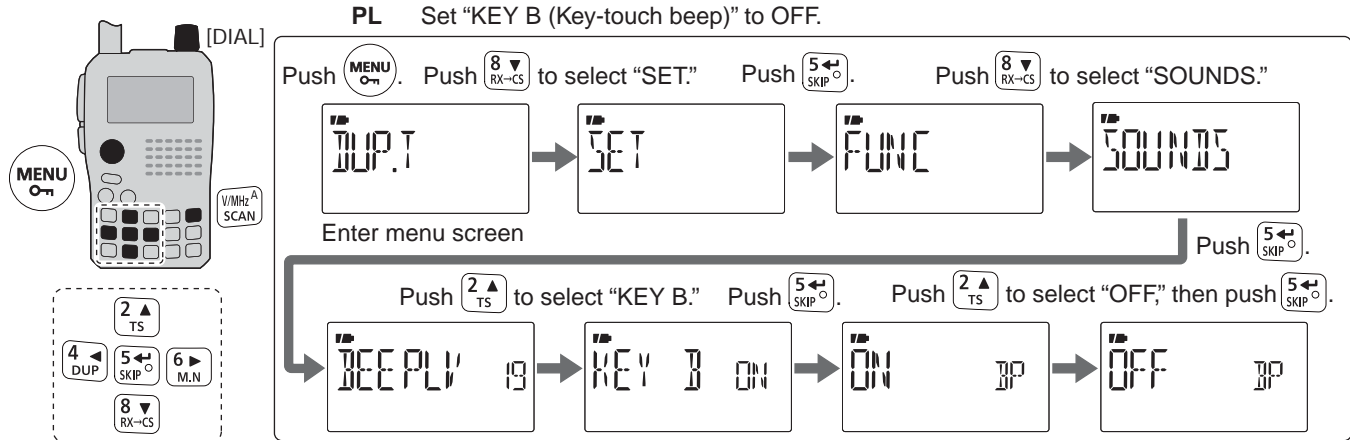
MENU screen is used for programming infrequently changed values or conditions of functions.

◇ Entering MENU screen and operation

e.g.) Set “KEY B (Key-touch beep)” to OFF.

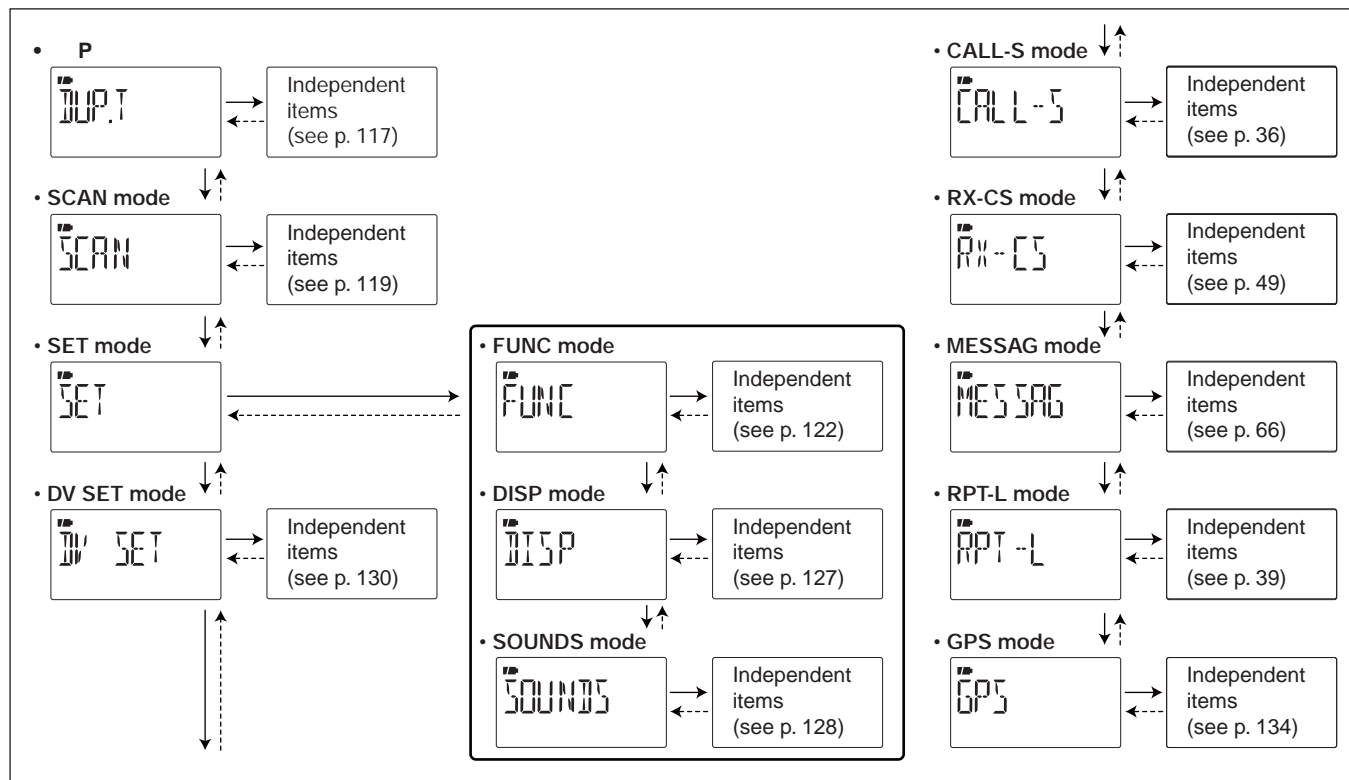
- ① Push [MENU] to enter MENU screen.
 - “DUPT,” “SCAN,” “SET,” “DV SET,” “CALL-S,” “RX-CS,” “MESSAGE,” “RPT-L” or “GPS” appears.
- ② Push [▲](2) or [▼](8) (or rotate [DIAL]) to select the desired menu group, then push [←](5) (or [→](6)).

- ③ When “SET” is selected, push [▲](2) or [▼](8) (or rotate [DIAL]) to select the desired function group, then push [←](5) (or [→](6)).
- ④ Push [▲](2) or [▼](8) to select the desired item, then push [←](5) (or [→](6)).
- ⑤ Push [▲](2) or [▼](8) (or rotate [DIAL]) to select the desired value or condition, then push [←](5) (or [→](6)) to return to the setting item selection mode.
- ⑥ Push [MENU] (or [V/MHz]) to return to frequency indication, repeat steps ② to ④ to set another items.



■ MENU screen indication and arrangement

MENU screen shows one of the following indication.



■ Items list

◇ DUP.T mode

Item indication	Ref.	Item indication	Ref.
OFF SET	p. 117	DTCS-P	p. 118
R TONE	p. 117	D CODE	p. 118
E TONE	p. 117	DTMF-S	p. 119
CODE	p. 118	DTMF-T	p. 119

◇ SCAN mode

Item indication	Ref.	Item indication	Ref.
PRIO	p. 119	WX-ALT	p. 120
PAUSE	p. 119	D-LINK	p. 120
RESUME	p. 120	P-LINK	p. 121

□ SET mode

◇ FUNC mode

Item indication	Ref.	Item indication	Ref.
ATT	p. 122	DIAL S	p. 125
P SAVE	p. 123	RECEVE	p. 125
MONI	p. 123	LOCK	p. 125
PTT LK	p. 123	MIC	p. 126
LK OUT	p. 124	SPEED	p. 126
TOT	p. 124	AP OFF	p. 126
AUTORP	p. 124	AP ON	p. 126

◇ DISP mode

Item indication	Ref.	Item indication	Ref.
LIGHT	p. 127	SCAN N	p. 128
BUSY	p. 127	OPNMSG	p. 128
CONT	p. 127		

◇ SOUNDS mode

Item indication	Ref.	Item indication	Ref.
DEEPLY	p. 128	STBY D	p. 129
KEY D	p. 128	EDGE D	p. 129
STOP D	p. 129		

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◇ DV SET mode

Item indication	Ref.	Item indication	Ref.
REPLY	p. 130	GW SET	p. 132
DATATX	p. 130	RX CS	p. 132
D MONI	p. 130	TX CS	p. 132
D RPT	p. 131	RX MSG	p. 133
CALL W	p. 131	SCROLL	p. 133
RPT W	p. 131	DK	p. 133
DV DET	p. 131	EMR	p. 134
EDIT R	p. 132		

◇ CALL-S mode

Item indication	Ref.	Item indication	Ref.
UR	p. 37	RPT 2	p. 38
RPT 1	p. 38	MY	p. 36

◇ RX-CS mode

See p. 49 for details.

◇ MESSAG mode

Item indication	Ref.	Item indication	Ref.
TX MSG	p. 66	TX GPS	p. 77
RX MSG	p. 67	RX GPS	p. 78

◇ RPT-L mode

Item indication	Ref.	Item indication	Ref.
ADD-L	p. 40	EDIT-L	p. 45

◇ GPS mode

Item indication	Ref.	Item indication	Ref.
GPS.SET	p. 134	ALM 1	p. 86
GPS.POS	p. 78	ALM 2	p. 87
D/F	p. 80	GPS-TX	p. 136
GPS.MEM	p. 82	GPS.ATX	p. 140
ALM-CH	p. 83		

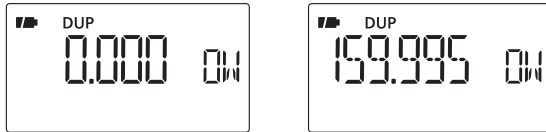
• GPS.SET mode

Item indication	Ref.	Item indication	Ref.
P FORM	p. 134	INDIC	p. 135
UNITS	p. 134	GPS.OUT	p. 135
UTC.OFF	p. 135		

■ DUP/TONE items (DUP.T)

◇ Offset frequency (OFFSET)

Sets the offset frequency for duplex (repeater) operation within the range of 0 to 159.995 MHz.



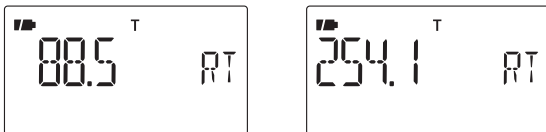
The default value may differ according to the selected frequency band (before accessing DUP.T set mode) and transceiver version.

/// The selected tuning step in VFO mode is used when setting the offset frequency.

◇ Repeater tone frequency (R TONE)

Selects subaudible tone frequency for accessing a repeater, etc. 50 tone frequencies (67.0–254.1 Hz) are available.

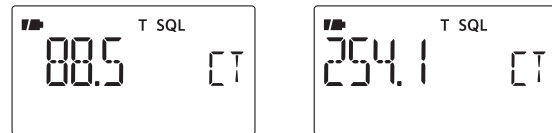
(default: 88.5)



◇ TSQL frequency (C TONE)

Selects tone frequency for tone squelch or pocket beep operation from of 50 available frequencies (67.0–254.1 Hz).

(default: 88.5)



• Available subaudible tone frequencies

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

/// 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.

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◇ DTCS code (CODE)

Selects DTCS (both encoder/decoder) code for DTCS squelch operation. Total of 104 codes (023–754) are available.

(default: 023)



• Available DTCS codes

023	054	125	165	245	274	356	445	506	627	732
025	065	131	172	246	306	364	446	516	631	734
026	071	132	174	251	311	365	452	523	632	743
031	072	134	205	252	315	371	454	526	654	754
032	073	143	212	255	325	411	455	532	662	
036	074	145	223	261	331	412	462	546	664	
043	114	152	225	263	332	413	464	565	703	
047	115	155	226	265	343	423	465	606	712	
051	116	156	243	266	346	431	466	612	723	
053	122	162	244	271	351	432	503	624	731	

◇ DTCS polarity (DTCS-P)

Sets DTCS polarity from “BOTH N” (TX/RX: normal), “TN-RR” (TX: normal, RX: reverse), “TR-RN” (TX: reverse, RX: normal) and “BOTH R” (TX/RX: reverse).

(default: BOTH N)

Transmitting or receiving DTCS code's polarity is sets by this item at transmitting side and receiving side respectively.



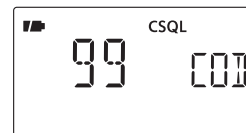
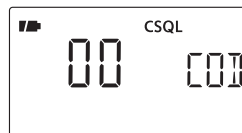
TX/RX: Normal polarity



TX/RX: Reverse polarity

◇ Digital code (D CODE)

Sets the desired digital code for digital code squelch operation. Total of 100 codes (00–99) are available. (default: 00)



◇ DTMF speed (DTMF-S)

Select the desired DTMF transmission speed from 100 msec, 200 msec, 300 msec, 500 msec.

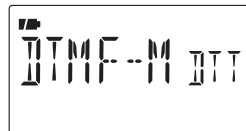
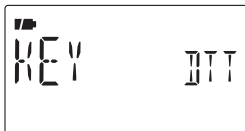
- 100 : 100-msec. interval; 5.0 characters per second (default)
- 200 : 200-msec. interval; 2.5 characters per second
- 300 : 300-msec. interval; 1.6 characters per second
- 500 : 500-msec. interval; 1.0 character per second



◇ DTMF TX key (DTMF-T)

Selects DTMF transmitting code when pushing and holding [PTT], then pushing one of the keypad buttons.

- KEY : [1]–[9], [0], [A], [B], [C], [D], [E](*) or [F](#) DTMF tones are transmitted when the key is pressed. (default)
- DTMF-M : The DTMF memory contents Ch01–Ch10 and transmitted.



■ Scan items (SCAN)

◇ Priority watch (PRIO)

Activates priority watch or priority watch with alert (Bell).

- OFF : The priority watch is turned OFF. (default)
- ON : The transceiver checks the memory channel frequency every 5 sec.
- BELL : The transceiver checks the memory channel frequency every 5 sec. You can be alerted with beeps and blinking “(••)”.



◇ Scan pause timer (PAUSE)

Selects the scan pause time. When receiving signals, the scan pauses according to the scan pause timer.

- 2–20 SEC : Scan pauses for 2–20 sec. while receiving a signal in 2 sec. steps. (default: 10 sec.)
- HOLD : Scan pauses on a received signal until it disappears.



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◇ Scan resume timer (RESUME)

Selects the scan resume time from a pause after the received signal disappears.

- 0 SEC : Scan resumes immediately after the received signal disappears.
- 1–5 SEC: Scan pauses 1–5 sec. after the received signal disappears. (default: 2 sec.)
- HOLD : Scan remains paused on the received signal according to the scan pause timer even if it disappears. Rotate [DIAL] to resume manually.

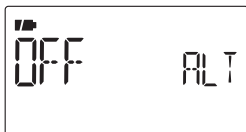


Scan resume timer must be set shorter than scan pause timer (previous item), otherwise this timer cannot be activated.

◇ Weather alert (WX-ALT)

U.S.A. version only

Turns weather alert function ON and OFF. (p. 153)
(default: OFF)

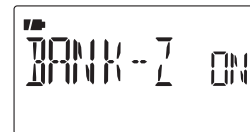


◇ Memory bank link function (B-LINK)

Sets the memory bank link function ON (default) and OFF. The link function provides continuous bank scan, scanning all channels in the selected banks during bank scan.

• Bank link setting

- ① Push [▲](2) or [▼](8) to select the bank that you want to change the link setting.



- ② Push [←](5) to enter bank setting.
- ③ Push [▲](2) or [▼](8) to select the setting.



- ④ Push [←](5) to set and return to the BANK selection screen.
- ⑤ Push [▲](2) or [▼](8) to select next bank and repeat steps ② to ④, or push [MENU] to exit MENU screen operation.

◇ Program scan link function (P-LINK)

Sets the program scan link function. The link function provides continuous program scan in the selected program scan number during program scan.

Default settings for P-LINK P0 to P-LINK P9 are PROG 1 to PROG 24 are linked and PROG 0 is no-linked.

• Program scan link setting

- ① Push [▲](2) or [▼](8) to select the program scan link number that you want to change.



- ② Push [←](5) to enter the program scan link setting.
- ③ Push [▲](2) or [▼](8) several times to select the setting "ADD" or "CLEAR."



- When "ADD" is selected, only no-linked program scans are displayed. When "CLEAR" is selected, only linked program scans are displayed.

- ④ Push [←](5), then push [▲](2) or [▼](8) to select the desired program scan.



- ⑤ Push [←](5) to set the program scan link setting.
- ⑥ Repeat steps ④ and ⑤ to add or clear the program scan to/from the link, or push [MENU] to exit MENU screen operation.

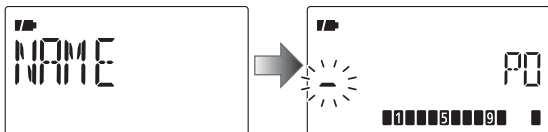
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• Program scan link setting

- ① Push [▲](2) or [▼](8) to select the program scan link number that you want to program the name.



- ② Push [←](5) to enter the program scan link setting.
- ③ Push [▲](2) or [▼](8) several times to select "NAME."
- ③ Push [←](5) to enter the program scan link setting.



- ④ Push [▲](2) or [▼](8) to select the desired character, number, symbol or space; push [▶](6) or [◀](4) to move the cursor right or left, respectively.
- ⑤ Push [←](5) to program the repeater name and exit the state.
- ⑥ Push [MENU] to exit MENU screen operation.

■ Set mode items (SET)

□ Function set mode items (FUNC)

◇ Attenuator (ATT)

The attenuator prevents distortion of a desired signal by very strong RF signals near the desired frequency or when very strong electric fields, such as from a broadcasting station, are present at your location.

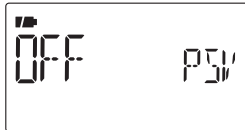
Select the attenuator function ON and OFF (default).



◇ Power save (P SAVE)

The power save function reduces the current drain to conserve battery power. This power save function can be turned OFF, if desired, by turning power ON and OFF.

- “AUTO1” selects “1:4” duty ratio when receiving no signal for 5 sec., then “1:8” 60 sec. after that.
- “AUTO2” suppresses the consumption of the battery by stopping the operation of a digital block of the DV mode in addition to the operation of Auto1.

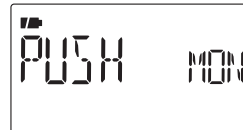


NOTE: Power save function is disabled when using the external power supply (More than 10 V DC) or if the Auto replay function is set to ON (p. 130).

◇ Monitor key action (MONI)

The monitor key, [SQL], can be set as a 'sticky' key. When set to the sticky condition, each push of [SQL] toggles the monitor function ON and OFF.

- PUSH: Pushing and holding [SQL] to monitor the frequency. (default)
- HOLD: Push [SQL] momentarily to monitor the frequency and push momentarily again to cancel it.



◇ PTT lock (PTT LK)

Turns the PTT lock function ON and OFF.

This function inhibits transmission with [PTT] is inhibited when ON is selected to prevent accidental transmission, etc. (default: OFF)

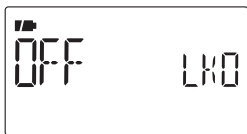


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◇ Busy lockout (LK OUT)

Turns the busy lockout function ON and OFF.

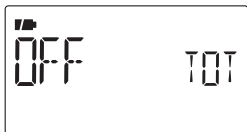
This function inhibits transmission while receiving a signal or when the squelch is open. (default: OFF)



◇ Time-out timer (TOT)

To prevent accidental prolonged transmission, etc., the transmitter has a time-out timer. This function cuts transmission OFF after 1, 3, 5, 10, 15 or 30 min. of continuous transmission. This timer can be cancelled.

- OFF : The time-out timer is turned OFF. (default)
- 1 to 30 MIN : The transmission is cut OFF after the set period elapses.



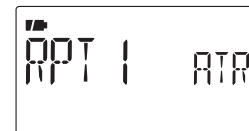
◇ Auto repeater (AUTORP)

U.S.A. and Korean versions only

The auto repeater function automatically turns ON or OFF the duplex operation and tone encoder. The offset and repeater tone is not changed by the auto repeater function. Reset these frequencies, if necessary.

U.S.A. version:

- OFF : The auto repeater function is turned OFF.
- RPT1 : Activates for duplex only. (default)
- RPT2 : Activates for duplex and tone.



Korean version:

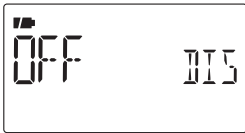
- OFF : The auto repeater function is turned OFF.
- ON : Activates duplex and tone. (default)



◇ Dial speed acceleration (DIAL S)

The dial speed acceleration automatically speeds up the tuning dial speed when rotating [DIAL] rapidly.

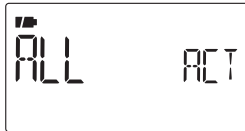
- OFF : The dial speed acceleration is turned OFF.
- ON : The dial speed acceleration is tuned ON. (default)



◇ Active band (ACTIVE)

Allows continuous frequency selection of the operating frequency across all bands.

- SINGLE : A single operating frequency can be selected within the current band. Push [BAND] for band selection in this case.
- ALL : The operating frequency can be selected continuously. (default)



◇ Key lock type (LOCK)

While the key lock function is ON, [PWR], [PTT], [SQL], [VOL] and [MENU] (Lock function only) can still be accessed. Accessible keys can be set to 1 of 4 groups.

- NORMAL : [PWR], [PTT], [SQL], [VOL] and [MENU] (Lock function only) accessible. (default)
- NO SQL : [PWR], [PTT], [VOL] and [MENU] (Lock function only) are accessible.
- NO VOL : [PWR], [PTT], [SQL] and [MENU] (Lock function only) are accessible.
- ALL : [PWR], [PTT] and [MENU] (Lock function only) are accessible.



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◇ Microphone simple mode (MIC)

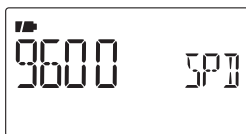
Microphone simple mode is used to change the function assignments for keys on the optional HM-75A REMOTE CONTROL SPEAKER-MICROPHONE. (p. 162)

- SIMPLE
- NORM-1 (default)
- NORM-2

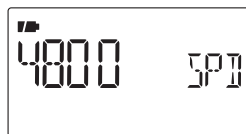


◇ DATA speed (SPEED)

Selects the data speed of [DATA] jack from 4800 bps and 9600 bps (default) for GPS receiving, etc.



When 9600 bps is selected

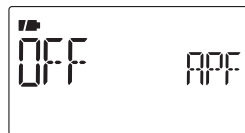


When 4800 bps is selected

◇ Auto power OFF (AP OFF)

The transceiver can be set to automatically turn OFF after a specified time period with a beep when no key operations are performed.

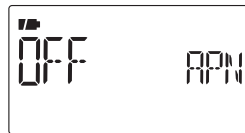
30 min., 60 min, 90 min, 120 min and OFF (default) can be specified. The specified time period is retained even when the transceiver is turned OFF by the auto power OFF function. To cancel the function, select "OFF" in this item.



◇ Auto power ON (AP ON)

Auto power ON function turns the transceiver power ON automatically after passing the set time period from power OFF.

Select the desired time period within 30 minutes to 24 hours in 30 minutes steps and OFF. (default: OFF)

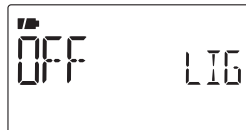


□ Display set mode items (DISP)

◇ Display backlighting (LIGHT)

The transceiver has display backlighting with a 5 sec. timer for night time operation. The display backlighting can be turned ON continuously or turned OFF, if desired.

- OFF : The backlight is turned OFF.
- ON : The backlight continuously lights ON.
- AUTO1 : Lights when an operation is performed, goes out after 5 sec. (default)
- AUTO2 : Lights when an operation is performed, goes out after 5 sec with a battery pack or battery case operation, or stays ON when using the external power supply (More than 10 V DC).



◇ Busy LED (BUSY)

The TX/RX indicator lights green while receiving a signal or when the squelch is open. This indication can be turned OFF to conserve the battery power, if desired.

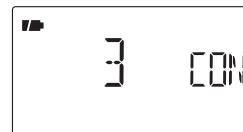
- OFF : The indicator does not function even if a signal is received.
- ON : The indicator lights green while receiving a signal or when the squelch is open. (default)



◇ LCD contrast (CONT)

The contrast of the LCD can be selected from 4 levels.

- 1 (Low contrast) to 4 (High contrast) (default: 3)



Default (3)



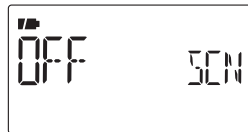
High contrast (4)

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◇ Scan name (SCAN N)

The programmed scan, programmed link scan or bank name is displayed during the scan type selection.

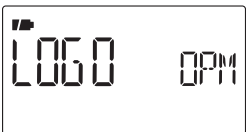
- OFF : The programmed scan, programmed link scan or bank name is not displayed.
- ON : The programmed scan, programmed link scan or bank name is displayed. (default)



◇ Opening message (OPN.MSG)

The opening message indication that is displayed at power ON is selectable from Icom logo, my call sign or skipped.

- OFF : Opening message indication is skipped.
- LOGO : Icom logo is displayed at power ON. (default)
- CALL : The set my call sign is displayed at power ON.



When LOGO is selected



When Call sign is selected

□ Sounds set mode items (SOUNDS)

◇ Beep output level (BEEPLV)

Adjusts the key-touch beep tone level to the desired level within 39 levels. (default: 19)



Minimum level



Maximum level

/// The key-touch beep (following item) must be set to ON to have a beep tone.

◇ Key-touch beep (KEY B)

Turns the key-touch beep ON or OFF. (default: ON)



Key-touch beep ON



Key-touch beep OFF

◇ **Scan stop beep (STOP B)**

Turns the scan stop beep function ON or OFF. (default: OFF)



Scan stop beep ON



Scan stop beep OFF

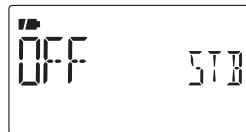
◇ **Standby beep (STBY B)**

Turns the beep emission capability ON and OFF when the communicating station finishes transmitting or the receive signal disappears while in the digital mode operation.

(default: ON)



Stand by beep ON



Stand by beep OFF

◇ **Band edge beep (EDGE B)**

Turns the beep emission capability ON and OFF when the frequency is changed over the band edge by rotating [DIAL].

(default: ON)



Band edge beep ON



Band edge beep OFF

12 MENU SCREEN OPERATION

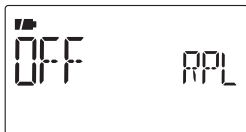
■ DV set mode items (DV SET)

◇ Auto reply (REPLY)

This function replies to an individual station call even you are away from the transceiver.

After a manual transmission (pushing [PTT]), the Auto Reply setting returns to OFF automatically.

- OFF : No reply is performed even if a call is received. (default)
- ON : Sets the caller's call sign and replies to the call with the programmed own call sign.



NOTE: When “ON” is set in the auto reply function, the power save function (p. 123) stop functioning automatically to receive call sign signal properly.

◇ DV data TX (DATATX)

During low-speed data operation, auto data transmission function is available. This function transmits when data has been input from PC via the [DATA] jack. (default: PTT)

- PTT : Data from [DATA] transmits when [PTT] is pushed. (default)
- AUTO : Data from [DATA] transmits automatically.



◇ Digital monitor (D MONI)

Sets the desired monitoring mode during digital mode operation from “Auto,” “Digital” and “Analog.”

- AUTO : The transceiver sets monitoring mode to FM and DV according to the received signal. (default)
- DIGI : Monitors in DV mode.
- ANALOG : Monitors in FM mode.



◇ Digital repeater setting (D RPT)

When accessing a digital repeater that the repeater call sign is different than the transceiver's current call sign, the repeater call sign can be stored into "RPT1" of the current call sign automatically by reading the repeater's down link signal.
(default: ON)



◇ RX call sign auto write (CALL W)

When your own individual station call is received, the calling station call sign can be automatically set in "UR" of the current call sign.
(default: OFF)



◇ Repeater call sign auto write (RPT W)

When your own individual station call is received via the digital repeater, the repeater call sign can be set into "RPT1" and/or "RPT2" automatically by reading the repeater's down link signal.
(default: OFF)



/// The transceiver sets the received repeater call sign for operation, over-writing the current repeater call sign.

◇ DV auto detect (DV DET)

When a signal other than DV mode is received during DV mode operation, the transceiver has capability of automatic FM mode selection.

- OFF : Operating mode is fixed in DV. (default)
- ON : The transceiver automatically selects FM mode for temporary operation.



12 MENU SCREEN OPERATION

◇ Call sign edit record (EDIT R)

Selects call sign programming when the call sign is edited or corrected with the pre-programmed call sign.

- OFF : The edited or corrected call sign is overwritten.
- SEL : The edited or corrected call sign is programmed into the selected call sign memory.
- AUTO : The edited or corrected call sign is programmed into a blank channel automatically. (default)



◇ Auto gateway setting (GW SET)

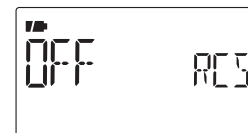
When the repeater has gateway capability and the repeater is set to the access repeater "RPT1," the link repeater "RPT2" is set the same repeater's call sign with G automatically.

- OFF : Auto gateway setting is disabled. (default)
- AUTO : RPT2 is automatically set as the gateway repeater by the RPT1's call sign.



◇ RX call sign display (RX CS)

When a call is received, the calling station call sign can be displayed automatically. (default: AUTO)



◇ TX call sign display (TX CS)

Selects call sign display function from YOUR, MY and OFF. When this setting is set to YOUR or MY, the transceiver automatically displays the set station or your own call sign during DV mode transmission. (default: YOUR)



◇ RX message display (RX MSG)

Sets auto received message display function AUTO and OFF. When this setting is set to AUTO, the transceiver automatically displays and scrolls the received message.

(default: AUTO)



◇ Scroll speed (SCROLL)

Set the displayed message, call sign, etc. scrolling speed.

- FAST : Scroll speed is set to fast. (default)
- SLOW : Scroll speed is set to slow.



◇ Break-in function (BK)

The break-in function allows you to break into a conversation where the two original stations are communicating with call sign squelch enabled.

- OFF : The break-in function is set to OFF. (default)
- ON : The break-in function is set to ON.
- "BK" appears on the display.



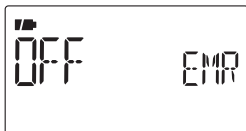
NOTE: The break-in function is turned OFF automatically when turning transceiver's power OFF.

12 MENU SCREEN OPERATION

◇ EMR function (EMR)

The EMR communication mode is available for digital mode operation. In the EMR communication mode, no call sign setting is necessary. When an EMR communication mode signal is received, the audio (voice) will be heard at the specified level even the volume setting level is set to minimum level, or digital call sign/digital code squelch is in use.

- OFF : The EMR function is set to OFF. (default)
- ON : The EMR function is set to ON.
- "EMR" appears on the display.



NOTE: The EMR communication function is turned OFF automatically when turning transceiver's power OFF

■ GPS mode items (GPS)

◇ GPS set mode items (GPS.SET)

◆ Position format (P FORM)

Selects the displaying position format from "mm.mm" (ddd°mm.mm') (default) and "mm.SS" (ddd°mm'ss").



When ddd°mm.mm' is selected



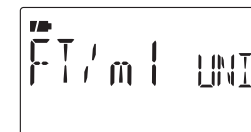
When ddd°mm'ss" is selected

◆ Units (UNITS)

Selects display units for distance and elevation from "m" or "ft/ml." (default : U.S.A. version; ft/ml, Other versions; m)



When "meter" is selected



When "Feet/mile" is selected

◆ UTC offset (UTC.OFF)

Sets time difference from UTC (Universal Time Coordinated) within -12:00 to +12:00 range in 5 min. steps. (default: 0:00)



Set to -12:00 hour



Set to +12:00 hour

◆ GPS indication (INDIC)

Sets the GPS indicator ON and OFF. (default : ON)

- OFF : "G" indicator does not appear.
- ON : "G" indicator appears on the display when a GPS receiver is connected and a valid position data is received; blinks when an invalid data is received.



GPS indication ON



GPS indication OFF

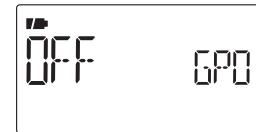
◆ GPS data out (GPS.OUT)

Sets the GPS data received from a connected optional GPS microphone, HM-189GPS to output from [DATA] jack.

- OFF : Transceiver does not output the GPS data. (default)
- ON : Transceiver outputs the GPS data from [DATA] jack.



Data output is ON



Data output is OFF

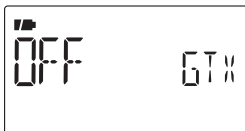
12 MENU SCREEN OPERATION

◇ GPS TX mode items (GPS-TX)

Sets the transmission of data from a connected GPS receiver ON and OFF.

When the position information is received from a connected GPS receiver and GPS.ATX (GPS Auto TX Timer) setting (p. 140) is set to a specific time, the transceiver automatically transmits the current position and message at the set interval.

- OFF : Transmitting position data is disabled. (default)
- DVG : Transmitting position data in GPS mode.
- DVA : Transmitting position data in GPS-A mode.



◆ Sentence formatter setting

- ① Select "DVG" in GPS TX mode item, then push [←](5) to enter the sentence formatter selection.
- ② Push [▲](2) or [▼](8) to select the desired sentence formatter.
 - RMC, GGA, GLL, GSA, VTG and GSV are selectable.



RMC sentence



GGA sentence

- ③ Push [←](5) to enter the desired sentence formatter selection.
- ④ Push [▲](2) or [▼](8) to select the setting.
 - See right above for setting details.



RMC sentence: OFF



RMC sentence: ON

- ⑤ Push [←](5) to set ON/OFF.
- ⑥ Push [▲](2) or [▼](8) to select next sentence and repeat steps ② to ⑤, or push [MENU] to return to frequency indication.
 - Only four sentence formatters can be activated at same time.

- RMC : (Default OFF)
Set RMC sentence ON or OFF.
- GGA : (Default ON)
Set GGS sentence ON or OFF.
- GLL : (Default OFF)
Set GLL sentence ON or OFF.
- GSA : (Default OFF)
Set GSA sentence ON or OFF.
- VTG : (Default OFF)
Set VTG sentence ON or OFF.
- GSV : (Default OFF)
Set GSV sentence ON or OFF.

◆ GPS-A set mode

Enter GPS-A set mode by selecting "DVA" in GPS TX mode, then push [←](5). This set mode is available to set unproto address, data extension, time stamp, GPS-A symbol and comment.

• Unproto Address (UNPROT)

56 characters address can be entered for unproto address.

- ① Push [←](5) to enter the unproto address edit mode.
- ② Push [▲](2) or [▼](8) to select the desired character.
 - The selected character blinks.
 - Push [▶](6) to move the cursor right; push [◀](4) to move the cursor left.
 - Push [CLR](1) to erase the selected character, or push and hold [CLR](1) for 1 sec. to erase all characters following the cursor.
- ③ Repeat step ② until the desired unproto address is programmed.
- ④ Push [←](5) to program the unproto address and exit the unproto address edit mode.
- ⑤ Push [◀](4) to return to GPS-A set mode screen.



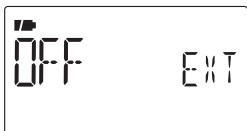
12 MENU SCREEN OPERATION

• DATA extension (DT EXT)

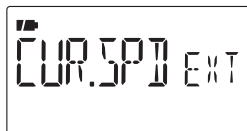
Sets the data extension capability to "CUR.SPD" (COURSE/SPEED) or OFF (default).

The transceiver's course and speed information is additionally transmitted with position data when "CUR/SPD" is selected.

/// **NOTE:** When "CUR/SPD" is selected, number of character for "COMMEN" (COMMENT) is limited to 36-character.



Set data extension to OFF



Set to course/speed

• Time stamp (TIME)

Selects transmitting time stamp type from DHM, HMS and OFF. This function can be transmitted UTC (Universal Time Coordinated)time only.

- **OFF** : No time stamp is transmitted. (default)
- **DHM** : Time stamp in the format of Day, Hour and Minute is transmitted.
- **HMS** : Time stamp in the format of Hour, Minute and Second is transmitted.



Set time stamp to OFF



Set to Hour/Minute/Second

• **GPS-A symbol (SYMBOL)**

Selects the desired GPS-A symbol.

Available symbols: AMBU (Ambulance), BUS (Bus), FIRE (Fire Truck), BICYCL (Bicycle), YACHT (Yacht), HELI (Helicopter), BALLOO (Balloon), AIRCRA (Small Aircraft), SHIP (Power Boat), CAR (Car): (default), M-CYCLE (Motorcycle), JEEP (Jeep), RV (Recreational Vehicle), TRUCK (Truck), VAN (Van) and OTHER (Other).

If "OTHER" is selected, set the desired symbol code as follows;

- ① Push [**←**](5) to begin the programming.
- ② Push [**▲**](2) or [**▼**](8) to select the 1st character from " and "/"
- ③ Push [**▶**](6) to select the 2nd digit.
- ④ Push [**▲**](2) or [**▼**](8) to select the 2nd digit character.
- ⑤ Push [**←**](5) to program the symbol code, then exit programming.
- ⑥ Push [**◀**](4) to return to GPS-A set mode screen.

/// When "OTHER" is selected, check the symbol codes of APRS® and set it correctly.



Helicopter is selected



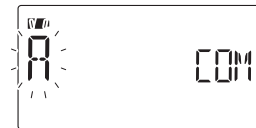
Car is selected

• **Comment (COMMENT)**

Program up to a 43-character* comment. The programmed comment is transmitted with the GPS position data.

*36-character comment can only be programmed when "CUR/SPD" (COURSE/SPEED) is selected in DT EXT (Data extension).

- ① Push [**←**](5) twice to enter the programming.
- ② Push [**▲**](2) or [**▼**](8) to select the desired character.
 - The selected character blinks.
 - Push [**▶**](6) to move the cursor right; push [**◀**](4) to move the cursor left.
 - Push [**CLR**](1) to erase the selected character, or push and hold [**CLR**](1) for 1 sec. to erase all characters following the cursor.
- ③ Repeat step ② until the desired comment is programmed.
- ④ Push [**←**](5) to program the comment and exit comment programming.
- ⑤ Push [**◀**](4) to return to GPS-A set mode screen.



12 MENU SCREEN OPERATION

◇ GPS auto TX timer (GPS.ATX)

Selects the desired interval for automatic position transmission function from OFF (default), 5, 10, 30 second, 1, 3, 5, 10 and 30 minutes.

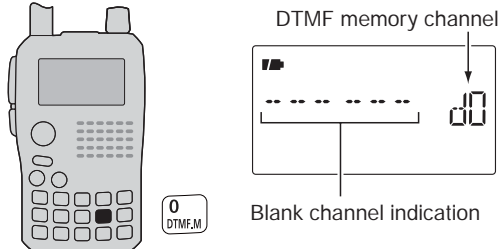


/// **NOTE:** When four sentence formatter are activated at the same time ("Sentence formatter setting" on pgs. 136, 137), "5SEC" can not be selected.

■ Programming a DTMF code

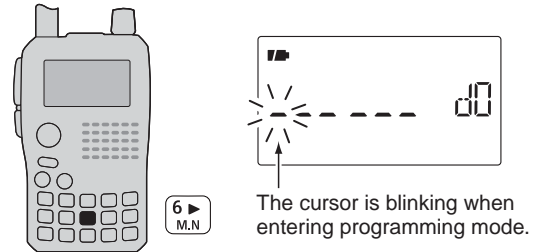
DTMF codes are used for autopatching, accessing repeaters, controlling other equipment, etc. The transceiver has 16 DTMF memory channels (D0–D9, DA, DB, DC, DD, DE, DF) for storage of often-used DTMF codes of up to 24 digits.

- ① Push and hold **[DTMF.M]**(0) for 1 sec. to enter DTMF memory.



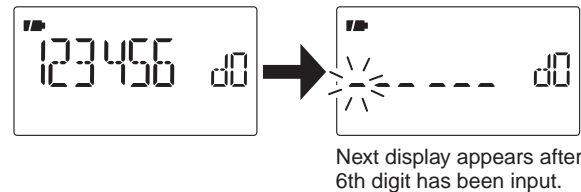
- ② Push **[▲]**(2) or **[▼]**(8) to select the desired DTMF memory channel.
- "T-CALL" appears when a 1750 Hz tone burst signal is selected. (p. 33)
 - Previously programmed DTMF code is displayed if programmed.

- ③ Push **[▶]**(6) to enter programming mode.



- ④ Push the desired keys to input the characters.

- **[0]–[9]** input "0"–"9," **[A]**(V/MHz) inputs "A," **[B]**(M/CALL) inputs "B," **[C]**(DR) inputs "C," **[D]**(△) inputs "D," **[#]**(.) inputs "E (#)" and **[*]**(BAND) inputs "* (F)."
- Up to 24 digits can be programmed.



- ⑤ Repeat step ④ until the desired code is input.
- ⑥ Push **[MENU ◀]** to program the DTMF code and exit programming mode.
- Entering 24th digit automatically exits the programming mode.
- ⑦ Push **[V/MHz]** to exit DTMF memory.

13 OTHER FUNCTIONS

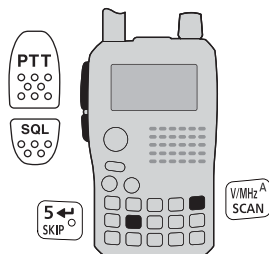
■ Transmitting a DTMF code

◇ Transmitting from DTMF memory

The selected DTMF code is transmitted at each push of the **[SQL]** switch while transmitting.

▨ The transmitting speed at which DTMF memories send individual DTMF characters can be set in “DTMF-S” (DTMF SPEED) item. (p. 119)

- ① Set the desired frequency. (p. 23)
- ② Push and hold **[DTMF.M](0)** for 1 sec. to enter DTMF memory.
- ③ Push **[▲](2)** or **[▼](8)** to select the desired DTMF memory channel.
- ④ Push **[←](5)** to set the DTMF memory.
- ⑤ Push **[V/MHz]** to exit DTMF memory.
- ⑥ While pushing **[PTT]**, push **[SQL]** to transmit the selected DTMF code.



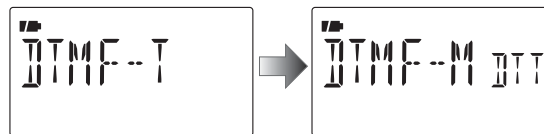
◇ Transmitting from DTMF memory in VFO mode

The selected DTMF memory can be transmitted via keypad directly while transmitting. Pushing **[0]–[9]**, **[A]**, **[B]**, **[C]**, **[D]**, **[#]** or **[*]** to transmit DTMF memory channel (**D0–D9**, **DA**, **DB**, **DC**, **DD**, **DE** or **DF**) respectively.

- ① Set the desired frequency. (p. 23)
- ② Enter “DTMF-T” in DUP.T set mode.

MENU ⇄ DUP.T ⇄ **DTMF-T** (p. 119)
(Push **[MENU]**, (Push **[▲](2)**/**[▼](8)**, then push **[←](5)**.)

- ③ Push **[▲](2)** or **[▼](8)** to select DTMF transmitting key (DTMF-M) as below.



- ④ Push **[←](5)** (or **[←](4)**) to return to DUP.T set mode, and push **[MENU]** to return to frequency indication.
- ⑤ While pushing **[PTT]**, push the desired key to transmit the selected DTMF memory.
 - **[0]–[9]**, **[A]**(V/MHz), **[B]**(M/CALL), **[C]**(DR), **[D]**(△), **[#]**(.) or **[*]**(BAND) transmits “D0”–“D9,” “DA,” “DB,” “DC,” “DD,” “DE” or “DF.”

◇ Transmitting a DTMF code directly

DTMF code can be transmitted via keypad directly while transmitting.

- ① Set the desired frequency. (p. 23)
- ② Enter "DTMF-T" in DUP.T set mode.

MENU ⇨ DUP.T ⇨ **DTMF-T** (p. 119)
 (Push [MENU] (5)), (Push [▲](2)/[▼](8), then push [←](5).)

- ③ Push [▲](2) or [▼](8) to select DTMF transmitting key (KEY).
- ④ While pushing [PTT], push the desired keys to transmit the DTMF code.
 - [0]–[9] input "0"–"9," [A](V/MHz) inputs "A," [B](M/CALL) inputs "B," [C](DR) inputs "C," [D](△) inputs "D," [#](.) inputs "#" and [*](BAND) inputs "*."



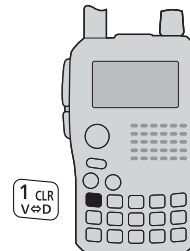
DTMF code keys



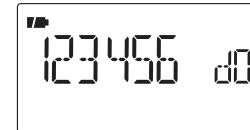
■ Clearing a DTMF memory

An unwanted DTMF memory can be cleared (erased).

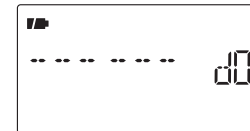
- ① Push and hold [DTMF.M](0) for 1 sec. to enter DTMF memory mode.
- ② Push [▲](2) or [▼](8) to select the desired DTMF memory channel to be cleared.
- ③ Push and hold [CLR](1) for 1 sec. to clear the selected DTMF memory channel.



When entering DTMF programming mode.



After clearing the DTMF memory.



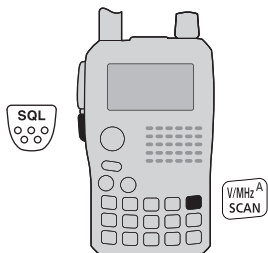
- ④ Push [V/MHz] to exit DTMF memory.

13 OTHER FUNCTIONS

■ Confirming a DTMF memory

A DTMF memory can be confirmed with a DTMF tone.

- ① Push and hold **[DTMF.M](0)** for 1 sec. to enter DTMF memory mode.
- ② Push **[▲](2)** or **[▼](8)** to select the desired DTMF memory channel.
- ③ Push **[SQL]** to confirm the DTMF memory contents.
- ④ Push **[V/MHz]** to exit DTMF memory.



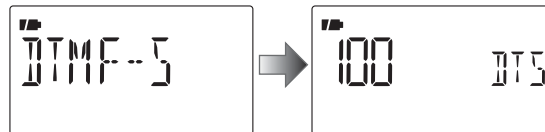
■ Setting DTMF transfer speed

The DTMF transfer speed can be selected.

- ① Enter "DTMF-S" in DUP.T set mode.

MENU ⇨ DUP.T ⇨ **DTMF-S** (p. 119)
(Push **[MENU 0-1]**), (Push **[▲](2)**/**[▼](8)**), then push **[←](5)**.)

- ② Push **[▲](2)** or **[▼](8)** to select DTMF transfer speed as below.
 - 100 : Transfer the DTMF tones at about 100 msec. per tone.
 - 200 : Transfer the DTMF tones at about 200 msec per tone.
 - 300 : Transfer the DTMF tones at about 300 msec per tone.
 - 500 : Transfer the DTMF tones at about 500 msec per tone.
- ③ Push **[←](5)** to return to DUP.T set mode, and push **[MENU 0-1]** to return to frequency indication.



■ Tone frequency and DTCS code

◇ Subaudible (repeater) tone

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

◇ Tone and DTCS squelches

The tone squelch (CTCSS) or DTCS squelch opens only when receiving a signal containing a matching subaudible tone or DTCS code, respectively. You can silently wait for calls from group members using the same tone or code. Separate tone frequencies can be set for repeater and tone squelch/pocket beep operation.

◇ Reverse tone/DTCS squelch

The reverse tone/DTCS squelch is convenient if you want to ignore a specific signal. The transceiver mutes the squelch when a signal with the matched tone or code is received. "T SQL-R" / "DTCS-R" is displayed when the reverse tone/DTCS squelch is set.

◇ Pocket beep

These functions use subaudible tones or DTCS codes for calling and can be used as a "common pager" to inform you that someone has called while you were away from the transceiver.

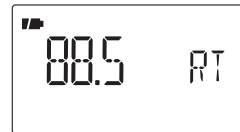
◇ Setting subaudible tones for repeater or tone squelch

- Enter "R TONE or C TONE" in DUP.T set mode.

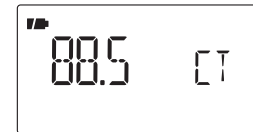
MENU ⇨ DUP.T ⇨ **R TONE** (p. 117)
(Push [MENU] (p. 117), (Push [▲](2)/[▼](8), then push [←](5).)

MENU ⇨ DUP.T ⇨ **C TONE** (p. 117)

- Push [▲](2) or [▼](8) to select the desired repeater or CTCSS tone frequency.
 - Each operating band and each memory channel have independent settings.
 - See page 117 for available tone frequencies for details.
- Push [←](5) to return to DUP.T set mode, and push [MENU] (p. 117) to return to frequency indication.



Repeater tone setting



CTCSS tone setting

13 OTHER FUNCTIONS

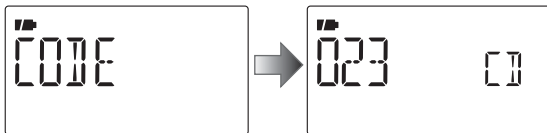
■ Tone frequency and DTCS code (Continued)

◇ Setting DTCS code for DTCS squelch or beep

- ① Enter "CODE" (DTCS CODE) in DUP.T set mode.

MENU ⇨ DUP.T ⇨ **CODE** (p. 118)
(Push [MENU] (), (Push [▲](2)/[▼](8), then push [←](5).)

- ② Push [▲](2) or [▼](8) to select the desired DTCS tone code.
 - Each operating band and each memory channel have independent settings.
 - See page 118 for available DTCS codes for details.
- ③ Push [←](5) (or [↵](4)) to return to DUP.T set mode, and push [MENU] () to return to frequency indication.



DTCS phase can be selected in "DTCS-P" (DTCS POLARITY) item. (p. 118)

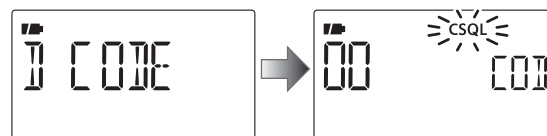
■ Digital code and digital call sign setting

◇ Setting digital code for digital code squelch or beep

- ① Push and hold [MODE](BAND) for 1 sec. several times to select DV mode.
- ② Enter "D CODE" (DIGITAL CODE) in DUP.T set mode.

MENU ⇨ DUP.T ⇨ **D CODE** (p. 118)
(Push [MENU] (), (Push [▲](2)/[▼](8), then push [←](5).)


- ③ Push [▲](2) or [▼](8) to select the desired digital code.
 - Each operating band and each memory channel have independent settings.



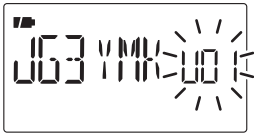
- ④ Push [←](5) to return to DUP.T set mode, and push [MENU] () to return to frequency indication.

◇ **Setting the YOUR and MY call signs for digital call sign squelch or beep**


- ① Push and hold [MODE](BAND) for 1 sec. several times to select DV mode.
- ② Enter "UR" in CALL-S set mode.


MENU ⇄ CALL-S ⇄ **UR** (p. 37)
 (Push [MENU ]), (Push [▲](2)/[▼](8), then push [←](5).)

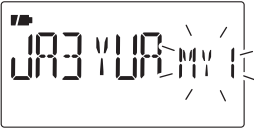
- ③ Push [▲](2) or [▼](8) to select the desired call sign.
 - Input the call sign if the desired call sign is not stored in the transceiver. See p. 37 for detail.



- ④ Push [←](5) to specify the call sign and then push [◀](4) to return to CALL-S set mode.
 - Push [◀](4) to return to CALL-S set mode without storing call sign.
- ⑤ Push [▲](2) three times to select "MY" in CALL-S set mode, then push [←](5) to enter "MY" setting.

MENU ⇄ CALL-S ⇄ **MY** (p. 36)
 (Push [MENU ]), (Push [▲](2)/[▼](8), then push [←](5).)

- ⑥ Push [▲](2) or [▼](8) to select the desired call sign.
 - Input the call sign if the desired call sign is not stored in the transceiver. See p. 36 for detail.
- ⑦ Push [←](5) to set call sign and push [MENU ] to return to frequency indication.



CAUTION!: Use digital code squelch when operating with more than 3 stations. Because the digital call sign squelch function recognizes "MY" (MY CALL SIGN) the digital call sign squelch function can be used when operating with only one station.

NOTE:

- The tone/DTCS code squelch opens sometimes when other stations communicate with adjacent tone frequency or DTCS code.
- No audio sounds with S-meter swaying when receiving signal except my call sign on DV mode .

13 OTHER FUNCTIONS

■ Tone/DTCS squelch

- ① Set the desired operating frequency on FM or FM-N mode, CTCSS tone and DTCS code.
- ② Push and hold **[TONE]**(7) for 1 sec. several times to activate the tone or DTCS squelch. (T SQL or DTCS)
 - Subaudible tone encoder “T,” pocket beep (tone squelch) “((•)) T SQL,” tone squelch “T SQL,” DTCS beep “((•)) DTCS,” DTCS squelch “DTCS,” tone squelch reverse “T SQL-R,” DTCS squelch reverse “DTCS-R” and no tone operation are activated in order.
 - Rotating **[DIAL]** while pushing **[TONE]**(7) also selects the tone functions.
- ③ Operate the transceiver in the normal way.
- ④ When the received signal includes a matching tone/code, the squelch opens and the signal can be heard.
 - When the received signal’s tone/code does not match, tone/DTCS squelch does not open, however, the S-indicator shows signal strength.
 - To open the squelch manually, push and hold **[SQL]**.

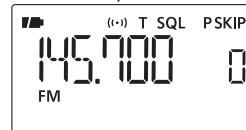
No tone operation



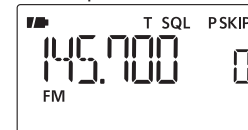
Subaudible tone encoder



Pocket beep



Tone squelch



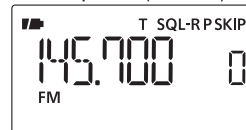
DTCS beep



DTCS squelch



Tone squelch (reverse)



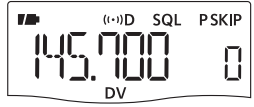
DTCS squelch (reverse)



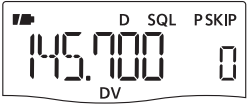
Digital squelch

- ① Set the desired operating frequency on DV mode, Digital code and "MY" (MY CALL SIGN).
- ② Push and hold **[DSQ](7)** for 1 sec. several times to activate the digital call sign or digital code squelch.
 - Digital call sign beep "DSQL ((·))," Digital call sign squelch "DSQL," Digital code beep "CSQL ((·))," Digital code squelch "CSQL," and no digital squelch operation are activated in order.
 - Rotating **[DIAL]** while pushing **[DSQ](7)** also selects the digital squelch functions.
- ③ Operate the transceiver in the normal way.
- ④ When the received signal includes a matching call sign/code, the squelch opens and the signal can be heard.
 - When the received signal's call sign/code does not match, digital call sign/digital code squelch does not open, however, the S-indicator shows signal strength.
 - To open the squelch manually, push and hold **[SQL]**.

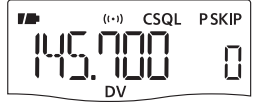
Digital call sign pocket beep



Digital call sign squelch



Digital code pocket beep



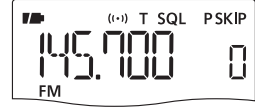
Digital code squelch



Pocket beep function

- ① Set the desired operating frequency.
- ② Set the desired CTCSS tone, DTCS code, Digital call sign or Digital code.
- ③ Push and hold **[TONE](7)** or **[DSQ](7)** for 1 sec. several times to activate the pocket beep, DTCS beep, Digital call sign beep or Digital code beep. ("((·)) T SQL," "((·)) DTCS," "((·)) D SQL" or "((·)) CSQL")
 - Rotating **[DIAL]** while pushing **[TONE](7)/[DSQ](7)** also selects the tone squelch or digital squelch functions.
- ④ When a signal with the correct tone, code, digital call sign or digital code is received, the transceiver emits beep tones for 30 sec. and blinks "((·)) ."
- ⑤ Push **[PTT]** to answer or push **[SQL]** to stop the beeps and blinking.

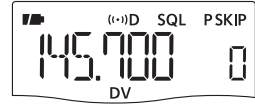
Pocket beep



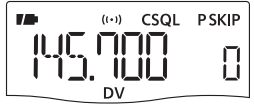
DTCS beep



Digital call sign pocket beep



Digital code pocket beep



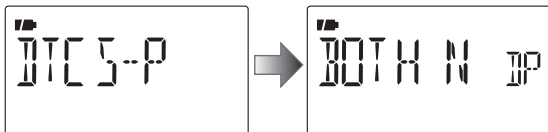
13 OTHER FUNCTIONS

■ DTCS polarity setting

- ① Enter "DTCS-P" in DUPT set mode.

MENU ⇨ DUPT ⇨ **DTCS-P** (p. 118)
(Push **[MENU]**, (Push **[▲]**(2)/**[▼]**(8), then push **[←]**(5).)

- ② Push **[▲]**(2) or **[▼]**(8) to select the desired DTCS polarity mode.
- **BOTH N** : Normal phase is used for both TX and RX. (Default)
 - **TN-RR** : Normal phase is used for TX; Reverse phase for RX.
 - **TR-RN** : Reverse phase is used for TX; Normal phase for RX.
 - **BOTH R** : Reverse phase is used for both TX and RX.

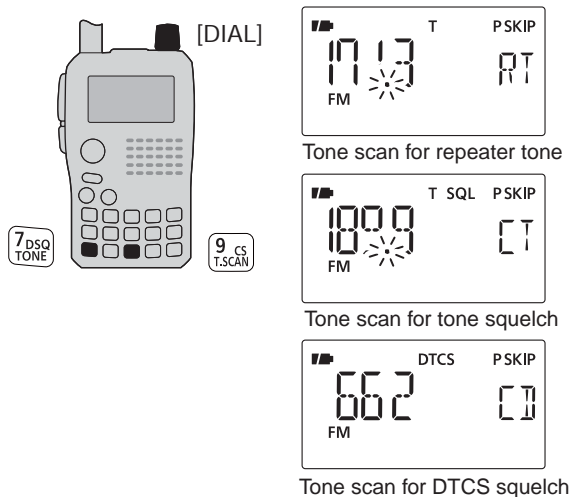


- ③ Push **[←]**(5) (or **[▲]**(4)) to return to DUPT set mode, and push **[MENU]** to return to frequency indication.

■ Tone scan

The transceiver can detect the subaudible tone frequency and DTCS code 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 Set the desired frequency on FM/FM-N mode or memory channel to be checked for a tone frequency or DTCS code.
- ② Push and hold **[TONE]**(7) for 1 sec. several times to activate the repeater tone, tone squelch or DTCS squelch. (T, T SQL or DTCS)
- Rotating **[DIAL]** while pushing and holding **[TONE]**(7) also selects the tone functions.
- ③ Push and hold **[T.SCAN]**(9) for 1 sec. to start the tone scan.
- To change the scanning direction, rotate **[DIAL]**.
- ④ When the tone frequency or DTCS code is decoded, the set mode contents are programmed with the frequency or code.
- The tone scan pauses for the set period in scan pause timer (p. 119) when a tone frequency or DTCS code is detected.
 - The decoded tone frequency is used for the repeater tone frequency when the tone squelch is OFF.
 - The decoded tone frequency is used for the tone squelch frequency when the tone squelch is ON.
 - The decoded DTCS code is used for the DTCS squelch code when the DTCS squelch is ON.



- ⑤ Push **[V/MHz]** to stop the scan.
- If the scan is cancelled before the transceiver detects the tone or code, the set mode contents are not changed.
 - The detected tone is used for temporary operation only. The stored tone setting in memory or call channel won't be changed.

NOTE: Tone frequency is over-written automatically when it corresponds with the scanning tone frequency in tone squelch mode. However, it is not over-written in memory or call channel mode.

■ Beep tones

You can select to have confirmation beeps sound at the push of a switch. The output level can be adjusted within 39 levels with “BEEPLV” in SOUNDS set mode.

MENU ⇨ SOUNDS ⇨ **BEEPLV** (p. 128)
(Push **[MENU]**), (Push **[▲]**(2)/**[▼]**(8), then push **[←]**(5).)

You can select silent operation by turning beep tones OFF with “KEY B” in SOUNDS set mode.

MENU ⇨ SOUNDS ⇨ **KEY B** (p. 128)
(Push **[MENU]**), (Push **[▲]**(2)/**[▼]**(8), then push **[←]**(5).)

■ Dial speed acceleration

The dial speed acceleration automatically speeds up the tuning dial speed when rotating **[DIAL]** rapidly.

This function can be turned ON and OFF with “DIAL S” (DIAL SPEED) in FUNC set mode (SET).

MENU ⇨ SET ⇨ FUNC ⇨ **DIAL S** (p. 125)
(Push **[MENU]**), (Push **[▲]**(2)/**[▼]**(8), then push **[←]**(5).)

13 OTHER FUNCTIONS

■ Key lock effect

While the lock function is ON, [PWR], [△]/[▽], [SQL] and [PTT] can still be accessed. Accessible switches can be set to one of 4 groups with "LOCK" in FUNC set mode (SET).

MENU ⇨ SET ⇨ FUNC ⇨ **LOCK** (p. 125)
(Push [MENU] (key)), (Push [▲](2)/[▼](8), then push [←](5).)

- "NORM": [PWR], [△]/[▽], [SQL] and [PTT] are accessible.
- "NO S" : [PWR], [SQL] and [PTT] are accessible.
- "NO V" : [PWR], [△]/[▽], and [PTT] are accessible.
- "ALL" : [PWR] and [PTT] are accessible.

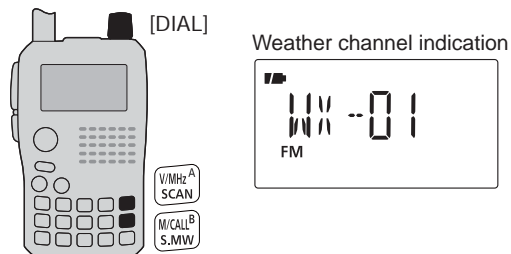
■ Weather channel operation

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



◇ Weather channel selection

- ① Push [M/CALL] several times to select weather channel mode.
 - "WX" and the weather channel number appear.
- ② Rotate [DIAL] to select the desired weather channel.
- ③ Push [V/MHz] or [M/CALL] to return to the previous frequency or memory channel.



◇ Weather alert function

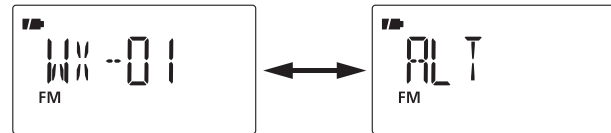
U.S.A. version only

NOAA broadcast stations transmit weather alert tones before important weather announcements. When the weather alert function is turned ON, the selected weather channel is monitored every 5 sec. for the announcement. When the alert signal is detected, the “ALT” and the WX channel indications are displayed alternately and sounds a beep tone until the transceiver is operated. The previously selected (used) weather channel is checked periodically during standby or while scanning.

- ① Select the desired weather channel.
- ② Enter “WX-ALT” in SCAN set mode.

MENU ⇄ SCAN ⇄ **WX-ALT** (p. 120)
 (Push [MENU] (key)), (Push [▲](2)/[▼](8), then push [←](5).)
- ③ Push [▲](2) or [▼](8) to select “ON” or “OFF.”
- ④ Push [←](5) (or [↶](4)) to return to SCAN set mode, and push [MENU] (key) to return to the weather channel indication.
- ⑤ Set the desired stand-by condition.
 - Select VFO, memory or call channel.
 - Scan or priority watch operation can also be selected.

- ⑥ When the alert is detected, a beep sounds and the following indication will be displayed.



Shows above indications alternately.

- ⑦ Turn the weather alert function OFF in Scan menu.

NOTE: While receiving a signal (on a frequency other than the weather alert ON frequency), the receiving signal or audio will be interrupted momentarily every 5 sec. (approx.) in the case that the alert function is turned ON. This symptom is caused by the WX alert function. To cancel these symptoms, set the weather alert item OFF in set mode.

13 OTHER FUNCTIONS

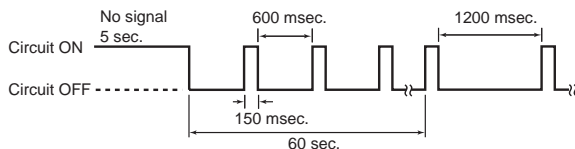
■ Power save

The power save function reduces the current drain to conserve battery power.

The power save duty cycle, the ratio of receive circuit on to receive circuit off during standby, can be set to automatic1 (default), 1 : 4 (150 msec. : 600msec.), 1 : 8 (150 msec. : 1200msec.), automatic2, in addition stopping the operation of a digital block at the DV mode, or OFF with "P SAVE" in FUNC set mode (SET).

MENU ⇨ SET ⇨ FUNC ⇨ **P SAVE** (p. 123)
(Push [MENU] (5)), (Push [▲](2)/[▼](8), then push [←](5).)

- "AUTO1" selects "1:4" duty ratio when receiving no signal for 5 sec., then "1:8" 60 sec. after that.
- "AUTO2" suppresses the consumption of the battery by stopping the operation of a digital block of the DV mode in addition to the operation of AUTO1.



■ Auto power OFF

The transceiver can be set to automatically turn OFF after a specified period with a beep when no switch is pushed.

120 min., 90 min., 60 min., 30 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 the auto power-off item in set mode.

This can be selected with "AP OFF" in FUNC set mode (SET).

MENU ⇨ SET ⇨ FUNC ⇨ **AP OFF** (p. 126)
(Push [MENU] (5)), (Push [▲](2)/[▼](8), then push [←](5).)

■ Auto power ON

The transceiver can be set to automatically turn ON after a specified period. The timer can be selected within 30 min. to 24 hrs. in 30 min. steps.

This can be selected with "AP ON" in FUNC set mode (SET).

MENU ⇨ SET ⇨ FUNC ⇨ **AP ON** (p. 126)
(Push [MENU] (5)), (Push [▲](2)/[▼](8), then push [←](5).)


- /// When operating with battery pack or case and the battery is exhausted, auto power-on does not function.
- /// During standby, a small current still flows in the radio.

■ Time-out timer

To prevent accidental prolonged transmission, etc., the transceiver has a time-out timer. This timer cuts a transmission OFF after 1, 3, 5 or 10 min. of continuous transmission. This timer can be cancelled (default).

/// Approx. 10 sec. before the time-out timer is activated, the transceiver emits a beep tone as a warning.


This can be selected with "TOT" in FUNC set mode (SET).

MENU ⇨ SET ⇨ FUNC ⇨ **TOT** (p. 124)
(Push [MENU 

■ PTT lock


To prevent accidental transmission, etc., the transceiver has a PTT lock function.

This can be selected with "PTT LK" in FUNC set mode (SET).

MENU ⇨ SET ⇨ FUNC ⇨ **PTT LK** (p. 123)
(Push [MENU 

■ Display backlighting

The transceiver has display backlighting with a 5 sec. timer for night time operation. The display backlighting can be turned ON continuously, turned AUTO or turned OFF, if desired.

MENU ⇨ SET ⇨ DISP ⇨ **LIGHT** (p. 127)
(Push [MENU 

■ LCD contrast

The contrast of the LCD can be selected from 4 levels.

MENU ⇨ SET ⇨ DISP ⇨ **CONT** (p. 127)
(Push [MENU 13

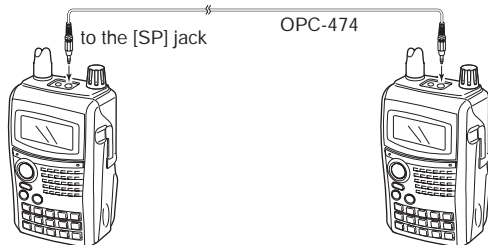
13 OTHER FUNCTIONS

■ Cloning function

The IC-80AD has transceiver-to-transceiver data cloning capability. This function is useful when you want to copy all of the programmed contents from one IC-80AD to another.

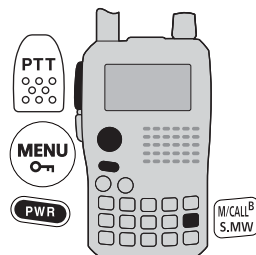
- An optional OPC-474 CLONING CABLE is required.

- ① Turn the transceiver's power OFF, then connect an optional OPC-474 between both [SP] jacks.



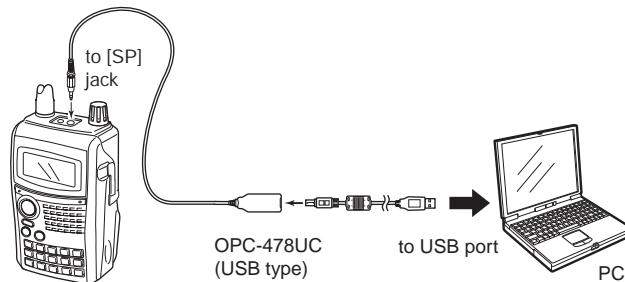
- ② While pushing [M/CALL] and [MENU], push and hold [PWR] for 1 sec. to enter cloning mode.

- “CLONE M” appears.



- ③ Push [PTT] on the “master” transceiver.
 - “CL OUT M” appears and the bar meter shows that cloning is taking place.
 - After the cloning is completed, the display returns to “CLONE M.”
- ④ Push and hold [PWR] for 1 sec. to turn power OFF.

The CS-80/880 CLONING SOFTWARE (free download) is also available to clone/edit contents with a PC (for Microsoft® Windows® 2000/XP or Windows Vista™) and using ICF format files.



■ Resetting

The display may occasionally display erroneous information (e.g. when first applying power). This may be caused externally by static electricity or by other factors.

If this problem occurs, turn power OFF. After waiting a few seconds, turn power ON again. If the problem persists, perform either or both procedures below.

• All reset

Reset the CPU before operating the transceiver for the first time, or if the internal CPU malfunctions, to clear and return all programmed contents to their default settings.

• Partial reset

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

◇ All reset

- ① Push and hold **[PWR]** for 1 sec. to turn power OFF.
- ② While pushing and holding **[V/MHz]**, **[M/CALL]** and **[△]**, then turn power ON to reset the CPU.
 - “CLEAR” appears when resetting the CPU (See the illustration below).

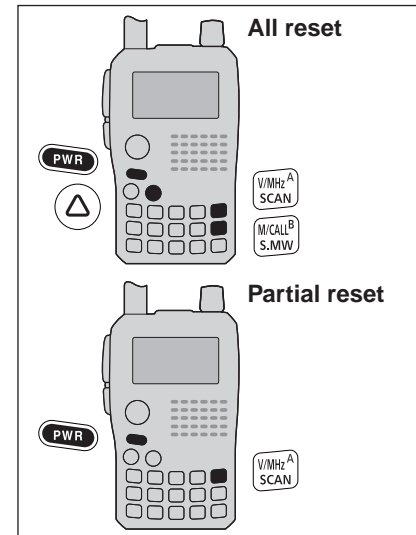


CAUTION: Resetting the CPU returns all programmed contents to their default settings.

◇ Partial reset


- ① Push and hold **[PWR]** for 1 sec. to turn power OFF.
- ② While pushing and holding **[V/MHz]**, then turn power ON to partially reset the transceiver.

NOTE: No message appears on the display after the partial reset is done.



14 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.
No power comes ON.	<ul style="list-style-type: none"> • The batteries are exhausted. • Loose connection of a battery pack (case). • The battery polarity is reversed. 	<ul style="list-style-type: none"> • Replace the batteries or charge the battery pack. • Clean battery terminals. • Check the battery polarity. 	pgs. 2, 12–14 p. 14 p. 14
No sound comes from the speaker.	<ul style="list-style-type: none"> • Volume level is too low. • External speaker is connected or cloning cable is inserted. 	<ul style="list-style-type: none"> • Push [△] or [▽] to suitable level. • Check the connection of the external speaker correctly or remove the cloning cable. 	p. 16 –
Transmitting is impossible.	<ul style="list-style-type: none"> • The batteries are exhausted. • A frequency outside of the 144/440 MHz amateur bands is set. 	<ul style="list-style-type: none"> • Replace the batteries or charge the battery pack. • Reset the frequency within 144/440 MHz amateur bands. 	pgs. 2, 12–14 pgs. 20, 159
No contact possible with another station.	<ul style="list-style-type: none"> • Different tone is selected with tone/DTCS squelch. 	<ul style="list-style-type: none"> • Check the tone/DTCS using tone scan. 	p. 150
Frequency can not be set.	<ul style="list-style-type: none"> • The lock function is activated. • Memory mode or call channel is selected. 	<ul style="list-style-type: none"> • Push [MENU  • Push [V/MHz] to set VFO mode. 	p. 24 p. 18
Program scan function can not start.	<ul style="list-style-type: none"> • Memory mode or call channel is selected. • Same frequencies are programmed both “*A” and “*B” of PROGRAM-CH. 	<ul style="list-style-type: none"> • Push [V/MHz] to set VFO mode. • Programming different frequencies in “*A” and “*B” respectively. 	p. 18 p. 103
Memory scan function can not start. The displayed frequency is erroneous.	<ul style="list-style-type: none"> • VFO mode or call channel is selected. • The programmed memory channel is only one. • The CPU malfunctioned. • External factors caused a fault. 	<ul style="list-style-type: none"> • Push [M/CALL] to set memory mode. • Program 2 or more memory channels. • Reset the transceiver. • Remove and re-attach the battery pack or battery case. 	p. 18 p. 92 p. 157 p. 2
Can not charge the battery with BC-139 (LED blinks orange).	<ul style="list-style-type: none"> • The transceiver's power is ON. • The battery pack is fault electric discharge. 	<ul style="list-style-type: none"> • Turn the transceiver's power OFF, or insert only the battery pack into the BC-139 to charge it. • The battery pack is charged alone (without the transceiver) or regular charge is carried out. 	p. 13 pgs. 12, 13

◇ General

- Frequency coverage : (unit: MHz)

Version	TX	RX
U.S.A.	144–148, 420–450*1	0.495–823.990, 849–868.990, 894–999.990
S.E.A. CHN EXP	137–174*2, 400–470*2	0.495–999.990
KOR	144–146, 430–440	144–146, 430–440
AUS	144–148, 420–450*2	0.495–999.990

*1Guaranteed 440–450 MHz only, *2Guaranteed 430–440 MHz only

- Mode : FM, FN-N, AM (Rx only), WFM (Rx only), DV
- No. of memory channels : 1052
(incl. 50 scan edges and 2 call channels)
- Usable temp. range : –20°C to +60°C; –4°F to +140°F
- Tuning steps : 5[‡], 6.25[‡], 8.33[‡], 9[‡], 10, 12.5, 15[‡], 20, 25, 30, 50, 100, 125 and 200 kHz
- Frequency stability : ±2.5 ppm
(–20°C to +60°C; –4°F to +140°F)
- Power supply : 10.0–16.0 V DC for external DC power,
or specified Icom battery pack
- Digital transmission speed: 4.8 kbps
- Voice coding speed : 2.4 kbps
- Current drain (at 7.4 V DC) :
 - Tx High 144 MHz 1.8 A typical
 - 430/440 MHz 2.1 A typical
 - Tx Mid. 144 MHz 1.2 A typical
 - 430/440 MHz 1.5 A typical
 - Tx Low 144 MHz 0.6 A typical
 - 430/440 MHz 0.7 A typical
 - Tx S-Low 144 MHz 0.4 A typical
 - 430/440 MHz 0.4 A typical

- Rx Rated output 170 mA typical (FM)
215 mA typical (DV)
- Power save 30 mA typical (FM)
(Duty 1:4) 38 mA typical (DV)
standby 62 mA typical (FM)
106 mA typical (DV)

- Antenna connector : SMA (50 Ω)
- Dimensions : 58.4(W)×103(H)×34.2(D) mm;
(projections not included) 2⁵/₁₆(W)×4¹/₁₆(H)×1¹¹/₃₂(D) in
- Weight (approx.) : 290 g; 10.3 oz (with antenna and BP-217)

◇ Transmitter

- Modulation system :
FM Variable reactance freq. modulation
DV (Digital) GMSK digital modulation
- Output power (at 7.4 V DC)
(Typical) : High 5.0 W, Mid. 2.5 W, Low 0.5 W,
S-Low 0.1 W
- Max. frequency deviation : ±5.0 kHz (FM wide: approx.)
±2.5 kHz (FM narrow: approx.)
- Spurious emissions : Less than –60 dBc at High/Mid.
Less than –13 dBm at Low/Slow
- Ext. mic. impedance : 2 kΩ

[‡]Selectable depending on the operating frequency band.

15 SPECIFICATIONS

◇ Receiver

- Receive system :
 - Except WFM Double-conversion superheterodyne
 - WFM Triple-conversion superheterodyne
- Intermediate frequencies :
 - 1st 61.65 MHz/59.25 MHz (WFM only)
 - 2nd 450 kHz/13.35 MHz (WFM only)
 - 3rd 1.95 MHz (WFM only)
- Sensitivity (except spurious points):
 - FM (1 kHz/3.5 kHz Dev.; 12 dB SINAD)
 - 1.625–29.995 MHz 0.4 μ V typ.
 - 30.000–75.995 MHz 0.25 μ V typ.
 - 76.000–117.995 MHz 0.25 μ V typ.
 - 118.000–173.995 MHz 0.14 μ V typ.
 - 174.000–259.995 MHz 0.32 μ V typ.
 - 260.000–349.995 MHz 0.32 μ V typ.
 - 350.000–469.995 MHz 0.16 μ V typ.
 - 470.000–599.995 MHz 0.32 μ V typ.
 - 600.000–999.990 MHz 0.56 μ V typ.
 - WFM (1 kHz/52.5 kHz Dev.; 12 dB SINAD)
 - 76.000–108.000 MHz 1 μ V typ.
 - 175.000–221.995 MHz 1.8 μ V typ.
 - 470.000–770.000 MHz 2.5 μ V typ.
 - AM (1 kHz/30% Mod.; 10 dB S/N)
 - 0.495–4.995 MHz 1.3 μ V typ.
 - 5.000–29.995 MHz 0.56 μ V typ.
 - 118.000–137.000 MHz 0.5 μ V typ.
 - 222.000–246.995 MHz 0.79 μ V typ.
 - 247.000–329.995 MHz 1 μ V typ.
 - DV (PN9/GMSK 4.8 kbps; BER 1%)
 - VHF (Amateur band only) 0.22 μ V typ.
 - UHF (Amateur band only) 0.22 μ V typ.
- Audio output power : More than 300 mW at 10% distortion
(at 7.4 V DC) with an 8 Ω load

- Selectivity :
 - FM (Wide), AM More than 50 dB
 - FM (Narrow), DV More than 45 dB
 - WFM More than 300 kHz/–3 dB
Less than 700 kHz/–20 dB
- Ext. speaker connector : 3-conductor 3.5(d) mm; (1/8")/8 Ω
- Spurious and image rejection ratio :
 - VHF More than 60 dB
 - UHF More than 50 dB
(Intermediate freq.; More than 60 dB)
- Squelch Sensitivity (except spurious points):
 - FM (1 kHz/3.5 kHz Dev.)
 - 1.625–29.995 MHz 0.4 μ V typ.
 - 30.000–75.995 MHz 0.25 μ V typ.
 - 76.000–117.995 MHz 0.25 μ V typ.
 - 118.000–173.995 MHz 0.14 μ V typ.
 - 174.000–259.995 MHz 0.32 μ V typ.
 - 260.000–349.995 MHz 0.32 μ V typ.
 - 350.000–469.995 MHz 0.16 μ V typ.
 - 470.000–599.995 MHz 0.32 μ V typ.
 - 600.000–999.990 MHz 0.56 μ V typ.
 - WFM (1 kHz/52.5 kHz Dev.)
 - 76.000–108.000 MHz 1 μ V typ.
 - 175.000–221.995 MHz 1.8 μ V typ.
 - 470.000–770.000 MHz 2.5 μ V typ.
 - AM (1 kHz/30% Mod.)
 - 0.495–4.995 MHz 1.3 μ V typ.
 - 5.000–29.995 MHz 0.56 μ V typ.
 - 118.000–137.000 MHz 0.5 μ V typ.
 - 222.000–246.995 MHz 0.79 μ V typ.
 - 247.000–329.995 MHz 1 μ V typ.

◇ Battery pack and charger

- **BP-216** BATTERY CASE
Battery case for LR6 (AA) × 2 alkaline batteries.
- **BP-217** LI-ION BATTERY PACK
7.4 V/1300 mAh (Min.)/1580 mAh (Typ.) Lithium Ion battery pack. Battery life: 6.7 hrs. (approx.; VHF, FM, high power, Tx : Rx : Standby = 1:1:8)
- **BC-167SA/SC/SV** BATTERY CHARGER
For regular charging of battery packs. Charging time : Max. 6 hrs.
- **BC-139** DESKTOP CHARGER+**BC-123** AC ADAPTER
Rapidly charges BP-217 LI-ION BATTERY PACK in approx. 2.5 hrs.

◇ Microphones

- **HM-189GPS** GPS SPEAKER-MICROPHONE
Allows you to operate in rainy condition; includes GPS receiver and antenna.
- **HM-75A** REMOTE CONTROL SPEAKER MICROPHONE
Allows you to remotely select operating channels, etc.
- **HM-131** SPEAKER-MICROPHONE
For operation while conveniently hanging the transceiver from your belt, etc.
- **HM-153/HM-166** EARPHONE-MICROPHONE
Ideal for hands-free operation by clipping the microphone with the PTT switch to your lapel or breast pocket. Allows you to operate in rainy condition.
- **HS-85** HEADSET WITH VOX/PTT UNIT
Hands-free headset with VOX control box.

• SP-13 EARPHONE

Provides clear audio in noisy environments.

◇ Other options

- **CP-12L** CIGARETTE LIGHTER CABLE WITH NOISE FILTER
- **CP-19R** CIGARETTE LIGHTER CABLE WITH DC-DC CONVERTER
Allows you to operate the transceiver through a 12 V cigarette lighter socket. You can also charge the attached battery pack (during stand-by only).
CP-19R: A built-in DC-DC converter provides an 11 V DC output.
- **OPC-254L** DC POWER CABLE
For operation and charging via an external power supply.
- **OPC-474** CLONING CABLE
Used for handheld-to-handheld cloning.
- **OPC-478UC** CLONING CABLE
Used for data cloning between transceiver and PC with CS-80/880 (free download software).
- **OPC-1529R** DATA COMMUNICATION CABLE
Allows GPS operation in DV mode.
- **LC-163** CARRYING CASE
Helps protect the transceiver from scratches, etc.
- **AD-92SMA** ANTENNA CONNECTOR ADAPTER
Allows you to connect an external antenna with a BNC connector.
- **CS-80/880** CLONING SOFTWARE (free download)
Use this software to program settings such as memory channels and set mode contents quickly and easily via your PC's USB port. OPC-478UC is required.

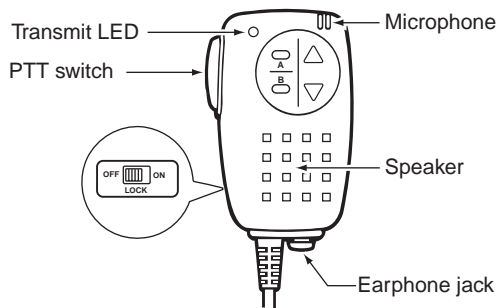
16 OPTIONS

■ Optional HM-75A R O C O R O L P R C R O P O

The optional HM-75A allows you to remotely select operating frequencies, memory channels, etc.

Remote control functions can be selected from 3 settings. These can be selected with "MIC" in FUNC set mode (SET).

MENU ⇄ SET ⇄ FUNC ⇄ **MIC** (p. 126)
 (Push [MENU] (1)), (Push [▲](2)/[▼](8), then push [←](5).)



The HM-75A has a lock switch on the backside to prevent accidental frequency changes, etc.

⚡ Be sure to turn power OFF when plugging/unplugging the HM-75A to/from the [SP/MIC] jack.

• NORM-1: (default)

[A]	Selects band.
[B]	Toggles VFO mode and memory mode.
[▲]	Frequency or memory channel "UP."
[▼]	Frequency or memory channel "DOWN."

• NORM-2:

[A]	Toggles the monitor function.
[B]	Toggles VFO mode and memory mode.
[▲]	Frequency or memory channel "UP."
[▼]	Frequency or memory channel "DOWN."

• SIMPLE:

[A]	Toggles the monitor function.
[B]	Selects call channel C0.
[▲]	Selects memory channel 0 in memory mode.
[▼]	Selects memory channel 1 in memory mode.

SIMPLE mode can select only 3 channels and is useful for group operations during touring, etc.

⚡ VFO mode cannot be selected via the microphone when SIMPLE mode is selected.

• COMMON (NORM-1/NORM-2/SIMPLE):

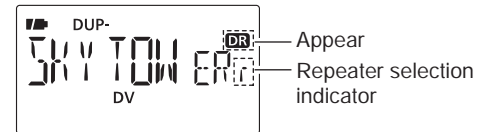
[A]	Transmits T-CALL (1750 Hz tone) while pushing [PTT].
[▲]	Volume "UP" while operating the monitor function.
[▼]	Volume "DOWN" while operating the monitor function.

- When transceiver is selected DR mode:

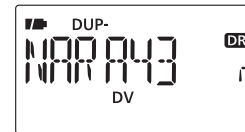
[A]	Selects access repeater selection.
[B]	Selects your call sign and link repeater selection.
[▲]	Repeater selection or station call sign selection "UP."
[▼]	Repeater selection or station call sign selection "DOWN."

◇ DR mode operation using HM-75A

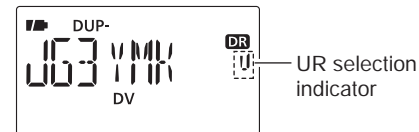
- ① Push [A] to enter the access repeater selection on DR mode.



- ② Push [▲] or [▼] to select the access repeater.



- ③ Push [B] to enter the your call sign selection.



- ④ Push [▲] or [▼] to select the your call sign.
- ⑤ Push [B] to enter the link repeater (RPT2) selection.
- ⑥ Push [▲] or [▼] to select the link repeater.
- ⑦ Push [PTT] to transmit; release to receive.

16 OPTIONS

■ Optional HM-189GPS P P

The optional HM-189GPS has a GPS receiver and allows you to operate the IC-80AD's GPS functions.

① PTT SWITCH

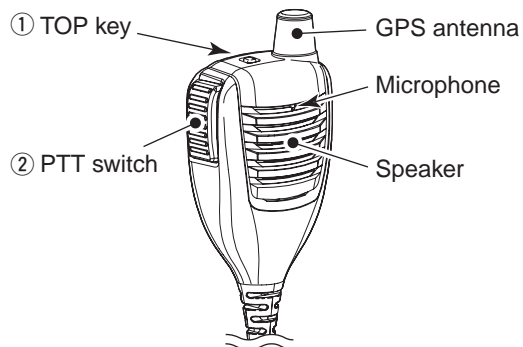
Push and hold to transmit; release to receive.

② TOP KEY

Push to turn the GPS receiver's power ON and OFF.

- Key illumination lights when GPS receiver is turned ON. Key illumination lights OFF when it's OFF.
- Key illumination blinks when GPS receiver receives GPS signals.

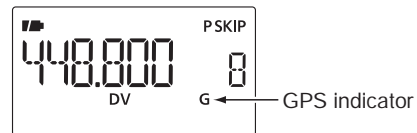
R CROP O



◇ GPS receiver power ON

- ① Turn the transceiver power OFF.
- ② Remove the rubber cap. from the [SP/MIC] jack.
- ③ Connect the HM-189GPS to the [SP/MIC] jack.
- ④ Turn the transceiver power ON, then push the top key of the HM-189GPS to turn the GPS receiver power ON.
 - Key illumination lights when GPS receiver is turned ON. "G" indicator blinks on the transceiver's display.
 - Key illumination blinks when GPS receiver receives GPS signals. Then "G" indicator stays ON on the transceiver's display.
- ⑤ Position, elevation, time, direction, etc. can be displayed. See Section 8 "GPS/GPS-A OPERATION" for details.

CAUTION! Turn power OFF the transceiver before connecting/disconnecting HM-189GPS to/from the [SP/MIC] jack.



Count on us!

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