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

Thank you for purchasing the IC-T8A or IC-T8E. This product represents Icom's state-of-the-art handheld transceiver technology. The IC-T8A/E features tri-band capabilities (VHF, UHF operation and 50 MHz reception), numerous functions and superior performance—in a package as compact as that of a single bander. With proper care this Icom product will provide years of trouble-free operation.

IMPORTANT

READ ALL INSTRUCTIONS carefully and completely before using the transceiver.

SAVE THIS INSTRUCTION MANUAL—This instruction manual contains important operating instructions for the IC-T8A and IC-T8E.

The IC-T8E complies with essential requirements of the 89/336/EEC directive for Electromagnetic Compatibility. This compliance is based on conformity with the ETSI specification ETS300 684 (EMC product standard for Commercially Available Amateur Radio Equipment).

CAUTIONS

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

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

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

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

NEVER attempt to charge alkaline or dry cell batteries. Be aware that external DC power connections will charge batteries inside the battery case. This will damage not only the battery case but also the transceiver.
DO NOT push the PTT when not actually desiring to transmit.

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

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

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

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

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

UNPACKING

Accessories included with the transceiver:

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*Not supplied with some versions.
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◊ Antenna
Insert the supplied antenna into the antenna connector and rotate the antenna as shown in the diagram below.

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

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

◊ Handstrap
Attach the handstrap to the belt clip, before attaching the belt clip to the transceiver, as below.

◊ Belt clip
Attach the belt clip to the transceiver as illustrated below.
Switches, controls, keys and connectors
1 **OUTPUT POWER SWITCH [H/L(SET)]** (p. 10)
   - Push to toggle between high and low output powers.
   - "LOW" appears when low output power is selected.
   - Push for 1 sec. to select set mode.

2 **PTT SWITCH [PTT]** (p. 10)
   - Push and hold to transmit; release to receive.

3 **POWER SWITCH [PWR]** (p. 8)
   - Push for 1 sec. to turn power on and off.

4 **SQUELCH SWITCH [SQL]** (p. 10)
   - Push and hold to temporarily open the squelch to listen to weak signals.
   - While pushing, rotate [DIAL] to set the squelch to "AUTO" or one of eight levels.

5 **ANTENNA CONNECTOR** (p. 1)
   - Connects the supplied antenna.

6 **EXTERNAL SPEAKER AND MICROPHONE JACKS [SP/MIC]**
   - Connect an optional speaker-microphone or headset, if desired. The internal microphone and speaker will not function when either is connected. (See p. 32 for options.)

7 **TUNING DIAL [DIAL]**
   - Rotate to select an operating frequency, select a memory channel, select set mode contents, change scan direction, etc.

8 **FUNCTION DISPLAY** (p. 6)
   - Displays the operating frequency and other operating conditions.

9 **BAND SWITCH [BAND(SCAN)]** (p. 9)
   - Push to select a frequency band (except when in memory mode).
   - Push for 1 sec. to start scanning.

10 **TONE SWITCH [TONE(DUP)]**
   - Push to activate the following functions in order:
     - Subaudible tone encoder—"T" appears (p. 12).
     - Pocket beep—"T SQL (●●) " appears (p. 23).
     - Tone squelch—"T SQL" appears (p. 22).
     - No tone operation—no indicator appears.
   - Push for 1 sec. to select semi-duplex or simplex operation (p. 12).
2 PANEL DESCRIPTION

• "DUP" appears during minus duplex operation; "DUP" appears during plus duplex operation; and no indication appears during simplex operation.

⇒ For the European version only, while pushing [PTT], push this switch to transmit a 1750 Hz tone burst signal (p. 12).

10 VOLUME SWITCHES [VOL▲/VOL▼] (p. 10)

⇒ Push or push and hold to adjust the audio output.

12 VFO/CLEAR KEY [VFO(CLR/MHz)▲] [CLR MHz ▲] [VFO]

⇒ Push to select VFO mode (p. 8).
⇒ Cancels some functions such as digit input before entry, scan, etc.
⇒ Push and hold for 1 sec., then rotate [DIAL] to change the MHz digit (p. 21).
⇒ While pushing [PTT], this key sends a DTMF "A."

13 MEMORY MODE KEY [MR(SKIP)▲] [MR]

⇒ Push to select memory mode (p. 10).
⇒ "MR" appears while in memory mode.
⇒ While in memory mode, push this key for 1 sec. to toggle the selected memory channel between a skip and non-skip channel (p. 21).
⇒ "SKIP" appears when the channel is set as a skip channel.
⇒ While pushing [PTT], this key sends a DTMF "B."

14 CALL MODE KEY [CALL(LOCK)▲] [LOCK ▲] [CALL]

⇒ Push to select the call channel (p. 15).
⇒ "C" appears when the call channel is selected.
⇒ Push for 1 sec. to toggle the lock function on and off (p. 10).
⇒ "■" appears when the lock function is activated.
⇒ While pushing [PTT], this key sends a DTMF "C."

15 SELECT MEMORY WRITE KEY [S.MW(MW)▲] [S.MW] [MW ▲]

⇒ Push to enter memory select mode (p. 15).
⇒ "MAR" flashes and the [DIAL] can be used for channel selection (for memory writing or clearing).
⇒ Push for 1 sec. to write the set contents into the selected memory channel (or VFO, call channel) (p. 15).
⇒ Push, then push and hold this key while in memory select mode to erase the contents of the selected memory channel (p. 17).
⇒ While pushing [PTT], this key sends a DTMF "D."

16 TONE SCAN KEY [T•SCAN▲] [T•SCAN]

⇒ Push for 1 sec. to start tone decode scan (p. 23); push momentarily to stop it.
• When a subaudible tone is detected, the tone frequency is displayed and overwrites the preprogrammed:
  ⇒ tone squelch frequency when the tone squelch is in use;
  ⇒ tone encoder (repeater tone) frequency when the
tone squelch is not in use.

- Push momentarily to toggle between regular FM and FM narrow operation on the VHF band. (Europe and Italy versions only—p. 11).
  - "FM" appears when FM narrow operation is selected.
  - While pushing [PTT], this key sends a DTMF “#.”

**DTMF KEY [DTMF+M #]**

- Enters a decimal for the MHz unit during frequency input (p. 9).
  - Push for 1 sec. to enter DTMF memory mode for programming or recall (p. 18).
    - To program use [(H/L)SET].
    - To transmit use [SQL] while transmitting.
  - While pushing [PTT], this key sends a DTMF “*.”

**DIGIT KEYS**

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

**EXTERNAL DC POWER JACK [DC13.5V]**

Allows you to operate the transceiver with a 4.5 to 16 V DC power source using optional cables, CP-12L or OPC-254L.

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

• Function display
1 FREQUENCY INDICATION
   Shows the selected frequency, set mode contents, etc.

2 WFM MODE INDICATOR (p. 11)
   Indicates WFM (wide FM) mode is selected—automatically
   appears when selecting a frequency in the range
   76–107.995 MHz.
   • “FM” only appears when narrow FM operation is selected.

3 DUPLEX INDICATORS (p. 12)
   Appear during semi-duplex operation.
   • “–DUP” appears for minus duplex; “DUP” only appears for plus
     duplex.

4 TONE INDICATORS (pgs. 12, 22, 23)
   “T” appears when the subaudible tone encoder is in use,
   “T SQL (••)” appears during pocket beep operation and
   “T SQL” appears when the tone squelch function is acti-
   vated.

5 LOCK INDICATOR (p. 10)
   Appears when the lock function is activated.

6 SKIP INDICATOR (p. 21)
   Appears when a selected memory channel is set as a skip
   channel.

7 MEMORY MODE INDICATOR (p. 10)
   Appears while in memory mode.

8 MEMORY CHANNEL INDICATOR (p. 15)
   Indicates the selected memory channel and other items
   such as the call channel.

9 AM INDICATOR (p. 11)
   Appears when the air band is selected (118–136 MHz)
   and indicates that AM mode is the receive mode.

10 S/RF INDICATORS (p. 10)
    Show the relative signal strength while receiving and the
    output power selection while transmitting.

11 LOW POWER INDICATOR (p. 10)
   Appears when low output power is selected.

12 VOLUME INDICATOR (p. 10)
   Appears while adjusting the volume.
   • The S/RF indicators also appear while adjusting volume to visu-
     ally indicate the selected volume level.
3 BASIC OPERATION

■ Power ON

⚠️ NOTE: Charge the battery pack before turning power on for the first time (see pgs. 28–31).

Push and hold [PWR] for 1 sec. to turn power on.
• Current battery voltage may be displayed for 2 sec.

Push for 1 sec.

4.5V

after 2 sec.

146.01

• The display shows the approx. voltage in 0.5 V steps.
• When the battery voltage is lower than a specified level (varies according to battery pack used), “LOW V” appears. Charge the battery pack in this case or replace the alkaline cells in the battery case.
• If “OVER V” appears, UNPLUG the external DC plug immediately. Connected voltage is over 16 V and could damage the transceiver.

■ Setting a frequency

◊ Via the keypad (from the MHz digits)

1 Push [VFO] to select VFO mode.
2 Push digit keys corresponding to the desired frequency.
• When inputting a frequency in the 50 MHz band, it is necessary to input the decimal point.
• When a digit is mistakenly input, push [VFO] and input from the beginning.
• When an unacceptable frequency is input, the display reverts to the previously displayed frequency.
• “0,” “2,” “5” and “7” are acceptable as the 1 kHz digit input depending on the 10 kHz digit.

[Example]

5 5
2 52
- 052.
5 052.5
8 52.58
7 52.58\textsuperscript{7}
**Via the keypad**
(from the decimal point)
1. Push [VFO] to select VFO mode.
2. Push [*] to leave the MHz setting as is and input from the kHz digits.

**Setting tuning steps**

This transceiver has 9 tuning steps (each band has independent settings) as follows:
- 5 kHz
- 10 kHz
- 12.5 kHz
- 15 kHz
- 20 kHz
- 25 kHz
- 30 kHz
- 50 kHz
- 100 kHz

1. Push [VFO] to select VFO mode.
2. Push [BAND] to select the desired band.
3. Push [(H/L)SET] for 1 sec. to enter set mode.
4. Push [TONE] or [H/L] several times until “TS” appears.
5. Rotate [DIAL] to select the desired tuning step.
6. Push [(VFO)CLR] to exit set mode.

**Convenient**
Select a tuning step that matches the frequency intervals of repeaters in your area.

**Other methods**

- **VIA THE DIAL:** Rotate [DIAL] to change the frequency according to the set tuning steps.
- **USING THE MHz STEP:** Push [(VFO)MHz] for 1 sec., then rotate [DIAL] to change the frequency in 1 MHz steps.
3 BASIC OPERATION

■ Selecting a memory channel

① Push [MR] to select memory mode.
② Push 2 digit keys to select the desired memory channel (or rotate [DIAL]).
  - The first nine memory channels are preceded by a “0.”
  - To select scan edges 0A to 9B, use [A] for “A” and [B] for “B.”
  - Only programmed memory channels can be selected.

■ Receive and transmit

① Push [PWR] for 1 sec. to turn power on.
② Push [VOL↑]/[VOL↓] to set a volume level.
  - The volume level is indicated by the S/RF readout while holding [VOL↑]/[VOL↓].
③ Set the squelch level.
  - While pushing [SQL], rotate [DIAL].
  - 10 selections are available, “OPEN”, “AUTO”, and “SQL 1” to “SQL 8.”
④ Set an operating band and frequency.
  When a signal is received:
  ➤ Squelch opens and audio is emitted from the speaker.
  ➤ The S/RF indicator shows the relative signal strength.
⑤ Push [H/L] to toggle output power between high and low.
  - “LOW” appears when low output power is selected.
⑥ Push and hold [PTT] to transmit; then speak into the mic.
  - Do not hold the microphone too close to your mouth or speak too loudly. This may distort the signal.
  - The S/RF indicator shows the output power selection.
⑦ Release [PTT] to return to receive.

✓ CONVENIENT

Monitor function: Push and hold [SQL] to listen to weak signals that do not open the squelch.
**FM broadcast reception**

The transceiver can receive FM radio broadcasts. These are typically in the range 76–107.995 MHz and are in WFM receive mode.

To select the FM broadcast band:
- Push [BAND] one or more times until “WFM” appears in the display; or,
- Select a frequency with the digit keys directly.
  - “WFM” automatically appears when a frequency in the range 76–107.995 MHz is input.

**NOTE:** When pushing [PTT], “OFF” appears indicating the frequency and mode are outside the permitted range.

**Air band reception**

The transceiver can receive frequencies reserved for commercial/private aircraft and ground support. These are in the range 118–135.995 MHz and are in AM receive mode.

To select the air band:
- Push [BAND] one or more times until the AM indicator appears in the display (see right); or,

**Narrow FM operation**

*(Europe, Italy versions only)*

1. Push band one or more times to select the 144 MHz band.
2. Push [#(T SCAN)] to toggle between wide and narrow FM operation.
   - “FM” appears when narrow FM operation is selected—max. deviation is ±2.5 kHz.
   - No indicator appears when regular FM operation is selected (same as for operation on other bands).

**NOTE:** When FM narrow operation is selected, memory and call modes operate in FM narrow also.

**FM narrow/regular lock**

Push [#(T SCAN)] + [PWR] to turn power on and lock the transceiver in FM narrow or regular FM operation.
- When locked, pushing [#(T SCAN)] DOES NOT toggle between FM narrow and regular FM operation.
REPEATER OPERATION

General

When using a repeater, the transmit frequency is shifted from the receive frequency by the offset frequency. It is convenient to program repeater information into memory channels (pgs. 15–17).

① Set the operating band and receive frequency (repeater output frequency).
② Push [TONE(DUP)] for 1 sec. once to select – DUP or twice to select DUP.
   • “– DUP“ or “DUP“ appears to indicate the transmit frequency for minus shift or plus shift, respectively.
   • When the auto repeater function is in use (U.S.A. version only) this selection and step ③ are not necessary (p. 14).
③ Push [TONE] to activate the subaudible tone encoder, according to repeater requirements.
   • “T“ appears.
   • Refer to the table of tone frequencies on the following page.
④ Push and hold [PTT] to transmit.
   • The displayed frequency automatically changes to the transmit frequency (repeater input frequency).
   • If “OFF“ appears, check the offset frequency (p. 13).
⑤ Release [PTT] to receive.
⑥ Push and hold [SQL] to check whether the other station's transmit signal can be directly received or not.

Tone information

Some repeaters require a tone to be accessed. In this case, precede step ④ at left with the required tone.

DTMF TONES (U.S.A. and Asia versions only)
While pushing [PTT], push the desired digit key(s) to transmit DTMF tones.
• The transceiver has 9 DTMF memory channels. See p. 18 for details.

1750 Hz TONE (Europe and Italy versions only)
While pushing [PTT], push and hold [TONE] for 1 to 2 sec. to transmit a 1750 Hz tone signal.

 ✓ CONVENIENT

Tone scan function: When you don't know the subaudible tone used for a repeater, the tone scan is convenient for detecting the tone frequency.
Push and hold [T SCAN] to activate. See p. 23 for more information.
Subaudible tones for repeater use

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

1. Push [VFO] to select VFO mode.
3. Push [(H/L)SET] for 1 sec. to enter set mode.
4. Push [TONE] or [H/L] several times until "rT" appears.
5. Rotate [DIAL] to select the desired subaudible tone.
6. Push [VFO(CLR)] to exit set mode.

- Available subaudible tone frequencies (unit: Hz)

<table>
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<tr>
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<th>79.7</th>
<th>94.8</th>
<th>110.9</th>
<th>131.8</th>
<th>156.7</th>
<th>171.3</th>
<th>186.2</th>
<th>203.5</th>
<th>229.1</th>
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<tr>
<td>77.0</td>
<td>91.5</td>
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<td>183.5</td>
<td>199.5</td>
<td>225.7</td>
<td>254.1</td>
</tr>
</tbody>
</table>

Setting an offset frequency

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

1. Push [VFO] to select VFO mode.
3. Push [(H/L)(SET)] for 1 sec. to enter set mode.
4. Push [TONE] or [H/L] several times until "OW" appears.
5. Rotate [DIAL] to select the desired offset.
   - The offset frequency changes according to the selected tuning steps.
   - The MHz step may be helpful for large frequency changes—push [VFO(MHz)] for 1 sec.
6. Push [VFO(MHz)] to exit set mode.
Auto repeater function (U.S.A. version only)

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

1. Turn power on while pushing [H/L (SET)] to enter initial set mode.
2. Push [H/L] or [TONE] one or more times until "Ar" appears.
3. Rotate [DIAL] to turn the auto repeater function on ("ON1" or "ON2") or off.

<table>
<thead>
<tr>
<th>FREQUENCY RANGE</th>
<th>DUPLEX DIRECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>145.200–145.495 MHz</td>
<td>&quot;–DUP&quot; appears</td>
</tr>
<tr>
<td>146.610–146.995 MHz</td>
<td>&quot;–DUP&quot; appears</td>
</tr>
<tr>
<td>147.000–147.395 MHz</td>
<td>&quot;DUP&quot; appears</td>
</tr>
<tr>
<td>442.000–444.995 MHz</td>
<td>&quot;DUP&quot; appears</td>
</tr>
<tr>
<td>447.000–449.995 MHz</td>
<td>&quot;–DUP&quot; appears</td>
</tr>
<tr>
<td>51.620–51.980 MHz</td>
<td>&quot;–DUP&quot; appears</td>
</tr>
<tr>
<td>52.500–52.980 MHz</td>
<td>&quot;–DUP&quot; appears</td>
</tr>
<tr>
<td>53.500–53.980 MHz</td>
<td>&quot;–DUP&quot; appears</td>
</tr>
</tbody>
</table>

Auto repeater function is turned off.
## General

The transceiver has 123 memory channels (100 regular, 10 pairs of scan edge channels for mixed bands and 1 call channel for each band—VHF, UHF and 50 MHz). Note that memory channels are not grouped according to band. In other words, a given memory channel can be programmed with either a VHF frequency, a UHF frequency or a 50 MHz band frequency. This is not the case with call channels. Call channels are band specific.

The following can be programmed into memory/call channels:

- Operating frequency
- Duplex direction with an offset frequency (pgs. 12, 13)
- Subaudible tone encoder or tone squelch on/off with a tone (CTCSS) frequency (pgs. 12, 22)
- Skip information (p. 21)

**NOTE:**
- Memory channels can be assigned names (of up to 4 characters) using an IBM compatible PC and the optional CS-T8 CLONING SOFTWARE.
- When memory names are assigned, each push of [MR] toggles between frequency and name indication (or channel and name indication in channel indication mode).

## Programming during selection

1. Push [VFO] to select VFO mode.
2. Set the desired frequency:
   - Set other data, such as repeater information, etc. using set mode if required.
   - "MR" and the previously selected memory channel number flash.
   - Do not hold [S.MW] for more than 1 sec., otherwise the memory channel will be overwritten.
4. Rotate [DIAL] to select the desired channel.
   - Call channel and scan edge channels, as well as regular memory channels, can be programmed in this way.
   - Only the decimal point appears for memories not yet programmed.
   - If you want to confirm the VFO frequency, push [S.MW] momentarily—the VFO frequency appears briefly.
   - "MR" and the memory channel number stop flashing.
   - VFO mode is selected.
5 MEMORY/CALL CHANNELS

■ Programming after selection

① Select the memory channel to be programmed:
  ➤ Push [MR] to select memory mode.
  ➤ Rotate [DIAL] (or use the keypad) to select the memory channel.
  • Non-programmed channels cannot be selected.
② Set the desired frequency in VFO mode:
  ➤ Push [VFO] to select VFO mode.
  ➤ Set the desired frequency using the keypad or [DIAL].
  ➤ Set other data, if desired.
③ Push [S.MW] for 1 sec. to program.
④ Push [MR] to confirm that the memory channel has been programmed, if desired.

■ Editing

◊ Memory/call ⇒ VFO
① Select the memory/call channel to be transferred:
  ➤ Push [MR] (or [CALL]) to select memory (call) mode.
  ➤ Rotate [DIAL] (or use the keypad) to select the memory channel.
② Push [S.MW] for 1 sec. to transfer to VFO.

Memory mode

VFO mode selected
Memory/call ➞ call/memory

1. Select the memory/call channel to be transferred:
   - Push [MR] (or [CALL]) to select memory (call) mode.
   - Rotate [DIAL] (or use the keypad) to select the memory channel.

   - A beep sounds, "VF" appears and "MR" flashes.
   - Do not hold [S.MW] for more than 1 sec., otherwise the memory channel will overwrite the VFO.

3. Rotate [DIAL] to select a memory or call channel to transfer the data to.

   - "MR" stops flashing.

Memory clear

2. Select the memory channel to be cleared with [DIAL].
3. Push [S.MW] briefly, then a second time for 1 sec.
   - 3 beeps sound, then the frequency is cleared.
   - "MR" and the memory channel number flash continuously.
   - Scan edges 0A/0B and call channels cannot be cleared.

Note: Be careful—the contents of cleared memories cannot be recalled.
# Programming a DTMF code

The transceiver has 9 DTMF memory channels (D1 to D9) for storage of often-used DTMF codes of up to 16 digits.

1. Push [(●)DTMF ● M] for 1 sec. to enter DTMF memory mode.
2. Rotate [DIAL] to select the desired channel.
3. Push [H/L(SET)] for 1 sec. to enter DTMF programming mode.
   - "-----" appears.
   - Programmed DTMF memories can be cleared in this way.
4. Push digit keys to enter the desired DTMF code.
   - A maximum of 16 digits can be input.
   - If a digit is mistakenly input, push [H/L] then repeat from step 3.
5. Push [H/L(SET)] to input the digits.
   - A beep sounds.
   - To program additional DTMF memories, repeat from step 2.
   - When pushing [SQL], the programmed contents can be monitored.

# Transmitting a DTMF code

1. Select the DTMF channel to be transmitted:
   - Push [(●)DTMF ● M] for 1 sec. to select DTMF memory mode.
   - Rotate [DIAL] to select the desired DTMF channel.
2. While pushing [PTT], push [SQL] to transmit the selected DTMF channel's contents.

◊ DTMF transmit speed

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

1. Turn power on while pushing [H/L(SET)] to enter initial set mode.
2. Push [H/L] or [TONE] one or more times until "DT" appears.
3. Rotate [DIAL] to select the desired DTMF transmission speed.

- **100**: fastest (100 msec. intervals)
- **500**: slowest (500 msec. intervals)
Scan types

**FULL SCAN** (p. 20) - Repeatedly scans all frequencies over a selected band.

**PROGRAMMED SCAN** (p. 20) - Repeatedly scans between two user-programmed frequencies. Used for checking for frequencies within a specified range such as repeater output frequencies.

**MEMORY SCAN** (p. 20) - Repeatedly scans all programmed memory channels.

**MEMORY SKIP SCAN** (p. 20) - Repeatedly scans all memories, except those set as skip channels.

**NOTE:**
Push [BAND] during full/programmed scan to change the band being scanned or to select a different pair of scan edges.

Push [BAND] during memory (skip) scan to change memory channel groups: VHF, UHF, 50 MHz, air band or WFM programmed memories; or, all programmed memories.
7 SCAN FUNCTIONS

Full/programmed scan

1. Push [VFO] to select VFO mode.
2. Push [(BAND)SCAN] for 1 sec.; then, while continuing to push [(BAND)SCAN], rotate the tuning dial to select the desired scan range.
   ➡ The following scan ranges are selectable:
   - "ALL 50" for full scan on the 50 MHz band.
   - "ALL 144" for full scan on the 144 MHz band.
   - "ALL 430" or "ALL 440" for full scan on the 430(440) MHz band.
   - "ALL WFM" for full scan on the WFM (FM broadcast) band.
   - "ALL 118" for full scan on the air band.
   - "PROG 0" to "PROG 9" for one of the programmed scans.
   ➡ After releasing [(BAND)SCAN] the selected scan starts.
   ➡ To activate the previously selected scan, dial rotation is not necessary—just push [(BAND)SCAN] for 1 sec.
   ➡ During scan, the following can be changed:
     - Scan range using [(BAND)SCAN], with/without [DIAL].
     - Scan direction using [DIAL].
3. To stop the scan, push [(VFO)CLR].

NOTE: For programmed scan, scan edges must be programmed in advance (0A/0B are programmed by default). Program scan edges in the same manner as regular memory channels (p. 15)

If the same frequencies are programmed into a pair of scan edges, programmed scan does not proceed.

Memory (skip) scan

2. Push [(BAND)SCAN] for 1 sec.; then, while continuing to push [(BAND)SCAN], rotate the tuning dial to select the desired band.
   ➡ The following memory groups are selectable:
     - "SEL ALL" scans all programmed memory channels.
     - "SEL 50" scans programmed memories in the 50 MHz band.
     - "SEL 144" scans programmed memories in the 144 MHz band.
     - "SEL 430" or "SEL 440" scans programmed memories in the 430(440) MHz band, depending on version.
     - "SEL WFM" scans all programmed WFM channels.
     - "SEL 118" scans all programmed air band channels.
   ➡ After releasing [(BAND)SCAN], the selected scan starts.
   ➡ To activate the previously selected scan, dial rotation is not necessary—just push [(BAND)SCAN] for 1 sec.
   ➡ During scan, the following can be changed:
     - Memory groups using [(BAND)SCAN], with/without [DIAL].
     - Scan direction using [DIAL].
3. To stop the scan, push [(VFO)CLR].

NOTE: For memory skip scan, program memory channels you don’t want to search, as “skip” channels (p. 21). Scan proceeds as above except that any channels specified as skip channels are not searched.
**Skip channel setting**

Memory channels can be set to be skipped during memory scan. This is useful to speed up the memory scan interval.

1. Select the memory channel to be programmed as a skip channel:
   - Push [MR] to select memory mode.
   - Rotate [DIAL] (or use the keypad) to select a memory channel.
   - "SKIP" appears.

2. Push [(MR)SKIP] for 1 sec. to set the memory channel as a skip channel.

3. Repeat step 2 to cancel a skip channel.
   - "SKIP" disappears.

*NONE*: Scan edge channels, 0A to 9B, cannot be set to show "SKIP" settings, however, they will be skipped during memory scan.

**Scan resume condition**

The resume condition can be selected as a pause or timer scan. This setting is common for all scans.

1. Push [(H/L)SET] for 1 sec. to enter set mode.
2. Push [H/L] or [TONE] one or more times until "SC" appears.
3. Rotate [DIAL] to select the desired scan resume condition.
   - "T-10": scan pauses for 10 sec. on a received signal.
   - "P-02": scan pauses on a received signal until it disappears.
4. Push [(VFO)CLR] to exit set mode.

When receiving a signal, pause scan pauses until the signal disappears; timer scan pauses for 10 sec.
Tone squelch

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

1. Set the operating frequency.
2. Set the desired subaudible tone in set mode.
   - See right for programming.
3. Push [TONE] one or more times until "TSQL" appears.
4. When the received signal includes a matching tone, squelch opens and the signal can be heard.
   - When the received signal's tone does not match, tone squelch does not open, however, the S-indicator shows signal strength.
   - To open the squelch manually, push and hold [SQL].
5. Operate the transceiver in the normal way.
6. To cancel the tone squelch, push [TONE].

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

✓ CONVENIENT
Store subaudible tone frequencies and tone squelch on/off settings in memory or call channels for easy recall.

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

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

Available subaudible tone frequencies (unit: Hz)

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Frequency</th>
<th>Frequency</th>
<th>Frequency</th>
<th>Frequency</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>67.0</td>
<td>79.7</td>
<td>94.8</td>
<td>110.9</td>
<td>131.8</td>
<td>156.7</td>
</tr>
<tr>
<td>69.3</td>
<td>82.5</td>
<td>97.4</td>
<td>114.8</td>
<td>136.5</td>
<td>159.8</td>
</tr>
<tr>
<td>71.9</td>
<td>85.4</td>
<td>100.0</td>
<td>118.8</td>
<td>141.3</td>
<td>162.2</td>
</tr>
<tr>
<td>74.4</td>
<td>88.5</td>
<td>103.5</td>
<td>123.0</td>
<td>146.2</td>
<td>165.5</td>
</tr>
<tr>
<td>77.0</td>
<td>91.5</td>
<td>107.2</td>
<td>127.3</td>
<td>151.4</td>
<td>167.9</td>
</tr>
</tbody>
</table>

*CTCSS stands or continuous tone coded squelch system.
Tone scan

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

1. Set the desired frequency or memory channel to be checked for a tone frequency.
2. Push [T • SCAN] for 1 sec. to start the tone scan.
   - To change the scanning direction, rotate [DIAL].
3. When the tone frequency is decoded, the set mode contents are programmed with the tone frequency.
   - The decoded tone frequency is used for the tone encoder or tone encoder/decoder, depending on the the tone squelch ON/OFF setting.
   - "CT" appears during tone scan when the tone squelch is activated; "rT" appears when the tone squelch is not activated.
   - Subaudible tone frequencies flash as they are scanned.
4. Push [VFO] to stop the scan.

Pocket beep

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

◆ Waiting for a call from a specific station
1. Set the operating frequency.
2. Set the desired subaudible tone (same as that used for tone squelch operation, “CT”) in set mode.
   - See p. 22 for programming.
4. When a signal with a matched tone is received, the transceiver emits beep tones for 30 sec. and flashes “(•••).”
5. Push [PTT] to answer or push [VFO] to stop the beeps and flashing.
   - Tone squelch is automatically selected.

◆ Calling a waiting station using pocket beep
A subaudible tone matched with the station’s tone frequency is necessary. Use the tone squelch on the opposite page or a subaudible tone encoder.
OTHER FUNCTIONS

Help function

When in set mode or initial set mode and no operation is performed for 5 sec., the name of the selected item scrolls across the function display for convenience.

Initial set mode

Initial set mode is accessed at power on and allows you to set seldom-changed settings. In this way you can "customize" transceiver operation to suit your preferences and operating style.

1. While pushing [(H/L)SET], turn power on to enter initial set mode.
2. Push [H/L] or [TONE] one or more times until the desired item appears.
3. Rotate [DIAL] to select the desired setting.

Optional HM-75A functions

This item turns the microphone simple mode to one of two settings or off. Microphone simple mode is used to change the function assignments for switches on the optional HM-75A REMOTE CONTROL MICROPHONE as below. These assignments are convenient for 3-channel use of simple operation.

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

<table>
<thead>
<tr>
<th>SWITCH</th>
<th>NORMAL 1/NORMAL 2</th>
<th>SIMPLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>NORMAL 1: BAND</td>
<td>MONITOR Toggles squelch between open and closed.</td>
</tr>
<tr>
<td></td>
<td>Selects a band.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No function in memory mode.</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>NORMAL 2: MONITOR</td>
<td>CALL</td>
</tr>
<tr>
<td></td>
<td>Toggles squelch between open and closed.</td>
<td>Selects the call channel.</td>
</tr>
<tr>
<td></td>
<td>VFO/MEMORY</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Toggles VFO and memory mode.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Change the frequency or memory channel when pushed.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Start previously selected scan when pushed and held.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>* Normal 2 (while squelch is open):</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Adjust volume.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M00</td>
<td>Selects memory channel 1.</td>
</tr>
<tr>
<td></td>
<td>M01</td>
<td>Selects memory channel 2.</td>
</tr>
</tbody>
</table>

NOTE: During transmit, pushing [A] transmits a 1750 Hz tone for Europe and Italy versions.
◊ **Auto-power off**
The transceiver can be set to automatically turn off after a specified period in which no switch is pushed. 60 min., 40 min., 20 min. and off can be specified. This setting is retained even after the transceiver is turned off.

◊ **Display backlighting**
When set to AUTO, display backlighting automatically turns on when a key is pushed, and then turns off automatically; when set to OFF, display backlighting cannot be turned on; when set to ON, display backlighting remains on continuously.

◊ **LCD contrast**
This item sets function display contrast to one of two levels. “1” is for low contrast and “2” is for high contrast.

◊ **Beep tones**
Switch and function confirmation beep tones can be turned on or off as you prefer.
9 OTHER FUNCTIONS

◊ Power saver
This item sets the power saver duty cycle—the ratio of receive circuit on to receive circuit off while standing by. The duty cycle can be set to auto, 1:4, or off. Setting to auto conserves the most battery power.

<table>
<thead>
<tr>
<th>AUTO</th>
<th>Selects “1:4” duty ratio when receiving no signal for 5 sec., then “1:8” 60 sec. after that.</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td>No power save function.</td>
</tr>
</tbody>
</table>

Channel indication mode
Channel indication mode is used to simplify operation. In this mode only pre-programmed memory channel numbers are displayed and functions are limited ([PWR], [PTT], [SQL], [H/L], [SCAN], [LOCK] and the tuning dial are functional).

While pushing [MR], push [PWR] for 1 sec. to turn power on.
• Repeat this operation to return to normal indication.
• Frequencies must be programmed into memory channels in advance.

◊ Battery voltage indication
This sets the battery voltage indication on or off. When set to on, the battery voltage is indicated for 2 sec. at power on (LOW V, 3.5–16 V in .05 V steps). If the voltage surpasses 16 V, “OVER V” appears and flashes regardless of this setting.

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

While pushing [MR] + [VFO] + [BAND], push [PWR] for 1 sec. to turn power on and reset the transceiver.

▼ CAUTION: Resetting the CPU returns all programmed contents to their default settings.
Handheld-to-handheld cloning

Cloning allows you to quickly and easily transfer the programmed contents from one transceiver to another transceiver; or, data from a PC to a transceiver using the optional CS-T8 Cloning Software.

1. Connect the OPC-474 cloning cable with adapter plugs to the [SP] jack of the master and slave transceivers.
   - The master transceiver is used to send data to the slave transceiver.
2. While pushing [S.MW], turn power on to enter cloning mode (master transceiver only—power on only for slave transceiver).
   - "CLONE" appears and the transceivers enter the clone standby condition.
   - "CLOUT" appears in the master transceiver’s display and the S/RF indicator shows that data is being transferred to the slave transceiver.
   - "CL IN" appears automatically in the slave transceiver’s display and the S/RF indicator shows that data is being received from the master transceiver.

When cloning is finished, turn power off, then on again to exit cloning mode.

- Cloning using a PC
  Data can be cloned to and from a PC (IBM compatible) using the optional CS-T8 Cloning Software and the optional OPC-478 Cloning Cable. Cloning from a PC allows you to name memory channels. Consult the CS-T8 Cloning Software Read Me files for details.

- Cloning error
  - NOTE: DO NOT push the [PTT] on the slave transceiver during cloning. This will cause a cloning error.

When the display at right appears, a cloning error has occurred.

In such a case, both transceivers automatically return to the clone standby condition and cloning must be repeated.
10 BATTERY PACKS AND CHARGING

■ General

The supplied* BP-199 or BP-200 Battery Pack includes rechargeable Ni-MH batteries and can be charged approx. 300 times. Charge the battery pack before first operating the transceiver or when the battery pack becomes exhausted.
*Optional for versions which come with the BP-197 Battery Case.

If you want to get the longest life out of your battery pack (300+ charges), the following points should be observed:
1. Avoid overcharging. The charging period should be less than 15 hours.
2. Use the battery until it becomes almost completely exhausted under normal conditions. We recommend battery charging just after transmitting becomes impossible.

■ Charging precautions

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

NEVER connect two or more chargers at the same time.

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

■ About the battery pack

♦ Operating period
Depending on the attached battery pack, the operating period of the transceiver varies. When the approx. voltage of battery packs BP-198 to BP-200 falls to 4, 5 or 8 V, respectively, charging is necessary. Refer to p. 32 for battery pack specifications.

♦ Battery pack life
If your battery pack seems to have no capacity even after being fully charged, completely discharge it by leaving the power on overnight. Then, fully charge the battery pack again. If the battery pack still does not retain a charge (or very little), a new battery pack must be purchased.

❖ NOTE: When using a battery pack for the first time or after long periods of inactivity between charges (approx. 2 months or more), the battery pack will not be able to retain a full charge immediately. Subsequent charge/discharge cycles will eventually bring the battery pack up to full charge capacity.
## Charging connections

### Regular charging
Attach the supplied* or optional battery pack; then, connect the supplied* wall charger via an AC outlet as shown at right.

*Optional for versions which include a battery case.

### Rapid charging with the BC-119
1. Fix the optional AD-88 TERMINAL PCB BOARD FOR CHARGER into the BC-119 with the 4 supplied screws.
2. Insert the optional AD-87A CHARGE ADAPTER into the charging slot of the BC-119.
3. Insert the optional AD-87B CHARGE ADAPTER into the AD-87A (check orientation).
4. Insert the battery pack, either by itself or attached to the transceiver, into the whole assembly for charging (see right).

**Charging periods:**
- 1 hour (w/BP-198 or BP-199)
- 1.5 hours (w/BP-200)
**10 BATTERY PACKS AND CHARGING**

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

⚠ **CAUTION:** When the BP-197 BATTERY CASE is connected, charging cannot take place.

*To charge the battery pack 13 to 16 V DC is necessary.

**Battery case**
When using a battery case attached to the transceiver, install 3 AA(R6) size alkaline batteries as illustrated below.

Remove the case from the transceiver.

Open the case.

Install 3 AA(R6) size alkaline batteries into the battery case.
If your transceiver seems to be malfunctioning, please check the following points before sending it to a service center.

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>POSSIBLE CAUSE</th>
<th>SOLUTION</th>
<th>REF.</th>
</tr>
</thead>
<tbody>
<tr>
<td>No power comes on.</td>
<td>• The battery is exhausted. (A slight current flows in the circuits even when the power is off.)&lt;br&gt;• Poor plug connection to the external DC power cable.</td>
<td>• Charge the battery pack or place new dry cell batteries in the battery case.&lt;br&gt;(Remove the battery pack if you will not be using the transceiver for a long time.)&lt;br&gt;• Check the connector or remove and replace the cable.</td>
<td>pgs. 29, 30</td>
</tr>
<tr>
<td>Transmitting is impossible.</td>
<td>• The battery is exhausted.</td>
<td>• Charge the battery pack or place new dry cells in the battery case.</td>
<td>pgs. 29, 30</td>
</tr>
<tr>
<td>Frequency cannot be set.</td>
<td>• Memory mode, call channel or channel indication mode is selected.&lt;br&gt;• The lock function is activated.</td>
<td>• Push [VFO] to select VFO mode; or push [MR] at power on to cancel channel indication.&lt;br&gt;• Push [LOCK(CALL)] for 1 sec. to turn it off.</td>
<td>pgs. 8, 26 p. 10</td>
</tr>
<tr>
<td>Scan does not function.</td>
<td>• The same frequencies are programmed intoXA and XB (a pair of scan edge channels).</td>
<td>• Program different frequencies.</td>
<td>p. 15</td>
</tr>
<tr>
<td>[▲] or [▼] keys do not function when using the optional HM-75A.</td>
<td>• Memory channels 1 and/or 2 are not programmed and simple mode is selected.</td>
<td>• Program the memory channels or set to microphone normal 1 or normal 2.</td>
<td>pgs. 15, 24</td>
</tr>
<tr>
<td>Squelch does not open for received signals.</td>
<td>• Tone squelch is activated.</td>
<td>• Turn off the tone squelch.</td>
<td>p. 22</td>
</tr>
<tr>
<td>No beep sounds even when a key is pushed.</td>
<td>• Beep tones are turned off in initial set mode.</td>
<td>• Set beep tones on in initial set mode.</td>
<td>p. 25</td>
</tr>
</tbody>
</table>
12 OPTIONS

◇ Battery packs

<table>
<thead>
<tr>
<th>BATTERY PACK</th>
<th>VOLTAGE</th>
<th>CAPACITY</th>
<th>OUTPUT POWER</th>
<th>OPER. PERIOD*</th>
</tr>
</thead>
<tbody>
<tr>
<td>BP-197</td>
<td>4.8 V</td>
<td>700 mAh</td>
<td>0.8 W</td>
<td>9.1 h</td>
</tr>
<tr>
<td>BP-198</td>
<td>6.0 V</td>
<td>700 mAh</td>
<td>1.2 W</td>
<td>3.8 h</td>
</tr>
<tr>
<td>BP-199</td>
<td>6.0 V</td>
<td>680 mAh</td>
<td>2.0 W</td>
<td>3.5 h</td>
</tr>
<tr>
<td>BP-200</td>
<td>9.6 V</td>
<td>680 mAh</td>
<td>4.5 W</td>
<td>3.8 h</td>
</tr>
</tbody>
</table>

*Operating periods are calibrated for the following conditions:
Tx : Rx : standby = 1 : 1 : 8 min.

◇ Chargers and cables

BC-110A/D/V WALL CHARGER
Regularly charge battery packs attached to the transceiver in 15 hrs.

BC-119 DESKTOP CHARGER +
AD-88 TERMINAL PC BOARD FOR CHARGER +
AD-87 DESKTOP CHARGER ADAPTER
Rapidly charge battery packs in 1 to 1.5 hrs. depending on the battery pack. An AC adapter is packed with the BC-119 (except for the UK version). The AD-87 must be used with the BC-119 for charging the battery pack. The CP-17L or OPC-515L can be used instead of the supplied AC adapter.

CP-12L CIGARETTE LIGHTER CABLE WITH NOISE FILTER
For operation and charging via a 12 V cigarette lighter socket.

OPC-254L DC POWER CABLE
For operation and charging via an external power supply.

◇ Speaker-microphones

HM-46
HM-54
HM-75A
HS-85
- PTT switch
- VOX
- One-touch PTT for hands-free operation

Remote control capability (see p. 24)

◇ Others

CS-T8 CLONING SOFTWARE
LC-147 CARRYING CASES
SP-13 EARPHONE
Provides clear receive audio in noisy environments.
**SPECIFICATIONS**

- **Frequency coverage (MHz):**
  - **50 MHz**
    - **VHF**
      - USA: 50–54
    - **UHF**
      - USA: Tx: 144–148, Rx: 118–174*1
      - Europe: 144–146
      - Italy: 144–148
      - Asia: 144–148

- **Mode:** FM (F3E), WFM (Rx only), AM (118–135.995 MHz; Rx only)

- **Frequency stability:** ±10 ppm (0°C to 50°C; 32°F to 122°F)

- **No. of memory channels:** 123 (incl. 10 scan edges + 1 call channel for each band)

- **Antenna connector:** SMA (50Ω)

- **Usable battery pack/case:** BP-198–BP-200/BP-197

- **Power supply requirement:** 4.5–16 V DC (neg. ground)

- **Current drain (at 13.5 V DC):**
  - Transmit: high 1.8 A, low 1.0 A
  - Receive: max. audio 250 mA (typical), standby 16 mA (typical)

- **Usable temperature range:** –10°C to 60°C; 14°F to 140°F

- **Dimensions:** 106(W) × 58(H) × 28.5(D) mm; 4¾(W) × 2½(H) × 1½(D) in

- **Weight (w/BP-198):** 270 g; 9½ oz

- **Output power (13.5 V DC):** 5 W (high) 0.5 W (low)

- **Modulation system:** Variable reactance frequency modulation

- **Spurious emissions:** Less than –60 dB

- **Max. freq. deviation:** ±5 kHz

- **Microphone impedance:** 2 kΩ

- **Receive system:** Double conversion superheterodyne

- **Intermediate frequencies:**
  - 1st: 41.85 MHz
  - 2nd: 450 kHz

- **Sensitivity (12 dB SINAD):** Less than 0.18 μV*

- **Squelch sensitivity (threshold):** Less than 0.18 μV*

- **Selectivity:**
  - Less than 15 kHz/–6 dB*
  - More than 30 kHz/–60 dB*
  *Excluding WFM.

- **Spurious and image rejection ratio (except 2nd image freq.):**
  - 144/50 MHz
  - 430 MHz
  - –60 dB (typical)  —50 dB (typical)

- **Audio output power:**
  - 250 mW (typ. with an 8 Ω load)
  - (at 13.5 V DC)

All stated specifications are subject to change without notice or obligation.
14 OPERATION FLOW CHART

NOTE:
Displays for set and initial set modes show the default settings—rotate [DIAL] to change the condition.

Additional bands may be available in VFO mode depending on version.

CHANNEL INDICATION MODE

AT POWER ON

See p. 26 for details
**SET MODE**

- **SET**
  - **H/L**
- **Repeater tones (p. 13)**
- **Tuning step* (p. 9)**
- **Scan resume condition (p. 21)**
- **Offset frequency* (p. 13)**

*Cannot be selected when entering set mode from a memory or call channel.

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**INITIAL SET MODE**

- **TO ENTER**
  - **SET**
    - **H/L**
  - **MIC simple mode (p. 24)**
  - **TONE**
    - **DUP**

- **H/L**

- **AUTO power OFF (p. 25)**
- **LCD backlight (p. 25)**
- **Beep tones (p. 25)**
- **Auto repeater (p. 14)**

- **OFF**
- **AUTO LI**
- **ON BE**
- **OFF Rr**

- **U.S.A. version only**

- **LCD contrast (p. 25)**
- **DTMF speed (p. 18)**
- **Battery voltage (p. 26)**
- **Power saver duty (p. 26)**

- **OFF**
- **100 BT**
- **ON LD**
- **AUTO PS**

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**CLR MHz**

**VFO**
Count on us!